

## **Habrochloa bullockii** C. E. Hubbard. *Hook. Ic. Pl.* vii. t. 3645 (1967).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Zambia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Zambia, Kalambo Falls: Bullock 2857 (K holo).

**Illustrations (Books):** R.M.Polhill, F.T.E.A., *Gramineae* (1(1970):134, Fig.44), G.V.Pope et al., *Flora Zambesiaca* 10 (2(1999):24, t. 11).

**Illustrations (Journals):** *Hooker's Icones Plantarum* (t.3644 (1967)).

**Derivation** (Clifford & Bostock 2007): in honor of Arthur Allman Bullock (1906–1980) English botanist.

**Classification.** Subfamily Chloridoideae. Tribe: Chlороideae incertae sedis.

**Habit, Vegetative Morphology.** Annual. Culms erect or geniculately ascending, 10–25 cm long. Ligule a fringe of hairs. Leaf-blades 3–7 cm long, 1–2.5 mm wide, flaccid. Leaf-blade surface glabrous or pilose, sparsely hairy. Leaf-blade margins unthickened.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong or ovate, 2–7 cm long. Panicle branches capillary. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–5 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 2–2.5 mm long, breaking up at maturity, disarticulating below each fertile floret. Floret callus pubescent, obtuse.

**Glumes.** Glumes persistent, similar, reaching apex of florets, similar to fertile lemma in texture. Lower glume lanceolate, 1.5–2 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 2–2.5 mm long, 2 length of adjacent fertile lemma, membranous, 1-keeled, 1 -veined. Upper glume lateral veins absent. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 1–1.3 mm long, membranous, keeled, 3 -veined, 0–3 -veined. Lemma margins ciliate. Lemma apex dentate, 2 -fid, truncate, awned, 1 -awned. Principal lemma awn from a sinus, curved, 4–6 mm long overall. Palea 1 length of lemma, 2 -veined. Palea keels scaberulous. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Lodicules 2, fleshy. Anthers 3. Caryopsis with adherent pericarp, linear, trigonous. Embryo 0.25 length of caryopsis. Hilum punctiform.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West-Central Tropical Africa, East Tropical Africa, South Tropical Africa. Cameroon. Tanzania. Malawi, Zambia, Zimbabwe.

## **Hainardia cylindrica** (Willd.) Greuter. *Boissiera*, xiii. 177 (1967).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae* 5 (2000), T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from Australia. **Basionym or Replaced Name:** *Rottboellia cylindrica* Willd., *Sp. Pl.* 1(1): 464 (1797). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Habitat in Europa australi,

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 2 Pooideae (2012) (253), T. Cope & A. Gray, *Grasses of the British Isles* (61), L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (72, Fig. 45, as *Monerma*), G.E.Gibbs Russell el al, *Grasses of Southern Africa* (1990) (173, Fig. 101), N.Feinbrun-Dothan, *Flora Palaestina* 4 (1986) (as *Monerma*), N.L.Bor, *Gramineae in Flora of Iraq* (1968) (271, Fig.94 as *Monerma*), J.P.Jessop, G.R.M. Dashorst & F.M.James, *Grasses of South Australia* (2006) (128, Fig. 84), C.A.Gardner, *Flora of Western Australia*, Vol 1, Part 1, *Gramineae* (1952) (189, Pl. 55), N.Walsh & T.Entwistle, *Flora of Victoria* Vol 2 (1994), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (271), A.Wilson (ed.), *Flora of Australia*, Vol 44A. *Poaceae* (2009) (350, Fig. 47), D.Sharp & B.K.Simon, *AusGrass*. *Grasses of Australia*. CD-Rom Version 1.0. (2002), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 *Poaceae*, part 1 (2007) (690), E.G.Nicora, *Los Generos de Gramineas de America Austral* (1987) (221,

Fig. 66), A.L.Cabrera, *Flora de la Provincia de Buenos Aires, IV Pt 2 Gramineas* (1970) (294, Fig. 75 as *Monerma*), B.Rosengurtt, *Gramineas Uruguayas I* (1970) (91, Fig. 30 as *Monerma*).

**Derivation** (Clifford & Bostock 2007): L. *cylindrus*, cylinder; L. -*ica*, belonging to. Inflorescences cylindrical.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Annual. Culms erect or geniculately ascending, 10–27 cm long. Culm-nodes brown or black. Ligule an eciliate membrane, 0.5 mm long. Leaf-blades involute, 6–10 cm long, 1.5–2 mm wide.

**Inflorescence.** Inflorescence composed of racemes, embraced at base by subtending leaf. Racemes 1, single, smoothly terete, bilateral, 4–12 cm long. Rhachis fragile at the nodes, subcylindrical and excavated. Spikelet packing adaxial. Rhachis internodes linear or oblong, 3–7 mm long. Spikelets sunken, solitary. Fertile spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 5–7 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes one the lower absent or obscure, exceeding apex of florets, firmer than fertile lemma. Upper glume lanceolate, 5–7 mm long, 1–1.4 length of adjacent fertile lemma, coriaceous, without keels, 3 -veined. Upper glume lateral veins ribbed. Upper glume apex acuminate.

**Florets.** Fertile lemma lanceolate, 5 mm long, membranous, without keel, 3 -veined, 0–3 -veined. Lemma lateral veins less than two thirds length of lemma. Lemma surface puberulous, hairy above. Lemma apex acuminate.

**Flower and Fruit.** Anthers 3, 3 mm long. Caryopsis with adherent pericarp, ovoid. Embryo 0.2 length of caryopsis.

*n* = 7 (2 refs TROPICOS), or 13 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa, Temperate Asia, Australasia (\*), North America, South America.

**Region. Northern Europe (\*), Southwestern Europe, Southeastern Europe, Eastern Europe.**

**Country /Province /State :** Great Britain (\*). : Baleares, Corsica, France, Portugal, Sardinia, Spain. : Albania, Bulgaria, Greece, Italy, Crete, Sicily, Turkey Europe, Yugoslavia. Krym. **Northern Africa, Macaronesia, Southern Africa** (\*). Algeria, Libya, Morocco, Tunisia. Canary Is, Madeira. Western Cape, Eastern Cape. **Caucasus, Western Asia.** Iran, Iraq. **Australia** (\*), **New Zealand** (\*). Western Australia (\*), South Australia (\*), New South Wales (\*), A.C.T. (\*), Victoria (\*), Tasmania (\*). New Zealand North I, New Zealand South I. **Southwestern USA, South-central USA, Southeastern USA, Mexico.** California. Texas. Louisiana. Northwest Mexico. **Southern South America.** Argentina Northeast, Chile Central, Uruguay.

South-West. NW & Lake Eyre, Southern. Coast, Tablelands, Western Slopes, Western Plains. Buenos Aires. Coquimbo, Biobio. Baja California.

### **Hakonechloa macra** (Munro) Honda. *J. Fac. Sci. Univ. Tokyo* 3,3 :113 (1930).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.Koyama, *Grasses of Japan and its neighboring regions* (1987).

**TYPE** from Japan. **Basionym or Replaced Name:** *Phragmites macer* Munro, *J. Bot.* 15: 298, 350 (1877)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Bisset 805*, Oct 1876, Japan: Uyama (K).

**Illustrations (Books):** T.Koyama, *Grasses of Japan and its neighbouring regions* (1987) (235, Fig 86), M.E.Barkworth et al, *Flora of North America north of Mexico Vol 25 Poaceae*, part 2 (2003) (9).

**Images:** R.Darke, *Ornamental Grasses* (2004); R.Darke, *The Encyclopaedia of Grasses for Liveable Landscapes* (2007);

**Derivation** (Clifford & Bostock 2007): L. thin. Leaf-blades narrow.

**Classification.** Subfamily Arundinoideae. Tribe: Arundineae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated, scaly. Stolons present. Culms erect, 40–70 cm long, 1–1.5 mm diam., 6–8 -noded. Leaves caudine. Leaf-sheath oral hairs pubescent. Ligule a ciliolate membrane. Leaf-blades lanceolate, 8–25 cm long, 4–12 mm wide.

**Inflorescence.** Inflorescence a panicle, comprising 15–20 fertile spikelets. Panicle open, ovate, 6–12 cm long, 5–7 cm wide, bearing few spikelets. Primary panicle branches 2 -nate. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, filiform, glabrous or ciliate, hairy above or below (base / tip).

**Fertile Spikelets.** Spikelets comprising 5–10 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 10–20 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 0.3–0.4 mm long. Floret callus elongated, 1.5–2 mm long, pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet. Lower glume lanceolate, 3–4 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1–3 -veined. Lower glume apex acuminate. Upper glume lanceolate, 3.8–5 mm long, 0.7 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acuminate.

**Florets.** Fertile lemma lanceolate, 6–7 mm long, membranous, keeled, 3 -veined, 0–3 -veined. Lemma margins ciliate, hairy below. Lemma apex acute, awned, 1 -awned. Principal lemma awn 3–4.5 mm long overall. Palea oblong, 0.8 length of lemma, 2 -veined. Palea keels ciliate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 2–3 mm long. Caryopsis with free soft pericarp, oblong, 2 mm long.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** Eastern Asia. Japan Honshu. Japan.

### **Halopyrum mucronatum** (L.) Stapf. *Hook. Ic. Pl. t.* 2448 (1896).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India, Sri Lanka. **Basionym or Replaced Name:** *Uniola mucronata* L., *Sp. Pl. (ed. 2)* 1: 104 (1762)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: NT: *Fosberg et al.* 50918, 30 Dec 1968, Sri Lanka: Wilpatti National Park (K; INT: US). LT designated by Renvoize in Cafferty et al., *Taxon* 49(2): 258 (2000).

**Illustrations (Books):** R.M.Polhill, F.T.E.A., *Gramineae* (2(1974):182, Fig.57), G.V.Pope et al., *Flora Zambesiaca* 10 (2(1999):38, t. 17), J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969) (133, Fig 43), S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (96, Fig 40), L.Boulos, *Flora of Egypt* 4 (2005) (249, Pl. 73), T.A.Cope, in M.Thulin, *Poaceae* (Gramineae). *Flora of Somalia* (1995) (175, Fig 89).

**Derivation** (Clifford & Bostock 2007): L. *mucro*, sharp point; -*ata*, possessing. With glumes or lemmas contracted into a short hard point or bifid and shortly awned from between the teeth.

**Classification.** Subfamily Chloridoideae. Tribe: Chlidoideae incertae sedis.

**Habit, Vegetative Morphology.** Perennial, caespitose. Stolons present. Butt sheaths scarious, glabrous. Culms erect, 60–100 cm long, wiry. Lateral branches sparse. Leaves basal and caudine. Leaf-sheaths wider than blade at the collar, smooth, glabrous on surface. Ligule a fringe of hairs, 1–2 mm long. Leaf-blades curled, involute, 15–45 cm long, 2–4 mm wide, stiff, glaucous. Leaf-blade surface ribbed. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence composed of racemes. Racemes 3–10, borne along a central axis, erect, unilateral, 2–6 cm long, bearing few fertile spikelets, bearing 3–7 fertile spikelets on each. Central inflorescence axis 10–40 cm long. Rhachis angular. Spikelet packing broadside to rhachis, lax. Spikelets ascending, solitary. Fertile spikelets pedicelled. Pedicels present, linear, 1.5–6 mm long.

**Fertile Spikelets.** Spikelets comprising 8–25 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, laterally compressed, 12–26 mm long, 5–7 mm wide, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 0.5 mm long, obscured by lemmas, villous, hairy at tip, with 3–5 mm long hairs. Floret callus bearded. Floret callus hairs 0.3–0.5 length of lemma.

**Glumes.** Glumes persistent, similar, shorter than spikelet. Lower glume lanceolate, 6–9 mm long, 0.9–1 length of upper glume, coriaceous, without keels, 3–5 -veined. Lower glume apex acute. Upper glume lanceolate, 6–9 mm long, 0.9–1 length of adjacent fertile lemma, coriaceous, without keels, 5–7 -veined. Upper glume apex acute.

**Florets.** Fertile florets free at tip. Fertile lemma lanceolate, 7–9 mm long, coriaceous, without keel or keeled, lightly keeled, keeled above, 3 -veined, 0–3 -veined. Lemma lateral veins midway between midvein and margin. Lemma surface asperulous. Lemma apex entire or dentate, 2 -fid, incised 0.05 of lemma length, obtuse or acute, mucronate. Palea 1 length of lemma, hyaline, 2 -veined. Palea keels scaberulous. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Lodicules 2, cuneate, 1 mm long, fleshy. Anthers 3, linear. Stigmas 2. Caryopsis with adherent pericarp, ellipsoid, dorsally compressed, concavo-convex, estipitate, glabrous. Embryo 0.4 length of caryopsis. Hilum punctiform. Endosperm farinose. Disseminule comprising a floret.

**Distribution (TDWG).** Continent. Africa, Temperate Asia, Tropical Asia.

**Country /Province /State.** Northern Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Western Indian Ocean. Egypt. Eritrea, Ethiopia (inc. Eritrea), Socotra, Somalia, Sudan, Kenya, Tanzania, Mozambique, Madagascar. Western Asia, Arabian Peninsula. Iran. Gulf States, Kuwait, Oman. Indian Subcontinent. India, Pakistan, Sri Lanka.

Maharashtra, Tamilnadu.

### **Harpachne bogdanii** Kennedy-O'Byrne. *Hook. Ic. Pl.* vi. 1. 3596 . (1962).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Kenya. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: ST: A. Bogdan AB 3767, 11 Jul 1953, Kenya: 35 m. SE of Embu (S of Tana Rv.), woodland, alt. 3700 ft (LE, US-2368551).

ST: A. Bogdan 3763, no date, Kenya: Central (US-2368550).

**Illustrations (Journals):** *Hooker's Icones Plantarum* (t.3596 (1962)).

**Derivation** (Clifford & Bostock 2007): in honor of A. V. Bogdan who collected in East Africa.

**Classification.** Subfamily Chloridoideae. Tribe: Eragrostideae.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms erect, 54–74 cm long. Ligule a fringe of hairs, 0.4–1 mm long. Leaf-blades flat or convolute, 14–28 cm long, 2.5–4.5 mm wide. Leaf-blade surface glabrous or pilose. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear or oblong, multilateral, 12–24 cm long. Rhachis angular. Spikelet packing lax. Spikelets pendulous, solitary. Fertile spikelets pedicelled. Pedicels present, filiform (branching into racemelets at base of raceme), 5–48 mm long, puberulous.

**Fertile Spikelets.** Spikelets comprising 11–18 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 9.5–15 mm long, falling entire, deciduous with the pedicel, pedicel base pungent or hooked. Rhachilla internodes definite, straight, obscured by lemmas.

**Glumes.** Glumes similar, shorter than spikelet. Lower glume oblong, 2.6–3.1 mm long, 0.6–0.8 length of upper glume, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex obtuse. Upper glume oblong, 3.3–4 mm long, 0.8–1 length of adjacent fertile lemma, 1-keeled, 1 -veined. Upper glume lateral veins absent. Upper glume apex obtuse.

**Florets.** Fertile florets decreasing in size upwards. Fertile lemma lanceolate in profile, 3.3–4.1 mm long, membranous or cartilaginous, of similar consistency above or much thinner above, keeled, 3 -veined, 0–3 -veined. Lemma midvein scaberulous. Lemma margins ciliolate. Lemma apex acuminate, mucronate. Palea bowed outwards, 0.6–0.7 length of lemma, 2 -veined. Palea keels winged, ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Caryopsis with adherent pericarp, ellipsoid, laterally compressed, biconvex, 1 mm long, dark brown.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** East Tropical Africa. Kenya.

## **Harpachne harpachnoides** (Hackel) Keng. *Claves Gen. & Spec. Gramin. Sinic.* 179 (1957).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**TYPE** from China. **Basionym or Replaced Name:** *Eragrostis harpachnoides* Hack., *Oesterr. Bot. Z.* 52: 306 (1902)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: China: Yunnan: secus vias ad Pee-long-tau prope Tapintze, *Delavay 1807* (HT: P).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 681).

**Derivation** (Clifford & Bostock 2007): Gk -*oides*, resembling. Similar to *Harpachne*.

**Classification.** Subfamily Chloridoideae. Tribe: Eragrostideae.

**Habit, Vegetative Morphology.** Annual. Culms 13–25 cm long, 3 -noded. Lateral branches lacking. Leaf-sheaths glabrous on surface, outer margin hairy. Ligule a fringe of hairs. Leaf-blades 3–7 cm long, 1–2.5 mm wide, stiff. Leaf-blade venation distinct. Leaf-blade surface glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear, multilateral, 4–7 cm long. Spikelet packing crowded. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, filiform, flexuous, 3 mm long, pubescent, tip widened.

**Fertile Spikelets.** Spikelets comprising 8 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 5–7 mm long, falling entire, deciduous with the pedicel. Rhachilla internodes glabrous.

**Glumes.** Glumes similar, shorter than spikelet. Lower glume oblong, 2 mm long, 0.66 length of upper glume, 1-keeled, 1 -veined. Lower glume primary vein scabrous. Lower glume lateral veins absent. Lower glume apex obtuse. Upper glume oblong, 3 mm long, 1 length of adjacent fertile lemma, 1-keeled, 1 -veined. Upper glume primary vein scabrous. Upper glume lateral veins absent. Upper glume apex obtuse.

**Florets.** Fertile florets increasing in size upwards. Fertile lemma ovate, 2.5–3 mm long, membranous, keeled, 3 -veined, 0–3 -veined. Lemma midvein scabrous. Lemma lateral veins prominent. Lemma margins ciliolate, hairy below. Lemma apex acuminate. Palea bowed outwards, 0.66 length of lemma, 2 -veined. Palea keels winged, with erose wings. Palea apex obtuse. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 1 mm long. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** China. China South Central.

Sichuan, Yunnan.

## **Harpachne schimperi** A. Rich. *Fl. Abyss.* 2:431 (1850).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: ST: *G.H.W. Schimper 171*, 13 Jan 1837, Ethiopia: Tigre, near Adua (P; IT: K, MO, US-81967).

ST: *Q. Dillon s.n.*, Ethiopia (P).

**Illustrations (Books):** H.Jacques-Felix, *Les Graminees d'Afrique tropicale* (1962) (197, Fig. 119), R.M.Polhill, F.T.E.A., *Gramineae* (2(1974):271, Fig. 74), G.V.Pope et al., *Flora Zambesiaca* 10 (2(1999):153 t. 44), S.Phillips, *Poaceae (Gramineae)* in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (131, Fig. 53), T.A.Cope, in M.Thulin, *Poaceae (Gramineae)*, *Flora of Somalia* (1995) (184, Fig. 96).

**Derivation** (Clifford & Bostock 2007): in honor of Georg Heinrich Wilhelm Schimper (1804–78) German plant collector in Near East and north-eastern Africa.

**Classification.** Subfamily Chloridoideae. Tribe: Eragrostideae.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms erect or geniculately ascending, 13–52 cm long. Ligule a fringe of hairs, 0.3–0.5 mm long. Leaf-blades flat or convolute, 5–19 cm long, 2–5 mm wide. Leaf-blade surface pilose. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, oblong, multilateral, 2.5–10 cm long. Rhachis angular. Spikelet packing crowded. Spikelets pendulous, solitary. Fertile spikelets pedicelled. Pedicels present, filiform, 2–8 mm long, pubescent.

**Fertile Spikelets.** Spikelets comprising 6–13 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 8.3–21 mm long, falling entire, deciduous with the pedicel, pedicel base pungent or hooked. Rhachilla internodes curved, eventually visible between lemmas.

**Glumes.** Glumes similar, shorter than spikelet. Lower glume oblong, 1.2–3 mm long, 0.6–0.8 length of upper glume, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume oblong, 2.1–3.6 mm long, 0.5–0.6 length of adjacent fertile lemma, 1-keeled, 1 -veined. Upper glume lateral veins absent. Upper glume apex acute.

**Florets.** Fertile florets increasing in size upwards. Fertile lemma lanceolate in profile, 3.8–7.3 mm long, membranous or cartilaginous, of similar consistency above or much thinner above, keeled, 3 -veined, 0–3 -veined. Lemma midvein scaberulous. Lemma margins ciliolate. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 0.5–2.6 mm long overall. Palea bowed outwards, 0.5–0.6 length of lemma, 2 -veined. Palea keels winged, ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Caryopsis with adherent pericarp, ellipsoid, laterally compressed, biconvex, 0.75–1.3 mm long, dark brown.

**Distribution (TDWG). Continent.** Europe (\*), Africa, Temperate Asia.

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa.** Rwanda. Eritrea, Ethiopia (inc. Eritrea), Somalia, Sudan. Kenya, Tanzania, Uganda. Zambia, Zimbabwe. **Arabian Peninsula.** Saudi Arabia, Yemen.

### **Harpochloa falx** (Linn. f.) Kuntze. *Rev. Gen.* 764 (1891).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. **Basionym or Replaced Name:** *Melica falx* L. f., *Suppl. Pl.* 109 (1781) [1782]

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: South Africa, Cape: Sparrmann (LINN holo).

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (190, Fig 166), G.E.Gibbs Russell et al, *Grasses of Southern Africa* (1990) (174, Fig. 102), R.Pilger, *Die Naturlichen Pflanzenfamilien* 14d (1956) (102, Fig. 27).

**Images:** F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999).

**Derivation** (Clifford & Bostock 2007): L. sickle. Inflorescence a curved spike.

**Classification.** Subfamily Chloridoideae. Tribe: Cynodonteae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with compacted dead sheaths. Culms 30–80 cm long. Ligule a ciliolate membrane. Leaf-blades convolute, 5–25 cm long, 1–3 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, arcuate, unilateral, 1–8 cm long. Rhachis semiterete, ciliate on margins, terminating in a barren extension, extension subulate. Spikelet packing broadside to rhachis, crowded, regular, 2 -rowed. Spikelets pectinate, solitary. Fertile spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 6–9 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes lower persistent, upper deciduous, dissimilar, reaching apex of florets, similar to fertile lemma in texture, gaping. Lower glume ovate, 0.5 length of upper glume, 0.5 length of spikelet, membranous, without keels, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma oblong, laterally compressed, 6–9 mm long, membranous, keeled, 3 -veined, 0–3 -veined. Lemma midvein ciliate. Lemma margins ciliate. Lemma apex emarginate. Apical sterile florets 2 in number, male or barren, in a clump, cuneate, 2–4 mm long. Apical sterile lemmas glabrous.

**Flower and Fruit.** Caryopsis with adherent pericarp, ellipsoid, isodiametric, trigonous.

*n* = 20 (1 ref TROPICOS), or 35 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. Southern Africa.** Limpopo, North-West, Gauteng, Mpumalanga, Swaziland, Free State, Kwazulu-Natal, Lesotho, Western Cape, Eastern Cape.

### **Harpochloa pseudoharpechloa** (Chiov.) W.D. Clayton. *Kew Bull.*, 37(3): 419 (1982).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Zaire. **Basionym or Replaced Name:** *Rendlia pseudoharpechloa* Chiov., *Ann. Bot. (Rome)* 13: 55 (1914)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: Zaire, Kayoyo: Bovone 47.

**Illustrations (Books):** G.V.Pope et al., *Flora Zambesiaca* 10 (2)(1999):224 t. 66.

**Classification.** Subfamily Chloridoideae. Tribe: Cynodonteae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with compacted dead sheaths. Culms 70–120 cm long. Ligule a ciliolate membrane. Leaf-blades filiform, conduplicate, 10–30 cm long, 1–2 mm wide, coriaceous, stiff.

**Inflorescence.** Inflorescence composed of racemes, exserted or embraced at base by subtending leaf. Racemes 1, single, arcuate, unilateral, 4–7 cm long. Rhachis semiterete, ciliate on margins, terminating in a barren extension, extension subulate. Spikelet packing broadside to rhachis, crowded, regular, 2 -rowed. Spikelets pectinate, solitary. Fertile spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, laterally compressed, 6–8 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes lower persistent, upper deciduous, dissimilar, reaching apex of florets, thinner than fertile lemma, parallel to lemmas. Lower glume ovate, 4–6 mm long, 0.66–0.75 length of upper glume, hyaline, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 6–8 mm long, 1 length of adjacent fertile lemma, hyaline, 1-keeled, 1 -veined. Upper glume lateral veins absent. Upper glume apex acute.

**Florets.** Fertile lemma ovate, laterally compressed, 6–8 mm long, chartaceous, keeled, 3 -veined, 0–3 -veined. Lemma midvein ciliate. Lemma margins ciliate. Lemma apex emarginate. Palea 0.8–0.9 length of lemma. Apical sterile florets 2 in number, dissimilar. First apical floret male, oblong, 5 mm long, glabrous, muticous. Apical sterile florets barren, cuneate, 0.5 mm long. Apical sterile lemmas glabrous.

**Flower and Fruit.** Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. West-Central Tropical Africa, South Tropical Africa.** DRC. Angola, Zambia.

### **Helictochloa adsurgens** (Simonk.) Romero Zarko. *Candollea* 66: 102 (2011).

**Illustrations:** None found.

### **Helictochloa aetolica** (K. H. Rechinger) Romero Zarco. *Candollea* 66: 102 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**TYPE** from Greece. **Basionym or Replaced Name:** *Avenastrum aetolicum* K. H. Rechinger, *Beih. Bot. Centralbl.* 54 E. 680 (1936). T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: Greece, Korax Mt.: Herb. Halacsy.

**Recent Synonyms:** *Avenula aetolica* (Rech. f.) J. Holub, *Folia Geobot. Phytotax.* 11(3): 294 (1976). *Helictotrichon aetolicum* (K. H. Rechinger) Holub, *Preslia*, i. 50 (1959).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. -ica*, belonging to. From Aitolia Province, Greece.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Rhizomes short. Culms slender, 20–60 cm long. Ligule an eciliate membrane, 4–6 mm long, 4–6 mm long on basal shoots, acute.

Leaf-blades conduplicate, 4–8 cm long, 1.5–2 mm wide. Leaf-blade venation with subepidermal sclerenchyma attached to veins above, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved, smooth. Leaf-blade margins scaberulous. Leaf-blade apex obtuse.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear or oblong, 5–10 cm long. Primary panicle branches 1-nate, 0.6–1 cm long. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 5–7 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 20 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2–2.5 mm long, pilose, with 1.5 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume elliptic, 11 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3-veined. Lower glume apex acute. Upper glume elliptic, 14 mm long, 1–1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3-veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 12–14 mm long, cartilaginous, without keel, 5–7-veined, more than 3-veined. Lemma apex dentate, 2-fid, awned, 1-awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 12–16 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG).** Continent. Europe.

**Region.** Southeastern Europe.

**Country /Province /State.** : Greece.

### **Helictochloa agropyroides** (Boiss.) Romero Zarco. *Candollea* 66: 102 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Greece. **Basionym or Replaced Name:** *Avena agropyroides* Boiss., *Diagn. Pl. Orient.* 2(13): 50 (1854)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: Greece, Argolide: Spruner.

**Recent Synonyms:** *Helictotrichon agropyroides* (Boiss.) Henrard, *Blumea*, 3: 430 (1940).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): Gk. *-oides*, resembling. Similar to Agropyron with respect to the inflorescence.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Butt sheaths persistent and investing base of culm, with compacted dead sheaths. Basal innovations extravaginal. Culms erect, 50–90 cm long. Ligule an eciliate membrane, 3–6 mm long, acute. Leaf-blades 1.7–2.6 mm wide, stiff. Leaf-blade midrib prominent beneath. Leaf-blade surface glabrous. Leaf-blade margins scabrous.

**Inflorescence.** Inflorescence a panicle, comprising 5–15 fertile spikelets. Panicle open, lanceolate, 10–22 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 1–6 mm long, scaberulous.

**Fertile Spikelets.** Spikelets comprising 5–10 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 15–34 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes glabrous or pubescent, hairy above. Floret callus pilose. Floret callus hairs 2 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 15 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3-veined. Lower glume apex acute. Upper glume elliptic, 20 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3-veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 15–18 mm long, cartilaginous, without keel, 7-veined, more than 3-veined. Lemma surface glabrous or pubescent, hairy below. Lemma apex dentate, 2-fid, awned, 1-awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, triquetrous below, 15–25 mm

long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 70$  (2 refs TROPICOS).

**Distribution (TDWG).** Continent. Europe.

**Region.** Southeastern Europe.

**Country /Province /State.** : Greece.

### **Helictochloa albinervis** (Boiss.) Romero Zarco. *Candollea* 66: 102 (2011).

**TYPE** from Spain. **Basionym or Replaced Name:** *Avena albinervis* Boiss., *Voy. Bot. Espagne*, 2: 656 (1845). T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: Spain, Sa. d'Estepona: Boissier (G lecto, K).

**Recent Synonyms:** *Avenula albinervis* (Boissier) M. Lainz, *Comun. L. N. L. A. Recursos Nat.*, 2: 23 (1974). *Helictotrichon albinerve* (Boiss.) Henrard, *Blumea*, 3: 429 (1940).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *albus*, white; *nervum*, vein. Veins of lemma white.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Stolons present. Culms 30–60 cm long. Leaf-sheaths open for most of their length. Ligule an eciliate membrane, 3–5 mm long, 0.5–2 mm long on basal shoots, acute. Leaf-blades tortuous, conduplicate, 7–20 cm long, 3–5 mm wide, 0.5–1.5 cm long at summit of culm, grey-green. Leaf-blade venation with 14–22 secondary veins, subepidermal sclerenchyma attached to veins above, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved, smooth.

**Inflorescence.** Inflorescence a panicle, comprising 11–40 fertile spikelets. Panicle open, linear or oblong, 7–16 cm long. Primary panicle branches 2 -nate. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–7 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 12–16 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose, with 1.5–2 mm long hairs. Floret callus pilose. Floret callus hairs 2–3 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 10–12 mm long, 0.9 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 11–14 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma obovate, 11–14 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma surface pubescent, hairy below. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 14–20 mm long overall, with twisted column. Lateral lemma awns present, 0.5–1 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 28$  (1 ref TROPICOS).

**Distribution (TDWG).** Continent. Europe, Africa.

**Region.** Southwestern Europe.

**Country /Province /State.** : France, Portugal, Spain. **Northern Africa.** Morocco.

### **Helictochloa armeniaca** (Schischk.) Romero Zarco. *Candollea* 66: 102 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Turkey. **Basionym or Replaced Name:** *Avena armeniaca* Schischkin, *Ber. Tomsk. Staats Univ.* 81: 418 (1928). T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: Turkey,

Sarikamis: Sapozhnikov (LE syn) ; Turkey, Chasan-kala: Sapozhnikov s.n. (LE syn) ; Turkey, Sonamei-su R.: Sapozhnikov sn (LE syn).

**Recent Synonyms:** *Helictotrichon armeniacum* (Schischk.) Grossheim, *Trud. Bot. Inst. Akad. Nauk SSSR, Azerb. Fil., Baku*, viii/48:214 (1939).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -ica, belonging to. From Armenia.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with fibrous dead sheaths. Culms 50–100 cm long, 2 -noded. Culm-internodes terete. Lateral branches lacking. Leaves mostly basal. Leaf-sheaths striately veined, smooth, glabrous on surface. Ligule an eciliate membrane, 2–5 mm long. Leaf-blades conduplicate, 7–14 cm long, 1–4 mm wide. Leaf-blade surface scaberulous, rough abaxially. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle, comprising 6–10 fertile spikelets. Panicle open, linear, 8–15 cm long, 0.8–1.2 cm wide, bearing few spikelets. Primary panicle branches spreading, 2.6–4.6 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 15–20 mm long, smooth.

**Fertile Spikelets.** Spikelets comprising 5–8 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 20–30 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 4–5 mm long, pubescent. Floret callus pilose. Floret callus hairs 1 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 15–18 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume surface asperulous, rough on veins. Lower glume apex acuminate. Upper glume lanceolate, 18–23 mm long, 1.1–1.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume surface asperulous, rough on veins. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 16–19 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, acute, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 16–17 mm long overall, with twisted column. Palea 11 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State. Caucasus, Western Asia.** North Caucasus, Transcaucasus. Turkey.

### ***Helictochloa blaui* (Aschers. & Janka) Romero Zarco. *Candollea* 66: 102 (2011).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**Basionym or Replaced Name:** *Avenula blaui*.

**Recent Synonyms:** *Helictotrichon blaui* (Aschers. & Janka) C. E. Hubbard, *Kew Bull.* 1939, 101 (1939).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Otto Blau (1828–1879) German diplomat.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Rhizomes short. Culms slender, 30–60 cm long. Ligule an eciliate membrane, 2–4 mm long, 1–2 mm long on basal shoots, acute. Leaf-blades filiform, convolute, 15–30 cm long, 0.4–0.6 mm wide, 5–7 cm long at summit of culm. Leaf-blade venation with 6 secondary veins, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved.

**Inflorescence.** Inflorescence a panicle, comprising 4–9 fertile spikelets. Panicle open, linear or oblong, 4–13 cm long, bearing few spikelets. Primary panicle branches indistinct the panicle almost racemose. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–7 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 15–30 mm long, breaking up at maturity,

disarticulating below each fertile floret. Rhachilla internodes 2–3 mm long, pilose, with 1.5–2.5 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 10–15 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 14–20 mm long, 1.1–1.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, widest at 0.5 of its length from base, 12–18 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 15–22 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region. Southeastern Europe.**

**Country /Province /State.** : Albania, Yugoslavia.

### **Helictochloa bromoides** (Gouan) Romero Zarco. *Candollea* 66: 102 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**TYPE** from France. **Basionym or Replaced Name:** *Avena bromoides* Gouan, *Hort. Monsp.* 52 (1762). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: France, Montpellier: Coll?.

**Recent Synonyms:** *Avenula bromoides* (Gouan) H. Scholz, *Willdenowia* 7(2): 420 (1974). *Helictotrichon bromoides* (Gouan) C. E. Hubbard, *Kew Bull.* 1939, 101 (1940).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): Gk. *-oides*, resembling. Resembling *Bromus*, usually with respect to the inflorescence.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms erect, 25–50 cm long. Ligule an eciliate membrane, 0.5–2 mm long, truncate or obtuse. Leaf-blades straight or tortuous, flat or conduplicate, 3–10 cm long, 1–3 mm wide. Leaf-blade margins cartilaginous, scabrous.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear, 4–20 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–5 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 14–20 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes glabrous. Floret callus pilose, with elliptic scar.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 5–8 mm long, 0.5–0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 9–10 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3–5 -veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate or oblong, 9–11 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma lateral veins obscure. Lemma surface glabrous or pubescent, hairy at base. Lemma apex entire or dentate, 2 -fid, emarginate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.6 way up back of lemma, geniculate, 12–17 mm long overall, with twisted column.

**Flower and Fruit.** Anthers 3, 5–5.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, oblong, 3 mm long, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe, Africa.

**Region. Northern Europe (\*), Southwestern Europe, Southeastern Europe.**

**Country /Province /State.** : GB Aliens (Ryves et al). : Baleares, France, Portugal, Spain. : Italy. **Northern Africa.** Algeria, Libya, Morocco, Tunisia.

### **Helictochloa cincinnata** (Tenore) Romero Zarco. *Candollea* 66: 102 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**TYPE** from Italy. **Basionym or Replaced Name:** *Bromus cincinnatus* Ten., *Corso Lez. Bot.* 4:52 (1820). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Italy: Coll?.

**Recent Synonyms:** *Helictotrichon cincinnatum* (Tenore) M. Roser, *Karyol., Syst. u. Chorol. Untersuch. Gatt. Helictotrichon* W. Mittelmeer. (*Diss. Bot.* 145): 126: (1989).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *cincinnus*, lock of hair; -*ata*, possessing.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 40–80 cm long, 1 mm diam. Ligule an eciliate membrane, 4–5 mm long, 1–1.5 mm long on basal shoots, acute. Leaf-blades tortuous, flat or conduplicate, 10–15 cm long, 2–3 mm wide, 0.5–3 cm long at summit of culm, glaucous. Leaf-blade venation with subepidermal sclerenchyma free from veins, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ribbed, grooved abaxially. Leaf-blade margins cartilaginous.

**Inflorescence.** Inflorescence a panicle, comprising 6–17 fertile spikelets. Panicle open, linear or oblong, 6–12 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 5–7 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 18–24 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2–3 mm long, glabrous. Floret callus pilose. Floret callus hairs 1.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate, 10–14 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3-veined. Lower glume apex acute. Upper glume lanceolate, 13–18 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3-veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, widest at 0.5 of its length from base, 12–16 mm long, cartilaginous, without keel, 5–7-veined, more than 3-veined. Lemma apex dentate, 2-fid, awned, 1-awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 13–22 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 28$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe, Southeastern Europe.

**Country /Province /State.** : Baleares, Spain. : Italy, Sicily.

### ***Helictochloa compressa* (Heuff.) Romero Zarco. *Candollea* 66: 102 (2011).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Yugoslavia. **Basionym or Replaced Name:** *Avena compressa* Heuff., *Flora* 18: 244 (1835)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Yugoslavia, Verschetz: Heuffel (BP holo, K).

**Recent Synonyms:** *Avenula compressa* (Heuffel) W. Sauer & H. Chmelitschek, *Mitt. Bot. Staatssamml. Munchen*, 12: 582 (1976). *Helictotrichon compressum* (Heuff.) Henrard, *Blumea*, 3: 429 (1940).

**Illustrations:** None found.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Culms erect, slender, 15–58 cm long, 1–2-noded. Culm-internodes elliptical in section (slightly at base). Lateral branches lacking. Leaves mostly basal. Leaf-sheaths smooth, glabrous on surface. Ligule an eciliate membrane, 1–10 mm long, acuminate. Leaf-blades conduplicate, 3–10 cm long, 1–4 mm wide, glaucous. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle, comprising 7–17 fertile spikelets. Panicle open, oblong, 4–12.5 cm long, 0.5–3 cm wide. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 1–7 mm long, scaberulous.

**Fertile Spikelets.** Spikelets comprising 3–6 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the

upper sterile. Spikelets oblong, laterally compressed, 14–24 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1–2.5 mm long, glabrous. Floret callus pubescent. Floret callus hairs 0.5–1 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 8–11 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume lanceolate, 10–13 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma oblong, 9–13 mm long, cartilaginous, light brown or red, without keel, 5 -veined, more than 3-veined. Lemma lateral veins prominent. Lemma surface scabrous. Lemma apex dentate, 2 -fid, acute, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 16 mm long overall, with twisted column. Palea 7.5–10 mm long. Palea keels eciliate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 4–6 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, Temperate Asia.

**Region. Middle Europe, Southeastern Europe, Eastern Europe.**

**Country /Province /State.** : Hungary. : Bulgaria, Greece, Romania, Turkey Europe, Yugoslavia. East European Russia. Siberia, **Western Asia.** Turkey.

### ***Helictochloa crassifolia* (Font Quer) Romero Zarco. *Candollea* 66: 102 (2011).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**Basionym or Replaced Name:** *Avenula crassifolia*.

**Recent Synonyms:** *Helictotrichon crassifolium* (Font Quer) M. Roser, *Karyol.*, *Syst. u. Chorol. Untersuch. Gatt. Helictotrichon* W. Mittelmeer. (*Diss. Bot.* 145): 123: (1989).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *crassus*, thick; *folium*, leaf. Leaf-blades thick.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Rhizomes absent or short. Butt sheaths pubescent. Basal innovations extravaginal. Culms 35–60 cm long. Ligule an eciliate membrane, 2–5 mm long, 0.1–0.3 mm long on basal shoots, acute. Leaf-blades convolute, 15–30 cm long, 2–4.5 mm wide, fleshy. Leaf-blade venation with 10–13 secondary veins, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved.

**Inflorescence.** Inflorescence a panicle, comprising 5–10 fertile spikelets. Panicle open, linear or oblong, 7–15 cm long, bearing few spikelets. Primary panicle branches indistinct the panicle almost racemose. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 5–7 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 15–28 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose, with 1.5 mm long hairs. Floret callus pilose. Floret callus hairs 1.5–2 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 12–15 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 15–18 mm long, 1–1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 13–18 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 17–23 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 5–6.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region. Southwestern Europe.**

**Country /Province /State.** : Baleares.

## **Helictochloa dahurica** (Komarov) Romero Zarco. *Candollea* 66: 102 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. **Basionym or Replaced Name:** *Avena planiculmis* subsp. *dahurica* Kom., *Fl. Kamtschatka* 1: 159 (1927)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Russia: Transbaikal, Kamtschatka, ad fl. Schilka, 1833, *Turczaninow* (LT: LE).

**Recent Synonyms:** *Helictotrichon dahuricum* (Komarov) Kitagawa, *Rep. Inst. Sc. Research Manchoukuo*, 3, App. 1, 77 (1939).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 437).

**Derivation** (Clifford & Bostock 2007): L.-ica, belonging to. From Dahuria, a region of south-eastern Siberia.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Culms 50–80 cm long. Culm-internodes elliptical in section. Leaf-sheaths tubular for much of their length, with 0.5 of their length closed. Ligule an eciliate membrane, 5 mm long. Leaf-blades 6–12 mm wide. Leaf-blade margins cartilaginous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear, 10–25 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 5–6 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10–15 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose. Floret callus pilose. Floret callus hairs 1–1.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 10 mm long, 0.9 length of upper glume, membranous, 1-keeled, 1-veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 11 mm long, 1.2–1.3 length of adjacent fertile lemma, membranous, 1-keeled, 3-veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 8–9 mm long, cartilaginous, without keel, 5–7-veined, more than 3-veined. Lemma apex dentate, 2-fid, awned, 1-awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 12–16 mm long overall, with twisted column. Palea keels scabrous, adorned all along. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** Siberia, Russian Far East, **China, Mongolia.** Buryatiya, Chita, Krasnoyarsk. Amur, Kamchatka, Khabarovsk, Magadan, Primorye, Sakhalin. Inner Mongolia, Manchuria. Mongolia.

## **Helictochloa gervaisii** (Holub) Romero Zarco. *Candollea* 66: 102 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**TYPE** from Spain. **Basionym or Replaced Name:** *Avenula gervaisii* J. Holub, *Preslia*, 49(3): 205 (1977). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Spain, Malaga: Huter, Porta & Rigo 147 (k ISO).

**Recent Synonyms:** *Helictotrichon gervaisii* (Holub) M. Roser, *Karyol.*, *Syst. u. Chorol. Untersuch. Gatt. Helictotrichon* W. Mittelmeer. (*Diss. Bot.* 145): 116: (1989).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Camille Gervais (1933-) Canadian botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 50–80 cm long, 1–2 mm diam. Culm-internodes antrorsely scabrous. Culm-nodes purple. Leaf-sheaths antrorsely scabrous. Ligule an eciliate membrane, 4–7 mm long, 1.5–3.5 mm long on basal shoots, acute. Leaf-blades filiform, convolute, 10–40 cm long, 0.6 mm wide, 3–8 cm long at summit of culm, grey-green. Leaf-blade venation with subepidermal

sclerenchyma free from veins, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ribbed, grooved abaxially.

**Inflorescence.** Inflorescence a panicle, comprising 13–21 fertile spikelets. Panicle open, linear or oblong, 10–22 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 7–9 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 18–30 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.5–2.5 mm long, glabrous. Floret callus pubescent. Floret callus hairs 0.5–1 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 10–12 mm long, 0.75–0.85 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 12–15 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 12–15 mm long, cartilaginous, much thinner above, without keel, 5–7 -veined, more than 3-veined. Lemma surface puberulous, hairy below. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5–0.66 way up back of lemma, geniculate, flat below, 14–24 mm long overall, with twisted column. Lateral lemma awns present, 1 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 28$  (1 ref TROPICOS).

**Distribution (TDWG).** Continent. Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** : Spain.

### **Helictochloa hackelii** (Henriq.) Romero Zarco. *Candollea* 66: 102 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Portugal. **Basionym or Replaced Name:** *Avena hackelii* Henriq., *Bol. Soc. Broter.* 20: 87 (1905). T:<Type of Basionym>: fide TROPICOS and Kew Synonomy Database: Portugal, Villa Nova to Milfontes: Coll?.

**Recent Synonyms:** *Avenula hackelii* (Henriques) J. Holub, *Folia Geobot. Phytotax.*, 11(3): 295 (1976). *Helictotrichon hackelii* (Henriq.) Henrard, *Blumea* 3 (3): 430

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Eduard Hackel (1850–1926) Bohemian-born Austrian botanist with special interest in the grasses.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Basal innovations intravaginal. Culms 40–80 cm long. Leaf-sheath oral hairs ciliate. Ligule an eciliate membrane, 5–8 mm long, 1–1.5 mm long on basal shoots, acute. Leaf-blades aciculate, terete, 20–45 cm long, 0.5–0.7 mm wide, 0.7–2.5 cm long at summit of culm, stiff. Leaf-blade venation with subepidermal sclerenchyma free from veins, with continuous uniform subepidermal sclerenchyma layer on the underside. Leaf-blade surface ungrooved, scabrous. Leaf-blade apex pungent.

**Inflorescence.** Inflorescence a panicle, comprising 7–17 fertile spikelets. Panicle open, linear or oblong, 7–20 cm long. Primary panicle branches 2 -nate. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–7 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 15–21 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2–2.5 mm long, pilose, with 2.5–4 mm long hairs. Floret callus pilose. Floret callus hairs 2–3 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 10–14 mm long, 0.9 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex

acute. Upper glume elliptic, 12–18 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 11–17 mm long, cartilaginous, dark brown, without keel, 5–7 -veined, more than 3-veined. Lemma surface glabrous to pubescent, hairy below. Lemma apex dentate, 2–4 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 15–20 mm long overall, with twisted column. Lateral lemma awns present, 1 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 42$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe.

**Region. Southwestern Europe.**

**Country /Province /State. :** Portugal.

### ***Helictochloa hookeri* (Scribn.) Romero Zarco. *Candollea* 66: 102 (2011).**

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online (as *Avenula*), W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula schelliana*), N.Tsvellev, *Grasses of the Soviet Union* (1983).

**TYPE from USA. Basionym or Replaced Name:** *Avena hookeri* Scribn., *True Grasses* 123 (1890)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: USA: Rocky Mountain region of the Northwest, *Drummond* 209 (HT: ?; IT: US).

**Recent Synonyms:** *Avenula schelliana* (Hack.) W. Sauer & H. Chmelitschek, *Mitt. Bot. Staatssamml. Munchen*, 12: 582 (1976). *Avenula hookeri* (Scribn.) J. Holub, *Folia Geobot. Phytotax.* 11(3): 295 (1976).

*Helictotrichon hookeri* (Scribn.) Henrard, *Blumea* 3 (3): 431.

**Illustrations (Books):** K.F.Best, et al, *Prairie Grasses* (1971) (143), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (699 as *Avenula hookeri*), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 25 Poaceae, part 2 (2003) (as *Avenula hookeri*), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 437 as subspecies *schellianum*).

**Derivation** (Clifford & Bostock 2007): in honor of William Jackson Hooker (1785–1865) English botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 30–40 cm long. Leaf-sheaths glabrous on surface. Ligule an eciliate membrane, 1–3 mm long, lacerate. Leaf-blades flat or conduplicate, 2–4 mm wide. Leaf-blade surface scaberulous, glabrous. Leaf-blade margins cartilaginous.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear or lanceolate, 5–10 cm long. Primary panicle branches appressed, bearing 1–2 fertile spikelets on each lower branch. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–6 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 15 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose. Floret callus pubescent.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 12 mm long, 0.8–0.9 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 14 mm long, 1–1.4 length of adjacent fertile lemma, membranous, 1-keeled, 5 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 10–13 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma surface scaberulous. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10–15 mm long overall, with twisted column.

**Flower and Fruit.** Lodicules 2, 2 mm long. Anthers 3, 4–5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe, Temperate Asia, North America.

**Region. Eastern Europe.**

**Country /Province /State.** Estonia, Latvia, Lithuania, Krym, Central European Russia, East European Russia, South European Russia, Northwest European Russia, Ukraine. Siberia, Russian Far East, **Middle**

**Asia, China, Mongolia, Russia.** Altay, Buryatiya, Chita, Irkutsk, Krasnoyarsk, Tuva. Amur, Primorye. Kazakhstan, Kirgizistan, Turkmenistan. China South Central, Inner Mongolia, Manchuria, China North-Central, Qinghai, China Southeast, Xinjiang. Mongolia. **Subarctic America, Western Canada, Eastern Canada, Northwest USA, North-central USA, Southwestern USA, South-central USA.** Yukon, Northwest Territories. Alberta, British Columbia, Manitoba, Saskatchewan. Quebec. Colorado, Montana, Wyoming. Minnesota, North Dakota. New Mexico.

Gansu, Hebei, Shaanxi, Shanxi. Henan. Sichuan, Yunnan.

**Helictochloa lusitanica** (Romero Zarko) Romero Zarko. *Candollea* 66: 102 (2011).

**Illustrations:** None found.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Helictochloa levis** (Hackel) Romero Zarco. *Candollea* 66: 102 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**TYPE** from Spain. **Basionym or Replaced Name:** *Avena levis* Hack., *Oesterr. Bot. Zeitschr.* 27:46 (1877). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Spain, Sierra Nevada: Coll?.

**Recent Synonyms:** *Avenula levis* (Hack.) J. Holub, *Folia Geobot. Phytotax.*, 11 (3): 295 (1976). *Helictotrichon leve* (Hackel) Potztal, *Engl. Bot. Jahrb.* 65: 331 (1951).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. smooth. Lacking hairs or roughness, usually of leaf-blades or lemmas.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Culms 20–50 cm long. Leaf-sheath oral hairs ciliate. Ligule an eciliate membrane, 3–7 mm long, 1–1.5 mm long on basal shoots, acute. Leaf-blades tortuous, 3–7 cm long, 2–4 mm wide, 0.2–1.2 cm long at summit of culm, glaucous, pruinose. Leaf-blade venation without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved.

**Inflorescence.** Inflorescence a panicle, comprising 6–8 fertile spikelets. Panicle open, linear or oblong, 6–13 cm long, bearing few spikelets. Primary panicle branches 1–2 -nate, 0.5–1.5 cm long. Panicle branches smooth. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 5–7 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 14–18 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2 mm long, pilose, with 1.5–2.5 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 9–11 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 12–14 mm long, 1.2–1.3 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, widest at 0.75 of its length from base, 9–12 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, obtuse, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 15–20 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** : Spain.

**Helictochloa marginata** (Lowe) Romero Zarko. *Candollea* 66: 102 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula marginatum* & *Avenula albinervis*).

**TYPE** from Madeira. **Basionym or Replaced Name:** *Avena marginata* Lowe, *Trans. Camb. Phil. Soc.* 6: 529 (1838). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Madeira, Boca do Bouraco: Coll? (BM lecto).

**Recent Synonyms:** *Avenula marginata* (Lowe) J. Holub, *Preslia*, 49 (3): 219 (1977). *Helictotrichon marginatum* (Lowe) M. Rouser, *Karyol.*, *Syst. u. Chorol. Untersuch. Gatt. Helictotrichon* W. Mittelmeer. (*Diss. Bot.* 145): 136: (1989).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *margo*, border; -*ata*, possessing.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes absent or elongated. Basal innovations intravaginal. Culms 20–120 cm long. Culm-internodes elliptical in section. Leaf-sheaths open for most of their length. Ligule a ciliolate membrane, 2–9 mm long, 1–5 mm long on basal shoots, acute. Leaf-blades tortuous, flat or conduplicate, 5–30 cm long, 1.5–4.5 mm wide. Leaf-blade venation with 11–29 secondary veins, subepidermal sclerenchyma attached to veins above, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved. Leaf-blade apex obtuse.

**Inflorescence.** Inflorescence a panicle, comprising 7–30 fertile spikelets. Panicle open, linear or oblong, 5–25 cm long. Primary panicle branches 1–3 -nate, 2–5 cm long, bearing 1–3(–5) fertile spikelets on each lower branch. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–8 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 11–19 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.5–2.5 mm long, pilose, with 3 mm long hairs. Floret callus pilose. Floret callus hairs 1.5–3.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 8–13 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 10–16 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3–5 -veined. Upper glume apex acute.

**Florets.** Fertile lemma obovate, 10–15 mm long, cartilaginous, without keel, 7–9 -veined, more than 3-veined. Lemma lateral veins ribbed. Lemma surface glabrous. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 13–20 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 4–6 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa.

**Region. Southwestern Europe.**

**Country /Province /State.** : France, Portugal, Spain. **Macaronesia.** Madeira.

**Helictochloa murcica** (J. Holub) Romero Zarco. *Candollea* 66: 102 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (?& as *Avenula murcica*).

**TYPE** from Spain. **Basionym or Replaced Name:** *Avenula murcica* Holub. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Spain, Murcia, Lorca: Porta & Rigo 298 (PRC holo).

**Recent Synonyms:** *Helictotrichon muricum* J. Holub, *Preslia*, 49 (3): 218 (1977).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -ica, belonging to. From Murcia Province, Spain.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Butt sheaths persistent and investing base of culm. Culms erect or geniculately ascending, 40–60 cm long. Culm-nodes glabrous.

Ligule a ciliate membrane, 0.5–1 mm long. Leaf-blades filiform, conduplicate, 0.7–0.9 mm wide, stiff. Leaf-blade venation with continuous uniform subepidermal sclerenchyma layer on the underside. Leaf-blade surface pubescent, hairy adaxially. Leaf-blade apex attenuate, pungent.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate, 15–20 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 14–18 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose. Floret callus bearded, with elliptic scar. Floret callus hairs 3–3.5 mm long.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma. Lower glume lanceolate, 10 mm long, 0.8 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 12 mm long, 1.5 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 8 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma surface scabrous, rough above. Lemma apex dentate, 2-fid, setaceous acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.4–0.5 way up back of lemma, geniculate, 20–25 mm long overall, with twisted column. Palea keels pubescent. Apical sterile florets rudimentary.

**Flower and Fruit.** Lodicules 2. Anthers 3. Ovary pubescent all over. Caryopsis with adherent pericarp, hairy all over. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** : Portugal, Spain.

### **Helictochloa planiculmis** (Schrad.) Romero Zarco. *Candollea* 66: 102 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Germany. **Basionym or Replaced Name:** *Avena planiculmis* Schrad., *Fl. Germ.* 1: 381. t. 6. f. 2. (1806). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Germany, Schneeberg Mts.: Seliger.

**Recent Synonyms:** *Avenula planiculmis* (Schrader) W. Sauer & H.Chmelitschek, *Mitt. Bot. Staatssamml. Munchen*, 12: 533 (1976). *Helictotrichon planiculme* (Schrad.) Pilger, *Fedde, Repert.* 45: 6 (1938).

**Illustrations (Books):** G.Hegi, *Flora von Mitteleuropa* 1 (1909) (as *Avena planiculmis*).

**Derivation** (Clifford & Bostock 2007): *L. planus*, flat; *culmus*, stem. Culms distinctly compressed.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes elongated. Culms robust, 70–120 cm long, 1 -noded. Culm-internodes elliptical in section, antrorsely scabrous. Lateral branches lacking. Leaves mostly basal. Leaf-sheaths antrorsely scabrous, glabrous on surface. Ligule an eciliate membrane, 3–11 mm long, acute. Leaf-blades conduplicate, 4–27 cm long, 3–7 mm wide. Leaf-blade margins cartilaginous, scabrous. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle, comprising 12–26 fertile spikelets. Panicle open, linear, interrupted, 14–16 cm long, 1–2 cm wide. Primary panicle branches appressed, 3–7.5 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, flattened, 5.5–15 mm long, scabrous.

**Fertile Spikelets.** Spikelets comprising 4–5 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 17–25 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 3 mm long, pilose, with 1.5–2.5 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 11–16 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acuminate. Upper glume lanceolate, 14–20 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 14–20 mm long, cartilaginous, light brown or purple, suffused with last colour, without keel, 5 -veined, more than 3-veined. Lemma lateral veins distinct. Lemma apex dentate, 2 -fid, acute, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 15–22 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 5.5–8 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe, Temperate Asia.

**Region. Middle Europe, Southeastern Europe, Eastern Europe.**

**Country /Province /State.** : Czechoslovakia, Poland. : Bulgaria, Yugoslavia. Northwest European Russia, Ukraine. Western Asia. Turkey.

### ***Helictochloa praeusta* (Reichb. ex Schur) Romero Zarco. *Candollea* 66: 103 (2011).**

**Accepted by:** U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Yugoslavia. **Basionym or Replaced Name:** *Avena praeusta* Reichb., *Fl. Germ. Excurs.* 140 (1830). T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: Yugoslavia, Krain: Welwitsch.

**Recent Synonyms:** *Avenula praeusta* (Reichenb.) J. Holub, *Folia Geobot. Phytotax.*, 11(3): 295 (1976). *Helictotrichon praeustum* (Reichb. ex Schur) Tsvelev, *Novosti Sist. Vyssh. Rast.*, 8: 67 (1971).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. praeuro*, burn at the tip. Awns black at their tips.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Rhizomes short. Culms 60–110 cm long. Culm-internodes elliptical in section. Ligule an eciliate membrane, 4–7 mm long, 1 mm long on basal shoots, acute. Leaf-blades 15–40 cm long, 2–6 mm wide, 1–5 cm long at summit of culm, glaucous. Leaf-blade venation with 12–20 secondary veins, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved, scabrous, rough adaxially.

**Inflorescence.** Inflorescence a panicle, comprising 12–30 fertile spikelets. Panicle open, linear or oblong, 8–21 cm long. Primary panicle branches 2 -nate, bearing 2–3 fertile spikelets on each lower branch. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–7 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 16–22 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2.5–3 mm long, pilose, with 2–3 mm long hairs. Floret callus pilose. Floret callus hairs 2 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 8–13 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 13–18 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, widest at 0.5 of its length from base, 12–16 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 15–20 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region. Middle Europe, Southeastern Europe, Eastern Europe.**

**Country /Province /State.** : Austria, Czechoslovakia, Hungary. : Italy, Romania, Yugoslavia. Northwest European Russia.

**Helictochloa pratensis** (L.) Romero Zarco. *Candollea* 66: 103 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Europe. **Basionym or Replaced Name:** *Avena pratensis* L., *Sp. Pl.* 80 (1753). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Europe: Herb. Linn. 95/17 (LINN holo).

**Recent Synonyms:** *Avenula pratensis* (L.) Dumort., *Bull. Soc. Bot. Belg.* 7: 68 (1868). *Helictotrichon pratense* (L.) Pilger, *Fedde, Repert.* 45: 6 (1938).

**Illustrations (Books):** C.E.Hubbard, *Grasses* (1968) (232), T. Cope & A. Gray, *Grasses of the British Isles* (as *Helictochloa*), G.Hegi, *Flora von Mitteleuropa* 1 (1909) (as *Avena pratensis*), N.L.Bor, *The grasses of Burma, Ceylon, India and Pakistan* (1960) (440, Fig 47).

**Derivation** (Clifford & Bostock 2007): *L. pratum*, a meadow; *-ense*, place of origin. Meadow species.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths dark brown. Culms erect, 30–85 cm long, 1–2 -noded. Leaves mostly basal. Leaf-sheaths glabrous on surface. Ligule an eciliate membrane, 2–4.5(–6) mm long. Leaf-blades 4–30 cm long, 1–5 mm wide. Leaf-blade venation distinct. Leaf-blade surface glabrous. Leaf-blade margins scaberulous.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, lanceolate, equilateral, 4–18 cm long. Primary panicle branches 1–2 -nate, 1–3.5 cm long, bearing 1–2 fertile spikelets on each lower branch. Panicle branches scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–5(–8) fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 14–28 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pubescent, hairy all along but hairs longer above, with 1–2 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 9.5–16 mm long, 0.7–0.8 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume lanceolate, 12–20 mm long, 1.1–1.2 length of adjacent fertile lemma, membranous, with hyaline margins, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma oblong, 10–17(–20) mm long, chartaceous or cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous, rough above. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5–0.6 way up back of lemma, geniculate, 12–27 mm long overall, with twisted column. Palea 0.9–1 length of lemma. Palea keels ciliolate. Rhachilla extension 0.33–0.5 length of fertile floret, pilose.

**Flower and Fruit.** Anthers 3, 4–7 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 126$  (1 ref TROPICOS).

**Distribution (TDWG).** Continent. Europe, Africa, Temperate Asia, Tropical Asia.

**Region. Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe.**

**Country /Province /State.** : Denmark, Finland, Great Britain, Norway, Sweden. : Austria, Belgium, Czechoslovakia, Germany, Netherlands, Switzerland. : France, Portugal, Spain. : Italy, Romania, Yugoslavia. Belarus, Estonia, Latvia, Lithuania, Baltic States, Central European Russia, East European Russia, Northwest European Russia, Ukraine. **Northern Africa.** Morocco. **Western Asia.** Iran. **Indian Subcontinent.** Pakistan, West Himalaya.

Jammu Kashmir.

**Helictochloa pruinosa** (Batt. & Trab.) Romero Zarco. *Candollea* 66: 103 (2011).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**TYPE** from Algeria. **Basionym or Replaced Name:** *Avena pruinosa* Hackel & Trabut, *Bull Soc. Bot. France*, 36: 411 (1890). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Algeria, Aissa: Coll?.

**Recent Synonyms:** *Avenula pruinosa* (Hack. & Trabut) J. Holub, *Folia Geobot. Phytotax.*, 11 (3): 295 (1976). *Helictotrichon pruinosum* (Batt. & Trab.) Henrard, *Blumea*, 3: 430 (1940).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. bluish-green. Leaf-blades are covered with short white hairs.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes elongated. Culms 50–80 cm long. Leaf-sheaths outer margin glabrous or hairy. Ligule an eciliate membrane, 3–4 mm long, 1–2 mm long on basal shoots, acute. Leaf-blades filiform, convolute, 20–25 cm long, 1.1–1.5 mm wide, 1.5 cm long at summit of culm, stiff, glaucous. Leaf-blade venation with subepidermal sclerenchyma free from veins, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved, scabrous. Leaf-blade margins cartilaginous.

**Inflorescence.** Inflorescence a panicle, comprising 10–16 fertile spikelets. Panicle open, linear or oblong, 7–13 cm long. Primary panicle branches 1–2 -nate, bearing 1 fertile spikelets on each lower branch. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 5–7 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 22–30 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 3 mm long, pubescent, with 0.6 mm long hairs. Floret callus pubescent. Floret callus hairs 1 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 14–17 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 17–20 mm long, 1.1–1.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, widest at 0.5 of its length from base, 14–18 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 18–24 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** : Spain.

## ***Helictochloa versicolor* (Vill.) Romero Zarco. *Candollea* 66: 103 (2011).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from France. **Basionym or Replaced Name:** *Avena versicolor* Vill., *Hist. Pl. Dauphine* 142, t. 4 (1787)

. T:<Type of Basionym>; fide TROPICOS and Kew Synchrony Database: France: Coll?.

**Recent Synonyms:** *Avenula versicolor* (Vill.) Holub, *Acta Hort. Bot. Prag.* 1962, 85 (1962). *Helictotrichon versicolor* (Vill.) Schult., *Syst. Veg. Mant.* 3 (Addit. 1) : 526 (1827).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. variously colored. Spikelets variously colored as with the glumes being green in the lower third, purple in the middle and brown in the upper third.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Basal innovations extravaginal. Culms 15–40 cm long. Leaf-sheaths tubular for much of their length, with 0.33 of their length closed. Ligule an eciliate membrane, 3–5 mm long, 1–2 mm long on basal shoots, acute. Leaf-blades 5–20 cm long, 2–4.5 mm wide, glaucous. Leaf-blade venation with 6–8 secondary veins, subepidermal sclerenchyma free from veins, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved, smooth.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear or oblong, 3–8 cm long. Primary panicle branches 1–2 -nate. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–6 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10–15 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.5–2 mm long, pilose, with 2 mm long hairs. Floret callus pubescent. Floret callus hairs 1 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume elliptic, 6–8 mm long, 0.66 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 9–12 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma obovate, 8–11 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma lateral veins excurrent. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5–0.66 way up back of lemma, geniculate, flat below, 11–14 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (3 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, Temperate Asia.

**Region.** Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe.

**Country /Province /State.** : Austria, Czechoslovakia, Switzerland. : France, Portugal, Spain. : Bulgaria, Italy, Romania, Yugoslavia. Northwest European Russia, Ukraine. **Western Asia.** Turkey.

### **Helictotrichon abietetorum** (Ohwi) Ohwi. *Acta Phytotax. & Geobot.*, Kyoto, 6: 151(1937).

**Accepted by:** S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**TYPE** from China. **Basionym or Replaced Name:** *Avena abietetorum* Ohwi, *Acta Phytotax. Geobot.* 2(3): 162 (1933)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: China: Taiwan: Mt. Niihaka, 1933, *J. Ohwi* 3675 (HT: ?; IT: LE).

**Illustrations (Books):** C-C Hsu, *Flora of Taiwan*, Vol 5 (1978) (276), C-C Hsu, *Taiwan Grasses* (1975) (417, Pl. 1382), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 439).

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** **China, Eastern Asia.** Taiwan.

### **Helictotrichon adzharicum** (Albov) Grossheim. *Trud. Bot. Inst. Akad. Nauk SSSR, Azerb. Fil., Baku*, viii/48 : 214 (1939).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. **Basionym or Replaced Name:** *Avena adzharica* Albov, *Prodr. Fl. Colchic.* 257 (1895)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Russia, Mt. Khino: Albov 335.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *-ica*, belonging to. From Adzhar, Georgia, former Soviet Union.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes elongated. Culms 40 cm long. Culm-internodes smooth. Ligule an eciliate membrane. Leaf-blades 5–10 cm long, 2–3 mm wide. Leaf-blade margins cartilaginous. Leaf-blade apex obtuse.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear or oblong, 10–20 cm long. Primary panicle branches bearing 1–2 fertile spikelets on each lower branch. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–5 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the

upper sterile. Spikelets oblong, laterally compressed, 12–14 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate, 5–7 mm long, 0.66–0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume lanceolate, 8–10 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 8–10 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma surface scaberulous. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10–15 mm long overall, with twisted column. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** Caucasus. North Caucasus, Transcaucasus.

### ***Helictotrichon alpinum* (Roem. & Schult.) Henrard. *Blumea*, iii. 431 (1940).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Scotland. **Basionym or Replaced Name:** *Avena alpina* Sm., non Vollst.(1782), *Trans. Linn. Soc.* 10: 335 (1811). T:<Type of Basionym>: fide TROPICOS and Kew Synonomy Database: : Based on *Avena alpina* Sm. ; Scotland, Mountains of Clova: Don (LNN holo, K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *alpes*, high mountain; *-ina*, indicating possession. Species growing at high altitudes.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Rhizomes short. Culms 60–110 cm long. Culm-internodes elliptical in section. Ligule an eciliate membrane, 4–7 mm long, 1 mm long on basal shoots, acute. Leaf-blades 15–40 cm long, 2–6 mm wide, 1–5 cm long at summit of culm, glaucous. Leaf-blade venation with 12–20 secondary veins, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved, scabrous, rough adaxially.

**Inflorescence.** Inflorescence a panicle, comprising 12–30 fertile spikelets. Panicle open, linear or oblong, 8–21 cm long. Primary panicle branches 2 -nate, bearing 2–3 fertile spikelets on each lower branch. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–7 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 16–22 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2.5–3 mm long, pilose, with 2–3 mm long hairs. Floret callus pilose. Floret callus hairs 2 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 8–13 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 13–18 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, widest at 0.5 of its length from base, 12–16 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 15–20 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region.** Middle Europe, Southeastern Europe, and Eastern Europe.

**Country /Province /State.** Ukraine.

**Helictotrichon altius** (Hitchcock) Ohwi. *Journ. Jap. Bot.* xvii. 440 (1941).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**TYPE** from China. **Basionym or Replaced Name:** *Avena altior* Hitchcock, *Proc. Biol. Soc. Wash.* 43: 96 (1930). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: China, Sining: Ching 716 (US holo).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 437).

**Derivation** (Clifford & Bostock 2007): L. taller. Taller than related species.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 100–120 cm long. Culm-internodes distally glabrous. Culm-nodes pubescent. Leaf-sheaths glabrous on surface. Ligule an eciliate membrane, 0.5–1 mm long, truncate. Leaf-blades 3–5 mm wide. Leaf-blade surface pubescent.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, 15 cm long. Primary panicle branches spreading, 2–4 cm long, bearing 1–3 fertile spikelets on each lower branch. Panicle axis with lower internodes 2–3 cm long, glabrous. Panicle branches flexuous, scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 5 mm long, 0.5 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 10 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 9 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10 mm long overall, with twisted column. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** China. China South Central, Inner Mongolia, Manchuria, China North-Central, Qinghai.

Gansu. Sichuan.

**Helictotrichon angustum** C. E. Hubbard. *Kew Bull.* 1936, 330. (1936).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Kenya. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Kenya, Ngong hills: Edwards 2960 (K holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. narrow. Narrow, with respect to leaf-blades or spicate panicles.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 30–90 cm long. Ligule an eciliate membrane, 1–2 mm long. Leaf-blades filiform or linear, 8–25 cm long, 1–2 mm wide. Leaf-blade surface glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, interrupted, nodding, 7–20 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–5 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10–14 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1–1.5 mm long, pilose, hairy above. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate, 4–6 mm long, 0.6–0.8 length of upper glume, herbaceous, much thinner above, much thinner on margins, 1-keeled, 1(–3) -veined. Lower glume lateral veins absent or obscure. Lower glume apex acute. Upper glume oblong, 6–8 mm long, 0.9–1 length of adjacent fertile lemma, herbaceous, much thinner above, with hyaline margins, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 6–7 mm long, coriaceous, much thinner above, much thinner on margins, without keel, 5 -veined, more than 3-veined. Lemma surface scabrous, rough above (with white prickles). Lemma apex dentate, 2 -fid, acute or setaceous acuminate, awned, 3 -awned. Principal lemma awn dorsal, arising 0.66–0.8 way up back of lemma, geniculate, 9–16 mm long overall, with twisted column. Lateral lemma awns present, arising on apex of lobes, 1–3 mm long, shorter than principal. Palea keels ciliolate. Rhachilla extension 0.75 length of fertile floret, pilose.

**Flower and Fruit.** Anthers 3, 2.5–3.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** East Tropical Africa. Kenya.

### **Helictotrichon arctum** Cope. *Kew Bull.* 61:243 (2006).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Yemen. T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: Yemen, Jebel Taqa, Jibla, c. 2800 m, rocky hillside: J.R.I. Wood 1144 (K holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. close. Distinguished only by careful comparison from a related species.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 15–30 cm long. Ligule an eciliate membrane, 1 mm long. Leaf-blades filiform or linear, involute, 0.4–0.5 mm wide. Leaf-blade surface smooth, glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, 6.5–9 cm long. Primary panicle branches appressed. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 8–9.5 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.5–2 mm long, pubescent, hairy above. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate, 4–4.5 mm long, 0.75 length of upper glume, herbaceous, much thinner above, much thinner on margins, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate or oblong, 5.5–6 mm long, 0.75 length of adjacent fertile lemma, herbaceous, much thinner above, with hyaline margins, 1-keeled, 3 -veined. Upper glume apex acuminate.

**Florets.** Fertile lemma elliptic, 7–8 mm long, herbaceous, much thinner above, much thinner on margins, without keel, 5 -veined, more than 3-veined. Lemma surface asperulous, rough above. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, geniculate, 9–16 mm long overall, with twisted column. Lateral lemma awns present, arising on apex of lobes, 1 mm long, shorter than principal. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG).** Continent. Temperate Asia.

**Country /Province /State.** Arabian Peninsula. Yemen.

### **Helictotrichon argaeum** (Boiss.) Parsa. *Fl. Iran*, v. 641 (1951).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Turkey. **Basionym or Replaced Name:** *Avena argaea* Boiss., *Fl. Orient.* 5: 546 (1884). T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: Turkey, Argaea Mts: Balansa 847 (G holo, K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): From Montus Argercus, now Erciyas Dagi, Turkey.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Culms erect or geniculately ascending, 17–48 cm long. Culm-internodes terete. Lateral branches lacking. Leaves mostly basal. Leaf-sheaths smooth, glabrous on surface. Ligule an eciliate membrane, 1–4 mm long, acuminate. Leaf-blades conduplicate, 3–11 cm long, 1–3 mm wide, glaucous. Leaf-blade margins scaberulous. Leaf-blade apex obtuse.

**Inflorescence.** Inflorescence a panicle, comprising 5–16 fertile spikelets. Panicle contracted, oblong, 3.5–7 cm long, 0.5–2 cm wide. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 1–8.5 mm long, smooth or scaberulous.

**Fertile Spikelets.** Spikelets comprising 4–6 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 16–19 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.6–2.4 mm long, pubescent, with 0.2–0.3 mm long hairs. Floret callus pubescent. Floret callus hairs 0.3–0.6 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 10–15 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume lanceolate, 12–16 mm long, 1.2–1.3 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma oblong, 10–12 mm long, cartilaginous, light brown or red, without keel, 5 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, acute, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 14–15 mm long overall, with twisted column. Palea 7.5–9 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 4–4.7 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** Western Asia. Turkey.

### **Helictotrichon barbatum** (Nees) Schweickerdt. *Bothalia*, iii. 190 (1937).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. **Basionym or Replaced Name:** *Trisetum barbatum* Nees, *Fl. Afr. Austr.* 345 (1841). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: South Africa, Kamiesbergen: Ecklon.

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (78, Fig 48).

**Derivation** (Clifford & Bostock 2007): *L. bearded*, barbed. With hairs on the callus, glumes or lemma.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with fibrous dead sheaths. Culms 60–80 cm long, 2 -noded. Lateral branches lacking. Leaf-sheaths smooth or scaberulous, glabrous on surface. Ligule an eciliate membrane, 3 mm long. Leaf-blades 15–30 cm long, 1.5–3.5 mm wide. Leaf-blade surface scaberulous.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, effuse, 8–10 cm long. Primary panicle branches 1–2.5 cm long, bearing 1–2 fertile spikelets on each lower branch. Panicle branches capillary, scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 14–17 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 3–3.5 mm long, eventually visible between lemmas, pilose, hairy above, with 5–6 mm long hairs. Floret callus 1 mm long, pilose. Floret callus hairs 2 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 8–9 mm long, 0.66 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume primary vein scaberulous. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 14 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume surface asperulous, rough on veins. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 15 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface asperulous, rough on veins. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 25–27 mm long overall, with twisted column. Column of lemma awn 10 mm long. Lateral lemma awns present, arising on apex of lobes, 1 mm long. Palea 8 mm long. Palea keels ciliolate.

**Flower and Fruit.** Anthers 3, 2–2.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Southern Africa. Northern Cape.

### **Helictotrichon breviaristatum** (Barrat ex Battand. & Trab.) Henrard. *Blumea*, iii. 430 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Algeria. **Basionym or Replaced Name:** *Avena breviaristata* Barratte., *Batt. et Trab. Fl. de l'Algérie (Monoc.)* 184 (1895). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Algeria, Boghari to Bou-Saada: Letourneux.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. brevis*, short; *arista*, bristle; *-ata*, possessing. Glumes or lemmas shortly awned.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths pilose. Basal innovations intravaginal. Culms erect, 90–100 cm long, 2 -noded. Leaf-sheaths without keel, smooth. Ligule an eciliate membrane, 5–6 mm long, truncate. Leaf-blades filiform, conduplicate or convolute, 40–50 cm long, 1–3 mm wide, stiff. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, nodding, 25 cm long. Primary panicle branches spreading, 2–3 -nate. Panicle axis pubescent. Panicle branches pilose. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 18 mm long, breaking up at maturity, disarticulating above glumes but not between florets. Rhachilla internodes pilose, with 5–6 mm long hairs. Floret callus pilose, with elliptic scar.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma, shiny. Lower glume lanceolate, 16 mm long, 0.9 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acuminate. Upper glume elliptic, 18 mm long, 1.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acuminate.

**Florets.** Fertile lemma elliptic, 15 mm long, cartilaginous, much thinner above, without keel, 7 -veined, more than 3-veined. Lemma midvein ciliate. Lemma apex entire, obtuse, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5–0.6 way up back of lemma, straight, 5–6 mm long overall. Palea keels pubescent. Apical sterile florets rudimentary.

**Flower and Fruit.** Lodicules 2, 2–2.5 mm long. Anthers 3, 5–6 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Northern Africa. Algeria.

### **Helictotrichon burmanicum** Bor. *Kew Bull.* 1951, 445 (1952).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from Myanmar. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Burma, Hpimaw: Su Koe 9962 (K holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. -ica*, belonging to. From Burma, now Myanmar.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 50–100 cm long. Culm-nodes glabrous. Lateral branches lacking. Leaf-sheaths glabrous on surface. Ligule an eciliate membrane, 3 mm long, lacerate. Leaf-blades 10–20 cm long, 3–5 mm wide, flaccid. Leaf-blade surface glabrous or pubescent. Leaf-blade margins scabrous. Leaf-blade apex attenuate, pungent.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, nodding, 12–24 cm long, 6–12 cm wide. Primary panicle branches 6–12 cm long. Panicle branches scabrous, rough distally, glabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 9–10 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2–5 mm long, pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate, 4–4.5 mm long, 0.75 length of upper glume, membranous, much thinner on margins, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 5.5–6.5 mm long, 0.8–1 length of adjacent fertile lemma, membranous, with hyaline margins, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 6.5 mm long, cartilaginous, much thinner on margins, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous, rough above. Lemma apex dentate, 2 -fid, setaceous acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.66 way up back of lemma, curved, 9–10 mm long overall. Palea 6–6.5 mm long. Palea keels pubescent. Apical sterile florets rudimentary.

**Flower and Fruit.** Lodicules 2. Anthers 3, 1.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG).** Continent. Tropical Asia.

**Country /Province /State.** Indo-China. Myanmar.

### **Helictotrichon canescens** (Buckley) Clayton. *Kew Bull.*, 40(4): 728 (1985).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from USA. **Basionym or Replaced Name:** *Trisetum canescens* Buckl., *Proc. Acad. Sc. Philad.* 1862 : 100 (1863). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: USA, Oregon: Nuttall? (PH holo, K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *canesco*, grow white. Leaf-blades or leaf-sheaths densely invested with white or grey hairs.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect or geniculately ascending, 50–100 cm long. Leaf-sheaths antrorsely scabrous, glabrous on surface to pilose. Leaf-sheath oral hairs ciliate, 2–3 mm long. Ligule an eciliate membrane, 1.5–4 mm long, erose, truncate. Leaf-blades 4–10 mm wide. Leaf-blade surface scaberulous, glabrous to pilose.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate, 10–20 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 8 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2–3 mm long, pilose, with 2 mm long hairs. Floret callus pubescent.

**Glumes.** Glumes persistent, dissimilar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume linear, 3–4 mm long, 0.66 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 5–6 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma oblong, 5–7 mm long, membranous, keeled, 5 -veined, more than 3-veined. Lemma surface scaberulous. Lemma apex lobed, 2 -fid, with lobes 2 mm long, incised 0.25 of lemma length, awned, 1 -awned. Principal lemma awn dorsal, arising 0.66 way up back of lemma, geniculate, 10–14 mm long overall, with twisted column. Palea gaping, hyaline. Rhachilla extension pilose.

**Flower and Fruit.** Lodicules 2, 1–1.5 mm long. Anthers 3, 1.3–2.3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp. Hilum punctiform. Endosperm soft.

**Distribution (TDWG). Continent.** North America.

**Country /Province /State.** Northwest USA and Southwestern USA. Montana, Oregon, Washington. California, Nevada.

### **Helictotrichon cantabricum** (Lag.) Gervais. *Denkschr. Schweiz. Naturf. Ges.* 88:69 (1973).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from Spain. **Basionym or Replaced Name:** *Avena cantabrica* Lag., *Agron. Gen.* 1: 141 (1818). T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: LT: May 1816, Habitat Real Madrid (MA-224969). LT designated by Rvser, 16 Dec 1998, in herb. apparently not published.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ica*, belonging to. From Cantabri, now northern Spain.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped moderately or densely. Rhizomes absent or short. Basal innovations extravaginal or intravaginal. Culms 60–125 cm long, 3–6 mm diam. Ligule a ciliolate membrane, 0.2–0.5 mm long. Leaf-blades persistent, 20–50 cm long, 2–3 mm wide, stiff, glaucous. Leaf-blade surface ribbed, glabrous. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle, comprising 20–60 fertile spikelets. Panicle open, linear or oblong, 13–25 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, clavate.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 11–14 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 3 mm long, pilose, with 4.5–5 mm long hairs. Floret callus pilose. Floret callus hairs 3 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 8–9 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 11–12 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 10–13 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, subterete below, 15–20 mm long overall, with twisted column. Palea 9–11 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** France, Spain.

### **Helictotrichon capense** Schweickerdt. *Bothalia*, iii. 193 (1937).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: South Africa, Kongha: Flanagan 935 (K iso).

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (78 & 79, Fig 48–49).

**Derivation** (Clifford & Bostock 2007): L. -*ense*, denoting origin. From the Cape of Good Hope, South Africa.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with fibrous dead sheaths. Culms erect, 50–100 cm long, 3 -noded. Lateral branches lacking. Leaf-sheaths smooth, glabrous on surface or puberulous. Ligule an eciliate membrane, 0.75 mm long. Leaf-

blades filiform, involute, 10–25 cm long, 1–2 mm wide. Leaf-blade surface smooth or scaberulous, rough abaxially, pilose, sparsely hairy, hairy abaxially.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, 10–20 cm long. Primary panicle branches 2–4 cm long. Panicle axis glabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–5 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 15 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2 mm long, pilose, hairy above, with 3 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 5.5 mm long, 0.66 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 7.9 mm long, 0.66 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume surface asperulous, rough above. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 12 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface scabrous, rough above. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10–12 mm long overall, with twisted column. Column of lemma awn 4–5 mm long. Lateral lemma awns present, arising on apex of lobes, 3 mm long. Palea 5.5 mm long. Palea keels ciliolate.

**Flower and Fruit.** Anthers 3, 2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Southern Africa. Western Cape, Eastern Cape.

### **Helictotrichon convolutum** (Presl) Henrard. *Blumea*, iii. 430 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from Sicily. **Basionym or Replaced Name:** *Avena convoluta* C. Presl, *Cyper. Gramin. Sicul.* 31 (1820)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Sicily, Cucii Panormi: Presl (PRC holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. rolled up longitudinally. Leaf-blades rolled length-wise.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 47–103 cm long. Culm-internodes terete. Lateral branches lacking. Leaves mostly basal. Leaf-sheaths smooth, glabrous on surface. Ligule an eciliate membrane, 0.3–0.5 mm long, scaberulous on abaxial surface, truncate. Leaf-blades convolute, 14–50 cm long, 0.5–1 mm wide, glaucous.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, 6–16 cm long, 1.5–4 cm wide. Primary panicle branches spreading, 2–6 cm long. Panicle branches flexuous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 3–12 mm long, scabrous, tip widened.

**Fertile Spikelets.** Spikelets comprising 3–6 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10–15 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose. Floret callus pilose. Floret callus hairs 2–3.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 9–9.5 mm long, 0.9 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume lanceolate, 10–11 mm long, 0.5–1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma oblong, 9–21 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, acute, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 15–20 mm long overall, with twisted column. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 4–6 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, oblong, hairy at apex. Hilum linear.

$2n = 14$  (5 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, Temperate Asia.

**Region. Southeastern Europe.**

**Country /Province /State.** : Albania, Greece, Italy, Sicily, Yugoslavia. **Western Asia.** Lebanon-Syria, Turkey.

**Helictotrichon cycladum** (K. H. Rechinger & Scheff.) K.H. Rechinger. *Denkschr. Akad. Wiss. Wien, Math.-Nat.*, cv. 1. 791 (1943).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**TYPE** from Greece. **Basionym or Replaced Name:** *Avenastrum cycladum* K. H. Rechinger & Scheffer, *Magyar Bot. Lap.* 33: 20 (1934). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Greece, Cyclades, Naxos: Rechinger 2240 ; Greece, Cyclades, Amorgos: Rechinger 2355.

**Recent Synonyms:** *Avenula cycladum* (Rech. fil. & Scheffer) Greuter, *Ann. Mus. Goulandris* 1: 75 (1973).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): from Cyclades Islands, Greece.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Culms slender, 20–30 cm long. Leaf-sheaths keeled, smooth. Ligule an eciliate membrane, 3–4 mm long, 2–3 mm long on basal shoots, acute. Leaf-blades curved, conduplicate, 2–5 cm long, 1.5–2 mm wide, stiff, pruinose. Leaf-blade venation with subepidermal sclerenchyma free from veins, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved, smooth. Leaf-blade margins scaberulous.

**Inflorescence.** Inflorescence a panicle, comprising 4–7 fertile spikelets. Panicle open, linear or oblong, 5–7 cm long, bearing few spikelets. Primary panicle branches 1–2 -nate. Panicle branches stiff. Spikelets solitary. Fertile spikelets sessile or pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–5 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 15–22 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose, hairy above. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 12 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 17 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3–5 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 15–16 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 15–20 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region. Southeastern Europe.**

**Country /Province /State.** : Greece, Crete.

**Helictotrichon decorum** (Janka) Henrard. *Blumea* iii. 430 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from Hungary. **Basionym or Replaced Name:** *Avena decora* Janka, *Termeszettud. Fuz.* 8: 28 (1884)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Hungary: Janka (K iso).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *decor*, elegance. Attractive, usually with respect to habit.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with compacted dead sheaths. Basal innovations extravaginal. Culms 40–80 cm long. Leaf-sheaths open for most of their length. Ligule a ciliolate membrane, 0.5 mm long, truncate. Leaf-blades flat or convolute, 20–50 cm long, 2.5–4 mm wide, glaucous. Leaf-blade venation without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ribbed, scabrous, rough adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear or oblong, 10–15 cm long. Primary panicle branches bearing 4–10 fertile spikelets on each lower branch. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, linear.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10–14 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2–3 mm long, pilose, with 2.5–3 mm long hairs. Floret callus pilose. Floret callus hairs 2–2.5 mm long, 0.25–0.33 length of lemma.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 7–9 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 9–11 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 7–10 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, subterete below, 10–15 mm long overall, with twisted column. Palea 6–9 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe.

**Region.** Southeastern Europe.

**Country /Province /State.** : Romania.

### **Helictotrichon delavayi** (Hackel) Henrard. *Blumea*, iii. 427 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**TYPE** from China. **Basionym or Replaced Name:** *Avena delavayi* Hack., *Oesterr. Bot. Z.* 52(5): 189 (1902)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: China: Yunnan: in pratis montanis cacuminis Heechanmen (Lankong), 3200 m, *Delavay* 726 (HT: P; IT: US).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 438).

**Derivation** (Clifford & Bostock 2007): in honor of Pierre Jean Marie Delavay (1834–95) French cleric who collected in China.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Culms erect, 15–35 cm long, 2–3 -noded. Culm-internodes distally glabrous. Lateral branches lacking. Leaf-sheaths mostly shorter than adjacent culm internode, glabrous on surface, outer margin hairy. Ligule an eciliate membrane, 1.5 mm long, truncate. Leaf-blades 2–6 cm long, 2 mm wide. Leaf-blade surface glabrous or puberulous, hairy abaxially. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong or ovate, nodding, 5–10 cm long. Primary panicle branches 2 -nate, 3–6 cm long. Panicle axis scabrous. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10–11 mm long, 3 mm wide, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 3 mm long, villous. Floret callus pubescent.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 5–7 mm long, 0.8–0.9 length of upper glume, membranous, yellow or purple, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 6–8 mm

long, 0.6–0.9 length of adjacent fertile lemma, membranous, yellow or purple, 1-keeled, 3 -veined. Upper glume primary vein scabrous. Upper glume apex acuminate.

**Florets.** Fertile lemma lanceolate, 9 mm long, chartaceous, mid-green or purple, tipped with last colour, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous. Lemma apex dentate, 2 -fid, with lobes 1.5 mm long, setaceous acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5–0.6 way up back of lemma, geniculate, 12–13 mm long overall, with twisted column. Palea keels ciliolate. Palea apex dentate, 2 -fid. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** China. China South Central, China North-Central.

Shaanxi. Sichuan, Yunnan.

### **Helictotrichon desertorum** (Less.) Pilger. *Fedde, Repert.* 45: 7 (1938).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. **Basionym or Replaced Name:** *Avena desertorum* Less., *Linnaea*, 9: 208 (1834). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Russia, Urals, Gumbica: Lessing (LE holo).

**Illustrations (Books):** G.Hegi, *Flora von Mitteleuropa* 1 (1909) (as *Avena desertorum*).

**Derivation** (Clifford & Bostock 2007): *L. desertum*, desert. Of deserts, that is, from arid places.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Basal innovations intravaginal. Culms slender, 30–60 cm long. Leaf-sheaths glabrous on surface or puberulous. Ligule an eciliate membrane, 3–8 mm long, acute. Leaf-blades filiform, 20–50 cm long, 0.5–0.7 mm wide, grey-green. Leaf-blade surface ribbed.

**Inflorescence.** Inflorescence a panicle, comprising 7–17 fertile spikelets. Panicle open, linear or oblong, 5–8 cm long. Primary panicle branches bearing 2–3 fertile spikelets on each lower branch. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, linear.

**Fertile Spikelets.** Spikelets comprising 2(–3) fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 9–12 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2–2.5 mm long, pilose, with 2.5–3 mm long hairs. Floret callus pilose. Floret callus hairs 2 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 6.5–9 mm long, 0.66–0.8 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 10–11 mm long, 1.1–1.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 8–10 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, subterete below, 12–17 mm long overall, with twisted column. Palea 8–9 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe, Temperate Asia.

**Region. Middle Europe, Eastern Europe.**

**Country /Province /State.** : Austria, Czechoslovakia. Central European Russia, East European Russia, South European Russia, Northwest European Russia. Siberia, **Middle Asia, China, Mongolia**. Altay, Buryatiya, Chita, Irkutsk, Tuva. Kazakhstan, Turkmenistan.

### **Helictotrichon devesiae** Romero Zarco. *Anales Jard. Bot. Madrid* 64 (2): 207–211, f. 1, f. 3, table 1 (2007).

**TYPE** from Spain. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Spain: in provincia toletana Hispaniae, ad rivulum Ciguela dictum, prope oppidum La Puebla de Almoradiel, in

salsuginosis pascuis appellatis a quibusdam "Senecio auriculae-Lygeetum et Schoeno nigrantis-Plantaginetum maritimae", Jul 1976, S. Cirujano s.n. (HT: SEV-217062; IT: MA-447900, SEV-217063).

**Illustrations:** None found.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Basal innovations intravaginal. Culms 27–35 cm long. Culm-internodes distally glabrous. Ligule a ciliolate membrane, 0.5–1 mm long, truncate. Leaf-blades filiform, conduplicate, 5–16 cm long, 0.5–0.6 mm wide. Leaf-blade venation with 7 secondary veins, 3 inner ridges, subepidermal sclerenchyma free from veins, with continuous uniform subepidermal sclerenchyma layer on the underside. Leaf-blade surface ribbed, scabrous, rough adaxially, glabrous or puberulous, hairy abaxially. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence a panicle, comprising 15–25 fertile spikelets. Panicle open, elliptic, 7–12 cm long. Panicle branches puberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, clavate, 3–11 mm long, pubescent.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 9.6–10.3 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.8–2.5 mm long, pilose, with 1–3 mm long hairs. Floret callus pilose. Floret callus hairs 0.5–2 mm long.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma. Lower glume lanceolate, 6–6.7 mm long, 0.66 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 9–9.8 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 8–9 mm long, cartilaginous, without keel, 7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10.5–13.5 mm long overall, with twisted column. Column of lemma awn puberulous. Apical sterile florets rudimentary.

**Flower and Fruit.** Lodicules 2, lanceolate, 1.5 mm long, entire. Anthers 3, 4–4.5 mm long. Ovary pubescent all over. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** : Spain.

### **Helictotrichon dodii** (Stapf) Schweickerdt. *Bothalia*, iii. 197 (1937).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. **Basionym or Replaced Name:** *Avenastrum dodii* Stapf, *Fl. Cap.* 7: 475–476 (1899)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: *Wolley Dod* 2775, South Africa: Coast Region: Cape Div., wet slopes near Oatlands Point (K).

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955).

**Derivation** (Clifford & Bostock 2007): in honor of Anthony Hurt Wolley-Dod (1861–1948) English botanist who collected in South Africa.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, slender, 50–100 cm long, 3–4 -noded. Lateral branches lacking. Leaf-sheaths smooth, glabrous on surface. Ligule an eciliate membrane, 2–4 mm long. Leaf-blades 30–50 cm long, 3–5 mm wide, glaucous. Leaf-blade surface scaberulous, rough adaxially. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, equilateral or nodding, 12–30 cm long. Primary panicle branches 2–5 cm long. Panicle axis smooth. Panicle branches smooth or scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–5 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 12–15 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2 mm long, pilose, hairy above, with 3–3.5 mm long hairs. Floret callus 0.6 mm long, pilose. Floret callus hairs 1.25 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 6–7 mm long, 0.75–0.9 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 12–15 mm long, 0.5–0.66 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acuminate, awned, 1 -awned, awn 1 mm long.

**Florets.** Fertile lemma oblong, 13–14 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface granulose. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 17–22 mm long overall, with twisted column. Column of lemma awn 5–7 mm long. Lateral lemma awns present, arising on apex of lobes, 4 mm long. Palea 5 mm long. Palea keels ciliolate.

**Flower and Fruit.** Anthers 3, 2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Southern Africa. Free State, Western Cape.

### **Helictotrichon elongatum** (Hochst. ex A. Rich.) C. E. Hubbard. *Kew Bull.* 1936, 335 (1936).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Danthonia elongata* Hochst. ex A. Rich., *Tent. Fl. Abyss.* 2: 419 (1850)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: ST: *Schimper, pl. Schimp. Abyss., sect I*, 402, 27 Oct 1837, Ethiopia: crescit in regione superioiris montis Selleuda prope Adoua (P; IST: K, L).

ST: *Quartin Dillon s.n.*, Oct, Ethiopia: in reigone superioiris montis Selleuda prope Adoua (P).

**Recent Synonyms:** *Helictotrichon avenoides* (Stapf) A.Camus, *Rev. Bot. Appliq.* 27: 276 (1947).

**Illustrations (Books):** H.Jacques-Felix, *Les Graminees d'Afrique tropicale* (1962) (188, Fig 110 as *H. rigidulum*), R.M.Polhill, F.T.E.A., *Gramineae* (1(1970):90, Fig.30), G.V.Pope et al., *Flora Zambesiaca* 10 (1(1970):78, Fig.23), J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969) (181, 63 as *H. avenoides*), S.Phillips, *Poaceae (Gramineae)* in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (32 & 34, Fig 15 & 16).

**Derivation** (Clifford & Bostock 2007): L. elongated. Inflorescence elongated.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths dark brown. Culms erect or decumbent, 45–150 cm long. Leaves mostly basal. Ligule an eciliate membrane, 2–4 mm long. Leaf-blades 15–45 cm long, 2–5 mm wide. Leaf-blade venation distinct. Leaf-blade surface glabrous or pilose, sparsely hairy.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear or oblong, dense or loose, equilateral or nodding, 10–35 cm long. Primary panicle branches appressed or ascending. Panicle branches scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 8–14 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2 mm long, pilose. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 5–10 mm long, 0.7–0.9 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 7–11 mm long, 1 length of adjacent fertile lemma, membranous, with hyaline margins, 1-keeled, 3–5 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 6.5–11 mm long, chartaceous or cartilaginous, pallid or purple, without keel, 7–9 -veined, more than 3-veined. Lemma surface smooth or granulose or scaberulous. Lemma apex dentate, 2 -fid, acute or setaceous acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 15–20 mm long overall, with twisted column. Palea 0.6–0.8 length of lemma. Palea keels ciliolate. Rhachilla extension 0.75 length of fertile floret, pilose.

**Flower and Fruit.** Anthers 3, 2.5–3.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, 3 mm long, hairy at apex. Hilum linear.

2n = 28 (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Africa, Temperate Asia.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Western Indian Ocean. Nigeria. Cameroon, Congo, Rwanda, DRC. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Malawi, Zambia, Zimbabwe. Madagascar. Arabian Peninsula. Yemen.

### **Helictotrichon fedtschenkoi** (Hackel) Henrard. *Blumea*, iii. 429 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. **Basionym or Replaced Name:** *Avena fedtschenkoi* Hack., *Act. Hort. Petrop.* 26: 55 (1906). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Russia, Shugnan: Fedtschenko 133 (LE holo, K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Boris Alexsevitch Fedtschenko (1872–1947) German-born Russian botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 40–60 cm long. Culm-internodes distally glabrous. Leaf-sheaths hispid. Ligule an eciliate membrane, 1 mm long, truncate. Leaf-blades involute, 2–3 mm wide. Leaf-blade surface hispid.

**Inflorescence.** Inflorescence a panicle. Peduncle scaberulous above. Panicle open, oblong, dense, 6–9 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 12 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose, with 2–3 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 11–12 mm long, 1 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 11–12 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 10 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 4 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10–15 mm long overall, with twisted column. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** Middle Asia. Turkmenistan.

### **Helictotrichon filifolium** (Lag.) Henrard. *Blumea*, iii. 430 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from Spain. **Basionym or Replaced Name:** *Avena filifolia* Lag., *Gen. & Sp. Nov.* 4 (1816). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Spain, Urchillo Mt.: Coll?.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. filum*, thread; *folium*, leaf. Leaf-blades very narrow.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Butt sheaths red, persistent and investing base of culm. Culms erect or geniculately ascending, 25–120 cm long. Culm-internodes retrorsely scabrous. Culm-nodes glabrous. Leaf-sheaths smooth or scaberulous, outer margin hairy. Leaf-sheath oral hairs ciliate. Ligule a ciliate membrane, 0.5–1 mm long. Leaf-blades filiform, conduplicate, 20–40 cm long, 1–1.5 mm wide, stiff. Leaf-blade venation with continuous uniform subepidermal sclerenchyma layer on the underside. Leaf-blade surface pubescent, hairy adaxially. Leaf-blade apex attenuate, pungent.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate, 14–25 cm long. Primary panicle branches 2–4 -nate. Panicle axis scabrous. Panicle branches straight or flexuous, scabrous, glabrous in axils or pubescent in axils. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 14–18 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose, with 5–6 mm long hairs. Floret callus pilose, with elliptic scar.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma. Lower glume lanceolate, 13–14 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume primary vein scaberulous. Lower glume lateral veins absent. Lower glume apex acute, muticous or mucronate. Upper glume elliptic, 15–18 mm long, 1.5 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume primary vein scaberulous. Upper glume apex acute, muticous or mucronate.

**Florets.** Fertile lemma elliptic, 12–14 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma surface scabrous, rough above. Lemma apex dentate, 2 -fid, setaceous acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.4–0.5 way up back of lemma, geniculate, 20–25 mm long overall, with twisted column. Palea 10–11 mm long. Palea keels pubescent. Apical sterile florets rudimentary.

**Flower and Fruit.** Lodicules 2, 3.5–5 mm long. Anthers 3, 6–7 mm long. Ovary pubescent all over. Caryopsis with adherent pericarp, hairy all over. Hilum linear.

$2n = 28$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa.

**Region. Southwestern Europe.**

**Country /Province /State. :** Spain. Northern Africa. Algeria, Morocco.

### **Helictotrichon galpinii** Schweickerdt. *Bothalia*, iii. 192 (1937).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: South Africa, Barkly East: Galpin 6902 (PRE holo, K).

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955).

**Derivation** (Clifford & Bostock 2007): in honor of Ernest Edward Galpin (1858–1941) banker and amateur botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with fibrous dead sheaths. Culms 30–60 cm long, 2–3 -noded. Lateral branches lacking. Leaf-sheaths smooth, pubescent. Ligule an eciliate membrane, 1.5 mm long. Leaf-blades 12–16 cm long, 2.5–3 mm wide, stiff. Leaf-blade surface pubescent, hairy on both sides.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, 10–16 cm long. Primary panicle branches 2–3.5 cm long, bearing 2–4 fertile spikelets on each lower branch. Panicle branches scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 8–10 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.25 mm long, pilose, hairy above, with 3 mm long hairs. Floret callus pilose. Floret callus hairs 2 mm long.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma. Lower glume lanceolate, 9 mm long, 0.8 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume lateral veins distinct. Lower glume surface asperulous. Lower glume apex acuminate. Upper glume lanceolate, 10.5 mm long, 1.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume surface asperulous. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 8.5 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous, rough generally. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 12 mm long overall, with twisted column.

Column of lemma awn 5 mm long. Lateral lemma awns present, arising on apex of lobes, 1 mm long. Palea keels ciliolate. Palea surface scaberulous.

**Flower and Fruit.** Anthers 3, 2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Southern Africa. Kwazulu-Natal, Lesotho, Eastern Cape.

### **Helictotrichon gonzaloi** (Sennen) Potztal. *Engl. Bot. Jahrb.* lxxv. 331 (1951).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**TYPE** from Spain. **Basionym or Replaced Name:** *Avena pratensis* var. *gonzaloi* Sennen ex St-Yves, *Candollea* 4:454 (1931). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Spain, Barcelona: Gonzalo.

**Recent Synonyms:** *Avenula gonzaloi* (Sennen) J. Holub, *Folia Geobot. Phytotax.* 11 (3): 295 (1976).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Gonzalo (fl.1925) who collected in Spain.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes elongated. Culms 50–90 cm long. Ligule an eciliate membrane, 3–6 mm long, 1–2.5 mm long on basal shoots, acute. Leaf-blades 10–20 cm long, 0.8–1 mm wide. Leaf-blade venation with 12 secondary veins, subepidermal sclerenchyma attached to veins above, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved, scabrous, rough abaxially. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle, comprising 7–17 fertile spikelets. Panicle open, linear or oblong, 10–20 cm long. Primary panicle branches 2–3 -nate. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 5–6 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 16–21 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2–3 mm long, glabrous. Floret callus pubescent. Floret callus hairs 1 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 10–12 mm long, 0.9 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 13–14 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 12–13 mm long, cartilaginous, yellow or mid-green, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 12–15 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** : Spain.

### **Helictotrichon hideoi** (Honda) Ohwi. *Acta Phytotax. & Geobot., Kyoto*, vi. 292 (1937).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.Koyama, *Grasses of Japan and its neighboring regions* (1987).

**TYPE** from Japan. **Basionym or Replaced Name:** *Avena hideoi* Honda, *Bot. Mag., Tokyo*, 40: 435 (1926). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Japan, Misaki: Koidzumi.

**Illustrations (Books):** T.Koyama, *Grasses of Japan and its neighbouring regions* (1987) (149, Fig 49).

**Derivation** (Clifford & Bostock 2007): in honor of Hideo Koidzumi (1886–1945) Japanese botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes short. Culms erect, 65–100 cm long, 2–4 -noded. Leaf-sheaths pubescent. Ligule a ciliolate membrane, 0.5–1 mm long, truncate. Leaf-blades flat or involute, 25–40 cm long, 1.5–3 mm wide. Leaf-blade surface glabrous or pilose, sparsely hairy, hairy abaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, 6–8 cm long. Primary panicle branches ascending or spreading, 2 -nate, bearing 1–3 fertile spikelets on each lower branch. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, compressed slightly, 7–10 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 3 mm long, pilose. Floret callus pilose. Floret callus hairs 1–2 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet or reaching apex of florets, thinner than fertile lemma. Lower glume lanceolate, 4–5 mm long, 0.66 length of upper glume, membranous, 1-keeled, 1–3 -veined. Lower glume lateral veins absent or distinct. Lower glume apex acute. Upper glume lanceolate, 7–8 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 7–8 mm long, cartilaginous, much thinner on margins, without keel, 7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, acute, awned, 1 -awned. Principal lemma awn dorsal, arising 0.75 way up back of lemma, geniculate, 12–15 mm long overall, with twisted column. Column of lemma awn 0.33 length of limb.

**Flower and Fruit.** Anthers 3, 2.5–3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State. China, Eastern Asia.** Japan Honshu. Japan, Taiwan.

### ***Helictotrichon hirtulum* (Steud.) Schweickerdt. *Bothalia*, iii. 193 (1937).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. **Basionym or Replaced Name:** *Trisetum hirtum* Nees, non Trin., *Fl. Afr. Austr.* 850 (1841). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: : Based on T. hirtum Nees ; South Africa, Olifantshoek: Ecklon.

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (78, Fig 48), G.E.Gibbs Russell el al, *Grasses of Southern Africa* (1990) (176, Fig 103).

**Derivation** (Clifford & Bostock 2007): *L. hirtus*, hairy; -ula, diminutive. Somewhat hairy with respect to some or all parts.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with fibrous dead sheaths. Culms 50–100 cm long, 2–3 -noded. Lateral branches lacking. Leaf-sheaths smooth, glabrous on surface or pubescent. Ligule an eciliate membrane, 1 mm long, erose. Leaf-blades filiform, involute, 10–25 cm long, 1–2 mm wide, firm or flaccid. Leaf-blade surface smooth or scaberulous, glabrous or pubescent.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, 10–20 cm long. Primary panicle branches 2 -nate, 2–6 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–5 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 8–11 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.5–2 mm long, pilose, hairy above, with 1.5–2 mm long hairs. Floret callus pubescent. Floret callus hairs 0.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 3.5–6 mm long, 0.5–0.9 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 7 mm long, 0.8–1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 7–8.5 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface scabrous, rough above. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 12–15 mm long overall, with twisted

column. Column of lemma awn 5–7 mm long. Lateral lemma awns present, arising on apex of lobes, 1 mm long. Palea 6–6.5 mm long. Palea keels ciliolate.

**Flower and Fruit.** Anthers 3, 1.5–2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. Southern Africa.** Mpumalanga, Free State, Kwazulu-Natal, Lesotho, Eastern Cape.

### **Helictotrichon hissaricum** (Roshev.) Henrard. *Blumea*, iii. 431 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. **Basionym or Replaced Name:** *Avenastrum hissaricum* Roshev., *Bull. Jard. Bot. Acad. Sc. URSS*, 30: 772 (1932). T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: Russia, Hissar range: Goncharov (LE holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -ica, belonging to. From Hissar District, Turkestan.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Butt sheaths persistent and investing base of culm, with compacted dead sheaths. Culms 60–70 cm long. Culm-internodes scaberulous, distally glabrous. Leaf-sheaths antorsely scabrous, glabrous on surface. Ligule an eciliate membrane, 1 mm long, lacerate. Leaf-blades involute, 10–30 cm long, 1.5–3.5 mm wide. Leaf-blade surface scabrous, glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, oblong, 7–9 cm long. Panicle branches puberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 12–15 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose, with 1.5–3 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 11 mm long, 0.8 length of upper glume, membranous, 1-keeled, 3–5 -veined. Lower glume apex acute. Upper glume elliptic, 13 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3–5 -veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 13 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma midvein scabrous. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 15–20 mm long overall, with twisted column. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State. Middle Asia.** Turkmenistan.

### **Helictotrichon imberbe** (Nees) J.F. Veldkamp. *Blumea*, 28(2): 342: (1983).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from South Africa. **Basionym or Replaced Name:** *Trisetum imberbe* Nees, *Fl. Afr. Austral. Ill.* 347–348 (1841)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: IT: *Drhge* 3918, South Africa: Cape Prov.: Aliwal North Distr., Leeuwenspruit, between Kraai Rivier and the Wittenbergen (L, MO(as s.n.)).

**Recent Synonyms:** *Helictotrichon turgidulum* (Stapf) Schweickerdt, *Bothalia* 3: 196 (1937).

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (78, Fig.48–7, as *H. turgidulum*).

**Images:** F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999) (as *H. turgidulum*).

**Derivation** (Clifford & Bostock 2007): L. beardless. Glumes and/or lemmas glabrous.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect or geniculately ascending, 30–100 cm long, 2–3 -noded. Lateral branches lacking. Leaf-sheaths smooth, pubescent. Ligule an eciliate membrane, 1–1.5 mm long, truncate. Leaf-blades 5–15 cm long, 1.5–6 mm wide. Leaf-blade surface scaberulous, rough adaxially, glabrous. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, continuous or interrupted, equilateral or nodding, 7–30 cm long. Primary panicle branches 2–5 cm long. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–5 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10–12 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2 mm long, pilose, hairy at tip, with 2–3 mm long hairs. Floret callus 0.6 mm long, pilose. Floret callus hairs 1.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 5–7 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 7–9 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 7–8 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface granulose, rough above. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.66 way up back of lemma, geniculate, 15–19 mm long overall, with twisted column. Column of lemma awn 5–7 mm long. Lateral lemma awns present, arising on apex of lobes, 1 mm long. Palea 6 mm long. Palea keels ciliolate.

**Flower and Fruit.** Anthers 3, 0.7–1 mm long, retained within floret. Ovary pubescent on apex. Caryopsis with adherent pericarp, 2.5 mm long, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe (\*), Africa.

**Region. Northern Europe (\*).**

**Country /Province /State.** : GB Aliens (Ryves et al). **Southern Africa.** Limpopo, North-West, Gauteng, Mpumalanga, Swaziland, Free State, KwaZulu-Natal, Lesotho, Northern Cape, Western Cape, Eastern Cape.

### **Helictotrichon jahandiezii** (Litard.) Potztal. *Engl. Bot. Jahrb.* lxxv. 330 (1951).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Morocco. **Basionym or Replaced Name:** *Avena jahandiezii* Litard. ex Jahandiez & Maire, *Bull. Soc. Hist. Nat. Afr. Nord.*, 16: 67 (1925). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Morocco, Afn-Kahla: Jahandiez.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Emile Jahandiez (1876–1938) who wrote about the grasses of North Africa.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Butt sheaths thickened and forming a bulb, pubescent, persistent and investing base of culm. Culms erect or geniculately ascending, 30–80 cm long, 2 -noded. Culm-internodes smooth or scaberulous. Culm-nodes brown. Leaf-sheaths tubular for much of their length, with 0.75 of their length closed, smooth or scaberulous. Ligule a ciliolate membrane, 0.8–1.5 mm long, pubescent on abaxial surface, truncate. Leaf-blades 4–8 cm long, 1.5–4 mm wide. Leaf-blade midrib conspicuous. Leaf-blade surface smooth. Leaf-blade margins scabrous. Leaf-blade apex obtuse, hooded.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong or ovate, 6–10 cm long. Primary panicle branches ascending, 2 -nate. Panicle axis smooth or scaberulous. Panicle branches flexuous, scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 12–16 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose. Floret callus pilose, with linear scar.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma. Lower glume lanceolate, 12–15 mm long, 1 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex

acute. Upper glume elliptic, 12–16 mm long, 1.2–1.3 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 9–13 mm long, cartilaginous, much thinner above, without keel, 5–7 -veined, more than 3-veined. Lemma midvein ciliate, hairy below. Lemma surface pilose. Lemma hairs 4–5 mm long. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.4–0.5 way up back of lemma, geniculate, 14–18 mm long overall, with twisted column. Column of lemma awn pubescent. Palea keels pubescent. Apical sterile florets rudimentary.

**Flower and Fruit.** Lodicules 2, 1–1.2 mm long. Anthers 3, 4.5–5 mm long, purple. Ovary pubescent on apex. Caryopsis with adherent pericarp, fusiform, sulcate on hilar side, 5 mm long, hairy at apex. Embryo 0.33 length of caryopsis. Hilum linear.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Northern Africa. Morocco.

### **Helictotrichon jingpoense** Y.X. Ma. *Bull. Bot. Res.*, Harbin 21(4): 506–507, f. 1. 2001.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -ense, denoting origin. From Jingpo, Yunnan Province, China.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** China. Manchuria.

Heilongjiang.

### **Helictotrichon junghuhnii** (Buse) Henrard. *Blumea*, iii. 425 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*).

**TYPE** from Indonesia. **Basionym or Replaced Name:** *Avena junghuhnii* Buse, *Miq. Pl. Jungh.* 345 [Feb.] (1854). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Java, Mt. Dieng: Junghuhn.

**Recent Synonyms:** *Helictotrichon asperum* (Munro ex Thwait.) Bor, *Indian Forest Rec. n. s. i. Bot.*, 68 (1938).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Franz Wilhelm Junghuhn (1809–1864) German botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 40–160 cm long. Culm-internodes terete. Lateral branches lacking. Leaves mostly basal. Leaf-sheaths smooth, glabrous on surface or pilose. Ligule an eciliate membrane, 1–5 mm long, glabrous on abaxial surface. Leaf-blades conduplicate, 8–35 cm long, 2–8.5 mm wide. Leaf-blade surface scaberulous, rough adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, equilateral or nodding, 10–30 cm long, 3–15 cm wide. Primary panicle branches ascending, 5–15 cm long, bearing 6–12 fertile spikelets on each lower branch. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3(–4) fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 9–18 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate or oblong, 5–9 mm long, 0.75 length of upper glume, membranous, much thinner above, much thinner on margins, 1-keeled, 1–3 -veined. Lower glume primary vein scabrous. Lower glume lateral veins absent or distinct. Lower glume apex acuminate. Upper glume lanceolate or oblong, 6–12 mm long, 0.8–1 length of adjacent fertile lemma, membranous, much thinner above, with hyaline margins, 1-keeled, 5 -veined. Upper glume primary vein scabrous. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 7.5–12.5 mm long, cartilaginous, much thinner above, much thinner on margins, shiny, without keel, 7(–9) -veined, more than 3-veined. Lemma surface smooth. Lemma apex dentate, 2 -fid, acuminate or setaceous acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising

0.5 way up back of lemma, geniculate, 10–18 mm long overall, with twisted column. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 3.3–4 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State. China.** China South Central, China North-Central, Qinghai, China Southeast, Tibet. **Indian Subcontinent, Indo-China, Malesia.** Eastern Himalaya, Nepal, Pakistan, Sri Lanka, West Himalaya. Myanmar. Java, Sumatra.

Shaanxi. Henan. Guizhou, Sichuan, Yunnan.

### **Helictotrichon krylovii** (Pavlov) Henrard. *Blumea*, iii. 431 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.Tsvelev, *Grasses of the Soviet Union* (1983) (as *H. krylovii*).

**TYPE** from Russia. **Basionym or Replaced Name:** *Avenastrum krylovii* Pavlov, *Animadvers. Syst. Herb. Univ. Tomsk.* Nos. 5–6, p. 1. (1933). T:<Type of Basionym>; fide TROPICOS and Kew Synonomy Database: Russia, Yakutsk: Bronsov (MW holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Porfirij Nikitic Krylov (1850–1931) Russian botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Butt sheaths persistent and investing base of culm, with compacted dead sheaths. Culms 20–40 cm long. Culm-internodes distally glabrous. Leaf-sheaths pilose. Ligule a ciliolate membrane, 0.2 mm long. Leaf-blades filiform, involute, 13–15 cm long, 1–2 mm wide. Leaf-blade surface pilose, hairy abaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, 4–6 cm long. Primary panicle branches 0.5–1.2 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 9–11 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose, with 2–3 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 9 mm long, 0.9 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 10 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 9–10 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10–15 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** Siberia, Russian Far East. Kamchatka.

### **Helictotrichon lachnanthum** (Hochst. ex A. Rich.) C. E. Hubbard. *Kew Bull.* 1936, 335 (1936).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Trisetum lachnanthum* Hochst. ex A. Rich., *Tent. Fl. Abyss.* 2: 416 (1850). T:<Type of Basionym>; fide TROPICOS and Kew Synonomy Database: Ethiopia, Mt. Aber: Schimper 859 (K iso).

**Illustrations (Books):** S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (32, Fig 15).

**Derivation** (Clifford & Bostock 2007): Gk. *lachnos*, wool; *anthos*, flower. Spikelets wooly.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Culms geniculately ascending or decumbent, 60–120 cm long. Ligule an eciliate membrane, 2–4 mm long. Leaf-blades 12–25 cm long, 3–5 mm wide. Leaf-blade surface glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, effuse, 10–25 cm long. Panicle branches flexuous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–5 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 8–12 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.5–2.5 mm long, villous, hairy above, with 2–3 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate, 3–5 mm long, 0.6–0.8 length of upper glume, hyaline, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume oblong, 5–6.5 mm long, 0.9 length of adjacent fertile lemma, hyaline, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 5.5–7 mm long, herbaceous, much thinner above, without keel, 7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, acute or setaceously acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.66–0.8 way up back of lemma, geniculate, 10–15 mm long overall, with twisted column. Palea keels ciliolate. Rhachilla extension 0.75 length of fertile floret, pilose.

**Flower and Fruit.** Anthers 3, 1.5–2.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Northeast Tropical Africa, East Tropical Africa. Ethiopia (inc. Eritrea). Kenya, Tanzania, Uganda.

### **Helictotrichon leianthum** (Keng) Ohwi. *Journ. Jap. Bot.* xvii. 440 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**Basionym or Replaced Name:** *Avena leiantha* Keng, *Bull. Fan Mem. Inst. Biol., Peiping, Bot. Ser.*, 7: 35 (1936).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 438).

**Derivation** (Clifford & Bostock 2007): Gk. *leios*, smooth; *anthos*, flower. Spikelets with glabrous glumes or lemmas.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 60 cm long, 2 mm diam., 2–3 -noded. Culm-internodes distally glabrous or pubescent. Culm-nodes constricted. Leaf-sheaths loose, longer than adjacent culm internode, glabrous on surface or puberulous. Leaf-sheath oral hairs pubescent. Ligule an eciliate membrane, 1 mm long, truncate. Leaf-blades flat or convolute, 10–20 cm long, 3–6 mm wide. Leaf-blade surface pubescent, hairy adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear or oblong, nodding, 15–18 cm long. Primary panicle branches spreading, 2 -nate, bearing 1–4 fertile spikelets on each lower branch. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2 mm long, pilose, with 1.2 mm long hairs. Floret callus pilose. Floret callus hairs 1 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 5 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 7 mm long, 0.75 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 9–10 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.4 way up back of lemma, geniculate, 18–20 mm long overall, with twisted column. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 3–3.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State. China.** China South Central, China North-Central, China Southeast.

Gansu, Shaanxi, Shanxi, Anhui, Zhejiang, Guizhou, Hubei, Sichuan, Yunnan.

### **Helictotrichon leoninum** (Steud.) Schweickerdt. *Bothalia*, iii. 191 (1937).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. **Basionym or Replaced Name:** *Avena leonina* Steud., *Flora*, 12 II. 484 (1829). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: South Africa, Cape: Ecklon 928 (K iso).

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (78, Fig 48).

**Derivation** (Clifford & Bostock 2007): L. -*ina*, belonging to. From places inhabited by lions.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with fibrous dead sheaths. Culms 15–50 cm long, 2–3 -noded. Lateral branches lacking. Leaf-sheaths smooth, glabrous on surface or pilose. Ligule an eciliate membrane, 1.5–2 mm long, erose. Leaf-blades 4–10 cm long, 2–3 mm wide. Leaf-blade surface glabrous or pubescent. Leaf-blade apex hardened.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, 6–10 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–5 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 12–14 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.5–2 mm long, glabrous. Floret callus 1 mm long, pubescent.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 5.5–7 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 7.5–9 mm long, 0.9 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 8–10 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface papillose. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 20–22 mm long overall, with twisted column. Column of lemma awn 7–9 mm long. Lateral lemma awns present, arising on apex of lobes, 4–5 mm long. Palea keels ciliolate.

**Flower and Fruit.** Anthers 3, 2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. Southern Africa.** Western Cape.

### **Helictotrichon longifolium** (Nees) Schweickerdt. *Bothalia*, iii. 195 (1937).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. **Basionym or Replaced Name:** *Trisetum longifolium* Nees, *Fl. Afr. Austr.* 348 (1841). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: South Africa, Wittebergen: Drege (K iso); South Africa, Wittebergen: Ecklon.

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (78, Fig 48).

**Derivation** (Clifford & Bostock 2007): L. *longus*, long; *folium*, leaf. With long leaf-blades.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with fibrous dead sheaths. Culms 30–90 cm long, 3–4 -noded. Lateral branches lacking. Leaf-sheaths smooth, glabrous on surface. Ligule an eciliate membrane, 1.5 mm long. Leaf-blades filiform, convolute, 20–40 cm long, 1–1.5 mm wide. Leaf-blade margins scabrous.

**Inflorescence.** Inflorescence a panicle. Panicle open, elliptic, 10–20 cm long. Primary panicle branches simple or sparsely divided, 2–5 cm long. Panicle branches capillary, scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 8–10 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2 mm long, eventually visible between lemmas, pilose, hairy above, with 3–4 mm long hairs. Floret callus 0.75 mm long, pilose. Floret callus hairs 1.5–2 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 5–6.5 mm long, 0.66–0.75 length of upper glume, hyaline, 1-keeled, 1 -veined. Lower glume primary vein scaberulous. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 8–9 mm long, 0.8–0.9 length of adjacent fertile lemma, hyaline, 1-keeled, 3 -veined. Upper glume primary vein scaberulous. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 10 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface smooth. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 15–25 mm long overall, with twisted column. Column of lemma awn 5–8 mm long. Lateral lemma awns present, arising on apex of lobes, 2 mm long. Palea 6 mm long. Palea keels ciliolate.

**Flower and Fruit.** Anthers 3, 2–3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 18$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. Southern Africa.** Mpumalanga, Free State, Kwazulu-Natal, Lesotho, Western Cape, Eastern Cape.

### ***Helictotrichon longum* (Stapf) Schweickerdt. *Bothalia*, iii. 189 (1937).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from South Africa. **Basionym or Replaced Name:** *Avena longa* Stapf, *Kew Bull.* 1897, 292 (1897). T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: South Africa, Doorn Hogte: Ecklon & Zeyer 1807 (K syn) ; South Africa, Doorn Hogte: Ecklon & Zeyer 1807B (K syn) ; South Africa, Cape: R. Brown.

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (78, Fig 48).

**Derivation** (Clifford & Bostock 2007): L. long. Panicle contracted, long.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Butt sheaths persistent and investing base of culm. Culms 60–110 cm long, 3 -noded. Lateral branches lacking. Leaf-sheaths smooth, glabrous on surface or pubescent. Ligule an eciliate membrane, 3–5 mm long, truncate. Leaf-blades 15–30 cm long, 2.5–10 mm wide, flaccid. Leaf-blade surface smooth or scaberulous, rough adaxially. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear or oblong, continuous or interrupted, nodding, 15–30 cm long. Primary panicle branches 2–5 cm long. Panicle branches scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–5 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 15–30 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2.5–3 mm long, pilose, hairy all along, with 3 mm long hairs. Floret callus evident, 1.25–2 mm long, pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 6.5–9 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1–3 -veined. Lower glume lateral veins absent or obscure. Lower glume apex acuminate. Upper glume lanceolate, 9–12 mm long, 0.66–0.75 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 15 mm long, cartilaginous, pallid or purple, without keel, 5 -veined, more than 3-veined. Lemma surface granulose. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 20–25 mm long overall, with twisted

column. Column of lemma awn 6–9 mm long. Lateral lemma awns present, arising on apex of lobes, 3 mm long. Palea 7 mm long. Palea keels ciliolate.

**Flower and Fruit.** Anthers 3, 2.5–3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. Southern Africa.** Northern Cape, Western Cape.

### **Helictotrichon macrostachyum** (Balansa ex Coss. & Durieu) Henrard. *Blumea*, iii. 430 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Algeria. **Basionym or Replaced Name:** *Avena macrostachya* Balansa & Dur., *Bull. Soc. Bot. Fr.* 1: 318 (1855). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Algeria, Batna: Balansa 718 (K iso).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): Gk. *makros*, large; *stachys*, ear of corn. Inflorescence large.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Culms erect or geniculately ascending, 40–100 cm long, 2–3 -noded. Ligule an eciliate membrane, 1–2 mm long, obtuse. Leaf-blades 10–16 cm long, 3–6 mm wide. Leaf-blade surface scaberulous, rough on both sides, glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, dense or loose, nodding. Primary panicle branches simple. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–6 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 20–30 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2 mm long, glabrous. Floret callus elongated, pilose.

**Glumes.** Glumes persistent, similar, reaching apex of florets or shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 10–12 mm long, 0.5–0.6 length of upper glume, membranous, without keels, 3 -veined. Lower glume apex setaceously acuminate. Upper glume lanceolate, 18–25 mm long, 1.3–1.4 length of adjacent fertile lemma, membranous, without keels, 7 -veined. Upper glume apex setaceously acuminate.

**Florets.** Fertile lemma elliptic, 14–18 mm long, coriaceous, without keel, 7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, setaceously acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.66 way up back of lemma, geniculate, 20–30 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 8–9 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. Northern Africa.** Algeria, Tunisia.

### **Helictotrichon mannii** (Pilger) C. E. Hubbard. *Kew Bull.* 1936:334 (1936).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Cameroon. **Basionym or Replaced Name:** *Avenastrum mannii* Pilger, *Notizbl. Bot. Gart. Berlin*, 9: 520 (1926). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Cameroun, Cameroon Mt.: Mann 2020 (B holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Gustav Mann (1836–1916) German botanist and plant collector employed as gardener at Royal Botanic Gardens, Kew, England.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Culms erect or geniculately ascending, 90–100 cm long, 4–7 -noded. Ligule an eciliate membrane, 2–3 mm long. Leaf-blades 15–30 cm long, 3–10 mm wide. Leaf-blade surface smooth or scaberulous, glabrous or pubescent, sparsely hairy, hairy adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear, effuse, 17–35 cm long. Panicle branches straight or flexuous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 14–18 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 3–3.5 mm long, pilose, hairy above, with 1–1.5 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 3.5–5 mm long, 0.6–0.7 length of upper glume, herbaceous, much thinner on margins, 1-keeled, 1–3 -veined. Lower glume apex acute. Upper glume oblong, 5–8 mm long, 0.5 length of adjacent fertile lemma, herbaceous, with hyaline margins, 1-keeled, 3–5 -veined. Upper glume surface smooth or asperulous, rough on veins. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 10–16 mm long, herbaceous, without keel, 7–9 -veined, more than 3-veined. Lemma surface scaberulous, rough above. Lemma apex dentate, 2 -fid, acute or setaceously acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.66–0.8 way up back of lemma, geniculate, 10–16 mm long overall, with twisted column. Palea keels ciliolate. Rhachilla extension 0.75 length of fertile floret, pilose.

**Flower and Fruit.** Anthers 3, 2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 28$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West-Central Tropical Africa. Cameroon, Bioko.

### ***Helictotrichon milanjianum* (Rendle) C. E. Hubbard. *Kew Bull.* 1936. 334 (1936).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Malawi. **Basionym or Replaced Name:** *Bromus milanjanus* Rendle, *Trans. Linn. Soc. Ser. II. 4 :59* (1894). T:<Type of Basionym>; fide TROPICOS and Kew Synonymy Database: Malawi, Mt. Milanje: Whyte 9 (K iso).

**Illustrations (Books):** S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (32, Fig 15).

**Derivation** (Clifford & Bostock 2007): L. -ana, indicating location. From Milanji, Malawi.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Butt sheaths dark brown. Culms erect or geniculately ascending, 50–120 cm long. Ligule an eciliate membrane, 2–4 mm long. Leaf-blades 8–30 cm long, 4–7 mm wide. Leaf-blade surface glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear, effuse, 15–25 cm long. Panicle branches flexuous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 13–15 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 3 mm long, pilose, hairy above. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 3–6 mm long, 0.7–0.8 length of upper glume, herbaceous, much thinner on margins, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume oblong, 4–8 mm long, 0.5–0.7 length of adjacent fertile lemma, herbaceous, with hyaline margins, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 8–12 mm long, herbaceous, without keel, 7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, setaceously acuminate, awned, 1 -awned. Principal lemma awn subapical or dorsal, arising 0.9 way up back of lemma, flexuous or geniculate, 12–20 mm long overall, without a column or with a straight or slightly twisted column. Palea keels ciliolate. Rhachilla extension 0.75 length of fertile floret, pilose.

**Flower and Fruit.** Anthers 3, 2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Western Indian Ocean. Rwanda, DRC. Ethiopia (inc. Eritrea). Kenya, Tanzania, Uganda. Malawi. Madagascar.

### **Helictotrichon (Avena) mirandanum** (Sennen) FORSAN. (1999).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**Basionym or Replaced Name:** *Avenula mirandana* Sennen ex St.-Yves, in syn, *Candollea*, 4: 457 (1931).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ana*, indicating connection. In honor of Mirand.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes elongated. Culms 30–60 cm long. Ligule an eciliate membrane, 3–7 mm long, 0.5–3 mm long on basal shoots, acute. Leaf-blades conduplicate, 6–15 cm long, 0.5–2 mm wide. Leaf-blade venation with subepidermal sclerenchyma attached to veins above, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ribbed, grooved abaxially.

**Inflorescence.** Inflorescence a panicle, comprising 3–12 fertile spikelets. Panicle open, linear, 8–14 cm long, bearing few spikelets. Primary panicle branches indistinct the panicle almost racemose. Panicle branches scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–6 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 15–20 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2–3 mm long, glabrous or pilose, with 1–1.5 mm long hairs. Floret callus pilose. Floret callus hairs 1.5–2.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 11–15 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 7–11 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 10–14 mm long, cartilaginous, yellow or light brown, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, obtuse, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 12–15 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** : Spain.

### **Helictotrichon mongolicum** (Roshev.) Henrard. *Blumea*, iii. 431 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. **Basionym or Replaced Name:** *Avena mongolica* Roshev., *Bull. Jard. Bot. Princ. URSS*, 27: 96 (1928). T:<Type of Basionym>: fide TROPICOS and Kew Synonomy Database: Russia, Sayan, Munku-Sardyk: Czekanovsky (LE lecto).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 440).

**Derivation** (Clifford & Bostock 2007): L. -*ica*, belonging to. From Mongolia.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 15–50 cm long. Culm-internodes smooth. Ligule a fringe of hairs. Leaf-blades 1.5–2.5 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear or oblong, 3–6 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 12 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose, with 3–4 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate, 10 mm long, 1 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume lanceolate, 10 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 11 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10–15 mm long overall, with twisted column. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** Siberia, Middle Asia, China, Mongolia, Russia. Altay, Buryatiya, Chita, Irkutsk, Tuva. Kazakhstan. Xinjiang. Mongolia.

### **Helictotrichon mortonianum** (Scribn.) Henrard. *Blumea*, iii. 429 (1940).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE from USA. Basionym or Replaced Name:** *Avena mortoniana* Scribn., *Coult. Bot. Gaz.* 21: 133 (1896). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: USA, Colorado, Silver Plume: Shear 697 (US holo).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (702).

**Derivation** (Clifford & Bostock 2007): in honor of Julius Sterling Morton (1832–1902), United States agricultural administrator.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Culms 10–20 cm long. Ligule an eciliate membrane. Leaf-blades erect, involute, 3–8 cm long, 1 mm wide, stiff.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear or oblong, 2–5 cm long, bearing few spikelets. Primary panicle branches appressed, bearing 1 fertile spikelets on each lower branch. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong or cuneate, laterally compressed, 10–12 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose. Floret callus pilose. Floret callus hairs 2 mm long.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma. Lower glume lanceolate, 10–12 mm long, 1 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acuminate. Upper glume lanceolate, 10–12 mm long, 1.5 length of adjacent fertile lemma, membranous, 1-keeled, 3–5 -veined. Upper glume apex acuminate.

**Florets.** Fertile lemma elliptic, 6–7 mm long, cartilaginous, without keel, more than 3-veined. Lemma apex dentate, 4 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10–15 mm long overall, with twisted column.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** North America.

**Country /Province /State.** Northwest USA, Southwestern USA, South-central USA. Colorado, Wyoming, Utah, New Mexico.

## **Helictotrichon namaquense** Schweickerdt. *Bothalia*, iii. 189 (1937).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: South Africa, Kamiesbergen: *Drege* 2526 (K iso).

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (78, Fig 48).

**Derivation** (Clifford & Bostock 2007): L. -ense, denoting origin. From Namaqualand, South Africa.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 25–45 cm long, 1 -noded. Lateral branches lacking. Leaf-sheaths smooth, glabrous on surface. Ligule an eciliate membrane, 2–3 mm long, truncate. Leaf-blades 5–16 cm long, 2–4 mm wide, stiff. Leaf-blade surface scaberulous, rough abaxially, pubescent, hairy adaxially. Leaf-blade apex hardened.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, equilateral or nodding, 6–12 cm long. Primary panicle branches 2 -nate, 1–2.5 cm long, bearing 1–3 fertile spikelets on each lower branch. Panicle branches capillary, scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10–17 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2.5–3 mm long, pilose, hairy above, with 4–5 mm long hairs. Floret callus evident, curved, 1.5 mm long, pilose. Floret callus hairs 2.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 8–9 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 12 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3–5 -veined. Upper glume primary vein scaberulous. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 10 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous, rough above. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 20 mm long overall, with twisted column. Column of lemma awn 8 mm long. Lateral lemma awns present, arising on apex of lobes, 2 mm long. Palea 8 mm long. Palea keels ciliolate.

**Flower and Fruit.** Anthers 3, 3.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

*n* = 14 (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. Southern Africa.** Northern Cape.

## **Helictotrichon natalense** (Stapf) Schweickerdt. *Bothalia*, iii. 194 (1937).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. **Basionym or Replaced Name:** *Avenastrum caffrum* var. *natalense* Stapf, *Fl. Cap.* 7:477 (1899). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: South Africa, Natal, Riet Vlei: Buchanan 238 (K holo).

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (78, Fig 48–1).

**Derivation** (Clifford & Bostock 2007): L. -ense, denoting origin. From Natal, South Africa.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 40–80 cm long, 4 -noded. Lateral branches lacking. Leaf-sheaths scaberulous, pilose. Ligule an eciliate membrane, 0.5 mm long. Leaf-blades 10–25 cm long, 3–5 mm wide. Leaf-blade surface scaberulous, rough on both sides, pilose, sparsely hairy, hairy adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, elliptic, 10–25 cm long. Primary panicle branches spreading, simple, 2–3.5 cm long. Panicle branches capillary, flexuous, scaberulous, glabrous or hispidulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 7–9 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.5 mm long, pilose, hairy at tip, with 3 mm long hairs. Floret callus pubescent.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 3 mm long, 0.5 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume primary vein scaberulous. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 6 mm long, 0.75 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume primary vein scaberulous. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 7–8 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface smooth. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 6–8 mm long overall, with a straight or slightly twisted column. Column of lemma awn 3 mm long. Lateral lemma awns present, arising on apex of lobes, 1 mm long. Palea 4 mm long. Palea keels ciliolate.

**Flower and Fruit.** Anthers 3, 1.5–2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Southern Africa. Mpumalanga, Kwazulu-Natal.

### **Helictotrichon newtonii** (Stapf) C.E.Hubb. *Kew Bull.* 1936, 334 (1936).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Angola. **Basionym or Replaced Name:** *Avena newtonii* Stapf, *Kew Bull.* 1897, 291 (1897). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Angola, Mossamedes: Newton 6 (K holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): In honor of Francisco Newton (1864–1909) Portuguese botanist who collected in Angola.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Culms slender, 60–90 cm long, 2–3 -noded. Culm-internodes smooth, distally glabrous. Leaf-sheaths mostly shorter than adjacent culm internode, striately veined, smooth, glabrous on surface. Ligule an eciliate membrane, 2 mm long, truncate. Leaf-blades 7–12 cm long, 2.5 mm wide. Leaf-blade surface scaberulous, rough adaxially, glabrous. Leaf-blade margins scaberulous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, 15–18 cm long. Primary panicle branches 2 -nate, simple or sparsely divided, 3–7 cm long. Panicle axis scaberulous (above). Panicle branches capillary, flexuous, scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 1–4 mm long.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 11–14 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 3–3.5 mm long, pilose, hairy above, with 2–3 mm long hairs. Floret callus 0.75 mm long, pilose, obtuse.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 7–8 mm long, 0.7–0.75 length of upper glume, hyaline, 1-keeled, 4–5 -veined. Lower glume primary vein scaberulous. Lower glume apex acuminate. Upper glume lanceolate, 10–11 mm long, 1–1.1 length of adjacent fertile lemma, hyaline, 1-keeled, 5–7 -veined. Upper glume primary vein scaberulous. Upper glume apex acuminate.

**Florets.** Fertile lemma lanceolate, 9–11 mm long, cartilaginous, much thinner above, without keel, 9–11 -veined, more than 3-veined. Lemma surface granulose. Lemma apex dentate, 2 -fid, setaceous acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10–18 mm long overall, with twisted column. Column of lemma awn 6–7 mm long. Palea oblong, 7–8 mm long. Palea keels ciliolate, adorned above. Rhachilla extension pilose.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, oblong, 4 mm long, hairy at apex. Hilum linear.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** South Tropical Africa. Angola.

**Helictotrichon occidentale** (Gervais) M. Roser. *Karyol., Syst. u. Chorol. Untersuch. Gatt.*

*Helictotrichon W. Mittelmeer. (Diss. Bot. 145): 154: (1989).*

**Accepted by:** T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**Basionym or Replaced Name:** *Avenula occidentalis* (Gervais) J. Holub, *Folia Geobot. Phytotax.*, 11(3): 295 (1976).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *occident*, west; -*ale*, pertaining to.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Stolons present. Basal innovations intravaginal. Culms 50–90 cm long. Culm-internodes elliptical in section. Leaf-sheaths open for most of their length. Ligule an eciliate membrane, 2.5–7 mm long, 0.8–2 mm long on basal shoots, acute. Leaf-blades conduplicate, 15–40 cm long, 1.8–2.5 mm wide. Leaf-blade venation with 8–12 secondary veins, subepidermal sclerenchyma attached to veins above, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved.

**Inflorescence.** Inflorescence a panicle, comprising 6–30 fertile spikelets. Panicle open, linear, 5–15 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–7 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 12–20 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose, with 2.5 mm long hairs. Floret callus pilose. Floret callus hairs 1.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 9–13 mm long, 0.9 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 11–14 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3–5 -veined. Upper glume apex acute.

**Florets.** Fertile lemma obovate, 11–16 mm long, cartilaginous, without keel, 7 -veined, more than 3-veined. Lemma surface pubescent, hairy below. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5–0.66 way up back of lemma, geniculate, flat below, 10–20 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 28$  (1 ref TROPICOS).

**Distribution (TDWG).** Continent. Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** : Portugal.

**Helictotrichon parlatorei** (Woods) Pilger. *Fedde, Repert. xlv. 7* (1938).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980).

**Illustrations (Books):** G.Hegi, *Flora von Mitteleuropa* 1 (1909) (as *Avena parlatorei*).

**Derivation** (Clifford & Bostock 2007): in honor of Filippo Parlatore (1816–1877) Italian botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes short. Butt sheaths persistent and investing base of culm, with compacted dead sheaths. Culms 40–80 cm long. Ligule an eciliate membrane, 3–6 mm long, lacerate. Leaf-blades flat or convolute, 20–40 cm long, 2–4 mm wide. Leaf-blade surface ribbed.

**Inflorescence.** Inflorescence a panicle, comprising 15–45 fertile spikelets. Panicle open, linear or oblong, 10–13 cm long. Primary panicle branches bearing 3–5 fertile spikelets on each lower branch. Panicle axis scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 3–4 mm long, glabrous.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the

upper sterile. Spikelets oblong, laterally compressed, 10–11 mm long, breaking up at maturity, disarticulating above glumes but not between florets. Rhachilla internodes 2–3 mm long, pilose, with 2–3 mm long hairs. Floret callus pilose. Floret callus hairs 1.5–2 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 7–10 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 9–12 mm long, 1.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 7–10 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, subterete below, 12–20 mm long overall, with twisted column. Palea 7–9 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe.

**Region.** Middle Europe, Southwestern Europe, Southeastern Europe.

**Country /Province /State.** : Austria, Germany. : France. : Italy, Yugoslavia.

### **Helictotrichon parviflorum** (Hook. f.) Bor. *Kew Bull.* 1 51, 445, *in obs.* (1952).

**Accepted by:** N.L.Bor, Grasses of Burma, Ceylon, India and Pakistan (1960).

**TYPE** from India. **Basionym or Replaced Name:** *Avena aspera* var. *parviflora* Hook. f., *Fl. Brit. India* 7: 276 (1896). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: India, Sikkim: Clarke (K holo).

**Illustrations (Books):** H.J.Noltie, *The Grasses of Bhutan* (2000) (583, Fig. 22).

**Derivation** (Clifford & Bostock 2007): L. *parvus*, small; *flos*, flower. Spikelets small or with few florets.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 50–70 cm long. Lateral branches lacking. Ligule an eciliate membrane. Leaf-blades 10–15 cm long, 2–4 mm wide. Leaf-blade apex attenuate, pungent.

**Inflorescence.** Inflorescence a panicle. Panicle open, elliptic or oblong, 10–15 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 9–10 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 3 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume ovate, 4 mm long, 0.66 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 6–7 mm long, cartilaginous, without keel, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.75 way up back of lemma, geniculate, 9–10 mm long overall, with twisted column. Palea keels pubescent. Apical sterile florets rudimentary.

**Flower and Fruit.** Lodicules 2. Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State.** Indian Subcontinent. Eastern Himalaya.

Darjeeling, Bhutan, Sikkim.

### **Helictotrichon petzense** Melzer. *Osterr. Bot. Zeitschr.* cxiv. 308 (1968).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from Austria. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Austria, Petzen: Melzer (GZU holo, KL, W).

**Illustrations:** None found.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Basal innovations intravaginal. Culms 20–60 cm long. Culm-internodes distally pubescent. Ligule a ciliolate membrane, 0.5–0.7 mm long, truncate. Leaf-blades filiform, 10–40 cm long, 0.7–0.9 mm wide. Leaf-blade surface puberulous, hairy adaxially.

**Inflorescence.** Inflorescence a panicle, comprising 8–15 fertile spikelets. Panicle open, linear or oblong, dense, 4–10 cm long. Panicle axis scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 12–15 mm long, breaking up at maturity, disarticulating above glumes but not between florets. Rhachilla internodes 1–2 mm long, pilose, with 4–6 mm long hairs. Floret callus pilose. Floret callus hairs 3–3.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 9–12 mm long, 0.9 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 10–14 mm long, 1.1–1.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 9–12 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, subterete below, 18–22 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe.

**Region.** Middle Europe, Southeastern Europe.

**Country /Province /State.** : Austria. : Yugoslavia.

### **Helictotrichon planifolium** (Willk.) Holub. *Folia Geobot. Phytotax.*, 9(3): 273 (1974).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from Spain. **Basionym or Replaced Name:** *Avena montana* var. *planifolia* Willk., *Prodr. Fl. Hisp.* 1:69 (1861). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Spain, Pyrenees: Endr.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *planus*, flat; *folium*, leaf. Leaf-blades flat.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Basal innovations extravaginal. Culms 60–100 cm long. Leaf-sheaths tubular for much of their length, with 0.5 of their length closed. Ligule a ciliolate membrane, 0.5 mm long, truncate. Leaf-blades flat, 20–35 cm long, (2–)3–4(–7) mm wide, flaccid. Leaf-blade venation without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ribbed.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear or oblong, 6–15 cm long. Primary panicle branches bearing 1–5 fertile spikelets on each lower branch. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, clavate.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 11–14 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.5–2.5 mm long, pilose, with 1.5–5 mm long hairs. Floret callus pilose. Floret callus hairs 2–2.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 7–9 mm long, 0.9 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral

veins absent. Lower glume apex acute. Upper glume elliptic, 8–11 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 7–10 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, subterete below, 10–15 mm long overall, with twisted column. Palea 6–9 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** : France, Spain.

### **Helictotrichon polyneurum** (Hook. f.) Henrard. *Blumea*, iii. 425 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.L.Bor, Grasses of Burma, Ceylon, India and Pakistan (1960).

**TYPE** from India. **Basionym or Replaced Name:** *Avena polyneura* Hook. f., *Fl. Brit. Ind.* 7: 277 (1896). T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: India, Nilgiri hills, Dodabetta: Gamble (K holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): Gk. *polys*, several; *neuron*, nerve.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 50–80 cm long. Ligule an eciliate membrane. Leaf-blades 10–15 cm long, 2–3 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, nodding, 12–15 cm long. Panicle branches capillary. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, filiform, sinuous.

**Fertile Spikelets.** Spikelets comprising 4 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 16–17 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate, 7–10 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 10–11 mm long, 1.1–1.2 length of adjacent fertile lemma, membranous, 1-keeled, 5 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 8–10 mm long, cartilaginous, without keel, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.75 way up back of lemma, geniculate, 10–13 mm long overall, with twisted column. Palea keels pubescent. Apical sterile florets rudimentary.

**Flower and Fruit.** Lodicules 2. Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

*n* = 14 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State.** China. China South Central, Tibet. **Indian Subcontinent.** India.

Yunnan. Tamilnadu.

### **Helictotrichon potaninii** Tsvelev. *Pl. Asiae Centr.* 4:101 (1968).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**TYPE** from China. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: China, Szechuan, Su-ye-schan: Potanin (LE holo).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 440).

**Derivation** (Clifford & Bostock 2007): in honor of Grigorij Nikolajevic Potanin (1835–1920) Russian botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Culms erect, 25–50 cm long. Culm-internodes smooth, distally glabrous. Lateral branches lacking. Leaf-sheaths smooth, glabrous on surface. Ligule an eciliate membrane, 1.5–3.5 mm long, glabrous on abaxial surface. Leaf-blades 2–4 mm wide. Leaf-blade surface smooth or scaberulous, rough adaxially, glabrous or pilose, hairy adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, lanceolate, 5–8 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 7–9.5 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes villous, with 3–4 mm long hairs.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma, shiny. Lower glume lanceolate, 0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 7–9.5 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acuminate.

**Florets.** Fertile lemma lanceolate, 7–9.5 mm long, cartilaginous, much thinner above, shiny, without keel, 7 -veined, more than 3-veined. Lemma surface scaberulous. Lemma apex dentate, 2 -fid, setaceous acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10–14 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 1–1.6 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** China. China South Central.  
Sichuan.

### ***Helictotrichon pubescens* (Huds.) Schult. *Syst. Veg. Mant.* 3 (Addit. 1):256 (1827).**

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online (as *Avenula*), W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**TYPE** from UK. **Basionym or Replaced Name:** *Avena pubescens* Huds., *Fl. Angl.* 42 (1762). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Britain, Banstead Downs: Hudson.

**Recent Synonyms:** *Avenula pubescens* (Huds.) Dumort., *Bull. Soc. Bot. Belg.* 7: 68 (1868).

**Illustrations (Books):** C.E.Hubbard, *Grasses* (1968) (230), T. Cope & A. Gray, *Grasses of the British Isles* (62), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (699 as *Avenula pubescens*), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 25 Poaceae, part 2 (2003) (as *Avenula pubescens*), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 437).

**Derivation** (Clifford & Bostock 2007): *L. pubesco*, become hairy. Plant whole or in part hairy.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Butt sheaths dark brown. Culms erect or geniculately ascending, 30–100 cm long, 2–3 -noded. Leaves mostly basal. Leaf-sheaths hirsute. Ligule an eciliate membrane, 4–8 mm long. Leaf-blades 4–30 cm long, 2–6 mm wide. Leaf-blade venation distinct. Leaf-blade surface pubescent.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate or oblong, equilateral or nodding, 10–18 cm long, 2–6 cm wide. Primary panicle branches bearing 1–3 fertile spikelets on each lower branch. Panicle branches scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 4–20 mm long.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 11–17 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes villous, hairy above, with 4–7 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 7–13 mm long, 0.7–0.8 length of upper glume, membranous, 1-keeled, 1 -veined. Lower

glume lateral veins absent. Lower glume apex acute. Upper glume lanceolate, 10–15(–17) mm long, 1.1 length of adjacent fertile lemma, membranous, with hyaline margins, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma oblong, 9–14 mm long, chartaceous or cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous, rough above. Lemma apex erose, obtuse, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 12–20 mm long overall, with twisted column. Palea 0.8–0.9 length of lemma. Palea keels eciliate. Rhachilla extension 0.66–0.75 length of fertile floret, villous.

**Flower and Fruit.** Anthers 3, 4.5–6.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$n = 7$ .  $2n = 14$  (4 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, Temperate Asia, North America (\*).

**Region. Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe.**

**Country /Province /State.** : Denmark, Finland, Great Britain, Iceland, Ireland, Norway, Sweden. : Austria, Belgium, Czechoslovakia, Germany, Hungary, Netherlands, Poland, Switzerland. : France, Portugal, Spain. : Albania, Bulgaria, Italy, Romania, Yugoslavia. Belarus, Estonia, Latvia, Lithuania, Baltic States, Central European Russia, East European Russia, North European Russia, South European Russia, Northwest European Russia, Ukraine. Siberia, **Middle Asia, Caucasus, Western Asia, China, Mongolia, Russia.** Altay, Buryatiya, Chita, Irkutsk, Krasnoyarsk, Tuva. Kazakhstan, Kirgizistan, Tadzhikistan. Iran, Turkey. Xinjiang. Mongolia. **Eastern Canada, Northeast USA.** Ontario, Quebec. Connecticut, Vermont.

### **Helictotrichon (Avenula) pungens** (Sennen ex StYves) FORSAN. (1999).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**TYPE** from Spain. **Basionym or Replaced Name:** *Avena pratensis* var. *pungens* Sennen & St.-Yves, *Candollea* 4: 449 (1931). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Spain, Cardagne to Llivia: Sennen 6276.

**Recent Synonyms:** *Avenula pungens* (Sennen ex St.-Yves) Holub.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *pungo*, prick. Leaf-blades sharp-pointed.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Culms robust, 50–80 cm long. Culm-internodes distally pubescent. Ligule an eciliate membrane, 8–10 mm long, 2–2.5 mm long on basal shoots, acute. Leaf-blades aciculate, terete, 1.5–2 mm wide. Leaf-blade venation without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved. Leaf-blade apex attenuate, pungent.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear or oblong, 12–17 cm long. Primary panicle branches 2 -nate, bearing 2–3 fertile spikelets on each lower branch. Panicle branches smooth. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, smooth.

**Fertile Spikelets.** Spikelets comprising 5 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 20 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 3 mm long, pilose, hairy above, with 2–3 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 10 mm long, 0.75 length of upper glume, membranous, purple, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 14 mm long, 1 length of adjacent fertile lemma, membranous, purple, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, widest at 0.66 of its length from base, 14 mm long, cartilaginous, purple, without keel, 5–7 -veined, more than 3-veined. Lemma apex entire, acute, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 15–20 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region. Southwestern Europe.**

**Country /Province /State.** : France, Spain.

### **Helictotrichon quinquesetum** (Steud.) Schweickerdt. *Bothalia*, iii. 188 (1937).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. **Basionym or Replaced Name:** *Avena quinqueseta* Steud., *Flora*, 12. II. 485 (1829). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: South Africa, Cape: Ecklon 929 (K iso).

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (78, Fig 48).

**Derivation** (Clifford & Bostock 2007): *L. quinque*, five; *seta*, bristle. Lemma five-awned.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 50–70 cm long, 2–4 -noded. Lateral branches lacking. Leaf-sheaths smooth, puberulous. Ligule an eciliate membrane, 2–3 mm long, lacerate, truncate. Leaf-blades flat or conduplicate, 12–15 cm long, 2–3 mm wide. Leaf-blade surface glabrous. Leaf-blade apex hardened.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, 12–15 cm long. Primary panicle branches appressed, 2–5 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 12–18 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 3.5–4.5 mm long, pilose, hairy all along, with 3–4 mm long hairs. Floret callus 1.25 mm long, pilose. Floret callus hairs 1.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 8–11 mm long, 0.75 length of upper glume, hyaline, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume lanceolate, 10–13 mm long, 0.66 length of adjacent fertile lemma, hyaline, 1-keeled, 3 -veined. Upper glume lateral veins prominent. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 18 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma lateral veins ribbed. Lemma surface granulose. Lemma apex dentate, 2 -fid, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 20–28 mm long overall, with twisted column. Column of lemma awn 8–10 mm long. Lateral lemma awns present, arising on apex of lobes, 5 mm long. Palea 9 mm long. Palea keels ciliolate.

**Flower and Fruit.** Anthers 3, 2.5 mm long. Ovary pubescent all over. Caryopsis with adherent pericarp, hairy all over. Hilum linear.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Southern Africa. Western Cape.

### **Helictotrichon requienii** (Mutel) Henrard. *Blumea*, iii. 430 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *Avenula*).

**TYPE** from France. **Basionym or Replaced Name:** *Avena longifolia* Req., non Thore(1810), DC. & Duby, *Bot. Gall.* 1: 514 (1828). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Based on *A. longifolia* Req. ; France, Narbonne: Requier.

**Recent Synonyms:** *Avenula requienii* Mutel, *Fl. Franc.* 4:62 (1837).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Esprit Requier (1788–1851) French botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Culms robust, 60–100 cm long. Ligule an eciliate membrane, 6–10 mm long, 1.4–4.5 mm long on basal shoots, acute. Leaf-blades terete, 30–50 cm long, 1.2–1.3 mm wide, stiff. Leaf-blade venation with 8–10 secondary veins, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle, comprising 14–17 fertile spikelets. Panicle open, linear or oblong, 15–20 cm long. Primary panicle branches bearing 2–3 fertile spikelets on each lower branch. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–7 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 16–23 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2.5–3 mm long, pilose, with 2–2.5 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 13 mm long, 0.75 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 17 mm long, 1.1–1.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 14–16 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, flat below, 15–20 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe.

**Country /Province /State. :** France, Spain.

### ***Helictotrichon rogerellisii* Mashau, Fish & A.E.van Wyk. *Bothalia* 40 (2): 179 (2010).**

**TYPE** from South Africa. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: Western Cape, 3420 (Bredasdorp): 2 km from De Hoop Nature Reserve entrance, on road to Wydgelegen, (-AD), 21 October 1984, R.P Ellis 4663 (PRE, holo.; K, iso.).

**Illustrations (Journals):** *Bothalia* (40: 180, Fig. 8, (2010)).

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms slender, 30–60 cm long, 1–2 -noded. Culm-internodes distally glabrous. Lateral branches lacking. Leaves cauline. Ligule an eciliate membrane, 2 mm long, erose or lacerate. Leaf-blades involute, 10–20 cm long, 1.5 mm wide. Leaf-blade surface scabrous, rough on both sides.

**Inflorescence.** Inflorescence a panicle, comprising 10–15 fertile spikelets. Panicle open, ovate, loose, 8–10 cm long. Primary panicle branches simple or sparsely divided. Panicle branches pubescent. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, unequal, pubescent.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 13–18 mm long, 3–4.5 mm wide, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2.8–3.3 mm long, pilose, hairy all along but hairs longer above, with 0.5–4.5 mm long hairs. Floret callus 1 mm long, pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 5–8 mm long, 0.66 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume margins ciliate. Lower glume apex acute, mucronate. Upper glume lanceolate, 8.5–12 mm long, 0.8 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume margins ciliolate. Upper glume apex acute, mucronate.

**Florets.** Fertile lemma oblong, 11–15 mm long, cartilaginous, purple, without keel, 5 -veined, more than 3-veined. Lemma lateral veins prominent. Lemma surface scaberulous. Lemma apex dentate, 2 -fid, with lobes 1–2 mm long, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 11–21.55 mm long overall, with twisted column. Lateral lemma awns present, arising on apex of lobes, 1–1.5 mm long. Palea keels ciliolate. Palea apex dentate, 2 -fid.

**Flower and Fruit.** Anthers 3, 3.8–4.5 mm long, yellow.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Southern Africa. Western Cape.

**Helictotrichon roggeveldense** Mashau, Fish & A.E.van Wyk. *Bothalia* 40 (2): 179 (2010).

**TYPE** from South Africa. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: Northern Cape, 3220 (Sutherland): Geelhoek (Vryfontein), (-BC), 21 September 1953, JPH. Acocks 17178 (PRE, holo.).

**Illustrations (Journals):** *Bothalia* (40: 182, Fig. 11 (2010).

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms slender, 25–28 cm long, 1–2 -noded. Culm-internodes distally glabrous. Lateral branches lacking. Leaves mostly basal. Leaf-sheaths ribbed. Ligule an eciliate membrane, 1.5–2 mm long or 8 mm long, erose or lacerate. Leaf-blades flat or convolute, 8–18 cm long, 2–3 mm wide, stiff. Leaf-blade surface ribbed, pubescent, hairy on both sides. Leaf-blade apex hooded.

**Inflorescence.** Inflorescence a panicle, comprising 15–18 fertile spikelets. Panicle contracted, elliptic, 5–6 cm long. Panicle branches scabrous, with insignificant pulvini. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, unequal, scabrous.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10–17 mm long, 2.5–3 mm wide, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2.5–3 mm long, pilose, hairy above, with 4–6.5 mm long hairs. Floret callus 1 mm long, bearded. Floret callus hairs 3–6 mm long.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma, shiny. Lower glume lanceolate, 5–11 mm long, 0.5–0.66 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume margins ciliolate. Lower glume apex acuminate. Upper glume lanceolate, 10–17 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume margins ciliolate. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 10–17 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma lateral veins prominent. Lemma surface scabrous. Lemma apex lobed, 2 -fid, with lobes 5–7 mm long, awned, 3 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 12–25 mm long overall, with twisted column. Lateral lemma awns present, arising on apex of lobes, 3–5 mm long. Palea keels ciliolate. Palea apex emarginate.

**Flower and Fruit.** Anthers 3, 1.7–2.6 mm long, yellow.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. Southern Africa.** Northern Cape.

**Helictotrichon sangilense** I.M. Krasnoborov. *Bot. Zhurn.*, 62(6): 854 (1977).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Russia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: Russia, Tuva, Sangilen: Krasnoborov & Daniljuk (NS holo, LE).

**Illustrations:** None found.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, culms solitary. Stolons present. Basal innovations extravaginal. Culms (50–)70–80 cm long. Culm-internodes antorsely scabrous. Leaf-sheaths pilose. Ligule an eciliate membrane, 1 mm long, erose. Leaf-blades conduplicate, 30–40 cm long, 1.5–2 mm wide. Leaf-blade venation distinct. Leaf-blade surface scaberulous, rough abaxially, pilose, hairy adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, 6.5–7 cm long. Primary panicle branches bearing 1–2 fertile spikelets on each lower branch. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 12–13 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose, with 1.5–2 mm long hairs.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate, 9–10 mm long, 1.1 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume lanceolate, 8–9 mm long, 0.9 length of adjacent fertile lemma, membranous, 1-keeled, 1 -veined. Upper glume lateral veins absent. Upper glume surface asperulous. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 9–10 mm long, cartilaginous, mid-green and purple, bordered with last colour, without keel, 5–7 -veined, more than 3-veined. Lemma lateral veins obscure. Lemma surface scaberulous. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 20 mm long overall, with twisted column. Palea 7–8 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 5 mm long, yellow or purple.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** Siberia. Tuva.

### **Helictotrichon sarracenorum** (Gandoger) Holub. *Preslia*, i. 5 (1959).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from Spain. **Basionym or Replaced Name:** *Avena sarracenorum* Gandoger, *Bull. Soc. Bot. France*, 60: 420 (1913). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Spain, Alfacar: Gandoger ; Spain, Moreda: Gandoger sn.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. Saracenus*, Saracen. Of the Saracens, that is from southern Spain.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Basal innovations intravaginal. Culms 40–90 cm long. Ligule a ciliolate membrane, 0.2–0.5 mm long. Leaf-blades erect, persistent, 15–25 cm long, 2–4 mm wide, glaucous. Leaf-blade venation with continuous uniform subepidermal sclerenchyma layer on the underside. Leaf-blade surface ribbed, pubescent, hairy abaxially. Leaf-blade apex pungent.

**Inflorescence.** Inflorescence a panicle, comprising 25–35 fertile spikelets. Panicle open, linear or oblong, 6–10 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, clavate.

**Fertile Spikelets.** Spikelets comprising 3–4 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10–14 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 3 mm long, pilose, with 4–5 mm long hairs. Floret callus pilose. Floret callus hairs 3–4 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 10 mm long, 0.9 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 11–12 mm long, 1–1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 9–12 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, subterete below, 15–22 mm long overall, with twisted column. Palea 9 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

*n* = 7 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe.

**Region. Southwestern Europe.**

**Country /Province /State.** : Spain.

### **Helictotrichon schmidii** (Hook. f.) Henrard. *Blumea*, iii. 427 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. **Basionym or Replaced Name:** *Avena aspera* var. *schmidii* Hook. f., *Fl. Brit. India* 7(22): 277 (1897) [1896]

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: India?: Ootacamund, 7500–8000 ft, C.B. Clarke (HT: ?).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 438 as varieties *schmidii*, *parviflorum*).

**Derivation** (Clifford & Bostock 2007): in honor of Ludwig Bernhard Ehregott Schmid (1788–1859) German-born Indian missionary and plant collector.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 40–60 cm long. Ligule an eciliate membrane. Leaf-blades 5–10 cm long, 2–3 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear or lanceolate, 5–20 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 4–6 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 6–9 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate, 4–5 mm long, 0.66 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 6–7 mm long, 0.66–0.75 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 7–9 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface asperulous. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.75 way up back of lemma, curved, 9–10 mm long overall. Palea keels pubescent. Apical sterile florets rudimentary.

**Flower and Fruit.** Lodicules 2. Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State. China.** China South Central. **Indian Subcontinent.** India.

Guizhou, Sichuan, Yunnan. Tamilnadu.

### **Helictotrichon sedenense (DC.) Holub.** *Folia Geobot. & Phytotax.* 5: 436 (1970).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from France. **Basionym or Replaced Name:** *Avena sedenensis* DC., *Fl. Fr.* 3: 719 (1805). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: France, Provence: Clarion.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. -ensis*, denoting origin. From Sedena that is the mountains of de la Seyna, France.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Basal innovations extravaginal. Culms 40–80 cm long. Leaf-sheaths tubular for much of their length, with 0.5 of their length closed. Ligule a ciliolate membrane, 0.5 mm long, truncate. Leaf-blades flat or convolute, 10–25 cm long, (1–)2(–4) mm wide, grey-green. Leaf-blade venation without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ribbed.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear or oblong, 6–15 cm long. Primary panicle branches bearing 1–5 fertile spikelets on each lower branch. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, clavate.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 9–12 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.2–2.5 mm long, pilose, with 2.5–4 mm long hairs. Floret callus pilose. Floret callus hairs 2–2.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 7–9 mm long, 0.9 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 8–11 mm long, 1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 7–10 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up

back of lemma, geniculate, subterete below, 10–15 mm long overall, with twisted column. Palea 6–9 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 3–4.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa.

**Region.** Southwestern Europe, Southeastern Europe.

**Country /Province /State.** : France, Spain. : Italy. Northern Africa. Morocco.

### **Helictotrichon sempervirens** (Vill.) Pilger. *Fedde, Repert.* xlv. 7 (1938).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from France. **Basionym or Replaced Name:** *Avena sempervirens* Vill., *Prosp.* 17 (1779). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: France: Coll?.

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (702).

**Images:** R.Darke, *Ornamental Grasses* (2004);, R.Darke, *The Encyclopaedia of Grasses for Liveable Landscapes* (2007);.

**Derivation** (Clifford & Bostock 2007): L. *semper*, always; *virens*, green. Perennial species.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Basal innovations intravaginal. Culms 40–100 cm long. Ligule a ciliolate membrane, 0.5–1.5 mm long, truncate. Leaf-blades deciduous at the ligule, flat or convolute, 15–60 cm long, 0.9–4 mm wide, stiff, glaucous, without exudate or pruinose. Leaf-blade venation with continuous uniform subepidermal sclerenchyma layer on the underside. Leaf-blade surface ribbed, scaberulous.

**Inflorescence.** Inflorescence a panicle, comprising 30–55 fertile spikelets. Panicle open, linear or oblong, 8–20 cm long. Primary panicle branches bearing 3–7 fertile spikelets on each lower branch. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2(–3) fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10–14 mm long, breaking up at maturity, disarticulating above glumes but not between florets. Rhachilla internodes 2.5–4 mm long, pilose, with 4–5 mm long hairs. Floret callus pilose. Floret callus hairs 3–4 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 7–10 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 10–12 mm long, 1–1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 9–12 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, subterete below, 9–18 mm long overall, with twisted column. Palea 8–9 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 28$  (2 refs TROPICOS), or 42 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe, North America.

**Region.** Southwestern Europe, Southeastern Europe.

**Country /Province /State.** : France. : Italy. Northwest USA, Southwestern USA. Oregon. California.

### **Helictotrichon setaceum** (Vill.) Henrard. *Blumea*, iii. 430 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from France. **Basionym or Replaced Name:** *Avena setacea* Vill., *Prosp.* 16 (1779). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: France, le Chastela: Coll?.

**Illustrations:** None found.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Basal innovations intravaginal. Culms 20–60 cm long. Culm-internodes distally glabrous. Ligule a ciliolate membrane or a fringe of hairs, 0.2–0.5 mm long, truncate. Leaf-blades filiform, 10–40 cm long, 0.5–0.8 mm wide. Leaf-blade surface puberulous, hairy adaxially.

**Inflorescence.** Inflorescence a panicle, comprising 8–15 fertile spikelets. Panicle open, linear or oblong, dense, 4–10 cm long. Primary panicle branches bearing 2–5 fertile spikelets on each lower branch. Panicle axis smooth. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, linear.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 8–12 mm long, breaking up at maturity, disarticulating above glumes but not between florets. Rhachilla internodes 1–2 mm long, pilose, with 4–6 mm long hairs. Floret callus pilose. Floret callus hairs 3–3.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 7–10 mm long, 0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 10–12 mm long, 1.1–1.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 8–11 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, subterete below, 12–18 mm long overall, with twisted column. Palea 7–8 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS), or 28 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe, Southeastern Europe.

**Country /Province /State.** : France. : Italy.

### ***Helictotrichon sumatrense* Ohwi. *Bull. Tokyo Sci. Mus.*, No. 18, 7 (1947).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, J.F.Veldkamp, Poaceae ms (*Flora Malesiana*).

**TYPE** from Indonesia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: HT: C.G.G.J. van Steenis 8572A, 2 Feb 1937, Indonesia: Sumatra: Aceh, Gajo landen, 3300–3400 m (BO; IT: L).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *-ense*, denoting origin. From Sumatra, Indonesia.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Butt sheaths glabrous or pubescent. Culms erect, 40–70 cm long. Culm-internodes terete. Culm-nodes glabrous. Lateral branches lacking. Leaves mostly basal. Leaf-sheaths smooth, glabrous on surface. Ligule an eciliate membrane, 1–2 mm long, pubescent on abaxial surface. Leaf-blades filiform or linear, convolute, 10–40 cm long, 1–6 mm wide, stiff.

**Inflorescence.** Inflorescence a panicle. Panicle open or contracted, oblong, equilateral or nodding, 7–20 cm long, 4–7 cm wide. Primary panicle branches ascending, 3–6 -nate, 4–6 cm long, bearing 4–8 fertile spikelets on each lower branch, bearing spikelets almost to the base. Panicle axis scabrous. Panicle branches flexuous, scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 8–11 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2.6–3.1 mm long, pilose, with 1–2 mm long hairs. Floret callus 0.4 mm long, pilose. Floret callus hairs 0.5–1.5 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate, 4–8 mm long, 0.66–0.75 length of upper glume, membranous, 1-keeled, 1(–3) -veined. Lower glume lateral veins absent or obscure. Lower glume surface scabrous, rough on veins. Lower glume

apex acute. Upper glume lanceolate, 6–10 mm long, 0.8–1.1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume surface scabrous, rough on veins. Upper glume apex acute.

**Florets.** Fertile lemma oblong or ovate, 7–9.3 mm long, cartilaginous, without keel, 5(–7) -veined, more than 3-veined. Lemma surface scabrous, rough on veins. Lemma apex dentate, 2 -fid, with lobes 0.5 mm long, acute, awned, 1 -awned. Principal lemma awn dorsal, arising 0.6 way up back of lemma, geniculate, 7.5–15 mm long overall, with a straight or slightly twisted column. Column of lemma awn 1.5–3 mm long, puberulous. Palea 1 length of lemma. Palea keels ciliolate, adorned above. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Lodicles 2, 1 mm long. Anthers 3, 2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State.** Malesia. Sumatra.

**Helictotrichon tenuifolium** M. Roser. *Karyol., Syst. u. Chorol. Untersuch. Gatt. Helictotrichon W. Mittelmeer.* (*Diss. Bot.* 145): 112 (1989).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE from Spain. Basionym or Replaced Name:** *Avenula murcica* Holub, *Preslia* 49(3): 206 (1977)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Spain, Murcia, Sierra Fuensanta: Porta & Rigo (PR holo, k).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. tenuis*, slender; *folium*, leaf. Leaf-blades narrow.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Basal innovations extravaginal. Culms 30–45 cm long, 0.5–1 mm diam. Culm-nodes purple. Ligule an eciliate membrane, 1–2 mm long, acute. Leaf-blades straight, filiform, 2–7 cm long, 0.3–0.4 mm wide, 0.3–0.4 cm long at summit of culm. Leaf-blade midrib indistinct. Leaf-blade venation with subepidermal sclerenchyma free from veins, without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface ungrooved, scabrous. Leaf-blade margins unthickened.

**Inflorescence.** Inflorescence a panicle, comprising 2–8 fertile spikelets. Panicle open, linear, 4–18 cm long. Primary panicle branches indistinct the panicle almost racemose. Spikelets solitary. Fertile spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 4–9 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 14–15 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.5–2 mm long, glabrous. Floret callus pubescent. Floret callus hairs 0.8–1 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 7–8 mm long, 0.75–0.85 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume elliptic, 9 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, widest at 0.66 of its length from base, 9–10 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface pubescent, hairy below. Lemma apex dentate, 2 -fid, obtuse, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5–0.66 way up back of lemma, geniculate, flat below, 10–15 mm long overall, with twisted column. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 3–6 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 28$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** : Portugal, Sardinia.

**Helictotrichon tianschanicum** (Roshev.) Henrard. *Blumea*, iii. 429 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. **Basionym or Replaced Name:** *Avenastrum tianschanicum* Roshev., *Bull. Jard. Bot. Acad. Sc. URSS*, 30: 773 (1932). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Russia, Tianshan, Karaarcha R.: Saposhnikov & Schischkin (LE lecto).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -ica, belonging to. From Tienshan, eastern Kazakhstan, former Soviet Union.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Butt sheaths persistent and investing base of culm, with compacted dead sheaths. Culms 14–30 cm long. Culm-internodes distally glabrous. Leaf-sheaths puberulous. Ligule a ciliolate membrane, 0.2 mm long. Leaf-blades 1.5–3 mm wide. Leaf-blade surface smooth, glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, 4–8 cm long, bearing few spikelets. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 9–10 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose, with 2–3 mm long hairs. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate, 8–9 mm long, 0.9 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume lanceolate, 9–10 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 5 -veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 9–10 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.66 way up back of lemma, geniculate, 10–15 mm long overall, with twisted column. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State. Middle Asia, China.** Kazakhstan, Tadzhikistan, Xinjiang.

**Helictotrichon tibeticum** (De Mire & Quezel) Holub. *Acta Univ. Carol., Biol.*, 1962, 155 (1962).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Chad. **Basionym or Replaced Name:** *Avena tibestica* deMire & Quezel, *Bull. Soc. Bot. France*, 106: 135 (1959). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Chad, Tibesti, Emi Koussi: Mire.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -ica, belonging to. From Tibesti Mountains, on the border of Chad and Libya.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Rhizomes elongated. Basal innovations extravaginal. Culms 30–60 cm long, 2 -noded. Leaf-sheaths tubular for much of their length, with 0.75 of their length closed, 5–10 cm long, without keel, indistinctly veined, glabrous on surface. Ligule an eciliate membrane, 1–1.5 mm long, truncate. Leaf-blades 30–70 cm long, 2–3 mm wide. Leaf-blade venation without layer of subepidermal sclerenchyma masking vein striation. Leaf-blade surface pilose, sparsely hairy, hairy abaxially.

**Inflorescence.** Inflorescence a panicle. Peduncle 12–20 cm long. Panicle open, oblong, 4–8 cm long. Panicle axis scaberulous. Panicle branches scaberulous, puberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 8–9 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2 mm long, pubescent. Floret callus pubescent.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate, 6.5–7.5 mm long, 0.9 length of upper glume, membranous, much thinner on margins, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex obtuse. Upper glume lanceolate, 8–8.5 mm long, 1 length of adjacent fertile lemma, membranous, with hyaline margins, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 8–9 mm long, cartilaginous, much thinner above, without keel, 7 -veined, more than 3-veined. Lemma surface puberulous. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 15 mm long overall, with a straight or slightly twisted column. Palea 6 mm long. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 2.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Northeast Tropical Africa. Chad.

**Helictotrichon tibeticum** (Roshev.) P. C. Keng. Keng, *Claves Gen. & Spec. Gramin. Sinic.* 200 (1957).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**TYPE** from China. **Basionym or Replaced Name:** *Avena tibetica* Roshev., *Bull. Jard. Bot. Princ. URSS*, 27: 98 (1928). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: China, Tibet, Djao-tschu R.: Przewalski (LE lecto).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 440 as *Helictotrichon tibeticum* var. *tibeticum* & *Helictotrichon tibeticum* var. *laxiflorum*).

**Derivation** (Clifford & Bostock 2007): L. -ica, belonging to. From Tibet Autonomous region, China.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Culms erect, 100–120 cm long. Culm-internodes scaberulous, distally glabrous. Leaf-sheaths smooth or scaberulous, glabrous on surface. Ligule a ciliolate membrane. Leaf-blades involute, 20–30 cm long, 2–3 mm wide. Leaf-blade surface scabrous.

**Inflorescence.** Inflorescence a panicle. Peduncle pubescent above. Panicle contracted, oblong or ovate, 3–6 cm long. Panicle axis pubescent. Panicle branches pubescent. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 12–15 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 10 mm long, 1 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 10 mm long, 1.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 8 mm long, cartilaginous, without keel, 5–7 -veined, more than 3-veined. Lemma surface scabrous. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10 mm long overall, with twisted column. Palea 1 length of lemma. Palea surface puberulous, hairy on back. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** China South Central, China North-Central, Qinghai, Tibet, Xinjiang. Gansu. Sichuan, Yunnan.

## **Helictotrichon turcomanicum** Czopanov. *Novit. Syst. Pl. Vasc., Acad. Sci. URSS*, vi. 23 (1970).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Russia, Kopetdag, Missumi Mts.: Chopanov (ASH holo, LE).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *-ica*, belonging to. From Turcomania, near Krasnovodsk, former Soviet Union.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Culms 35–70 cm long. Culm-internodes distally pubescent. Leaf-sheaths puberulous. Ligule an eciliate membrane, 1–3 mm long, 1.5–4 mm long on basal shoots. Leaf-blades filiform, convolute, 1–2 mm wide. Leaf-blade surface smooth or scaberulous, puberulous, hairy adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear, 7–12 cm long. Panicle axis puberulous. Panicle branches puberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 11–12 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose, with 1–2 mm long hairs. Floret callus pilose. Floret callus hairs 1–2 mm long.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 4–8 mm long, 0.9 length of upper glume, membranous, 1-keeled, 1–3 -veined. Lower glume lateral veins absent or obscure. Lower glume apex acute. Upper glume elliptic, 5–9 mm long, 1 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 5–9 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 5–14 mm long overall, with twisted column. Palea 1 length of lemma. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 3.2–4.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** Middle Asia. Tadzhikistan.

## **Helictotrichon umbrosum** (Hochst. ex Steud.) C. E. Hubbard. *Kew Bull.* 1936, 334 (1936).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Trisetum umbrosum* Hochst. ex Steud., *Syn. Pl. Gram.* 227 (1854). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Ethiopia: Schimper (P holo).

**Illustrations (Books):** S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (32, Fig 15).

**Derivation** (Clifford & Bostock 2007): L. *umbra*, any shady place; *-osa*, abundance. Growing in shady places.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Butt sheaths dark brown. Culms erect or geniculately ascending, 60–90 cm long. Ligule an eciliate membrane, 2 mm long. Leaf-blades flat or involute, 10–20 cm long, 1–5 mm wide. Leaf-blade surface pubescent, sparsely hairy, hairy adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear, dense or loose, 7–20 cm long. Primary panicle branches appressed. Panicle branches straight or flexuous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2–4 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 9–16 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2–2.5 mm long, pilose, hairy above. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume elliptic, 3–7 mm long, 0.6–0.8 length of upper glume, hyaline, 1-keeled, 1(–3) -veined. Lower glume lateral veins absent or obscure. Lower glume apex acute. Upper glume oblong, 5–9 mm long, 0.7–0.9 length of adjacent fertile lemma, hyaline, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 7–10 mm long, membranous, without keel, 5–7 -veined, more than 3-veined. Lemma apex dentate, 2 -fid, acute or setaceously acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5–0.6 way up back of lemma, geniculate, 13–20 mm long overall, with twisted column. Palea keels ciliolate. Rhachilla extension 0.75 length of fertile floret, pilose.

**Flower and Fruit.** Anthers 3, 2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Northeast Tropical Africa, East Tropical Africa. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda.

## **Helictotrichon uniyalii**

**Illustrations:** None found.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Helictotrichon virescens** (Nees ex Steud.) Henrard. *Blumea*, iii. 425, *in obs.* (1940).

**Accepted by:** U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. **Basionym or Replaced Name:** *Trisetum virescens* Nees ex Steud., *Syn. Pl. Glumac.* 1: 226 (1854)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: LT: *Royle* 137, (LIV (photo, K); ILT: K). LT designated by ?; cited by Veldkamp, *Blumea* 41: 410 (1996).

ST: *Royle* 138, India orientalis.

**Illustrations (Books):** K.M.Matthew, *Flora Palni Hills Supplement* (1998), T.A.Cope, *Flora of Pakistan* 143: *Poaceae* (1982), H.J.Noltie, *The Grasses of Bhutan* (2000) (583, Fig. 22).

**Derivation** (Clifford & Bostock 2007): L. *viresco*, become green. Panicle shiny-green.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 40–160 cm long. Culm-internodes terete. Lateral branches lacking. Leaves mostly basal. Leaf-sheaths smooth, glabrous on surface or pilose. Ligule an eciliate membrane, 1–5 mm long, glabrous on abaxial surface. Leaf-blades conduplicate, 8–35 cm long, 2–8.5 mm wide. Leaf-blade surface scaberulous, rough adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, equilateral or nodding, 10–30 cm long, 3–15 cm wide. Primary panicle branches ascending, 5–15 cm long, bearing 6–12 fertile spikelets on each lower branch. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 3(–4) fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 9–18 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes pilose. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume lanceolate or oblong, 5–9 mm long, 0.75 length of upper glume, membranous, much thinner above, much thinner on margins, 1-keeled, 1–3 -veined. Lower glume primary vein scabrous. Lower glume lateral veins absent or distinct. Lower glume apex acuminate. Upper glume lanceolate or oblong, 6–12 mm long, 0.8–1 length of adjacent fertile lemma, membranous, much thinner above, with hyaline margins, 1-keeled, 5 -veined. Upper glume primary vein scabrous. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 7.5–12.5 mm long, cartilaginous, much thinner above, much thinner on margins, shiny, without keel, 7(–9) -veined, more than 3-veined. Lemma surface smooth. Lemma apex dentate, 2 -fid, acuminate or setaceously acuminate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 10–18 mm long overall, with twisted column. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Anthers 3, 3.3–4 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 21$  (1 ref TROPICOS), or 28 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State. Western Asia, China.** Iran. China South Central, China North-Central, Tibet. **Indian Subcontinent, Malesia, Papuasia.** Eastern Himalaya, Pakistan. Java, Sumatra. New Guinea.

Shaanxi. Sichuan, Yunnan. Darjeeling, Bhutan, Sikkim. Kerala. Uttah Pradesh. Himachal Pradesh, Jammu Kashmir.

### ***Helictotrichon yunnanense* S.Wang & B.S.Sun. *J. Yunnan Univ.* 15(2):188 (1993).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**TYPE** from China. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: China: Yunnan: Zhongdian, mountain slopes ca. 3500 m, (HT: ?).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -ense, denoting origin. From Yunnan Province, China.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes short. Culms 60–70 cm long, 3–4 -noded. Culm-nodes pubescent. Leaf-sheaths longer than adjacent culm internode, pilose. Ligule an eciliate membrane or a ciliolate membrane, 1 mm long. Leaf-blades 15–18 cm long, 5–8 mm wide. Leaf-blade surface scabrous, rough adaxially, pilose, sparsely hairy, hairy adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate, 20–30 cm long, 4–6 cm wide. Primary panicle branches 3–8 -nate, 5–10 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 4 mm long, scabrous.

**Fertile Spikelets.** Spikelets comprising 3–5 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 15 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2 mm long. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume lanceolate or oblong, 5 mm long, 0.5 length of upper glume, chartaceous, much thinner on margins, 1-keeled, 1 -veined. Lower glume primary vein scabrous. Lower glume lateral veins absent. Lower glume apex setaceous acuminate. Upper glume lanceolate or oblong, 10 mm long, 1 length of adjacent fertile lemma, chartaceous, with hyaline margins, 1-keeled, 3 -veined. Upper glume primary vein scabrous. Upper glume apex setaceous acuminate.

**Florets.** Fertile lemma oblong, 10 mm long, 2 mm wide, cartilaginous, much thinner above, without keel, 5 -veined, more than 3-veined. Lemma apex attenuate, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, flexuous, 15 mm long overall. Palea 9 mm long, 2 -veined. Palea keels scabrous. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Lodicules 2, lanceolate, 1.8 mm long. Anthers 3, 3.5 mm long, yellow. Filaments 1 mm long. Stigmas 2. Ovary pubescent on apex.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State. China.** China South Central.

Yunnan.

### ***Hemarthria altissima* (Poir.) Stapf & C. E. Hubbard. *Kew Bull.* 1934, 109 (1934).**

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), T.G.Tutin et al, *Flora Europaea* 5 (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983), W.D.Clayton & N.Snow, *Key to Pacific Grasses* (2010).

**TYPE** from Algeria. **Basionym or Replaced Name:** *Rottboellia altissima* Poir., *Voy. Barbarie* 2: 105 (1789)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Algeria: Bastion, *Poiret s.n.* (HT: P-LA; IT: US (fragm. ex P-LA & photo)).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 1, Aristidoideae a Pharoideae (2012) (524), H.Jacques-Felix, *Les Graminees d'Afrique tropicale* (1962) (280, Fig. 215 as *H. fasciculata*), L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (520, Fig 414), G.E.Gibbs Russell et al, *Grasses of Southern Africa* (1990) (178, Fig. 103), J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969) (205, Fig. 73), N.Feinbrun-Dothan, *Flora Palaestina* 4 (1986) (Pl. 421), S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (364, Fig 151), L.Boulos, *Flora of Egypt* 4 (2005) (346, Pl. 102), M.E.Barkworth et al, *Flora of North America north of Mexico Vol 25 Poaceae, part 2* (2003) (686), F.W.Gould, *The Grasses of Texas* (1975) (619, Fig. 328), A.S.Hitchcock, *Manual of the Grasses of the West Indies* (1936) (as *mainsuris*), S.A.Renvoize, *Gramineas de Bolivia* (1998) (613, Fig 146), E.G.Nicora, *Los Generos de Gramineas de America Austral* (1987) (541, Fig. 196), L.B. Smith, D.C. Wasshausen, R.M. Klein *Flora Illustrada Catarinensis Gramineas* (1981–1982) (1184, Fig. 230 & 1185, Fig. 231), A.Burkat, *Flora Ilustrada de Entre Rios (Argentina)*, Pt II, *Gramineas* (1969) (459, Fig. 195), A.L.Cabrera, *Flora de la Provincia de Buenos Aires, IV Pt 2 Gramineas* (1970) (577, Fig. 154), B.Rosengurtt, *Gramineas UruguayasI* (1970) (180, Fig. 72), E.Judziewicz, *Flora of the Guianas*, 187. *Poaceae* (1990) (119, Fig. 17), S-L Chen et al, *Flora of China, Illustrations, Poaceae* (2007) (Fig. 894).

**Illustrations (Journals):** *Ruizia* (13:453 Fig 61g-i (1993)).

**Images:** F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999).

**Derivation** (Clifford & Bostock 2007): *L. altus*, tall; -*issima*, most. Very tall compared with other members of the genus.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Perennial. Stolons present. Culms prostrate, 100–250 cm long (long), 2–4 mm diam., rooting from lower nodes. Lateral branches ample. Ligule a ciliate membrane. Leaf-blades 5–15 cm long, 3–4 mm wide.

**Inflorescence.** Inflorescence composed of racemes, exserted. Racemes 1, single, smoothly terete, 4–10 cm long. Rhachis fracturing into irregular segments, flattened, glabrous on margins. Rhachis internodes cuneate. Rhachis internode tip transverse, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, 4–6 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, acute. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, glabrous, base truncate, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, herbaceous, 2-keeled, winged on keel, winged narrowly. Lower glume intercarinal veins distinct. Lower glume surface not waisted or transversely waisted (near apex). Lower glume apex emarginate or obtuse. Upper glume oblong, membranous, without keels, 3 -veined. Upper glume apex obtuse to cuspidate.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, hyaline, 2 -veined, obtuse. Fertile lemma oblong, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Lemma apex obtuse. Palea hyaline, 0 -veined, without keels.

**Flower and Fruit.** Caryopsis with adherent pericarp, obovoid, dorsally compressed.

$n = 10$  (1 ref TROPICOS).  $2n = 20$  (1 ref TROPICOS), or 36 (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa, Temperate Asia, Tropical Asia, North America, South America.

**Region. Southwestern Europe, Southeastern Europe.**

**Country /Province /State.** : Baleares, Spain. : Greece, Italy, Crete, Sicily. **Northern Africa, Macaronesia, West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean.** Algeria, Egypt, Tunisia. Canary Is. Mali, Nigeria, Senegal. Rwanda, DRC. Ethiopia (inc. Eritrea). Tanzania. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Namibia, Botswana, Limpopo, North-West, Gauteng, Mpumalanga, Swaziland, Free State, Kwazulu-Natal, Lesotho, Northern Cape, Western Cape. Mauritius,

Madagascar. **Caucasus, Western Asia, China.** China South Central, China North-Central, China Southeast. **Indian Subcontinent, Indo-China, Malesia.** India. Myanmar, Thailand, Vietnam. Borneo. New Caledonia. Hawaii. **South-central USA, Southeastern USA, Mexico.** Texas. Florida. Central Mexico, Northeast Mexico, Gulf (Mexico), Northwest Mexico, Southwest Mexico, Southeast Mexico. **Mesoamerica, Caribbean, Northern South America, Western South America, Brazil, Southern South America.** El Salvador, Honduras, Nicaragua. Jamaica. French Guiana, Guyana. Bolivia, Colombia, Peru. Brazil West Central. Argentina Northeast, Argentina Northwest, Paraguay, Uruguay.

Beijing, Shandong. Anhui, Henan, Zhejiang, Guizhou, Hubei, Yunnan. Tamilnadu. Mato Grosso, Mato Grosso do Sul. Jujuy (\*), Salta, Tucuman. Buenos Aires, Chaco, Cordoba, Corrientes, Distrito Federal, Entre Rios, Formosa, Misiones, Santa Fe. Morelos, Puebla. Coahuila, San Luis Potosi, Tamaulipas. Sonora. Guerrero. Campeche, Chiapas.

### **Hemarthria compressa** (Linn.f.) R. Br. *Prod.* 207. (1810).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), T.Koyama, *Grasses of Japan and its neighboring regions* (1987), W.D.Clayton & N.Snow, *Key to Pacific Grasses* (2010).

**TYPE** from India. **Basionym or Replaced Name:** *Rottboellia compressa* L. f., *Suppl. Pl.* 114 (1781)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: NT: *Wallich* 8871-E, India (L; INT: K, P, W). NT designated by van den Heuvel & Veldkamp, *Blume* 45(2): 454 (2000).

**Illustrations (Books):** N.L.Bor, *Gramineae in Flora of Iraq* (1968) (529, Pl. 202), T.Koyama, *Grasses of Japan and its neighbouring regions* (1987) (472, Fig. 185), C-C Hsu, *Flora of Taiwan*, Vol 5 (1978) (698), C-C Hsu, *Taiwan Grasses* (1975) (658, Pl. 1467), H.J.Noltie, *The Grasses of Bhutan* (2000) (827, Fig. 62), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 894), E.Hafliger & E.Schultz, *Grass Weeds*, CIBA-GEIGY (1:60(1980)), G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012) (Fig. 63).

**Images:** G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012) (Pl. 19).

**Derivation** (Clifford & Bostock 2007): L. comprimo, squeeze together. Culms flattened.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Perennial. Stolons present. Culms prostrate, 50–100 cm long, rooting from lower nodes. Lateral branches ample. Leaf-sheaths 2.5–3 cm long. Ligule a ciliate membrane. Leaf-blades 2–15 cm long, 2–5 mm wide. Leaf-blade surface glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes, subtended by an inflated leaf-sheath. Racemes 1, single, smoothly terete, 2–8 cm long. Rhachis fracturing into irregular segments, flattened, glabrous on margins. Rhachis internodes columnar, adherent to upper glume of sessile spikelet. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate or elliptic, 4–5 mm long, longer than fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, acute. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic or oblong, dorsally compressed, 3–4 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, glabrous, base truncate, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume elliptic or oblong, 1 length of spikelet, herbaceous, 2-keeled, keeled laterally, winged on keel, winged narrowly, 7 - veined. Lower glume intercarinal veins distinct. Lower glume surface flat. Lower glume apex emarginate or obtuse. Upper glume oblong, membranous, without keels, 3 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 1, male, with palea. Lemma of lower sterile floret oblong, 3.2 mm long, hyaline, obtuse. Fertile lemma oblong, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Lemma apex obtuse. Palea absent or minute.

**Flower and Fruit.** Anthers 3, 2.8 mm long. Caryopsis with adherent pericarp.

$n = 18$  (1 ref TROPICOS).  $2n = 36$  (1 ref TROPICOS), or 54 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State.** Western Asia, Arabian Peninsula, China, Eastern Asia. Afghanistan, Iraq. China South Central, China Southeast. Japan Kyushu. Japan, Nansei-Shoto, Ogasawara-shoto, Taiwan. Indian Subcontinent, Indo-China, Malesia, Papuasia. Bangladesh, Eastern Himalaya, India, Pakistan, Sri Lanka, West Himalaya. Myanmar, Thailand, Vietnam. Borneo, Malaya. Solomon Is.

Guangdong, Guangxi. Yunnan. Darjeeling, Bhutan, Sikkim.

### **Hemarthria debilis** Bor. *Dansk Bot. Arkiv*, xxiii. 162 (1965).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Thailand. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: K. Larsen 10117, 15 Jul 1963, Thailand: Southeastern: Chanthaburi, Makam, 50 m (K; IT: C, L).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. weak. Culms decumbent often much branched at the base.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms 22 cm long. Culm-nodes pubescent. Lateral branches ample. Ligule a ciliate membrane. Leaf-blades 2–3.5 cm long, 2–3.5 mm wide. Leaf-blade surface glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes, subtended by an inflated leaf-sheath. Racemes 1, single, smoothly terete, 3–7 cm long. Rhachis fracturing into irregular segments, flattened, glabrous on margins. Rhachis internodes columnar, adherent to upper glume of sessile spikelet. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets rudimentary, containing empty lemmas, lanceolate, shorter than fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, acute. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, 4–6.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, glabrous, base truncate, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume elliptic, 1 length of spikelet, herbaceous, 2-keeled, keeled laterally, winged on keel, winged narrowly. Lower glume intercarinal veins distinct. Lower glume surface flat. Lower glume apex dentate, 2 -fid, caudate. Upper glume elliptic, membranous, without keels, 3 -veined. Upper glume apex caudate.

**Florets.** Basal sterile florets 1, barren, with palea. Lemma of lower sterile floret oblong, 5 mm long, hyaline, obtuse. Fertile lemma oblong, 3 mm long, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Lemma apex obtuse. Palea absent or minute.

**Flower and Fruit.** Anthers 3, 1.5 mm long. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State.** Indo-China. Thailand.

### **Hemarthria depressa** Heuvel & Veldkamp. *Blumea*, 45(2): 456 (2000).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Vietnam. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Vietnam: Dalat, 9 Jun 1960, Schmid s.n. (HT: P).

**Illustrations:** None found.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Perennial. Culms 40–50 cm long. Culm-internodes elliptical in section, distally glabrous or pubescent. Culm-nodes glabrous. Leaf-sheaths loose, longer than adjacent culm internode, keeled, outer margin glabrous or hairy. Ligule a ciliolate membrane, 0.5–1.5 mm long.

Leaf-blades conduplicate, 5–25 cm long, 1–3 mm wide. Leaf-blade surface scabrous, glabrous or pubescent, sparsely hairy, hairy adaxially or abaxially or on both sides.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, smoothly terete, 10–18 cm long. Rhachis fracturing into irregular segments, flattened. Rhachis internodes columnar, 7–8 mm long. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, 7.7–10.3 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, keeled, 11–13 -veined. Companion sterile spikelet lemmas 2, enclosed by glumes, 5–7.6 mm long.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear or lanceolate, dorsally compressed, 9–12 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1.5–4 mm long, glabrous, base truncate, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume linear or lanceolate, 6.9–9 mm long, 1 length of spikelet, coriaceous, 2-keeled, keeled laterally, 9–15 -veined. Lower glume primary vein scabrous. Lower glume surface flat. Lower glume apex acuminate. Upper glume linear, 6.8–9.2 mm long, coriaceous, without keels, 3–5 -veined.

**Florets.** Basal sterile florets 1, male, with palea. Lemma of lower sterile floret oblong, 5.2–7.5 mm long, hyaline. Fertile lemma oblong, 4.4–6 mm long, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Palea absent or minute.

**Flower and Fruit.** Anthers 3, 2.7–3.6 mm long. Caryopsis with adherent pericarp, 2 mm long.

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State.** **Western Asia, China, Eastern Asia.** Afghanistan, Iraq. China South Central, Hainan, Inner Mongolia, China North-Central, China Southeast. Japan, Taiwan. **Indian Subcontinent, Indo-China, Malesia.** Bangladesh, Eastern Himalaya, India, Nepal, Pakistan, Sri Lanka. Laos, Myanmar, Thailand, Vietnam. Malaya.

Shaanxi. Fujian, Guangdong, Guangxi. Guizhou, Sichuan, Yunnan.

### **Hemarthria hamiltoniana** Steud. *Syn. Pl. Gram.* 358 (1854).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: HT: *herb. Wallich* 8870-C, India: upper Gangetic Plains (?; IT: K, L (fragm.)).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ana*, indicating connection. As for *Chrysopogon hamiltonii*.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Perennial. Stolons present. Culms prostrate, 100 cm long, 5 mm diam., rooting from lower nodes. Lateral branches ample. Ligule a ciliate membrane. Leaf-blades 20 cm long, 6 mm wide. Leaf-blade surface glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes, subtended by an inflated leaf-sheath. Racemes 1, single, smoothly terete, 9–14 cm long. Rhachis fracturing into irregular segments, flattened, glabrous on margins. Rhachis internodes oblong, 5–6 mm long, adherent to upper glume of sessile spikelet. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, 5–6 mm long, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, 4–7 mm long, longer than fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, attenuate, awned, one glume awned, with 1–2 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets oblong, dorsally compressed, 5–6 mm long, falling

entire, deciduous with accessory branch structures. Spikelet callus cuneate, pubescent, base truncate, attached obliquely. Spikelet callus hairs tawny.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 1 length of spikelet, herbaceous, 2-keeled, keeled laterally, winged on keel, winged narrowly. Lower glume intercarinal veins distinct. Lower glume surface flat. Lower glume apex obtuse or rostrate (abruptly constricted to a blunt tip). Upper glume oblong, membranous, without keels, 3 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, hyaline, obtuse. Fertile lemma oblong, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Lemma apex obtuse. Palea absent or minute.

**Flower and Fruit.** Anthers 3. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. Tropical Asia.

**Country /Province /State.** Indian Subcontinent. India.

Uttah Pradesh.

### **Hemarthria humilis** Keng. *Sunyatssenia*, 1: 128 (1933).

**Accepted by:** S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**TYPE** from China. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: China: Guangdong: Kozhou City, open swamp, 21 May 1929, Y. Tsing 2401 (HT: SYS; IT: NY 278450).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 895).

**Derivation** (Clifford & Bostock 2007): L. low growing. Short-statured in comparison with related species and often prostrate.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Rottboelliinae.

**Distribution (TDWG).** Continent. Temperate Asia.

**Country /Province /State.** China. China Southeast.

Guangdong.

### **Hemarthria longiflora** (Hook. f.) A. Camus. *Lecomte, Fl. Gen. Indo-Chine*, vii. 380 (1922).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*), N.L.Bor, Grasses of Burma, Ceylon, India and Pakistan (1960).

**TYPE** from India. **Basionym or Replaced Name:** *Rottboellia longiflora* Hook. f., *Fl. Brit. India* 7(21): 154 (1897) [1896]

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: India: Tenasserim: at Mergui, *Griffith KD* 1009 (LT: K).

**Recent Synonyms:** *Hemarthria longiflora* var. *tonkinensis* (A.Camus) A.Camus, Lecomte, *Fl. Gen. Indo-Chine* 7:379 (1922).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 894).

**Derivation** (Clifford & Bostock 2007): L. *longus*, long; *flos*, flower. Having long spikelets.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Perennial. Stolons present. Butt sheaths purple. Culms prostrate, 25–100 cm long. Lateral branches ample. Leaf-sheaths 5–6 cm long. Ligule a ciliate membrane. Leaf-blades conduplicate, 7–15 cm long, 412 mm wide. Leaf-blade surface glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes, subtended by an inflated leaf-sheath. Racemes 1, single, smoothly terete, 8–20 cm long. Rhachis fracturing into irregular segments, flattened, glabrous on margins. Rhachis internodes columnar, 6–15 mm long, adherent to upper glume of sessile spikelet. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, 6–15 mm long, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, acute, muticous or awned, with 5–10 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, dorsally compressed, 9–20 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, glabrous, base truncate, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume linear, 1 length of spikelet, herbaceous, 2-keeled, keeled laterally, winged on keel, winged narrowly, 13–15 - veined. Lower glume intercarinal veins distinct. Lower glume surface flat. Lower glume apex attenuate, muticous or awned, 1 -awned, awn 3–10 mm long. Upper glume linear, membranous, without keels, 3 - veined. Upper glume apex attenuate, muticous or awned, 1 -awned, awn 5–10 mm long.

**Florets.** Basal sterile florets 1, male, with palea. Lemma of lower sterile floret oblong, 1–5 mm long, hyaline, obtuse. Fertile lemma oblong, 4.4 mm long, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Lemma apex obtuse. Palea absent or minute.

**Flower and Fruit.** Anthers 3, 1.4 mm long. Caryopsis with adherent pericarp.

*n* = 27 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State. China.** China South Central, Hainan. **Indian Subcontinent, Indo-China, Malesia.** Bangladesh, India. Myanmar, Thailand, Vietnam. Borneo, Malaya.

Yunnan.

### **Hemarthria natans** Stapf. *Prain, Fl. Trop. Afr.* ix. 56 (1917).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Malawi. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Malawi: Buchanan 1310 (K syn) ; Malawi, Umbaca R.: Scott (K syn).

**Illustrations (Books):** R.M.Polhill, F.T.E.A., *Gramineae* (3)(1982):852, Fig 202), G.V.Pope et al., *Flora Zambesiaca* 10, S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (364, Fig 151).

**Derivation** (Clifford & Bostock 2007): *L. nato*, swim. Culms floating.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Perennial. Stolons present. Culms prostrate, 100–250 cm long (long), 2–5 mm diam., rooting from lower nodes. Lateral branches ample. Ligule a ciliate membrane. Leaf-blades 4–15 cm long, 2–5 mm wide.

**Inflorescence.** Inflorescence composed of racemes, embraced at base by subtending leaf. Racemes 1, single, smoothly terete, 3–7 cm long. Rhachis fracturing into irregular segments, flattened, glabrous on margins. Rhachis internodes cuneate. Rhachis internode tip transverse, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, 4–7 mm long, as long as fertile or longer than fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, acute to acuminate. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 3.5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, glabrous, base truncate, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, herbaceous, 2-keeled, keeled laterally, winged on keel, winged narrowly. Lower glume intercarinal veins distinct. Lower glume surface not waisted or transversely waisted (near apex). Lower glume apex acute or caudate or acuminate. Upper glume oblong, membranous, without keels, 3 -veined. Upper glume apex acute to acuminate.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, hyaline, 2 -veined, obtuse. Fertile lemma oblong, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Lemma apex obtuse. Palea hyaline, 0 -veined, without keels.

**Flower and Fruit.** Caryopsis with adherent pericarp, obovoid, dorsally compressed.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa. DRC. Ethiopia (inc. Eritrea). Kenya, Tanzania, Uganda. Angola, Malawi, Zambia.

**Hemarthria pratensis** (Bal.) Clayton. *Kew Bull.* 24:314 (1970).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*).

**TYPE** from Vietnam. **Basionym or Replaced Name:** *Rottboellia pratensis* Balansa, *J. Bot. (Morot)* 4: 110 (1890)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *B. Balansa* 1786, 11 Jun 1886, Vietnam: Tonkin: Zuang Yen (L-908.94–1216; IT: K, L-908.94–1215, P).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *pratum*, a meadow; -*ense*, place of origin. Meadow species.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with compacted dead sheaths. Culms erect, 100–150 cm long, 4–6 -noded. Lateral branches ample. Ligule a ciliate membrane. Leaf-blades 30–60 cm long, 2–4 mm wide. Leaf-blade surface glabrous. Leaf-blade margins scabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes, subtended by an inflated leaf-sheath. Racemes 1, single, smoothly terete, 10–20 cm long. Rhachis fracturing into irregular segments, flattened, glabrous on margins. Rhachis internodes oblong, 3–4 mm long, adherent to upper glume of sessile spikelet. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, 3–4 mm long, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, acuminate. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets oblong, dorsally compressed, 5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, glabrous, base truncate, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 1 length of spikelet, herbaceous, 2-keeled, keeled laterally, winged on keel, winged narrowly, 7 -veined. Lower glume intercarinal veins distinct. Lower glume surface flat. Lower glume apex acute. Upper glume oblong, membranous, without keels, 3 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, 3.5–4 mm long, hyaline, obtuse. Fertile lemma oblong, 3–3.5 mm long, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Lemma apex obtuse. Palea absent or minute.

**Flower and Fruit.** Anthers 3, 4 mm long. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. Tropical Asia.

**Country /Province /State.** Indo-China, Malesia, Papuasia. Thailand, Vietnam. New Guinea.

**Hemarthria protensa** Steud. *Syn. Pl. Gram.* 359 (1954).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: India: Khasia:, *Gomez Marks in Herb. Wallich* 8872 (HT: P; IT: K, L (fragm.)).

**Illustrations (Books):** H.J.Noltie, *The Grasses of Bhutan* (2000) (827, Fig. 62).

**Derivation** (Clifford & Bostock 2007): L. *protendo*, stretch out. Inflorescence a long spike.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Perennial. Culms geniculately ascending, 90–180 cm long. Lateral branches ample. Ligule a ciliate membrane. Leaf-blades linear or lanceolate, 6–50 cm long, 4–6 mm wide. Leaf-blade surface glabrous. Leaf-blade margins smooth. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes, subtended by an inflated leaf-sheath. Racemes 1, single, smoothly terete, 10–20 cm long. Rhachis fracturing into irregular segments, flattened, glabrous on margins. Rhachis internodes columnar, 4.5–5.2 mm long, adherent to upper glume of sessile spikelet. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, 3.5–4.5 mm long, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, 6–7 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, acuminate, muticous or awned, one glume awned, with 0–4 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 6–7 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, glabrous, base truncate, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, herbaceous, 2-keeled, keeled laterally, winged on keel, winged narrowly. Lower glume intercarinal veins distinct. Lower glume surface flat. Lower glume apex acute or acuminate. Upper glume elliptic, membranous, without keels, 3 -veined. Upper glume apex attenuate, muticous or awned, 1 -awned, awn 0–4 mm long.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, 4.5–7 mm long, hyaline, obtuse. Fertile lemma oblong, 1.5–1.7 mm long, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Lemma apex obtuse. Palea absent or minute.

**Flower and Fruit.** Anthers 3. Caryopsis with adherent pericarp.

$n = 9$  (1 ref TROPICOS), or 10 (1 ref TROPICOS).  $2n = 20$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State.** **China.** China South Central, China Southeast. **Indian Subcontinent, Indo-China, and Malesia.** Assam, Eastern Himalaya, Nepal. Myanmar, Thailand, Vietnam. Java.

Guangdong, Guangxi. Yunnan. Bhutan. Meghalaya.

### **Hemarthria sibirica** (Gandoger) Ohwi. *Bull. Tokyo Sci. Mus.*, No. 18, 1 (1947).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.Tsvelev, *Grasses of the Soviet Union* (1983), T.Koyama, *Grasses of Japan and its neighboring regions* (1987).

**TYPE from Russia. Basionym or Replaced Name:** *Rottboellia sibirica* Gand., *Bull. Soc. Bot. France* 66(7): 302, in key only. (1919) [1920]

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Russia: Sibiria: ad Chabarowsk, *Desoulay in Herb. fl. Ross.* 2392 (HT: LY (photo, K); IT: LE).

**Illustrations (Books):** N.N.Tsvelev, *Grasses of the Soviet Union* (1983) (1039 (689), Pl.16), T.Koyama, *Grasses of Japan and its neighbouring regions* (1987) (471, Fig 184), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 773).

**Derivation** (Clifford & Bostock 2007): L. -ica, belonging to. From Siberia.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Perennial. Stolons present. Culms prostrate, 100–150 cm long, rooting from lower nodes. Lateral branches ample. Ligule a ciliate membrane. Leaf-blades 6–40 cm long, 4–8 mm wide. Leaf-blade surface glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes, subtended by an inflated leaf-sheath. Racemes 1, single, smoothly terete, 4–10 cm long. Rhachis fracturing into irregular segments, flattened, glabrous on margins. Rhachis internodes columnar, adherent to upper glume of sessile spikelet. Rhachis internode tip transverse, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, acute. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic or oblong, dorsally compressed, 4.5–7.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus square, glabrous, base truncate, attached transversely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume elliptic or oblong, 1 length of spikelet, herbaceous, 2-keeled, keeled laterally, winged on keel, winged narrowly. Lower glume intercarinal veins distinct. Lower glume surface flat. Lower glume apex emarginate or obtuse. Upper glume oblong, membranous, without keels, 3 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, hyaline, obtuse. Fertile lemma oblong, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Lemma apex obtuse. Palea absent or minute.

**Flower and Fruit.** Anthers 3. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State.** Siberia, Russian Far East, **China, Eastern Asia, Russia.** Amur, Primorye. China South Central, Manchuria, China North-Central, China Southeast. Japan Honshu, or Shikoku, or Kyushu. Japan, Korea. **Indian Subcontinent.** Pakistan.

Hebei, Shandong. Anhui, Guangdong, Guangxi, Hunan, Jiangsu, Jiangxi, Zhejiang. Guizhou, Hubei.

### **Hemarthria stolonifera** Bor. *Dansk Bot. Ark.* 23: 163 (1965).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Thailand. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: HT: *Larsen 10033*, Thailand (K; IT: C).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *stolo*, shoot; *fero*, bear. Plant with well developed underground stems.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Perennial. Stolons present. Basal innovations extravaginal. Culms prostrate, 30 cm long, rooting from lower nodes. Lateral branches ample. Ligule a ciliate membrane. Leaf-blades 10–20 cm long, 2–3 mm wide. Leaf-blade surface glabrous. Leaf-blade apex abruptly acute, hooded.

**Inflorescence.** Inflorescence composed of racemes, subtended by an inflated leaf-sheath. Racemes 1, single, smoothly terete, 13 cm long. Rhachis fracturing into irregular segments, flattened, glabrous on margins. Rhachis internodes columnar, 3 mm long, adherent to upper glume of sessile spikelet. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, 3 mm long, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, 6.5 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, acute. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic or oblong, dorsally compressed, 6.5–7 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, glabrous, base truncate, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume elliptic or oblong, 1 length of spikelet, herbaceous, 2-keeled, keeled laterally, winged on keel, winged narrowly. Lower glume intercarinal veins distinct. Lower glume surface flat. Lower glume apex truncate or obtuse. Upper glume oblong, membranous, without keels, 3 -veined. Upper glume apex acuminate.

**Florets.** Basal sterile florets 1, male or barren, with palea. Lemma of lower sterile floret oblong, 4.5 mm long, hyaline, obtuse. Fertile lemma oblong, 4 mm long, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Lemma apex obtuse. Palea absent or minute.

**Flower and Fruit.** Anthers 3, 2–3 mm long. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. Tropical Asia.

**Country /Province /State.** Indo-China. Thailand.

### **Hemarthria uncinata** R. Br. *Prod.* 1: 207 (1810).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: HT: *R. Brown 6160*, Australia (BM (photo, BI, K); IT: K, LE?).

**Illustrations (Books):** J.P.Jessop, G.R.M. Dashorst & F.M.James, *Grasses of South Australia* (2006) (521, Fig 445 as var. *uncinata*), C.A.Gardner, *Flora of Western Australia*, Vol 1, Part 1, *Gramineae* (1952) (305, Pl 89), N.Walsh & T.Entwistle, *Flora of Victoria* Vol 2 (1994) (622, Fig 125 as var. *uncinata*), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (272), J.C.Tothill,& J.B.Hacker. *The grasses of southern Queensland* (1983) (256), D.Sharp & B.K.Simon, *AusGrass*. *Grasses of Australia*. CD-Rom Version 1.0. (2002).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. *Grasses of Australia*. CD-Rom Version 1.0. (2002);, K.Domin, *Bibliotheca Botanica* 85 (1915) (262, Fig.62 as *Rottboellia compressa* var. *spathacea*).

**Derivation** (Clifford & Bostock 2007): L. *uncinus*, hook; -ata, possessing. Upper glume drawn out into a hook.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Perennial. Culms prostrate, 20–80 cm long, rooting from lower nodes. Culm-nodes glabrous. Lateral branches sparse. Ligule a ciliate membrane. Leaf-blades flat or conduplicate, 5–15 cm long, 1.5–5 mm wide. Leaf-blade surface glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes, subtended by an inflated leaf-sheath. Racemes 1, single, smoothly terete, 6–14 cm long. Rhachis fracturing into irregular segments, flattened, glabrous on margins. Rhachis internodes columnar, adherent to upper glume of sessile spikelet. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, acute, muticous or awned, one glume awned. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets oblong, dorsally compressed, 6–10 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, glabrous, base truncate, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 1 length of spikelet, herbaceous, 2-keeled, keeled laterally, winged on keel, winged narrowly. Lower glume intercarinal veins distinct. Lower glume surface flat. Lower glume apex acute to setaceously acuminate, muticous or awned, 1 -awned, awn straight or hooked. Upper glume oblong, membranous, without keels, 3 -veined. Upper glume apex acute to setaceously acuminate (and sometimes hooked).

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, hyaline, obtuse. Fertile lemma oblong, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Lemma apex obtuse. Palea absent or minute.

**Flower and Fruit.** Anthers 3. Caryopsis with adherent pericarp.

$2n = 36$  (1 ref TROPICOS).

**Distribution (TDWG).** Continent. Tropical Asia, Australasia.

**Country /Province /State.** Malesia. Borneo. **Australia.** Western Australia, South Australia, Queensland, New South Wales, A.C.T., Victoria, Tasmania.

South-West. Southern. North, Central, South East. Coast, Tablelands, Western Slopes.

**Hemarthria vaginata** Bse. *Pl. Jungh., Gramineae* 3: 14, 354 (1854).

**Accepted by:** S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*).

**TYPE** from Indonesia. **Basionym or Replaced Name:** *Hemarthria protensa* Nees ex Steud., *Synopsis Plantarum Glumacearum* 1: 359. (July)1854.

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Indonesia: Java: Tijibogo, F.W. Junghuhn s.n. (HT: L-903.342-454; IT: L-908.90-1126).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 894).

**Derivation** (Clifford & Bostock 2007): *L. vagina*, sheath; -*ata*, possessing. Inflorescences concealed or partially concealed in uppermost leaf-sheaths.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Rottboelliinae.

**Habit, Vegetative Morphology.** Perennial. Culms geniculately ascending, 90–180 cm long. Lateral branches ample. Ligule a ciliate membrane. Leaf-blades linear or lanceolate, 6–50 cm long, 4–6 mm wide. Leaf-blade surface glabrous. Leaf-blade margins smooth. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes, subtended by an inflated leaf-sheath. Racemes 1, single, smoothly terete, 10–20 cm long. Rhachis fracturing into irregular segments, flattened, glabrous on margins. Rhachis internodes columnar, 4.5–5.2 mm long, adherent to upper glume of sessile spikelet. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, fused to internode, united wholly, oblong, flattened, 3.5–4.5 mm long, tip rectangular.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, 6–7 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus truncate. Companion sterile spikelet glumes herbaceous, acuminate, muticous or awned, one glume awned, with 0–4 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 6–7 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, glabrous, base truncate, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, herbaceous, 2-keeled, keeled laterally, winged on keel, winged narrowly. Lower glume intercarinal veins distinct. Lower glume surface flat. Lower glume apex acute or acuminate. Upper glume elliptic, membranous, without keels, 3 -veined. Upper glume apex attenuate, muticous or awned, 1 -awned, awn 0–4 mm long.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, 4.5–7 mm long, hyaline, obtuse. Fertile lemma oblong, 1.5–1.7 mm long, hyaline, without keel, 0 -veined, 0–3 -veined, without veins. Lemma apex obtuse. Palea absent or minute.

**Flower and Fruit.** Anthers 3. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State. China.** China South Central, China Southeast. **Indian Subcontinent, Indo-China, Malesia, Papuasia.** Bangladesh, Eastern Himalaya, India, Nepal. Myanmar, Thailand, Vietnam. Java, Sumatra. New Guinea.

Guangdong, Guangxi. Yunnan.

**Hemisorghum mekongense** (A. Camus) C. E. Hubbard. *Bor, Grasses Burma, Ceyl., Ind. & Pakist.* 687 (1960).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from Laos. **Basionym or Replaced Name:** *Sorghum halepense* var. *mekongense* A.Camus, *Bull. Mus. Paris* 1919 :497 (1919). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Laos, Muong Mai: Thorel.

**Illustrations (Books):** J.P.Jessop, G.R.M. Dashorst & F.M.James, *Grasses of South Australia* (2006) (532, Fig 454 as *Sorghum halepense*), B.Rosengurtt, *Gramineas Uruguayas I* (1970) (200, Fig. 82 as *Sorghum halepense*).

**Derivation** (Clifford & Bostock 2007): L. *-ense*, denoting origin. From Mikong, Laos.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Sorghinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 5–10 mm diam. Culm-internodes solid. Ligule a ciliolate membrane. Leaf-blades flat, 30–40 cm long, 30–40 mm wide.

**Inflorescence.** Inflorescence a panicle with branches tipped by a raceme. Panicle open, elliptic, 30–50 cm long. Primary panicle branches whorled at most nodes. Racemes 2–6 cm long, bearing few fertile spikelets, bearing 3–7 fertile spikelets on each. Rhachis fragile at the nodes, angular, scabrous on margins, glabrous on margins. Rhachis internodes filiform. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, filiform, angular, scabrous, glabrous.

**Sterile Spikelets.** Companion sterile spikelets well-developed, comprising 2 subequal glumes without lemmas, lanceolate, dorsally compressed, shorter than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, muticous.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, 5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus pubescent, base obtuse, attached transversely.

**Glumes.** Glumes dissimilar, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, 2-keeled. Lower glume primary vein scabrous. Lower glume intercarinal veins distinct. Lower glume surface flat, glabrous or pilose. Lower glume apex obtuse.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, 0.9 length of spikelet, membranous, 2 -veined, ciliolate on margins. Fertile lemma elliptic, 3.5–4 mm long, hyaline, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma margins ciliolate. Lemma apex entire or dentate, 2 -fid, muticous. Palea 1 length of lemma, hyaline, 0 -veined, without keels.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy, glabrous.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State. Indo-China.** Laos, Myanmar, Thailand.

### **Hemisorghum venustum** (Thw.) Clayton. *Kew Bull.*, 27(3): 448 (1972).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960) (as *Capillipedium*).

**TYPE** from Sri Lanka. **Basionym or Replaced Name:** *Andropogon venustus* Thwaites, *Enum. Pl. Zeyl.* 136 (1864)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: **TYPE COLLECTION:** *G.H.K. Thwaites C.P. 2875*, 1866, Sri Lanka: Central Province: Rambodde (US-1127068).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. beautiful, graceful. Mostly a reference to habit.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Sorghinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Basal innovations flabellate. Culms erect, 100 cm long. Culm-internodes solid. Ligule a fringe of hairs. Leaf-blades flat or convolute, 30–60 cm long, 3–6 mm wide.

**Inflorescence.** Inflorescence a panicle with branches tipped by a raceme. Panicle open, elliptic, 20–40 cm long. Primary panicle branches whorled at most nodes. Racemes 0.7–2 cm long, bearing few fertile spikelets, bearing 3–7 fertile spikelets on each. Rhachis fragile at the nodes, subterete, smooth on margins, glabrous on margins. Rhachis internodes filiform. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, filiform, terete, smooth, glabrous.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, elliptic, dorsally compressed, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, muticous. Companion sterile spikelet lemmas enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, 3.5–5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus pubescent, base obtuse, attached transversely.

**Glumes.** Glumes dissimilar, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, 2-keeled. Lower glume primary vein scabrous. Lower glume intercarinal veins absent. Lower glume surface flat. Lower glume apex obtuse.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, 0.9 length of spikelet, membranous, 2 -veined, ciliolate on margins. Fertile lemma elliptic, 3–4.5 mm long, hyaline, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma margins ciliolate. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, flexuous, 8–10 mm long overall, with twisted column. Column of lemma awn glabrous. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy, glabrous.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State. Indian Subcontinent.** India, Sri Lanka.

### **Henrardia persica** (Boiss.) C. E. Hubbard. *Blumea, Suppl.* 3, 17 (1946).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Iran. **Basionym or Replaced Name:** *Lepturus persicus* Boiss., *Diagn. Pl. Orient.* 13: 71 (1853)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: LT: *Aucher-Eloy* 2914, 1837, Persia australi (G-Herb. Boiss.); ILT: G, JE, P. LT designated by Frederiksen, Nord. J. Bot. 13: 489 (1993).

**Illustrations (Books):** N.N.Tsvelev, *Grasses of the Soviet Union* (1983) (199 (139), Pl.2), N.L.Bor, *Gramineae* in K.H.Rechinger, *Flora Iranica*. No. 70/30 (1970) (Tab. 23), N.L.Bor, *Gramineae* in *Flora of Iraq* (1968) (241, Pl. 83), N.L.Bor, *The grasses of Burma, Ceylon, India and Pakistan* (1960), T.A.Cope, *Flora of Pakistan* 143: *Poaceae* (1982) (593, Fig 67).

**Illustrations (Journals):** *Hooker's Icones Plantarum* (t.3453 (1947)).

**Derivation** (Clifford & Bostock 2007): L. -ica, belonging to. From Persia, now Iran.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms erect or geniculately ascending, 10–28 cm long. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane, 0.5 mm long. Leaf-blades flat or convolute, 2–8 cm long, 1.5–4 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, erect, straight or arcuate, smoothly terete, bilateral, 6–16 cm long. Rhachis fragile at the nodes, semiterete, 1.5–4 mm wide, glabrous on surface or puberulous on surface, smooth on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 6–10 mm long. Rhachis internode tip transverse. Spikelets appressed, solitary. Fertile spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 1–2 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets, or of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, dorsally compressed, 7–10 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, with lower wider than upper, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 1 length of upper glume, coriaceous, without keels, 7–9 -veined. Lower glume surface glabrous or puberulous. Lower glume apex obtuse. Upper glume oblong, coriaceous, without keels, 5–7 -veined. Upper glume surface glabrous or puberulous. Upper glume apex acute.

**Florets.** Fertile florets appressed to rhachilla. Fertile lemma oblong, 7–8 mm long, membranous, without keel, 3–5 -veined, 0–3 -veined or more than 3-veined. Lemma surface puberulous, hairy below, with clavate hairs. Lemma apex acute. Palea surface pubescent. Rhachilla extension 0.2 length of fertile floret, pubescent.

**Flower and Fruit.** Lodicules 2, ovate, 1.3–1.8 mm long, membranous, ciliate, hairy across the apex. Anthers 3, 1.5–2.2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, oblong, dorsally

compressed, sulcate on hilar side, 6–7 mm long, dark brown, hairy at apex. Embryo 0.3 length of caryopsis. Hilum linear, 1 length of caryopsis.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State. Middle Asia, Caucasus, Western Asia.** Kazakhstan, Turkmenistan, Tadzhikistan, Uzbekistan. Iran. **Indian Subcontinent.** Pakistan.

### **Henrardia pubescens** (Bertol.) C. E. Hubbard. *Blumea, Suppl.* 3, 19 (1946).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Iraq. **Basionym or Replaced Name:** *Rottboellia pubescens* Bertol., *Misc. Bot.* 1: 10, t. 1, f. 3–4 (1842)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: LT: *Colonel Chesney's Exped. 197*, Ex oris Euphrates (G; ILT: K). LT designated by Frederiksen, Nord. J. Bot. 13: 489 (1993).

**Illustrations (Books):** N.L.Bor, *Gramineae in Flora of Iraq* (1968) (239, Pl. 82).

**Derivation** (Clifford & Bostock 2007): *L. pubesco*, become hairy. Plant whole or in part hairy.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms erect or geniculately ascending, 10–15 cm long. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane, 1 mm long. Leaf-blades flat or convolute, 3–5 cm long, 1.5–2.5 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, erect, straight or arcuate, smoothly terete, bilateral, 6–8 cm long. Rhachis fragile at the nodes, semiterete, 2 mm wide, puberulous on surface, scabrous on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 7–8 mm long. Rhachis internode tip transverse. Spikelets appressed, solitary. Fertile spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, dorsally compressed, 8–9 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, with lower wider than upper, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of upper glume, coriaceous, without keels, 5–7 - veined. Lower glume lateral veins ribbed. Lower glume surface hispidulous. Lower glume apex acute. Upper glume lanceolate, coriaceous, without keels, 5–7 - veined. Upper glume lateral veins ribbed. Upper glume surface hispidulous. Upper glume apex acute.

**Florets.** Fertile lemma lanceolate, 7–8 mm long, membranous, without keel, 5 - veined, more than 3- veined. Lemma surface scaberulous, rough on veins, puberulous, hairy below, with clavate hairs. Lemma apex acute. Palea surface pubescent. Rhachilla extension 0.2 length of fertile floret, pubescent.

**Flower and Fruit.** Lodicules 2, ovate, 1 mm long, membranous, ciliate, hairy across the apex. Anthers 3, 0.5–0.7 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, oblong, dorsally compressed, sulcate on hilar side, dark brown, hairy at apex. Embryo 0.3 length of caryopsis. Hilum linear, 1 length of caryopsis.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State. Middle Asia, Western Asia, Arabian Peninsula.** Turkmenistan, Tadzhikistan, Uzbekistan. Iran, Iraq. Gulf States.

### **Hesperostipa comata** (Trin. & Rupr.) Barkworth. *Phytologia* 74(1): 16. 1993.

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online (as *Stipa*), U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Canada. **Basionym or Replaced Name:** *Stipa comata* Trin. & Rupr., *Mem. Acad. Petersb. Ser. VI. Sc. Nat.* 5: 75 (1842). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Canada, Carlton House Fort: Drummond (LE lecto).

**Illustrations (Books):** K.F.Best, et al, *Prairie Grasses* (1971) (227 as *Stipa*), M.E.Barkworth et al, *Flora of North America north of Mexico Vol 24 Poaceae, part 1* (2007) (159, as subsp. *comata* & subsp. *intermedia*), F.W.Gould, *The Grasses of Texas* (1975) (74, Fig. 32 as *Stipa*).

**Derivation** (Clifford & Bostock 2007): *L. coma*, hair of the head; *-ata*, possessing.

**Classification.** Subfamily Pooideae. Tribe: Stipeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 30–70 cm long. Ligule an eciliate membrane, (1.5–)3–5(–6) mm long, glabrous on abaxial surface or pubescent on abaxial surface, lacerate, obtuse or acute. Leaf-blades involute, 1–2 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear, 7–20 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, subterete, 15–25 mm long, breaking up at maturity, disarticulating below each fertile floret. Floret callus elongated, 3–4 mm long, pubescent, pungent.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma. Lower glume lanceolate, 15–25 mm long, 1 length of upper glume, membranous, without keels, 5 -veined. Lower glume apex acuminate, awned, 1 -awned, awn 5–7 mm long. Upper glume lanceolate, 15–25 mm long, 2 length of adjacent fertile lemma, membranous, without keels, 5 -veined. Upper glume apex acuminate, awned, 1 -awned, awn 3–7 mm long.

**Florets.** Fertile lemma elliptic, subterete, 8–12 mm long, coriaceous, mid-green or light brown, without keel, more than 3-veined. Lemma surface pubescent, hairy all along. Lemma margins convolute, covering most of palea. Lemma apex awned, 1 -awned. Principal lemma awn bigeniculate, 120–150 mm long overall, with twisted column. Palea without keels.

**Flower and Fruit.** Lodicules 2 or 3, 1.5 mm long. Anthers 3. Stigmas 2. Caryopsis with adherent pericarp. Hilum linear.

$2n = 38$ , or 44, or 46.

**Distribution (TDWG).** Continent. North America.

**Country /Province /State.** Subarctic America, Western Canada, Eastern Canada, Northwest USA, North-central USA, Northeast USA, Southwestern USA, South-central USA, Mexico. Yukon. Alberta, British Columbia, Manitoba, Saskatchewan. Ontario. Colorado, Idaho, Montana, Oregon, Washington, Wyoming. Iowa, Kansas, Minnesota, North Dakota, Nebraska, Oklahoma, South Dakota, Wisconsin. Arizona, California, Nevada, Utah. New Mexico, Texas. Northwest Mexico.

Baja California.

### ***Hesperostipa curtiseta* (Hitchc.) Barkworth. *Phytologia* 74(1): 16. 1993.**

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE from USA. Basionym or Replaced Name:** *Stipa spartea* var. *curtiseta* Hitchc., *Contrib. US Nat. Herb.* 24:230 (1925). T:<Type of Basionym>; fide TROPICOS and Kew Synonomy Database: USA, Montana, Hound Creek Valley: Scribner 339 (US holo).

**Recent Synonyms:** *Stipa curtiseta* (Hitchc.) Barkworth, *Canad. J. Bot.* 56(6): 624 (1978)

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (160).

**Classification.** Subfamily Pooideae. Tribe: Stipeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous or sparsely hairy. Culms erect or geniculately ascending, 30–60 cm long. Culm-internodes distally glabrous. Lateral branches lacking. Leaf-sheaths glabrous on surface. Leaf-sheath oral hairs ciliate. Ligule an eciliate membrane, 1–3 mm long. Leaf-blades involute, 10–20 cm long, 1 mm wide, stiff. Leaf-blade surface smooth or scaberulous, rough abaxially, pubescent, hairy adaxially. Leaf-blade margins ciliate. Leaf-blade apex pungent.

**Inflorescence.** Inflorescence a panicle. Panicle open, pyramidal, nodding, 15–20 cm long. Primary panicle branches whorled at most nodes, 5–10 cm long. Panicle axis with lower internodes 5–10 cm long, puberulous. Panicle branches flexuous, puberulous. Spikelets appressed, solitary. Fertile spikelets pedicelled. Pedicels present, 2 mm long.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, subterete, 15 mm long, breaking up at maturity, disarticulating below each fertile floret. Floret callus elongated, 3.5 mm long, pubescent, pungent.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma. Lower glume lanceolate, 15 mm long, 1 length of upper glume, membranous, much thinner above, purple, without keels, 3 -veined. Lower glume apex attenuate. Upper glume lanceolate, 15 mm long, membranous, much thinner above, purple, without keels, 3 -veined. Upper glume apex attenuate.

**Florets.** Fertile lemma linear, subterete, 8 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface puberulous or pubescent. Lemma margins convolute, covering most of palea. Lemma apex surmounted by a ring of hairs, awned, 1 -awned. Principal lemma awn bigeniculate, 50–70 mm long overall, with 30–50 mm long limb, with twisted column, deciduous, limb ciliate, glabrescent towards tip. Middle segment of lemma awn ciliate. Column of lemma awn 10 mm long, hirtellous, with 2 mm long hairs. Palea 0 -veined, without keels.

**Flower and Fruit.** Lodicules 2. Anthers 3. Stigmas 2. Caryopsis with adherent pericarp. Hilum linear.  
 $2n = 46$  (FNA).

**Distribution (TDWG). Continent.** North America.

**Country /Province /State.** Western Canada, Northwest USA, North-central USA. Alberta, British Columbia, Manitoba, Saskatchewan. Montana, Wyoming. North Dakota.

### **Hesperostipa neomexicana** Phytologia 74(1): 16. 1993. (Thurb.) Barkworth.

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online (as *Stipa*), U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE from USA. Basionym or Replaced Name:** *Stipa pennata* var. *neomexicana* Thurb., Coulteer, *Man. Rocky Mount.* :408 (1895). T:<Type of Basionym>; fide TROPICOS and Kew Synonomy Database: USA, New Mexico, Rio Mimbres: Thurber 269 (NY lecto).

**Recent Synonyms:** *Stipa neomexicana* (Thurb.) Scribn., *U. S. Dept. Agric. Bull. Agrost.* 17: 132 (1899).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007), F.W.Gould, *The Grasses of Texas* (1975) (75, Fig. 33 as *Stipa*).

**Derivation** (Clifford & Bostock 2007): L. -ana, indicating location. From New Mexico, USA.

**Classification.** Subfamily Pooideae. Tribe: Stipeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 40–80 cm long. Culm-internodes distally glabrous. Leaf-sheaths glabrous on surface. Ligule an eciliate membrane, 0.5–1.4 mm long. Leaf-blades convolute, 10–30 cm long, 0.5–1 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear, 3–8 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, subterete, 30–50 mm long, breaking up at maturity, disarticulating below each fertile floret. Floret callus elongated, 4–5 mm long, pilose, acute.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma, shiny. Lower glume lanceolate, 30–50 mm long, 1 length of upper glume, hyaline, pallid, without keels, 3–5 -veined. Lower glume apex attenuate. Upper glume lanceolate, 30–50 mm long, 2–2.5 length of adjacent fertile lemma, hyaline, pallid, without keels, 3–5 -veined. Upper glume apex attenuate.

**Florets.** Fertile lemma linear, subterete, 15–18 mm long, coriaceous, pallid, without keel, 5 -veined, more than 3-veined. Lemma surface glabrous or pubescent. Lemma margins convolute, covering most of palea. Lemma apex awned, 1 -awned. Principal lemma awn bigeniculate, 120–180 mm long overall, with twisted column, persistent or deciduous, limb hirsute, with 0.6–1.5 mm long hairs. Middle segment of lemma awn 10–20 mm long. Column of lemma awn 30–60 mm long, ciliate, hairy on the spiral. Palea without keels.

**Flower and Fruit.** Lodicules 2. Anthers 3. Stigmas 2. Ovary glabrous. Hilum linear.

$2n = 44$  (FNA).

**Distribution (TDWG). Continent.** North America.

**Country /Province /State.** Northwest USA, Southwestern USA, South-central USA, Mexico. Wyoming. Arizona, Nevada, Utah. New Mexico, Texas. Northeast Mexico, Northwest Mexico.

Coahuila, Chihuahua, Nuevo Leon, San Luis Potosi, Tamaulipas. Baja California, Sonora.

**Hesperostipa saxicola** (Hitchc.) Valdis-Reyna & Barkworth. *Contr. U.S. Natl. Herb.* 48: 384 (2003).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online (as *Stipa*), U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Mexico. **Basionym or Replaced Name:** *Stipa saxicola* Hitchc., *Contr. U.S. Natl. Herb.* 24(7): 232, t. 51, f. 1–2 (1925)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Mexico: Puebla: collected on a rocky hill, Esperanza, 28 Aug 1910, A.S. Hitchcock 6488 (HT: US-993394).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. saxum*, rock; *-cola*, dweller. Growing on or amongst boulders.

**Classification.** Subfamily Pooideae. Tribe: Stipeae.

**Distribution (TDWG). Continent.** North America.

**Country /Province /State. Mexico.** Central Mexico.

Puebla.

**Hesperostipa spartea** (Trin.) Barkworth. *Phytologia* 74(1): 16. 1993.

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online (as *Stipa*), U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from USA. **Basionym or Replaced Name:** *Stipa spartea* Trin., *Mem. Acad. Imp. Sci. St.-Petersbourg, Ser. 6, Sci. Math.* 1(1): 82 (1830)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Hooker Cat.* 253, USA: Philadelphia (LE-TRIN-1442.02; IT: US-78615 (fragm. ex LE)).

**Illustrations (Books):** K.F.Best, et al, *Prairie Grasses* (1971) (231 as *Stipa*), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (160).

**Images:** R.Darke, *Ornamental Grasses* (2004);, R.Darke, *The Encyclopaedia of Grasses for Liveable Landscapes* (2007);

**Derivation** (Clifford & Bostock 2007): Gk. *spartos*, broom (*Spartium junceum*) used for making rope. Name transferred to the grass because it too is a source of fibre.

**Classification.** Subfamily Pooideae. Tribe: Stipeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 70–120 cm long. Ligule an eciliate membrane, 0.5–3 mm long, glabrous on abaxial surface, obtuse. Leaf-blades flat or involute, 20–30 cm long, 2–5 mm wide. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear or oblong, dense, nodding, 10–20 cm long. Primary panicle branches appressed or ascending, bearing 1–2 fertile spikelets on each lower branch. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, subterete, 30–40 mm long, breaking up at maturity, disarticulating below each fertile floret. Floret callus elongated, 4–7 mm long, pubescent, pungent.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma. Lower glume lanceolate, 1 length of upper glume, membranous, without keels, 5–7 -veined. Lower glume apex acuminate. Upper glume lanceolate, 30–40 mm long, hyaline, without keels, 5–7 -veined. Upper glume apex acuminate.

**Florets.** Fertile lemma lanceolate, subterete, 13–25 mm long, coriaceous, dark brown, without keel, 5 -veined, more than 3-veined. Lemma surface pubescent, hairy below. Lemma margins convolute, covering most of palea, ciliate. Lemma apex acute, surmounted by a ring of hairs, with this appendage 0.5–1 mm long, awned, 1 -awned. Principal lemma awn bigeniculate, 50–200 mm long overall, with twisted column. Column of lemma awn glabrous. Palea 2 -veined, without keels.

**Flower and Fruit.** Lodicules 3, 1.5 mm long. Anthers 3, 1 mm long. Stigmas 2. Ovary glabrous. Caryopsis with adherent pericarp. Hilum linear.

$2n = 44$  (FNA), or 46 (FNA).

**Distribution (TDWG). Continent.** North America.

**Country /Province /State.** Western Canada, Eastern Canada, Northwest USA, North-central USA, Northeast USA, Southwestern USA, South-central USA. Alberta, British Columbia, Manitoba, Saskatchewan. Ontario. Colorado, Washington, Wyoming. Illinois, Iowa, Kansas, Minnesota, Missouri, North Dakota, Nebraska, Oklahoma, South Dakota, Wisconsin. Michigan, Ohio. Arizona, Nevada. New Mexico.

**Heterachne abortiva** (R. Br.) Hughes. *Bot. Exch. Club Brit. Isles Rep.* 1916 : 627 (1917).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

**TYPE** from Australia. **Basionym or Replaced Name:** *Poa abortiva* R. Br., *Fl. Nov. Holl.* 181 (1810). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *R. Brown 6160*, Australia (BM (photo, BI, K); IT: K, LE?).

**Illustrations (Books):** K.O.Mallett (ed.), *Flora of Australia*, Vol 44B. *Poaceae* (2004) (414, Fig 74), D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002).

**Illustrations (Journals):** *Hooker's Icones Plantarum* (t. 3283 (1935)).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002);, K.O.Mallett (ed.). *Flora of Australia*, Vol 44 A (2002) & Vol 44B (2004). *Poaceae*;.

**Classification.** Subfamily Chloridoideae. Tribe: Eragrostideae.

**Habit, Vegetative Morphology.** Annual. Culms erect or decumbent, 10–35 cm long, 3–5 -noded. Ligule a fringe of hairs. Leaf-blades convolute, 5–16 cm long, 1–2.5 mm wide, stiff. Leaf-blade surface ribbed. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence a panicle. Panicle spiciform, oblong, continuous or interrupted, 1.5–5 cm long, 1–2 cm wide. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, oblong, 0.5 mm long, ciliate.

**Fertile Spikelets.** Spikelets comprising 1–2 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets, or of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong or ovate, laterally compressed, compressed strongly, 3–10 mm long, breaking up at maturity, disarticulating above glumes but not between florets. Rhachilla internodes definite, zig-zag.

**Glumes.** Glumes deciduous, similar, shorter than spikelet. Lower glume ovate, 1–1.5 mm long, 0.6 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume ovate, 1.8–2.5 mm long, 0.7 length of adjacent fertile lemma, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Fertile lemma ovate, 2.6–3.5 mm long, membranous, keeled, winged on keel, 3 -veined, 0–3 -veined. Lemma midvein ciliolate, hairy above. Lemma apex obtuse. Palea bowed outwards, 0.75 length of lemma. Palea keels winged, conspicuously winged, ciliolate. Apical sterile florets 4–22 in number, barren, in a clump (fan-like), oblong, 2.5–3 mm long. Apical sterile lemmas winged on keel.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3, 0.3–0.5 mm long. Caryopsis with adherent pericarp, ellipsoid, 1.3–1.5 mm long.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State. Australia.** Western Australia, Northern Territory, Queensland.

Kimberley. Darwin & Gulf, Victoria R & Barkly Tableland. North.

**Heterachne baileyi** C. E. Hubbard. *Hook. Ic. Pl.* iii. sub t. 3283, p. 3 (1935).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

**TYPE** from Australia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Australia: Queensland: Cook Dist.: Weipa, on the Embley River, Jun 1901, *J.F. Bailey s.n.* (HT: K; IT: BRI).

**Illustrations (Books):** K.O.Mallett (ed.), *Flora of Australia*, Vol 44B. *Poaceae* (2004) (414, Fig 74), D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002).

**Derivation** (Clifford & Bostock 2007): in honor of John Frederick Bailey (1866–1932) Australian horticulturalist.

**Classification.** Subfamily Chloridoideae. Tribe: Eragrostideae.

**Habit, Vegetative Morphology.** Annual. Culms erect or geniculately ascending, slender, 10–36 cm long, 4–6 -noded. Leaf-sheaths glabrous on surface or pilose. Ligule a fringe of hairs. Leaf-blades flat or convolute, 3–7 cm long, 1–3.5 mm wide. Leaf-blade surface glabrous or pilose, sparsely hairy, hairy adaxially. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle. Panicle open, linear or lanceolate, interrupted, 5–20 cm long, 2–6 cm wide. Primary panicle branches spreading, 1–3.5 cm long, bearing spikelets almost to the base. Panicle axis pilose. Panicle branches pilose. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, oblong, ciliate.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate or orbicular, laterally compressed, compressed strongly, 3–3.5 mm long, 2–3.5 mm wide, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet. Lower glume lanceolate or ovate, 1.8–3 mm long, 1 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume primary vein scaberulous. Lower glume lateral veins absent. Lower glume apex acute. Upper glume lanceolate or ovate, 1.8–3 mm long, 0.6–0.9 length of adjacent fertile lemma, 1-keeled, 1 -veined. Upper glume primary vein scaberulous. Upper glume lateral veins absent. Upper glume apex acute.

**Florets.** Fertile lemma oblong, 2.8–3.2 mm long, cartilaginous, keeled, winged on keel, 3 -veined, 0–3 -veined. Lemma surface glabrous. Lemma apex obtuse. Palea bowed outwards, 0.66 length of lemma. Palea keels winged, conspicuously winged, eciliate. Apical sterile florets 1–3 in number, barren, oblong. Apical sterile lemmas winged on keel.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State. Australia.** Queensland.

North.

### **Heterachne gulliveri** Benth. *Hook. Ic. Pl. t.* 1250. (1877).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

**TYPE** from Australia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: Australia: Northern Australia: between Norman and Gilbert Rivers, Carpentaria, *Gulliver s.n.*.

**Illustrations (Books):** J.R.Wheeler et al, *Flora of the Kimberley Region* (1992) (1178, Fig. 333).

**Illustrations (Journals):** *Hooker's Icones Plantarum* (t.1250 (1877)).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. *Grasses of Australia*. CD-Rom Version 1.0. (2002);.

**Derivation** (Clifford & Bostock 2007): in honor of Thomas A. Gulliver botanical collector in northern Australia.

**Classification.** Subfamily Chloridoideae. Tribe: Eragrostideae.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms erect, 10–25 cm long. Leaf-sheath oral hairs bearded. Ligule a fringe of hairs. Leaf-blades filiform, convolute, 5–15 cm long, 1–2 mm wide. Leaf-blade surface pubescent, sparsely hairy, hairy adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle spiciform, linear, interrupted, 2–7 cm long. Panicle branches pilose. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, oblong, 0.5 mm long, ciliate.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets orbicular, laterally compressed, compressed strongly, 2–2.5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes deciduous, similar, shorter than spikelet. Lower glume ovate, 1–1.5 mm long, 0.66–0.75 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume primary vein scaberulous. Lower glume lateral veins absent. Lower glume margins ciliolate. Lower glume apex obtuse or acute. Upper glume ovate, 1.5–2 mm long, 0.7–0.8 length of adjacent fertile lemma, 1-keeled, 3 -veined. Upper glume primary vein scaberulous. Upper glume margins ciliolate. Upper glume apex obtuse or acute.

**Florets.** Fertile lemma ovate, 2–2.5 mm long, membranous, keeled, winged on keel, 3 -veined, 0–3 -veined. Lemma midvein scaberulous. Lemma margins ciliolate (obscurely). Lemma apex obtuse. Palea

bowed outwards, 0.75 length of lemma. Palea keels winged, conspicuously winged, ciliolate. Apical sterile florets 2–3 in number, barren, in a clump (fan-like), oblong. Apical sterile lemmas winged on keel.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Caryopsis with adherent pericarp, ellipsoid, 1 mm long.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State. Australia.** Western Australia, Northern Territory, Queensland.

Kimberley, Darwin & Gulf, Victoria R & Barkly Tableland. North.

### **Heteranthelium piliferum** (Sol.) Hochst. ex Jaub. & Spach. *Illustr. iv.* 24 (1850).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Syria. **Basionym or Replaced Name:** *Elymus pilifer* Banks & Sol., *Nat. Hist. Aleppo* (ed. 2) 2: 244 (1794)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: *Russell s.n.*, Syria: circa Aleppo (BM).

**Illustrations (Books):** N.Feinbrun-Dothan, *Flora Palaestina* 4 (1986) (Pl 207), N.L.Bor, *Gramineae* in K.H.Rechinger, *Flora Iranica*. No. 70/30 (1970) (Tab. 33), N.L.Bor, *Gramineae in Flora of Iraq* (1968) (243, Pl. 84), T.A.Cope, *Flora of Pakistan* 143: *Poaceae* (1982) (604, Fig 71).

**Derivation** (Clifford & Bostock 2007): *L. pilus*, a hair; *fero*, bear. Hairy in some respect.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual. Culms decumbent, 10–30 cm long. Leaf-sheaths hirsute, with reflexed hairs. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane. Leaf-blades 5–12 cm long, 2–4 mm wide. Leaf-blade surface scabrous, rough on both sides, pilose, hairy on both sides. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, oblong, bilateral, 2.5–5 cm long. Rhachis fracturing into irregular segments. Spikelet packing broadside to rhachis. Rhachis internodes oblong, falling in segments of 1–2 fertile nodes surmounted by 1–3 nodes of sterile spikelets, these alternating along the raceme. Spikelets ascending, solitary or in a cluster of closely packed nodes (1 per node). Fertile spikelets sessile, 1–2 in the cluster (below). Companion sterile spikelets sessile, 1–3 in the cluster (above).

**Sterile Spikelets.** Companion sterile spikelets represented by awns.

**Fertile Spikelets.** Spikelets comprising 1–2 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets, or of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 13–15 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes similar, exceeding apex of florets, gaping. Lower glume subulate, 13–15 mm long, 1 length of upper glume. Lower glume surface pilose, hairy below. Upper glume subulate, 13–15 mm long. Upper glume surface pilose, hairy below.

**Florets.** Fertile lemma elliptic, 7–8 mm long, coriaceous, without keel, 7 -veined, more than 3-veined. Lemma surface tuberculate, villous. Lemma apex attenuate, awned, 1 -awned. Principal lemma awn 20–25 mm long overall, limb scabrous. Palea apex with excurrent keel veins. Apical sterile florets 2–4 in number, barren, in a clump, rudimentary. Apical sterile lemmas awned, 1 -awned.

**Flower and Fruit.** Ovary with a fleshy appendage below style insertion, pubescent on apex. Caryopsis with adherent pericarp, ellipsoid, laterally compressed, sulcate on hilar side, hairy at apex, apex fleshy. Embryo 0.25–0.33 length of caryopsis. Hilum linear, 1 length of caryopsis.

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State. Middle Asia, Caucasus, Western Asia.** Turkmenistan, Tadzhikistan, Uzbekistan. Iran, Iraq. **Indian Subcontinent.** Pakistan.

### **Heteranthoecia guineensis** (Franch.) Robyns. *Bull. Jard. Bot. Brux.* ix. 201 (1932).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from DRC & Gabon. **Basionym or Replaced Name:** *Dinebra guineensis* Franch., *Bull. Soc. Hist. Nat. Autun* 8: 376 (1895)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: ST: *Griffon du Bellay s.n.*, Gabon: dans les sables inondes de la plaine de Bouando (P).

ST: *Thollon s.n.*, Congo (P; IST: K).

**Illustrations (Books):** H.Jacques-Felix, *Les Graminees d'Afrique tropicale* (1962) (264, Fig. 196), R.M.Polhill, F.T.E.A., *Gramineae* (2)(1974):433, Fig.117), G.V.Pope et al., *Flora Zambesiaca* 10, R.Pilger, *Die Naturlichen Pflanzenfamilien* 14e (1940).

**Illustrations (Journals):** Hooker's *Icones Plantarum* (t.2927 (1911) as *H. ischnoides*).

**Derivation** (Clifford & Bostock 2007): L. -ense, denoting origin. From British Guiana, now Guyana.

**Classification.** Subfamily Micrairoideae. Tribe Isachneae.

**Habit, Vegetative Morphology.** Annual, mat forming. Culms 10–30 cm long, rooting from lower nodes. Ligule a fringe of hairs. Leaf-blades lanceolate, 1–3 cm long, 2–5 mm wide, stiff.

**Inflorescence.** Inflorescence composed of racemes. Racemes 2–15, borne along a central axis, deflexed or spreading, unilateral, 0.5–1.2 cm long. Central inflorescence axis 2–8 cm long. Rhachis flattened, setose on margins, terminating in a barren extension, extension subulate. Spikelet packing abaxial, regular, 2 -rowed. Spikelets solitary. Fertile spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 2 fertile florets, without rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, dorsally compressed, 1.7–2.3 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes lower deciduous, upper persistent, similar, shorter than spikelet, thinner than fertile lemma, gaping. Lower glume ovate, 1–1.8 mm long, 1 length of upper glume, membranous, without keels, 3–7 -veined. Lower glume apex acute. Upper glume ovate, 1–1.8 mm long, 0.7–0.8 length of adjacent fertile lemma, membranous, with hyaline margins, without keels, 3–7 -veined. Upper glume apex acute.

**Florets.** Fertile florets with the lowest dissimilar. Lowest fertile lemma elliptic, 1.8–2.3 length of adjacent lemma, thinner than adjacent lemma. Fertile lemma ovate, 0.8–1 mm long, chartaceous, without keel, 5 -veined, more than 3-veined. Lemma surface pubescent, with clavate hairs. Lemma apex obtuse.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas laterally exserted (lower floret) or terminally exserted (upper floret). Caryopsis with adherent pericarp, obovoid, dorsally compressed, 0.5 mm long. Hilum punctiform.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State. West Tropical Africa, West-Central Tropical Africa, East Tropical Africa, South Tropical Africa.** Guinea, Liberia, Nigeria, Sierra Leone. Gabon, DRC. Tanzania, Uganda. Angola, Zambia.

### **Heteropogon contortus** (L.) Beauv. ex Roem. & Schult. *Syst. ii.* 836 (1817).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), T.G.Tutin et al, *Flora Europaea* 5 (1980), T.Koyama, *Grasses of Japan and its neighboring regions* (1987), W.D.Clayton & N.Snow, *Key to Pacific Grasses* (2010).

**TYPE** from India. **Basionym or Replaced Name:** *Andropogon contortus* L., *Sp. Pl.* 2: 1045 (1753). T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: India:, *Plukenet, Phyt. pl.* 191, f. 5, 1692.

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 1, Aristidoideae a Pharoideae (2012) (525), G.Hegi, *Flora von Mitteleuropa* 1 (1909) (as *Andropogon*), H.Jacques-Felix, *Les Graminees d'Afrique tropicale* (1962) (312, Fig. 250), W. Robyns (1929 and 1934). Flora Agrostologique du Congo Belge et du Ruanda-Urundi, I. Maydees et Andropogonees and II. Panicees. Bruxelles, Goemaere (213, Pl. 17), F.N.Hepper, F.W.T.A. 3(2) (1972) (474, Fig.451), R.M.Polhill, F.T.E.A., *Gramineae* (3)(1982):826, Fig. 191), G.V.Pope et al., *Flora Zambesiaca* 10 (4)(2002):146, T. 47), L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (Pl. 19), M.A.N.Muller, *Grasses of South West Africa/Namibia* (1984), G.E.Gibbs Russell el al, *Grasses of Southern Africa* (1990) (178, Fig. 105), J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969) (235, Fig 84), S.Phillips, *Poaceae*

(Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (357, Fig. 146), T.A.Cope, in M.Thulin, *Poaceae* (Gramineae). *Flora of Somalia* (1995) (266, Fig. 158), N.L.Bor, *Gramineae in Flora of Iraq* (1968) (531, Pl. 203), T.Koyama, *Grasses of Japan and its neighbouring regions* (1987) (453, Fig. 178), C-C Hsu, *Flora of Taiwan*, Vol 5 (1978) (700), C-C Hsu, *Taiwan Grasses* (1975) (660, Pl. 1468), N.L.Bor, *The grasses of Burma, Ceylon, India and Pakistan* (1960) (164, Fig. 6), K.M.Matthew, *Illustrations on the Flora of Tamilnadu Carnatic* (1982) (Pl. 876 & 877), T.A.Cope, *Flora of Pakistan* 143: *Poaceae* (1982) (313, Fig. 36), H.J.Noltie, *The Grasses of Bhutan* (2000) (827, Fig. 62), H.B.Gilliland, *Grasses of Malaya* (1971) (293, Fig. 63), H.Duistermaat, *Field Guide to the Grasses of Singapore* (2005) (75, Fig. 72), E.E.Henty, *A Manual of the Grasses of New Guinea* (1969) (106, Pl. 42), C.A.Gardner, *Flora of Western Australia*, Vol 1, Part 1, *Gramineae* (1952) (339, Pl. 99), J.R.Wheeler et al, *Flora of the Kimberley Region* (1992) (1180, Fig. 334), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (273), J.C.Tothill,& J.B.Hacker. *The grasses of southern Queensland* (1983) (258), T.D.Stanley & E.Ross, *Flora of South East Queensland, Gramineae* (1989), D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia*. CD-Rom Version 1.0. (2002), W.L.Wagner et al., *Manual of the Flowering Plants of Hawa'i*, Vol. 2 (1990) (1549, Pl. 229), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 25 *Poaceae*, part 2 (2003) (681), F.W.Gould, *The Grasses of Texas* (1975) (617, Fig. 327), A.S.Hitchcock, *Manual of the Grasses of the West Indies* (1936) (414, Fig. 364), S.A.Renvoize, *Gramineas de Bolivia* (1998) (608, Fig. 145), J.A.Steyermark et al, *Flora of the Venezuelan Guayana* Vol. 8 (2004) (116, Fig. 78), E.G.Nicora, *Los Generos de Gramineas de America Austral* (1987) (526, Fig. 189), G.Harling & C.Persson, *Flora of Ecuador* (2006) (78: 196, Fig. 23 (2006)), E.Judziewicz, *Flora of the Guianas*, 187. *Poaceae* (1990) (254, Fig. 43), R.Pilger, *Die Naturlichen Pflanzenfamilien* 14e (1940), S-L Chen et al, *Flora of China*, Illustrations, *Poaceae* (2007) (Fig. 890), E.Hafliger & E.Schultz, *Grass Weeds*, CIBA-GEIGY (1:61(1980)), G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012) (Fig. 64).

**Illustrations (Journals):** *Ruizia* (13:453 Fig 61c-d (1993)).

**Images:** D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia*. CD-Rom Version 1.0. (2002);, H.B.Gilliland et al., *Flora of Malaya Vol. 3 Grasses* (1971);, F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999), G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012) (Pl. 19).

**Derivation** (Clifford & Bostock 2007): L. twisted. Awns hygroscopic and so twisted when dry.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriiinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Basal innovations intravaginal. Culms erect, 30–100 cm long, 1.5–3 mm diam. Culm-internodes solid. Culm-nodes black. Lateral branches fastigiate. Leaves caudate. Leaf-sheaths keeled. Ligule a fringe of hairs, 1 mm long. Collar glabrous or pilose. Leaf-blades 3–30 cm long, 2–8 mm wide. Leaf-blade surface ribbed. Leaf-blade apex abruptly acute.

**Inflorescence.** Inflorescence composed of racemes. Peduncle antrotorse scabrous above. Racemes 1, single, erect, unilateral, 3–10 cm long. Rhachis fragile at the nodes, glabrous on margins. Rhachis internodes linear. Rhachis internode tip oblique. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, oblong, semiterete, 0.2 length of fertile spikelet.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 6–34 in number, larger than fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, male, lanceolate, asymmetrical, dorsally compressed, 5–15 mm long, longer than fertile, separately deciduous. Companion sterile spikelet callus linear, 2–3 mm long. Companion sterile spikelet glumes chartaceous, eglandular, winged on margins, distinctly veined, smooth or tuberculate, glabrous or pubescent or pilose or villous, acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 5.5–10 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 2–3 mm long, bearded, base pungent, attached obliquely. Spikelet callus hairs red, 0.2 length of spikelet.

**Glumes.** Glumes dissimilar, with lower wider than upper, exceeding apex of florets, firmer than fertile lemma. Lower glume linear, 1 length of spikelet, coriaceous, dark brown, without keels, 9 -veined. Lower glume surface puberulous or pubescent or pilose. Lower glume apex obtuse. Upper glume linear, coriaceous, without keels. Upper glume muticous.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret linear, 1 length of fertile lemma, hyaline, 2 -veined, erose. Fertile lemma linear, 3–5 mm long, membranous, 1 - veined, 0–3 -veined, one-veined. Lemma apex entire, awned, 1 -awned. Principal lemma awn apical, geniculate, 50–80 mm long overall, with twisted column. Column of lemma awn hirtellous. Palea absent or minute.

**Flower and Fruit.** Anthers 3, 2.5 mm long. Stigmas 2.

$n = 20$  (5 refs TROPICOS).  $2n = 40$ , or 50, or 60.

**Distribution (TDWG).** **Continent.** Europe, Africa, Temperate Asia, Tropical Asia, Australasia, Pacific, North America, South America.

**Region. Southwestern Europe, Southeastern Europe, Middle Europe.**

**Country /Province /State.** : Switzerland. : Baleares, France, Spain. : Italy, Sicily, Yugoslavia.

**Northern Africa, Macaronesia, West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Middle Atlantic Ocean, Western Indian Ocean.** Algeria, Morocco, Tunisia. Cape Verde. Benin, Burkina, Ghana, Ivory Coast, Nigeria, Sierra Leone, Togo. Rwanda, DRC. Eritrea, Ethiopia (inc. Eritrea), Socotra, Somalia, Sudan. Kenya, Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Namibia, Botswana, Limpopo, North-West, Gauteng, Mpumalanga, Swaziland, Free State, Kwazulu-Natal, Lesotho, Northern Cape, Western Cape, Eastern Cape. Ascension. Mauritius, Madagascar, Reunion, Rodrigues, Seychelles. **Western Asia, Arabian Peninsula, China, Eastern Asia.** Afghanistan, Iraq. Oman. China South Central, Hainan, China North-Central, China Southeast, Tibet. Nansei-Shoto, Ogosawara-shoto, Taiwan. **Indian Subcontinent, Indo-China, Malesia, Papuasia.** India, Pakistan, Sri Lanka, West Himalaya. Andaman Is, Laos, Myanmar, Thailand, Vietnam. Java, Lesser Sunda Is, Malaya, Singapore, Moluccas, Philippines, Sulawesi, Sumatra. New Guinea. **Australia.** Western Australia, Northern Territory, Queensland, New South Wales. **Southwestern Pacific, Northwestern Pacific, North-central Pacific.** Fiji, New Caledonia, Samoa, Tonga. Marquesas, Society Is. Marianas. Hawaii. **Southwestern USA, South-central USA, Southeastern USA, Mexico.** Arizona, California. New Mexico, Texas. Alabama, Florida. Central Mexico, Northeast Mexico, Gulf (Mexico), Pacific Is (Mexico), Northwest Mexico, Southwest Mexico, Southeast Mexico. **Mesoamerica, Caribbean, Northern South America, Western South America, Brazil, Southern South America.** Belize, Guatemala, Honduras, Nicaragua. Cuba, Dominican Republic, Haiti, Jamaica, Leeward Is, Venezuelan and Netherlands Antilles. Guyana, Venezuela. Bolivia, Colombia, Ecuador, Peru. Brazil Northeast, Brazil North. Argentina Northwest, Paraguay.

Gansu, Shaanxi, Fujian, Guangdong, Guangxi, Henan, Hunan, Jiangxi, Zhejiang, Guizhou, Hubei, Sichuan, Yunnan. Darjeeling, Bhutan, Sikkim. Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura. Andhra Pradesh, Bihar, Chandigarh, Chattisgarh, Dadra-Nagar-Haveli, Diu, Delhi, Daman, Goa, Gujarat, Haryana, Jharkhand, Kerala, Karaikal, Karnataka. Mahe, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Punjab, Rajasthan, Tamilnadu, Uttah Pradesh, West Bengal, Yanam. Himachal Pradesh, Jammu Kashmir, Uttaranchal. Kimberley, Eremean. Darwin & Gulf, Victoria R & Barkly Tableland, Central Australia. North, Central, South East, Inland. Coast, Tablelands, Western Slopes, Western Plains. Maranhão, Piaui. Acre. Jujuy, Salta, San Luis, Tucuman. Chaco, Cordoba, Corrientes, Formosa, Misiones. Distrito Federal, Mexico State, Morelos, Puebla, Tlaxcala. Aguascalientes, Coahuila, Chihuahua, Durango, Guanajuato, Neuvo Leon, Queretaro, San Luis Potosi, Tamaulipas, Zacatecas. Veracruz. Revillagigedo Is. Baja California, Baja California Sur, Sinaloa, Sonora. Colima, Guerrero, Jalisco, Michoacan, Nayarit, Oaxaca. Chiapas, Quintana Roo, Tabasco, Yucatan.

### **Heteropogon fischerianus** Bor. *Kew Bull.* 1951, 170 (1951).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: IT: *Bourne* 2025, 1 Jul 1901, India: Madras (US-1258192).

**Illustrations (Books):** K.M.Matthew, *Flora Palni Hills* (1996) (836, Pl 836).

**Derivation** (Clifford & Bostock 2007): L. -*anus*, indicating connection. In honor of Cecil Ernest Claude Fischer (1874–1950) Indian botanist born of European parents.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 30–40 cm long. Leaves cauline (middle third of culm), distichous. Leaf-sheaths 2.5 cm long, keeled, striately veined. Ligule a fringe of hairs, 1 mm

long. Leaf-blades conduplicate, 2.5–7 cm long, 2–4 mm wide, stiff. Leaf-blade surface glabrous, hairless except near base. Leaf-blade margins cartilaginous, scabrous, tuberculate-ciliate, hairy at base.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, erect, unilateral, 4–5 cm long. Rhachis fragile at the nodes. Rhachis internodes linear. Rhachis internode tip oblique. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, oblong, semiterete, 0.3 mm long, 0.05 length of fertile spikelet.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 8–12 in number, larger than fertile. Basal sterile spikelet lower glume muticous.

Companion sterile spikelets well-developed, male, lanceolate, dorsally compressed, 7–8 mm long, longer than fertile, separately deciduous. Companion sterile spikelet callus linear, 1.5 mm long, truncate. Companion sterile spikelet glumes chartaceous, eglandular, winged on margins, smooth, glabrous, acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 8.5–9 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, curved, 2.5 mm long, bearded, base pungent, attached obliquely. Spikelet callus hairs dark brown.

**Glumes.** Glumes dissimilar, with lower wider than upper, exceeding apex of florets, firmer than fertile lemma. Lower glume linear, 1 length of spikelet, coriaceous, dark brown, without keels. Lower glume surface grooved on either side of midvein, pubescent. Lower glume apex truncate. Upper glume linear, coriaceous, without keels. Upper glume muticous.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 0 -veined, without lateral veins, erose. Fertile lemma linear, 2–3 mm long, membranous, 1 -veined, 0–3 -veined, one-veined. Lemma apex entire, awned, 1 -awned. Principal lemma awn apical, geniculate, 40–70 mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Flower and Fruit.** Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Tropical Asia.

**Country /Province /State. Indian Subcontinent.** India.

Tamilnadu.

### **Heteropogon melanocarpus** (Ell.) Benth. *Journ. Linn. Soc.* xix. 71 (1881).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from USA, Georgia. **Basionym or Replaced Name:** *Andropogon melanocarpus* Elliott, *Sketch Bot. S. Carolina* 1(2): 146 (1816)

. T:<Type of Basionym>: fide TROPICOS and Kew Synchrony Database: HT: *Habersham s.n.*, USA: Georgia (CHARL; IT: K).

**Recent Synonyms:** *Heteropogon betafensis* A.Camus, *Bull. Soc. Bot. France*, 61: 924 (1925).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 1, Aristidoideae a Pharoideae (2012) (526), M.A.N.Muller, *Grasses of South West Africa/Namibia* (1984), J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969) (235, Fig. 84 as *H. betafensis*), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 25 Poaceae, part 2 (2003) (681), A.S.Hitchcock, *Manual of the Grasses of the West Indies* (1936) (415, Fig. 365), R.Pilger, *Die Naturlichen Pflanzenfamilien* 14e (1940) (183, Fig. 97), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 890).

**Derivation** (Clifford & Bostock 2007): Gk. *melas*, black; *karpos*, fruit. Mature spikelets black.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Culms erect, robust, 50–250 cm long, with prop roots. Leaves caudate. Leaf-sheaths glandular. Ligule an eciliate membrane. Leaf-blades 15–50 cm long, 4–10 mm wide. Leaf-blade apex attenuate.

**Inflorescence.** Synflorescence compound, paniculate, 10–30 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole linear, 7–12 cm long, herbaceous. Racemes 1, single, unilateral, 3–6 cm long. Rhachis fragile at the nodes, glabrous on margins. Rhachis internodes linear, 2–3 mm long. Rhachis internode tip oblique. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, oblong, semiterete, 0.2 length of fertile spikelet.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2–6 in number, larger than fertile.

Companion sterile spikelets well-developed, male, lanceolate, asymmetrical, dorsally compressed, 15–25 mm long, longer than fertile, separately deciduous. Companion sterile spikelet callus linear, 2–3 mm long. Companion sterile spikelet glumes herbaceous, glandular (along midline), winged on margins, distinctly veined, glabrous, attenuate, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 10–11 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 4 mm long, bearded, base pungent, attached obliquely. Spikelet callus hairs red.

**Glumes.** Glumes dissimilar, with lower wider than upper, exceeding apex of florets, firmer than fertile lemma. Lower glume elliptic or oblong, 1 length of spikelet, coriaceous, dark brown, without keels, 7–9 - veined. Lower glume surface hispidulous. Lower glume apex obtuse. Upper glume linear, coriaceous, without keels. Upper glume muticous.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret linear, 2.5 mm long, hyaline, 0 -veined, without midvein, without lateral veins. Fertile lemma linear, 6–10 mm long, membranous, 1 -veined, 0–3 -veined, one-veined. Lemma apex entire, awned, 1 -awned. Principal lemma awn apical, geniculate, 70–120 mm long overall, with twisted column. Column of lemma awn pubescent. Palea fused below to rhachilla internode, 0.2–0.3 length of lemma.

**Flower and Fruit.** Anthers 3, 1 mm long. Stigmas 2.

$n = 10$  (1 ref TROPICOS).  $2n = 20$ .

**Distribution (TDWG).** **Continent.** Africa, Temperate Asia, Tropical Asia, North America, South America.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean. Benin, Gambia, Nigeria, Senegal. DRC. Ethiopia (inc. Eritrea). Kenya, Tanzania. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Namibia, Botswana, Limpopo. Madagascar. Arabian Peninsula, China. Oman. China South Central. **Indian Subcontinent.** India. Southwestern USA, Southeastern USA, Mexico. Arizona. Alabama, Florida. Central Mexico, Northeast Mexico, Northwest Mexico, Southwest Mexico. Mesoamerica, Caribbean, Northern South America, Western South America, Brazil, Southern South America. El Salvador, Guatemala, Nicaragua. Haiti. French Guiana, Venezuela. Bolivia, Colombia, Ecuador, Peru. Brazil West Central, Brazil North. Argentina Northwest, Paraguay.

Yunnan. Goiás. Acre. Jujuy, Salta. Distrito Federal, Mexico State, Morelos, Puebla. Aguascalientes, Coahuila, Chihuahua, Durango, Guanajuato, Nuevo Leon, Queretaro, San Luis Potosi, Tamaulipas, Zacatecas. Veracruz. Baja California, Baja California Sur, Sinaloa, Sonora. Colima, Guerrero, Jalisco, Michoacan, Nayarit, Oaxaca. Chiapas.

### **Heteropogon polystachyos** (Roxb.) Schult. Mant. ii. 460 (1824).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. **Basionym or Replaced Name:** *Andropogon polystachyos* Roxb., *Fl. Ind.*, ed. 1820 1: 265 (1820)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: India: Roxburgh.

**Illustrations (Books):** G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012) (Fig. 65).

**Derivation** (Clifford & Bostock 2007): Gk *polys*, many; *stachys*, spike as of an ear of wheat. Plants with many branched culms or inflorescences.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Culms slender, 12–25 cm long. Ligule an eciliate membrane. Leaf-blades 2–7 cm long, 0.5–2 mm wide. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence composed of racemes. Peduncle glabrous. Racemes 1, single, erect, unilateral, 1.5–2 cm long. Rhachis fragile at the nodes. Rhachis internodes linear. Rhachis internode tip oblique. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, oblong, 0.2 mm long.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2–4 in number, 5–7 mm long, larger than fertile. Basal sterile spikelet lower glume muticous.

Companion sterile spikelets well-developed, male, lanceolate, dorsally compressed, 4 mm long, longer than fertile, separately deciduous. Companion sterile spikelet callus cuneate, 1 mm long, truncate. Companion sterile spikelet glumes chartaceous, eglandular, 9 -veined, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 0.5 mm long, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, with lower wider than upper, exceeding apex of florets, firmer than fertile lemma. Lower glume linear, 1 length of spikelet, coriaceous, without keels. Lower glume surface glabrous. Upper glume linear, coriaceous, without keels. Upper glume muticous.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, hyaline. Fertile lemma linear, membranous, 1 -veined, 0–3 -veined, one-veined. Lemma apex entire, awned, 1 -awned. Principal lemma awn apical, geniculate, 30–35 mm long overall, with twisted column. Column of lemma awn puberulous. Palea absent or minute.

**Distribution (TDWG).** Continent. Tropical Asia.

**Country /Province /State.** Indian Subcontinent. India.

Tamilnadu.

### **Heteropogon ritchiei** (Hook.f.) Blatter & McCann. *Journ. Bombay Nat. Hist. Soc.* ii. 623 (1928).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. **Basionym or Replaced Name:** *Andropogon ritchiei* Hook. f., *Fl. Brit. India* 7(21): 201 (1897) [1896]

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: The Deccan; Belgaum [India], *Ritchie*.

**Illustrations (Books):** G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012) (Fig. 66).

**Images:** G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012)  
(Pl. 19).

**Derivation** (Clifford & Bostock 2007): in honor of David Ritchie (1809–1866) physician and plant collector in India.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Culms 90–120 cm long. Leaf-sheaths keeled, glabrous on surface. Ligule an eciliate membrane, 4–6 mm long, brown, lacerate. Leaf-blades 15–45 cm long, 8–10 mm wide. Leaf-blade surface pilose, sparsely hairy, hairy on both sides. Leaf-blade margins serrulate. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, erect, unilateral, 2.5–5 cm long. Rhachis fragile at the nodes. Rhachis internodes linear. Rhachis internode tip oblique. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, oblong, semiterete, 0.2 mm long, 0.05 length of fertile spikelet.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2–4 in number, larger than fertile. Basal sterile spikelet lower glume muticous.

Companion sterile spikelets well-developed, male, lanceolate, dorsally compressed, 10–13 mm long, longer than fertile, separately deciduous. Companion sterile spikelet callus linear, 1 mm long, truncate. Companion sterile spikelet glumes chartaceous, eglandular, winged on margins, tuberculate, setose, with yellow hairs (4–5mm long), acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 4.5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 2 mm long, bearded, base pungent, attached obliquely. Spikelet callus hairs dark brown.

**Glumes.** Glumes dissimilar, with lower wider than upper, exceeding apex of florets, firmer than fertile lemma. Lower glume linear, 1 length of spikelet, coriaceous, dark brown, without keels. Lower glume surface pubescent. Lower glume apex truncate. Upper glume linear, coriaceous, without keels. Upper glume muticous.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 0 -veined, without lateral veins, erose. Fertile lemma linear, 2–3 mm long, membranous, 1 -veined, 0–3 -veined, one-veined. Lemma apex entire, awned, 1 -awned. Principal lemma awn apical, geniculate, 30–40 mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Flower and Fruit.** Anthers 3, 3.5–4 mm long. Stigmas 2.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State. Indian Subcontinent.** India.

Bihar, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan, Uttah Pradesh.

### **Heteropogon triticeus** (R.Br.) Stapf ex Craib. *Kew Bull.* 1912, 432 (1912).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from Australia. **Basionym or Replaced Name:** *Andropogon triticeus* R. Br. *Prodr.* 201 (1810). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Australia: Brown 6179 (K iso).

**Illustrations (Books):** D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia*. CD-Rom Version 1.0. (2002), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 890), G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012) (Fig. 67a and Fig. 67b).

**Images:** D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia*. CD-Rom Version 1.0. (2002);, G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012)

(Pl. 19).

**Derivation** (Clifford & Bostock 2007): resembling *Triticum* with respect to the inflorescence.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistirinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 100–160 cm long, 4–8 mm diam. Culm-internodes solid. Culm-nodes constricted, brown or black. Lateral branches fastigiate. Leaves cauline. Leaf-sheaths keeled. Ligule an eciliate membrane, 1 mm long, membranous, truncate. Collar glabrous. Leaf-blades 20–80 cm long, 3–11 mm wide. Leaf-blade midrib evident. Leaf-blade surface ribbed, scaberulous. Leaf-blade margins ciliate, hairy at base. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence composed of racemes. Peduncle smooth. Racemes 1, single, erect, 9–14 cm long, bearing 5–7(–10) fertile spikelets on each. Rhachis fragile at the nodes, glabrous on margins. Rhachis internodes cuneate, 0.5–1 mm long. Rhachis internode tip oblique. Spikelets appressed, in pairs. Fertile spikelets sessile, 2 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, 0.5–1 mm long, 0.1 length of fertile spikelet, smooth.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 16–40 in number, subsessile or pedicelled, larger than fertile. Basal sterile spikelet glumes coriaceous, scabrous on margins, lower glume muticous.

Companion sterile spikelets well-developed, male, elliptic, asymmetrical, dorsally compressed, 21–25 mm long, longer than fertile, separately deciduous. Companion sterile spikelet callus linear, 2–3 mm long. Companion sterile spikelet glumes herbaceous or coriaceous, eglandular, winged on margins, distinctly veined, smooth or tuberculate, acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 13–15 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 4.5–6 mm long, bearded, base pungent, attached obliquely. Spikelet callus hairs dark brown or red, 0.3 length of spikelet.

**Glumes.** Glumes dissimilar, with lower wider than upper, exceeding apex of florets, firmer than fertile lemma. Lower glume linear, 1 length of spikelet, coriaceous, dark brown, without keels, 9 -veined. Lower glume surface grooved on either side of midvein, puberulous or pubescent. Lower glume apex obtuse. Upper glume linear, symmetrical, coriaceous, with membranous margins, dark brown, without keels, winged on margins, 3 -veined. Upper glume surface puberulous or pubescent. Upper glume muticous.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret elliptic, 1 length of fertile lemma, hyaline, 0 -veined, without midvein, without lateral veins. Fertile lemma linear or oblong, membranous, 3 -veined, 0–3 -veined. Lemma apex entire, awned, 1 -awned. Principal lemma awn geniculate, 120–140 mm long overall, with twisted column. Column of lemma awn hirtellous. Palea absent or minute.

**Flower and Fruit.** Anthers 3, 8 mm long. Stigmas 2.

*n* = 11 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia, Australasia.

**Country /Province /State.** China. Hainan. **Indian Subcontinent, Indo-China, Malesia, Papuasia.** India, Sri Lanka. Laos, Myanmar, Thailand. Java, Lesser Sunda Is, Malaya, Philippines, Sulawesi. New Guinea West Papua (Irian Jaya). New Guinea. **Australia.** Northern Territory, Queensland.

Darwin & Gulf, Victoria R & Barkly Tableland. North, Central, South East.

### **Hickelia africana** S. Dransfield. *Kew Bull.*, 49(3): 440 (1994).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Tanzania. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Tanzania: Iringa District: Mufindi area, Luisenga stream, alt. 1800 m, flowers, 1 Apr 1988, S. *Bigwood*, C. *Congdon* & K. *Vollesen* 873 (HT: K; IT: BR, C, COI, DSM, EA, MO, NHT, P, WAG, UPS).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ana*, indicating location. From Africa.

**Classification.** Subfamily Bambusoideae. Tribe: Bambuseae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo. Butt sheaths absent. Culms leaning or rambling, 300 cm long, 8 mm diam., woody. Culm-internodes terete, thick-walled, 40 cm long. Lateral branches dendroid. Bud complement 1. Branch complement many, with 1 branch dominant, thinner than stem. Culm-sheaths present, 2 times as long as wide, green, puberulous. Culm-sheath ligule 1 mm high. Culm-sheath blade lanceolate, 8.5–13.5 cm long, 12–15 mm wide, glabrous on surface, attenuate. Leaf-sheaths glabrous on surface. Ligule a ciliate membrane. Leaf-blade base with a brief petiole-like connection to sheath. Leaf-blades lanceolate, 5–12 cm long, 7–10 mm wide, light green. Leaf-blade venation without cross veins. Leaf-blade surface glabrous or puberulous, hairy abaxially. Leaf-blade apex acuminate.

**Inflorescence.** Synflorescence bractiferous, stellate, 4–8 cm long, with glumaceous subtending bracts, without axillary buds at base of spikelet.

Fertile spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, laterally compressed, 15 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes several, 4 empty glumes, persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume ovate, chartaceous, without keels. Lower glume margins ciliolate. Lower glume apex acute. Upper glume ovate, 11–12 mm long, chartaceous, without keels, 15–23 -veined. Upper glume margins ciliolate. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea, attached to and deciduous with the fertile. Lemma of lower sterile floret similar to fertile lemma, ovate, 11–12 mm long, indurate, ciliolate on margins, acute. Fertile lemma ovate, 8 mm long, indurate, shiny, without keel, 17 -veined, more than 3-veined. Lemma lateral veins transversely connected at apex. Lemma margins ciliolate. Lemma apex cuspidate. Palea ovate, 6 mm long, coriaceous. Palea keels contiguous above a sulcus, ciliolate. Rhachilla extension 0.2 length of fertile floret.

**Flower and Fruit.** Lodicules 3, 4 mm long. Anthers 6, 9 mm long. Stigmas 3. Ovary umbonate, pubescent on apex. Caryopsis with tardily free pericarp, ovoid, 3 mm long, hairy at apex.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. East Tropical Africa.** Tanzania.

**Hickelia alaotrensis** A. Camus. *Bull. Soc. Bot. France*. cii. 120 (1955).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Madagascar. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Madagascar, Aloatra to Andilamena: Boiteau 4330.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ensis*, denoting origin. From the road to Lake Alaotra, Madagascar.

**Classification.** Subfamily Bambusoideae. Tribe: Bambuseae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo. Butt sheaths absent. Culms leaning or rambling, woody. Culm-internodes terete, thick-walled. Lateral branches dendroid. Bud complement 1. Branch complement many, with 1 branch dominant, thinner than stem. Culm-sheaths present, glabrous. Culm-sheath blade lanceolate. Leaf-sheaths glabrous on surface or puberulous. Ligule a ciliate membrane. Leaf-blade base with a brief petiole-like connection to sheath. Leaf-blades lanceolate, 3.5–6 cm long, 5–9 mm wide. Leaf-blade venation without cross veins. Leaf-blade surface glabrous or puberulous, hairy abaxially. Leaf-blade apex acuminate.

**Inflorescence.** Synflorescence bractiferous, linear, with glumaceous subtending bracts, without axillary buds at base of spikelet.

Fertile spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, laterally compressed, 15 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes two or several, 2–3 empty glumes, persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume ovate, chartaceous, without keels. Lower glume margins ciliolate. Lower glume apex acute. Upper glume ovate, 6–10 mm long, chartaceous, without keels. Upper glume margins ciliolate. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea, attached to and deciduous with the fertile. Lemma of lower sterile floret similar to fertile lemma, ovate, 10 mm long, indurate, ciliolate on margins, acute. Fertile lemma ovate, 10 mm long, indurate, shiny, without keel, more than 3-veined. Lemma margins ciliolate. Lemma apex cuspidate. Palea ovate, 11–12 mm long, coriaceous. Palea keels contiguous above a sulcus. Palea apex pubescent. Rhachilla extension 0.2 length of fertile floret.

**Flower and Fruit.** Lodicules 3. Anthers 6. Stigmas 3. Ovary umbonate, pubescent on apex. Caryopsis with tardily free pericarp, ovoid, hairy at apex.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. Western Indian Ocean.** Madagascar.

**Hickelia madagascariensis** A. Camus. *Compt. Rend. clxxix*. 480 (1924).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Madagascar. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: J.M.H.A. Perrier de la Bathie 10787, no date, Madagascar: bois d'Ambatofitorano (P; IT: K, US-2876324 (fragm.)).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ense*, denoting origin. From Madagascar.

**Classification.** Subfamily Bambusoideae. Tribe: Bambuseae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo, culms solitary. Rhizomes elongated, pachymorph. Butt sheaths absent. Culms leaning or rambling, 1000–1500 cm long, 10–18 mm diam., woody. Culm-internodes terete, thick-walled, 25–40 cm long, mid-green, distally glabrous. Lateral branches dendroid. Bud complement 1. Branch complement many, with 1 branch dominant, thinner than stem. Culm-sheaths present, purple, puberulous, with tawny hairs. Culm-sheath ligule 1 mm high. Culm-sheath blade lanceolate, erect or spreading, 11–14 cm long, 120–150 mm wide, glabrous on surface. Leaf-

sheaths glabrous on surface. Ligule a ciliate membrane. Leaf-blade base with a brief petiole-like connection to sheath. Leaf-blades lanceolate, 8–14 cm long, 8–16 mm wide, purple (when young). Leaf-blade venation without cross veins. Leaf-blade surface glabrous or pilose, moderately hairy, hairy abaxially. Leaf-blade apex acuminate.

**Inflorescence.** Synflorescence bractiferous, stellate, 2–5 cm long, with glumaceous subtending bracts, without axillary buds at base of spikelet.

Fertile spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, laterally compressed, 20 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes two or several, 2–3 empty glumes, persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume ovate, chartaceous, without keels. Lower glume margins ciliolate. Lower glume apex acute. Upper glume ovate, 8–10 mm long, chartaceous, without keels, 13–21 -veined. Upper glume margins ciliolate. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, similar, barren, without significant palea, attached to and deciduous with the fertile. Lemma of lower sterile floret similar to fertile lemma, ovate, 10–12 mm long, indurate, ciliolate on margins, acute. Fertile lemma ovate, 15 mm long, indurate, shiny, without keel, more than 3-veined. Lemma margins ciliolate. Lemma apex cuspidate. Palea ovate, 15 mm long, coriaceous. Palea keels contiguous above a sulcus. Rhachilla extension 0.2 length of fertile floret.

**Flower and Fruit.** Lodicules 3. Anthers 6. Stigmas 3. Ovary umbonate, pubescent on apex. Caryopsis with tardily free pericarp, ovoid, 8 mm long, hairy at apex.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Western Indian Ocean. Madagascar.

### **Hickelia perrieri** (A. Camus) S. Dransfield. *Kew Bull.*, 49(3): 441 : (1994).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Madagascar. **Basionym or Replaced Name:** *Pseudocoix perrieri* A. Camus, *Compt. Rend. Hebd. Seances Acad. Sci.* 179: 478 (1924)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: HT: *J.M.H.A. Perrier de la Bbthie 16361*, Apr 1924, Madagascar: mont Tsaratana (P (fragm., US-2876323)).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Joseph Marie Henri Alfred Perrier de la Bbthie (1872–1958) French botanist.

**Classification.** Subfamily Bambusoideae. Tribe: Bambuseae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo. Butt sheaths absent. Culms rambling, 400–600 cm long, 40–60 mm diam., woody. Culm-internodes terete, thick-walled. Lateral branches dendroid. Bud complement 1. Branch complement many, with 1 branch dominant, thinner than stem. Culm-sheaths present, glabrous. Culm-sheath blade lanceolate, erect, 15 cm long, 30 mm wide. Leaf-sheaths glabrous on surface, outer margin hairy. Ligule a ciliate membrane. Leaf-blade base with a brief petiole-like connection to sheath. Leaf-blades lanceolate, 3.5–11 cm long, 5–9 mm wide. Leaf-blade venation without cross veins. Leaf-blade surface glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Synflorescence bractiferous, scanty, 3–5 cm long, with glumaceous subtending bracts, without axillary buds at base of spikelet.

Fertile spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, laterally compressed, compressed slightly, acuminate, 15–16 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes one to two the lower present in some spikelets, persistent, similar, shorter than spikelet, thinner than fertile lemma. Lower glume ovate, 0.6–0.8 length of upper glume, chartaceous, without keels, 21–23 -veined. Lower glume surface pubescent, hairy above. Lower glume margins ciliolate. Lower glume hairs tawny. Lower glume apex acuminate. Upper glume ovate, 9–14 mm long, chartaceous,

without keels, 21–23 -veined. Upper glume surface pubescent, hairy above. Upper glume hairs tawny. Upper glume apex acuminate.

**Florets.** Basal sterile florets 2 or more, similar, barren, without significant palea, attached to and deciduous with the fertile. Lemma of lower sterile floret similar to fertile lemma, ovate, 9–14 mm long, 1 length of spikelet, indurate, 9 -veined, with cross-veins, pubescent, hairy above, ciliolate on margins, bearing tawny hairs, cuspidate. Fertile lemma ovate, 14–15 mm long, indurate, shiny, without keel, 9–11 -veined, more than 3-veined. Lemma lateral veins with cross-veins. Lemma surface pubescent, hairy above. Lemma apex cuspidate, mucronate. Palea ovate, 12 mm long, 0.9 length of lemma, coriaceous, 9 -veined. Palea keels contiguous above a sulcus. Palea surface pubescent, hairy on back. Rhachilla extension 0.2–0.4 length of fertile floret.

**Flower and Fruit.** Lodicules 3. Anthers 6, 8–9 mm long. Stigmas 3. Ovary umbonate, pubescent on apex. Caryopsis with tardily free pericarp, ovoid, hairy at apex.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Western Indian Ocean. Madagascar.

### **Hierochloe australis** (Schrad.) Roem. & Schult. Syst. ii. 514. (1817).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Germany. **Basionym or Replaced Name:** *Holcus australis* Schrad., *Fl. Germ.* 1: 253 (1806)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: IT: *U.J.*, 1826, [Europe]: Styriae (LE).

LT: *Hoppe s.n.*, Germany: Regensburg, Schwabelweisbergen (M). LT designated by ?; cited by Schouten & Veldkamp, *Blumea* 30: 347 (1985).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. of the south. From the south in general as from Africa, America, Europe or elsewhere.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Culms 30–60 cm long. Ligule an eciliate membrane, 1.5–4 mm long, obtuse or acute. Leaf-blades 2–7 mm wide, aromatic. Leaf-blade surface glabrous or pilose, sparsely hairy, hairy adaxially. Leaf-blade margins scabrous.

**Inflorescence.** Inflorescence a panicle, comprising 20–35 fertile spikelets. Panicle open, pyramidal, 3.5–7 cm long. Primary panicle branches 1–2 -nate. Panicle axis 6–8 noded. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, puberulous, hairy at tip, with 0.1–0.3 mm long hairs.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 3.5–5.5 mm long, breaking up at maturity, disarticulating below each fertile floret. Floret callus pubescent. Floret callus hairs 0.15–0.3 mm long.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma, shiny. Lower glume ovate, 3.5–5.5 mm long, 1 length of upper glume, membranous, 1-keeled. Lower glume apex acute. Upper glume ovate, 3.5–5.5 mm long, 1.1–1.4 length of adjacent fertile lemma, membranous, 1-keeled. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, dissimilar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 3–4.5 mm long, chartaceous, 1-keeled, 3–5 -veined, ciliate on margins, dentate, 2 -fid, mucronate or awned. Awn of lower sterile floret 0.1–0.5 mm long. Palea of lower sterile floret 1 mm long. Lemma of upper sterile floret oblong, 3–4.5 mm long, chartaceous, ciliate on margins, dentate, 2 -fid, awned. Awn of upper sterile floret dorsal, arising 0.5 way up back of lemma, geniculate, 1–3 mm long. Fertile lemma ovate, 3–4 mm long, cartilaginous, without keel, more than 3-veined. Lemma surface puberulous, hairy above. Lemma margins convolute, covering most of palea. Lemma apex acute. Palea 1 -veined, without keels.

**Flower and Fruit.** Anthers 2 (bisexual) or 3 (male), 1.3–2.6 mm long. Ovary glabrous. Caryopsis with adherent pericarp.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe.

**Region. Northern Europe, Southeastern Europe, Eastern Europe, Middle Europe.**

**Country /Province /State.** : Finland. : Austria, Czechoslovakia, Germany, Hungary, Poland. : Bulgaria, Italy, Romania, Yugoslavia. Belarus, Estonia, Latvia, Lithuania, Baltic States, Central European Russia, Northwest European Russia, Ukraine.

**Hierochloe brunonis** Hook. f. *Fl. Antarct.* 93. (1844).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae* 5 (2000).

**TYPE** from New Zealand. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *J.D. Hooker s.n.*, Nov 1840, New Zealand: in tufts at the top of the mountains above Rendezvous harbour, Lord Auckland Islands (K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Robert Brown, (1773–1858), Scots-born English botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Culms 25–50 cm long, 3 -noded. Leaf-sheaths 4–20 cm long, glabrous on surface. Ligule an eciliate membrane, 5 mm long, obtuse. Leaf-blades convolute, 7–30 cm long, 4–8 mm wide, coriaceous. Leaf-blade venation comprising 25 vascular bundles. Leaf-blade surface ribbed, with rectangular ribs, glabrous.

**Inflorescence.** Inflorescence a panicle, bracteate at branch bases (a few lower branches). Panicle open, elliptic, dense, nodding, 5–10 cm long. Primary panicle branches 2 -nate. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 2–5 mm long, puberulous to villous, hairy above.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 12–14 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma, shiny. Lower glume ovate, 1 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute, mucronate. Upper glume ovate, 12–14 mm long, 1 length of spikelet, membranous, 1-keeled, 3 -veined. Upper glume apex acute, mucronate.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret oblong, 7 mm long, chartaceous, much thinner above, light brown, 1-keeled, pubescent on midvein, ciliate on margins, erose, obtuse, awned. Awn of lower sterile floret dorsal, arising 0.6 way up back of lemma, straight, 6 mm long. Lemma of upper sterile floret oblong, 1 length of lower sterile floret, chartaceous, pubescent on midvein, ciliate on margins, erose, obtuse, awned. Awn of upper sterile floret dorsal, arising 0.6 way up back of lemma, straight, 6 mm long. Fertile lemma ovate, 5 mm long, cartilaginous, without keel, more than 3-veined. Lemma margins convolute, covering most of palea. Lemma apex pubescent, mucronate. Principal lemma awn subapical, 1 mm long overall. Palea elliptic, without keels.

**Flower and Fruit.** Anthers 2 (bisexual) or 3 (male), 3 mm long. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State.** New Zealand. New Zealand South I, Campbell Is, Auckland Is.

**Hierochloe cuprea** Zотов. *New Zealand J. Bot.*, 11(3): 571 (1973).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae* 5 (2000).

**TYPE** from New Zealand. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *V.D. Zотов s.n.*, 31 Dec 1933, New Zealand: west of Kime Hut, ca. 4500 ft, Tararua Mountains (CHR-7509).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. coppery. The purple spikelets are reminiscent of burnished copper.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Culms 30–60 cm long, 3–4 - noded. Leaf-sheaths 5–20 cm long, glabrous on surface. Ligule an eciliate membrane, 1–2 mm long. Leaf-blades 20–40 cm long, 6–12 mm wide. Leaf-blade venation comprising 30 vascular bundles. Leaf-blade surface ribbed, with rounded ribs, scabrous, rough adaxially, glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, 10–20 cm long. Primary panicle branches spreading or drooping, 1–2 -nate. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 5–10 mm long, puberulous to villous, hairy above.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 7.5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma, shiny. Lower glume ovate, 1 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute, mucronate. Upper glume ovate, 7.5 mm long, 1 length of spikelet, membranous, 1-keeled, 3 -veined. Upper glume apex acute, mucronate.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret oblong, 6 mm long, chartaceous, light brown, 1-keeled, pubescent on midvein, ciliate on margins, erose, obtuse, awned. Awn of lower sterile floret dorsal, arising 0.75 way up back of lemma, straight, 3–6 mm long. Lemma of upper sterile floret oblong, 1 length of lower sterile floret, chartaceous, pubescent on midvein, ciliate on margins, erose, obtuse, awned. Awn of upper sterile floret dorsal, arising 0.75 way up back of lemma, straight, 3–6 mm long. Fertile lemma ovate, 3.5 mm long, cartilaginous, shiny, without keel, more than 3-veined. Lemma surface scabrous, rough above, with conspicuous apical hairs. Lemma margins convolute, covering most of palea. Lemma apex mucronate. Principal lemma awn subapical. Palea elliptic, without keels.

**Flower and Fruit.** Anthers 2 (bisexual) or 3 (male), 2 mm long. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State.** New Zealand North I, New Zealand South I.

### **Hierochloe davidsei** R. W. Pohl. *Iowa State J. Res.*, 47(1): 71 (1972).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Costa Rica. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: R.W. Pohl & G. Davidse 11004, 23 Aug 1968, Costa Rica: San Josi: paramo along Carretera Interamericana, km 86, 3030 m, 9.45N 83.58W (ISC; IT: CR-50765, F, US).

**Illustrations (Books):** W.Burger, *Flora Costaricensis* 15, Gramineae: *Fieldiana Botany New Series* 4 (1980) (256, Fig 91).

**Derivation** (Clifford & Bostock 2007): In honor of Gerrit Davidse (1942-) Netherlands-born United States botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, culms solitary. Rhizomes elongated. Culms erect, 30–60 cm long, 2–3 mm diam. Culm-internodes thin-walled, distally glabrous. Lateral branches lacking. Leaves 5–7 per branch. Leaf-sheaths ribbed, glabrous on surface or pilose, with reflexed hairs. Ligule an eciliate membrane, 1.5–5 mm long, pubescent on abaxial surface, truncate. Leaf-blades 6–15 cm long, 5–8 mm wide, aromatic. Leaf-blade surface pilose, hairy adaxially.

**Inflorescence.** Inflorescence a panicle. Peduncle 10–15 cm long, glabrous. Panicle spiciform, linear, continuous or interrupted, 3–11 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 1–3 mm long, pubescent.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, laterally compressed, 5.5–6.5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, dissimilar, exceeding apex of florets, thinner than fertile lemma. Lower glume ovate, 4–4.5 mm long, 0.7–0.8 length of upper glume, membranous, 1-keeled, 1 -veined. Lower

glume lateral veins absent. Lower glume apex acute. Upper glume ovate, 5.5–6.5 mm long, 1.8–2.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, dissimilar, barren, without significant palea, attached to and deciduous with the fertile. Lemma of lower sterile floret lanceolate or oblong, 5 mm long, membranous, without keels, 5 -veined, ciliate on margins, dentate, 2 -fid, obtuse, awned. Awn of lower sterile floret dorsal, arising 0.65–0.85 way up back of lemma, 1 mm long. Lemma of upper sterile floret oblong, 5 mm long, membranous, ciliate on margins, dentate, 2 -fid, obtuse, awned. Awn of upper sterile floret dorsal, arising 0.5 way up back of lemma, geniculate, 4–5.5 mm long. Fertile lemma oblong, 3 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma lateral veins obscure. Lemma margins convolute, covering most of palea. Lemma apex emarginate, muticous or mucronate. Palea oblong, 3 mm long, 1 length of lemma, 1 -veined, without keels.

**Flower and Fruit.** Lodicles absent. Anthers 2, 1.5 mm long, yellow. Stigmas 2, protogynous, pubescent. Caryopsis with adherent pericarp. Hilum punctiform.

**Distribution (TDWG). Continent.** South America.

**Country /Province /State.** Mesoamerica. Costa Rica.

### **Hierochloe equiseta** Zotov. *New Zealand J. Bot.*, 11(3): 568 (1973).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae* 5 (2000).

**TYPE** from New Zealand. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: HT: *V.D. Zotov s.n.*, 5 Jan 1936, New Zealand: Bold Peak, Humboldt Mountains (CHR-9679).

**Illustrations:** None found.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Culms 30–60 cm long, 3–4 -noded. Leaf-sheaths 5–20 cm long, glabrous on surface. Ligule an eciliate membrane, 0.5 mm long. Leaf-blades 15–30 cm long, 4–8 mm wide. Leaf-blade venation comprising 15 vascular bundles. Leaf-blade surface ribbed, with rectangular ribs, pubescent, hairy adaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, 8–15 cm long. Primary panicle branches drooping, 2 -nate. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 5–10 mm long, puberulous to villous, hairy above.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 7 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma, shiny. Lower glume ovate, 1 length of upper glume, membranous, much thinner on margins, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume ovate, 7 mm long, 1 length of spikelet, membranous, with scariosus margins, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret oblong, 6 mm long, chartaceous, light brown, 1-keeled, pubescent, hairy below, ciliate on margins, dentate, 2 -fid, acute, awned. Awn of lower sterile floret dorsal, arising 0.33 way up back of lemma, geniculate, 6 mm long. Palea of lower sterile floret pubescent, adorned on keels. Lemma of upper sterile floret oblong, 1 length of lower sterile floret, chartaceous, ciliate on margins, dentate, 2 -fid, acute, awned. Awn of upper sterile floret dorsal, arising 0.33 way up back of lemma, geniculate, 6 mm long. Fertile lemma ovate, 5 mm long, cartilaginous, shiny, without keel, more than 3-veined. Lemma surface pubescent, hairy above. Lemma margins convolute, covering most of palea. Lemma apex muticous or mucronate. Principal lemma awn subapical. Palea elliptic, without keels.

**Flower and Fruit.** Anthers 2 (bisexual) or 3 (male), 2.5 mm long. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State.** New Zealand. New Zealand South I, Stewart Is.

## **Hierochloe flexuosa** Hook. f. *Fl. Brit. Ind.* vii. 222. (1896).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: India, Sikkim, Bijean: King's collector (K holo).

**Illustrations:** None found.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 30–60 cm long. Ligule an eciliate membrane. Leaf-blades 5–12 cm long, 2–4 mm wide. Leaf-blade apex abruptly acute.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, effuse, 5–8 cm long. Panicle branches capillary, flexuous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma, shiny. Lower glume ovate, 5 mm long, 1 length of upper glume, membranous, purple, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume ovate, 5 mm long, 1.4–1.5 length of adjacent fertile lemma, membranous, purple, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret oblong, 5 mm long, chartaceous, 1-keeled, 5 -veined, pubescent, dentate, 2 -fid, obtuse, awned. Awn of lower sterile floret 1.5 mm long. Lemma of upper sterile floret oblong, 5 mm long, chartaceous, pubescent, lobed, 2 -fid, obtuse, awned. Awn of upper sterile floret dorsal, arising 0.5 way up back of lemma, geniculate, 5–6 mm long. Fertile lemma ovate, 3.5 mm long, chartaceous, without keel, more than 3-veined. Lemma surface pubescent, hairy above. Lemma margins convolute, covering most of palea. Lemma apex acute. Palea elliptic, 1 length of lemma, 1 -veined, without keels.

**Flower and Fruit.** Anthers 2 (bisexual) or 3 (male), 1.5 mm long. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State. Indian Subcontinent.** Eastern Himalaya, Nepal.

## **Hierochloe fraseri** Hook. f. *Fl. Tasm.* ii. 108 (1860).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

**TYPE** from Australia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Tasmania, Mt Wellington: Gunn 337 (K holo).

**Illustrations (Books):** A.Wilson (ed.), *Flora of Australia*, Vol 44A. *Poaceae* (2009) (148, Fig 22), D.Sharp & B.K.Simon, *AusGrass*. *Grasses of Australia*. CD-Rom Version 1.0. (2002).

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Culms erect, 30–60 cm long. Leaf-sheaths loose, longer than adjacent culm internode, ribbed. Ligule an eciliate membrane, 2–5 mm long, erose, obtuse or acute. Leaf-blades 10–20 cm long, 4.5–8 mm wide, stiff, aromatic. Leaf-blade surface scaberulous, rough on both sides. Leaf-blade apex attenuate, hardened.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, lanceolate, 4–9 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny, gaping. Lower glume ovate, 2.5–4 mm long, 1 length of upper glume, hyaline, without keels, 1 -veined. Lower glume lateral veins absent. Upper glume ovate, 3.5–4 mm long, 0.8–1.3 length of adjacent fertile lemma, hyaline, without keels, 3 -veined.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 3.5–4.5 mm long, 1.1–1.5 length of fertile lemma, 1 length of spikelet, chartaceous, much thinner above, light brown, 1-keeled, 5 -veined, scaberulous, ciliolate on margins, awned. Awn of lower sterile floret subapical, 1–2 mm long. Lemma of upper sterile floret elliptic, 3.5–4.5 mm long, 1 length of lower sterile floret, chartaceous, scabrous, ciliolate on margins, awned. Awn of upper sterile floret subapical, 1–2 mm long. Fertile lemma ovate, 3 mm long, cartilaginous, shiny, without keel, 5 -veined, more than 3-veined. Lemma surface pubescent, hairy above. Lemma margins convolute, covering most of palea. Lemma apex mucronate. Palea elliptic, 1 length of lemma, 1 -veined, 1-keeled.

**Flower and Fruit.** Lodicules 2. Anthers 2 (bisexual) or 3 (male), 1.5–2 mm long. Caryopsis with adherent pericarp, obovoid, 1.5 mm long.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State.** Australia. Tasmania.

### **Hierochloe fusca** Zotov. *New Zealand J. Bot.*, 11 (3): 576 (1973).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae* 5 (2000).

**TYPE** from New Zealand. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: HT: V.D. Zotov s.n., 3 Jan 1961, New Zealand: Beeman Hill, Campbell Island (CHR-119477).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L., dark, swarthy. Glumes or lemmas dark-brown.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Culms 60–120 cm long, 4–5 -noded. Leaf-sheaths 5–25 cm long, glabrous on surface. Ligule an eciliate membrane, 3–5 mm long, erose. Leaf-blades 30–75 cm long, 8–12 mm wide. Leaf-blade venation comprising 40 vascular bundles. Leaf-blade surface ribbed, with rectangular ribs, scabrous, rough adaxially, glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, 15–30 cm long. Primary panicle branches 1–2 -nate. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 0.5–1 mm long, puberulous to villous, hairy above.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 9 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma, shiny. Lower glume ovate, 6 mm long, 0.66 length of upper glume, membranous, much thinner above, much thinner on margins, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume ovate, 9 mm long, 1 length of spikelet, membranous, much thinner above, with scarious margins, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret oblong, 7 mm long, chartaceous, dark brown, 1-keeled, scabrous, pilose, hairy at base, ciliate on margins, erose, obtuse, awned. Awn of lower sterile floret dorsal, arising 0.75 way up back of lemma, straight, 5–7 mm long. Palea of lower sterile floret pubescent, adorned on keels. Lemma of upper sterile floret oblong, 1 length of lower sterile floret, chartaceous, scabrous, ciliate on margins, erose, obtuse, awned. Awn of upper sterile floret dorsal, arising 0.75 way up back of lemma, straight, 5–7 mm long. Fertile lemma ovate, 5 mm long, cartilaginous, without keel, more than 3-veined. Lemma margins convolute, covering most of palea. Lemma apex pubescent, muticous or mucronate. Principal lemma awn subapical, 0–1 mm long overall. Palea elliptic, without keels.

**Flower and Fruit.** Anthers 2 (bisexual) or 3 (male), 3 mm long. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State.** New Zealand. Chatham Is, New Zealand South I, Stewart Is, Campbell Is, Auckland Is.

## **Hierochloe juncifolia** (Hack.) L. Parodi. *Not. Mus. La Plata, Bot.*, iii. 27 (1938).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Argentina. **Basionym or Replaced Name:** *Hierochloe utriculata* var. *juncifolia* Hack., *Anales Mus. Nac. Buenos Aires* 21: 64 (1911)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: HT: *N. Illin* 222, 20–25 Mar 1901, Argentina: Chubut: Dep. Languiqo: region del Rmo Corcovado (W; IT: BAA, BAF, LPS-2543, SI, US-990307).

**Illustrations (Books):** E.G.Nicora, *Los Generos de Gramineas de America Austral* (1987) (214, Fig. 63), M.N.Correa, *Flora Patagonica Parte III, Gramineae* (1978) (284, Fig 185).

**Derivation** (Clifford & Bostock 2007): *L. juncea*, rush-like; *folium*, leaf. With rush-like leaf-blades or culms.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Cataphylls evident. Culms 30–80 cm long. Leaf-sheaths longer than adjacent culm internode, smooth or scaberulous. Ligule a ciliolate membrane, 1–4 mm long, obtuse. Leaf-blades filiform, convolute, 7–35 cm long, 1–2 mm wide, stiff. Leaf-blade surface puberulous, hairy adaxially. Leaf-blade apex pungent.

**Inflorescence.** Inflorescence a panicle. Peduncle antorseously scabrous above. Panicle spiciform, linear, continuous, 6–10 cm long. Panicle axis scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, scabrous, pubescent, hairy at tip.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, laterally compressed, 6–7 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet or reaching apex of florets, thinner than fertile lemma. Lower glume ovate, 5.5–6.5 mm long, 1 length of upper glume, membranous, 1-keeled, 3 - veined. Lower glume primary vein scabrous. Lower glume apex acute. Upper glume ovate, 5.5–6.5 mm long, membranous, 1-keeled, 3 - veined. Upper glume primary vein scabrous. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 5–6.5 mm long, chartaceous, 1-keeled, 5 -veined, ciliolate on margins, obtuse, mucronate. Lemma of upper sterile floret oblong, 1 length of lower sterile floret, chartaceous, ciliolate on margins, obtuse, awned. Awn of upper sterile floret dorsal, arising 0.75 way up back of lemma, geniculate, 1.5–4 mm long. Fertile florets female. Fertile lemma ovate, 4–4.5 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous, rough above. Lemma margins convolute, covering most of palea. Lemma apex acute. Palea linear, 1 -veined, without keels.

**Flower and Fruit.** Anthers 3, 2.5–4 mm long. Staminodes two present. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** South America.

**Country /Province /State. Western South America and Southern South America.** Peru. Argentina South, Chile South.

Rest of Chile- Biobio, La Auracania, Maule, O'Higgins, Santado, Valpariso.

## **Hierochloe khasiana** C. B. Clarke, ex Hook. f. *Fl. Brit. Ind.* vii. 223 (1896).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: India, Khasia Hills: Clarke 43385 (K syn) ; India, Khasia Hills: Clarke 43676a (K syn) ; India, Khasia Hills: Clarke 43913 (K syn) ; India, Khasia Hills: Clarke 43956 (K syn).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. -ana*, indicating location. From the Khasia Hills, India.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Culms geniculately ascending, 40–80 cm long. Ligule an eciliate membrane, erose. Leaf-blades 3–6 cm long, 2–4 mm wide, aromatic.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, oblong, 4–6 cm long, 1 cm wide. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 1–5 mm long, ciliate.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic or cuneate, laterally compressed, truncate, 3–3.5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma. Lower glume elliptic, 3–3.5 mm long, 1 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume primary vein scaberulous. Lower glume apex acute. Upper glume elliptic, 3–3.5 mm long, 1.2 length of adjacent fertile lemma, membranous, much thinner above, 1-keeled, 3 -veined. Upper glume primary vein scaberulous. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, dissimilar, barren, without significant palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 3–3.5 mm long, 1.2 length of fertile lemma, membranous, 5 -veined, pubescent, bearing tawny hairs, lobed, 2 -fid, obtuse, awned. Awn of lower sterile floret 1 mm long. Lemma of upper sterile floret oblong, 3–3.5 mm long, 1 length of lower sterile floret, membranous, pubescent, lobed, 2 -fid, awned. Awn of upper sterile floret 1.5–2 mm long. Fertile lemma elliptic or oblong, 2.5 mm long, membranous, without keel. Lemma surface pubescent. Lemma margins convolute, covering most of palea. Lemma apex obtuse or acute. Palea linear, 2 mm long, 1 -veined, without keels.

**Flower and Fruit.** Lodicules 2. Ovary glabrous. Caryopsis with adherent pericarp.

$2n = 20$  (1 ref TROPICOS), or 21 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State. Indian Subcontinent, Indo-China.** Assam.

Meghalaya.

### **Hierochloe laxa** Hook. f. *Fl. Brit. India* 7:222 (1896).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: T: *Wallich* 3796, 1848, India Orient. (LE). H. laxa R.Br. ex Hook.f..

LT: *Thomson s.n.*, NW Himalaye: temperate region, 3050–3960 m (K; ILT: L). LT designated by ?; cited by Schouten & Veldkamp, *Blumea* 30: 348 (1985).

**Illustrations (Books):** N.L.Bor, *The grasses of Burma, Ceylon, India and Pakistan* (1960) (442, Fig 48), T.A.Cope, *Flora of Pakistan* 143: *Poaceae* (1982) (498, Fig 55).

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Culms erect, 20–75 cm long. Ligule an eciliate membrane, 0.75–2.5 mm long. Leaf-blades 2.5–17 cm long, 4–14 mm wide, aromatic. Leaf-blade surface glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, 5–16 cm long. Panicle branches capillary. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 5–7 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet or reaching apex of florets, thinner than fertile lemma, shiny, gaping. Lower glume ovate, 4–7 mm long, 1 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume ovate, 4–7 mm long, 1.3–1.8 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 4.5–5.5 mm long, 1.5 length of fertile lemma, membranous, 1-keeled, 5 -veined, ciliolate on margins, emarginate or truncate, awned. Awn of lower sterile floret dorsal, 0.5–3 mm long. Fertile lemma ovate, 3–4 mm long, cartilaginous, shiny, without keel, 5 -veined, more than 3-veined. Lemma surface pubescent, hairy above. Lemma margins convolute, covering most of palea, ciliate. Lemma apex acute, muticous or awned, 1 -awned. Principal lemma awn 0–2 mm long overall. Palea elliptic, 1 -veined, 1-keeled.

**Flower and Fruit.** Lodicules 2. Anthers 2 (bisexual) or 3 (male). Stigmas plumose. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. Temperate Asia and Tropical Asia.

**Country /Province /State.** **Western Asia** and **China.** China South Central, China North-Central. **Indian Subcontinent.** West Himalaya.

Gansu. Sichuan. Uttah Pradesh. Himachal Pradesh, Jammu Kashmir.

### **Hierochloe mexicana** (Fourn.) Hitchc. *Contrib. US Nat. Herb.* 24:614 (1930).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Mexico. **Basionym or Replaced Name:** *Ataxia mexicana* Rupr. ex E. Fourn., *Mexic. Pl.* 2: 71 (1886)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: LT: *Galeotti* 5756, Mexico (BR; ILT: US-865363 (fragm. ex BR)). LT designated by Hitchcock, Contr. U.S. Natl. Herb. 17(3): ? (1913).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ana*, indicating connection. From Mexico.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms geniculately ascending, 40–70 cm long. Lateral branches lacking. Ligule an eciliate membrane. Leaf-blades 5–15 cm long, 2–4 mm wide. Leaf-blade apex abruptly acute.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear or lanceolate, interrupted, 6–12 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, ciliate.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 5–6 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes elongated below proximal fertile floret. Rhachilla elongation 0.2 mm long.

**Glumes.** Glumes persistent, dissimilar, exceeding apex of florets, thinner than fertile lemma. Lower glume ovate, 3.5–4 mm long, 0.66 length of upper glume, membranous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume oblong, 5–6 mm long, 2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume surface asperulous. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, dissimilar, barren, without significant palea, attached to and deciduous with the fertile. Lemma of lower sterile floret oblong, 5 mm long, chartaceous, without keels, 5 -veined, pubescent, bearing tawny hairs, dentate, 2 -fid, obtuse, awned. Awn of lower sterile floret dorsal, arising 0.75 way up back of lemma, 1–1.5 mm long. Lemma of upper sterile floret oblong, 5 mm long, chartaceous, pubescent, dentate, 2 -fid, obtuse, awned. Awn of upper sterile floret dorsal, arising 0.25 way up back of lemma, geniculate, 6–7 mm long. Fertile lemma oblong, 2.5 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma lateral veins obscure. Lemma margins convolute, covering most of palea. Lemma apex obtuse. Palea oblong, 1 -veined, without keels.

**Flower and Fruit.** Lodicules absent. Anthers 2. Stigmas 2, protogynous, pubescent. Caryopsis with adherent pericarp. Hilum punctiform.

**Distribution (TDWG).** Continent. North America, South America.

**Country /Province /State.** **Mexico.** Central Mexico, Southwest Mexico, Southeast Mexico. **Mesoamerica and Northern South America.** Guatemala. Venezuela.

### **Hierochloe moorei** De Paula de Brooks. *Bol. Soc. Argent. Bot.*, 15(4): 393 (1974).

**TYPE** from Argentina. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Argentina: Tierra del Fuego: Isla de los Estados, Bajima Colnett, D.M. Moore 2064 (HT: BAA; IT: LTR).

**Illustrations (Books):** M.N.Correra, *Flora Patagonica* Parte III, Gramineae (1978) (280, Fig 181).

**Derivation** (Clifford & Bostock 2007): in honor of David Moresby Moore (1933-) English botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Basal innovations extravaginal. Culms 40–50 cm long. Leaf-sheaths scaberulous. Ligule an eciliate membrane, obtuse. Leaf-blades convolute, 20–30 cm long, 2–3 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate, dense, 6–10 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile floret, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 7–7.5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma. Lower glume ovate, 7–7.5 mm long, 1 length of upper glume, membranous, 1-keeled, 1–3 -veined. Lower glume lateral veins absent or obscure. Lower glume apex acute. Upper glume ovate, 7–7.5 mm long, membranous, 1-keeled, 1–3 -veined. Upper glume lateral veins absent or obscure. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 6–6.5 mm long, chartaceous, 1-keeled, 5 -veined, obtuse, awned. Awn of lower sterile floret dorsal, arising 0.66 way up back of lemma, 3.4–4.5 mm long. Lemma of upper sterile floret oblong, 1 length of lower sterile floret, chartaceous, obtuse, awned. Awn of upper sterile floret dorsal, arising 0.5–0.66 way up back of lemma, straight, 5.5–9 mm long. Fertile florets female. Fertile lemma ovate, 4 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma margins convolute, covering most of palea. Lemma apex acute. Palea linear, 1 -veined, without keels.

**Flower and Fruit.** Anthers 3. Staminodes two present. Ovary glabrous. Caryopsis with adherent pericarp, fusiform, 1.4 mm long.

**Distribution (TDWG).** Continent. South America.

**Country /Province /State.** Southern South America. Argentina South.

### **Hierochloe novae-zelandiae** Gaudiger. *Bull. Soc. Bot. France*, lxvi. 300 (1920).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae* 5 (2000).

**TYPE** from New Zealand. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: HT: *G.M. Thomson s.n.*, 1896, New Zealand: Dunedin (LY).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): from New Zealand.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 20–40 cm long, 3–4 -noded. Leaf-sheaths 2–10 cm long, glabrous on surface. Ligule an eciliate membrane, 0.7 mm long. Leaf-blades 2–10 cm long, 1.5–3 mm wide. Leaf-blade venation comprising 11 vascular bundles. Leaf-blade surface glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, 5–10 cm long. Primary panicle branches 1–2 -nate. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 1–5 mm long, glabrous.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile floret, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 4 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume obovate, 1 length of upper glume, membranous, much thinner on margins, 1-keeled, 3 -veined. Lower glume apex obtuse or acute. Upper glume obovate, 3.5 mm long, 0.9 length of spikelet, membranous, with scarious margins, 1-keeled, 3 -veined. Upper glume apex obtuse or acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret oblong, 4 mm long, chartaceous, light brown, 1-keeled, scaberulous, rough above, ciliate on margins, obtuse, awned. Awn of lower sterile floret dorsal, arising 0.75–0.9 way up back of lemma, straight, 1–3 mm long. Lemma of upper sterile floret oblong, 1 length of lower sterile floret, chartaceous, scabrous, ciliate on margins, obtuse, awned. Awn of upper sterile floret dorsal, arising 0.75–0.9 way up back of lemma, straight, 1–3 mm long. Fertile lemma ovate, 3 mm long, cartilaginous, without keel, more than 3-veined. Lemma surface pubescent, hairy above. Lemma margins convolute, covering most of palea. Lemma apex truncate, muticous or mucronate. Principal lemma awn subapical, 0.3 mm long overall. Palea elliptic, without keels.

**Flower and Fruit.** Anthers 2 (bisexual) or 3 (male), 1.8 mm long. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. Australasia.

**Country /Province /State.** New Zealand. New Zealand North I, New Zealand South I, Stewart Is.

**Hierochloe occidentalis** Buckl. *Proc. Acad. Sc. Philad.* 1862 :100 (1863).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from USA. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: Nuttall s.n., USA: Oregon: Columbia woods (PH; IT: US- (fragm. ex PH & photo 63; fragm. ex PH & photo rt 62)).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. occident*, west; -ale, pertaining to. From the western states of the United States.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes elongated. Culms 60–90 cm long. Leaf-sheaths scaberulous. Ligule an eciliate membrane, 3–6 mm long, pubescent on abaxial surface, erose, obtuse or acute. Leaf-blades 20–40 cm long, 7–12 mm wide, aromatic. Leaf-blade venation prominent, with distinct cross veins. Leaf-blade margins scabrous.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, 8–13 cm long, bearing few spikelets. Primary panicle branches drooping. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny. Lower glume ovate, 4 mm long, 1 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume ovate, 4 mm long, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 4.5 mm long, 0.9 length of fertile lemma, chartaceous, 1-keeled, 5 -veined, puberulous, ciliate on margins, dentate, 2 -fid, obtuse, muticous or mucronate. Lemma of upper sterile floret oblong, 1 length of lower sterile floret, chartaceous, pubescent, ciliate on margins, lobed, 2 -fid, obtuse, muticous or mucronate. Fertile lemma ovate, 4.5 mm long, cartilaginous, shiny, without keel, more than 3-veined. Lemma surface puberulous, hairy above. Lemma margins convolute, covering most of palea. Lemma apex acute. Palea elliptic, 1 -veined, without keels.

**Flower and Fruit.** Anthers 2 (bisexual) or 3 (male), 2.5 mm long. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. North America.

**Country /Province /State.** Northwest USA and Southwestern USA. Oregon, Washington, California.

**Hierochloe pluriflora** Koidz. *Bot. Mag., Tokyo*, i. 136. (1917).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.Koyama, *Grasses of Japan and its neighboring regions* (1987).

**TYPE** from Japan. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: topo T: Ohwi J. 8 5155, Jul 1934, Japan: Jeso: Mt. Yubari (LE).

HT: *Koidzumi s.n.*, 1916, Japan: Hokkaido: Prov. Ishikari, Mt. Yubaridake (KYO).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. plus*, several; *flos*, flower. Florets several per spikelet.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, culms solitary. Rhizomes elongated. Culms 18–40 cm long, 1–1.2 mm diam. Ligule a ciliolate membrane. Leaf-blades involute, 25–40 cm long, 4–6 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, 2–3 cm long, 1–1.5 cm wide. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, laterally compressed, 5–6 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma, shiny. Lower glume ovate, 5–6 mm long, 1 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex obtuse. Upper glume ovate, 5–6 mm long, 1.2 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex obtuse.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 4.5–5.5 mm long, chartaceous, 1-keeled, 5 -veined, pubescent, ciliate on margins, obtuse, muticous or mucronate or awned. Awn of lower sterile floret 0–2 mm long. Lemma of upper sterile floret oblong, 4.5–5.5 mm long, chartaceous, pubescent, ciliate on margins, muticous or mucronate or awned. Fertile lemma ovate, 4–5 mm long, cartilaginous, without keel, more than 3-veined. Lemma surface pubescent, hairy at base. Lemma margins convolute, covering most of palea. Lemma apex acute. Palea elliptic, 1 -veined, without keels.

**Flower and Fruit.** Anthers 2 (bisexual) or 3 (male). Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. Temperate Asia.

**Country /Province /State.** Eastern Asia. Japan.

### **Hierochloe pusilla** Hackel ex Dusen. *Arkiv Bot. Stockh.* vii. No. 2, 4 (1907).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Argentina. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: Dusen 5999, Argentina: Santa Cruz: Rmo Chico, Rmo Fssiles, 900 m (S; IT: BAA (fragm. ex S), US (fragm. ex W), W).

**Illustrations (Books):** E.G.Nicora, *Los Generos de Gramineas de America Austral* (1987) (214, Fig. 63), M.N.Correa, *Flora Patagonica Parte III*, Gramineae (1978) (284, Fig 184).

**Derivation** (Clifford & Bostock 2007): L. very small. Plants of small stature.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Culms 5–10 cm long. Leaf-sheaths inflated, pubescent. Ligule an eciliate membrane, erose, truncate. Leaf-blades curved, flat or conduplicate, 1–3 cm long, 2–3 mm wide. Leaf-blade surface puberulous, hairy adaxially.

**Inflorescence.** Inflorescence a panicle. Peduncle pubescent above. Panicle spiciform, oblong, 1–2 cm long, 0.7–1 cm wide, bearing few spikelets. Panicle axis smooth. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, pubescent, hairy at tip.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, laterally compressed, 4.5–5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma. Lower glume ovate, 4.5–5 mm long, 1 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume primary vein extending to apex. Lower glume apex obtuse. Upper glume ovate, 4.5–5 mm long, membranous, 1-keeled, 3 -veined. Upper glume lateral veins all falling short of apex. Upper glume apex obtuse.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 5 mm long, chartaceous, 1-keeled, 5 -veined, scaberulous, rough above, truncate or obtuse, muticous. Palea of lower sterile floret 3.5 mm long. Lemma of upper sterile floret oblong, 1 length of lower sterile floret, chartaceous, scabrous, truncate or obtuse, muticous. Fertile florets female. Fertile lemma ovate, 3–3.5 mm long, cartilaginous, light brown, without keel, 5 -veined, more than 3-veined. Lemma margins convolute, covering most of palea. Lemma apex acute. Palea linear, 1 -veined, without keels.

**Flower and Fruit.** Anthers 3, 2.5 mm long. Staminodes two present. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. South America.

**Country /Province /State.** Southern South America. Argentina South, Chile South.

Chiloe, Aisen, Magellanes.

**Hierochloe quebrada** Connor & Renvoize. Kew Bulletin 64 (4): 727–734 (2009).

**TYPE** from Peru:. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Ancash, 37 km E of Yungay. HT: S.A. Renvoize & S. Laegaard 5079 K; IT: AAU, MO-4945250.

**Illustrations (Journals):** *Kew Bulletin* (64: 729, Fig. 1 (2009)).

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Rhizomes elongated, scaly. Basal innovations extravaginal. Culms erect, 60–100 cm long, 2 -noded. Culm-internodes 25–35(–50) cm long, antrorsely scabrous. Culm-nodes brown, glabrous. Leaf-sheaths 10–20 cm long, mostly shorter than adjacent culm internode, ribbed, antrorsely scabrous. Leaf-sheath auricles erect, 6–11 mm long. Ligule an eciliate membrane, 6–8 mm long, erose. Collar dark, glabrous. Leaf-blades 20–40 cm long, 5–10 mm wide, aromatic. Leaf-blade surface ribbed, scabrous. Leaf-blade apex acute or acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle spiciform, linear, continuous, 10–20 cm long, 1 cm wide. Panicle axis scaberulous. Panicle branches puberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 1–2 mm long, pubescent.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, laterally compressed, 5–6.5 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes elongated between basal sterile florets and elongated below proximal fertile floret. Rhachilla elongation 0.3–0.5 mm long. Floret callus pilose. Floret callus hairs 0.8–1 mm long.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma. Lower glume ovate, 4.5–6.2 mm long, 0.9 length of upper glume, scarious, 1-keeled, 1–3 -veined. Lower glume lateral veins absent or distinct. Lower glume apex acute. Upper glume ovate, 5–6.5 mm long, scarious, 1-keeled, 1–3 -veined. Upper glume lateral veins absent or distinct. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 4.5–6.1 mm long, chartaceous, 1-keeled, 5 -veined, prominently veined, scaberulous, ciliate on margins, bearing white hairs, bearing hairs 0.7–1 mm long, acute, mucronate or awned. Awn of lower sterile floret dorsal, arising 0.75–0.9 way up back of lemma, straight, 0.2–1.5 mm long. Palea of lower sterile floret 4.5–5.7 mm long, pubescent, adorned on keels. Lemma of upper sterile floret elliptic, 4.2–5.9 mm long, 1 length of lower sterile floret, chartaceous, scabrous, ciliate on margins, acute, awned. Awn of upper sterile floret dorsal, arising 0.5 way up back of lemma, geniculate, 3–6.6 mm long. Fertile florets female. Fertile lemma ovate, 3.4–4.5 mm long, cartilaginous, light brown, shiny, keeled, 3 -veined, 0–3 -veined. Lemma midvein scaberulous. Lemma surface scaberulous, rough above, puberulous, hairy above. Lemma margins convolute, covering most of palea, ciliolate, hairy above. Lemma apex acute, muticous or mucronate. Palea linear, 3.8–4.8 mm long, 1 -veined, without keels. Palea apex dentate, 2 -fid.

**Flower and Fruit.** Anthers 3, 2.4–4.1 mm long, yellow. Staminodes two present, 0.6–1.2 mm long. Stigmas 2, protogynous. Styles 0.8–2.3 mm long, free to the base. Ovary beaked, glabrous. Caryopsis with adherent pericarp, 1.3–2.2 mm long. Embryo 0.3–0.5 length of caryopsis.

**Distribution (TDWG). Continent.** South America.

**Country /Province /State. Western South America.** Peru.

**Hierochloe rariflora** Hook. f. *Fl. Antarct.* 93. (1844).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

**TYPE** from Australia. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: *Hooker s.n.*, Australia (K).

**Illustrations (Books):** S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (274), J.C.Tothill,& J.B.Hacker. *The grasses of southern Queensland* (1983) (262), T.D.Stanley & E.Ross, *Flora of South East Queensland, Gramineae* (1989) (123, Fig. 19), A.Wilson (ed.), *Flora of Australia*, Vol 44A. *Poaceae* (2009) (148, Fig 22), D.Sharp & B.K.Simon, *AusGrass*. *Grasses of Australia*. CD-Rom Version 1.0. (2002).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. *Grasses of Australia*. CD-Rom Version 1.0. (2002);

**Derivation** (Clifford & Bostock 2007): *L. rarus*, far apart. *flos*, flower. With florets well separated on the rachilla.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rootstock evident. Cataphylls evident. Basal innovations extravaginal. Culms geniculately ascending or decumbent, 60–100 cm long, wiry. Lateral branches ample. Ligule an eciliate membrane, 1 mm long. Leaf-blades deciduous at the ligule, flat or convolute, 10–20 cm long, 2–9 mm wide, aromatic. Leaf-blade apex acuminate, filiform.

**Inflorescence.** Inflorescence a panicle. Panicle open, pyramidal, 4–10 cm long, 3–8 cm wide. Primary panicle branches branching divaricately. Panicle branches capillary, puberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, puberulous.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile floret, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, laterally compressed, 5–5.5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet, thinner than fertile lemma, shiny, gaping. Lower glume ovate, 2.5 mm long, 1 length of upper glume, herbaceous, 1-keeled, 3 -veined. Lower glume margins ciliate. Lower glume apex obtuse. Upper glume oblate, 2.5 mm long, 0.5 length of adjacent fertile lemma, herbaceous, 1-keeled, 3 -veined. Upper glume margins ciliate. Upper glume apex obtuse.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 4.5–5 mm long, 1 length of fertile lemma, membranous, 1-keeled, 5 -veined, scaberulous, rough above, ciliolate on margins, obtuse, muticous. Fertile lemma ovate, 4.5–5 mm long, cartilaginous, shiny, without keel, 5 -veined, more than 3-veined. Lemma surface glabrous. Lemma margins convolute, covering most of palea. Lemma apex acute. Palea elliptic, 1 -veined, 1-keeled.

**Flower and Fruit.** Lodicules 2. Anthers 2 (bisexual) or 3 (male). Stigmas plumose. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. Australasia.

**Country /Province /State. Australia.** Queensland, New South Wales, Victoria, Tasmania.

South East. Coast, Tablelands.

### ***Hierochloe recurvata* (Hackel ex Cheeseman) Zotov. *New Zealand J. Bot.*, 11 (3): 566 (1973).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae* 5 (2000).

**TYPE** from New Zealand. **Basionym or Replaced Name:** *Hierochloe fraseri* var. *recurvata* Hack., *Man. New Zealand Fl.* 856 (1906)

. T:<Type of Basionym>: fide TROPICOS and Kew Synonymy Database: HT: *D. Petrie s.n. [1039]*, Jan 1889, New Zealand: Ruahine Range, 4000–5000 ft (AK-1330; IT: WELT-76772).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. reflexed. Spikelets with spreading or reflexed awns.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Culms 20–40 cm long, 3–4 -noded. Leaf-sheaths 2–10 cm long, glabrous on surface. Ligule an eciliate membrane, 1 mm long. Leaf-blades 7–15 cm long, 3–6 mm wide. Leaf-blade venation comprising 15 vascular bundles. Leaf-blade surface smooth or scaberulous, rough on both sides, glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, 8–16 cm long. Primary panicle branches 1–2 -nate. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 1–5 mm long, puberulous to villous, hairy above.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile floret, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 6 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma, shiny. Lower glume obovate, 1 length of upper glume, membranous, much thinner on margins, 1-keeled, 3 -veined. Lower glume apex obtuse or acute. Upper glume obovate, 6 mm long, 1 length of spikelet, membranous, with scarious margins, 1-keeled, 3 -veined. Upper glume apex obtuse or acute.

**Florets.** Basal sterile florets 2 or more, dissimilar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret oblong, 5.5 mm long, chartaceous, light brown, 1-keeled, scaberulous, ciliate on margins, obtuse, awned. Awn of lower sterile floret dorsal, arising 0.75 way up back of lemma, straight, 2–3 mm long. Lemma of upper sterile floret oblong, 1 length of lower sterile floret, chartaceous, scabrous, ciliate on margins, obtuse, awned. Awn of upper sterile floret dorsal, arising 0.75 way up back of lemma, geniculate, 4–6 mm long. Fertile lemma ovate, 4 mm long, cartilaginous, without keel, more than 3-veined. Lemma surface pubescent, hairy above. Lemma margins convolute, covering most of palea. Lemma apex mucronate or awned. Principal lemma awn subapical, 1–2 mm long overall. Palea elliptic, without keels.

**Flower and Fruit.** Anthers 2 (bisexual) or 3 (male), 2 mm long. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. Australasia.

**Country /Province /State.** New Zealand. New Zealand North I, New Zealand South I.

### **Hierochloe redolens** (Vahl) Roem. & Schult. Syst. ii. 514. (1817).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae 5* (2000).

**TYPE** from Argentina. **Basionym or Replaced Name:** *Holcus redolens* Vahl, *Symb. Bot.* 2: 102 (1791). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: HT: [*J.R. & G. Forster*] *Fabricius [misit]*, 20 Dec. 1774 – 3 Jan. 1775, Terra del Fuego (C; IT: BM-FORST, K (p.p. Tierra del Fuego)). "Vahl index card: Habitat in terra del fuego Prof Fabricius." This is a Forster collection sent to Vahl by Dr. Fabricius, of Kiel. See Hansen & Wagner, *Allertonia* 7: 345 (1998). The province of the C specimen has been argued to be New Zealand by Zотов [who saw a photo] (1973), or Fuegian by De Paula (1975).

**Illustrations (Books):** E.E.Henty, *A Manual of the Grasses of New Guinea* (1969) (27, Pl.3), J.R.Wheeler et al, *Flora of the Kimberley Region* (1992), N.Walsh & T.Entwistle, *Flora of Victoria* Vol 2 (1994) (466, Fig. 91), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler, *Grasses of New South Wales*, 4th edn (2008) (274), A.Wilson (ed.), *Flora of Australia*, Vol 44A. *Poaceae* (2009) (148, Fig 22), D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002), E.Edgar. & H.E.Connor, *Flora of New Zealand 5, Gramineae* (2000) (342, Fig. 11), S.A.Renvoize, *Gramineas de Bolivia* (1998) (Fig. 41), M.N.Correa, *Flora Patagonica Parte III*, Gramineae (1978) (280, Fig. 182).

**Illustrations (Journals):** *Ruizia* (13:166, Fig.18a-c (1993)).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002);, E.Edgar & H.E.Connor, *Flora of New Zealand 5, Gramineae* (2000);

**Derivation** (Clifford & Bostock 2007): *L. redoleo*, give off an odor. Inflorescences smell of coumarin.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Basal innovations extravaginal. Culms erect, 50–100 cm long, 4–5 -noded. Culm-nodes glabrous. Lateral branches lacking. Ligule an eciliate membrane, 4–9 mm long, obtuse. Leaf-blades 15–45 cm long, 5–12 mm wide, stiff, aromatic. Leaf-blade surface ribbed (deeply), scaberulous, rough adaxially. Leaf-blade margins scabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate, 10–20 cm long. Primary panicle branches 2 -nate, 5–10 cm long. Panicle branches capillary, pilose. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 1–7 mm long, ciliate.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 6–8 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet or reaching apex of florets or exceeding apex of florets, thinner than fertile lemma, shiny, gaping. Lower glume ovate, 5–8 mm long, 1 length of upper glume, hyaline, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex obtuse or acute. Upper glume ovate, 5–8 mm long, 1.1–1.8 length of adjacent fertile lemma, hyaline, 1-keeled, 3 -veined. Upper glume apex obtuse or acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 6.5 mm long, 1.5 length of fertile lemma, chartaceous, 1-keeled, 5 -veined, scaberulous, ciliolate on margins, obtuse, awned. Awn of lower sterile floret dorsal. Fertile lemma ovate, 4.5 mm long, cartilaginous, shiny, without keel, 5 -veined, more than 3-veined. Lemma surface pilose, hairy above. Lemma margins convolute, covering most of palea. Lemma apex acute. Palea elliptic, 1 -veined, 1-keeled.

**Flower and Fruit.** Lodicules 2. Anthers 2 (bisexual) or 3 (male), 1.5–3.5 mm long. Stigmas plumose. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Tropical Asia, Australasia, South America, and Antarctica.

**Country /Province /State.** Papuasia. New Guinea. **Australia and New Zealand.** New South Wales, Victoria, Tasmania. **Western South America and Southern South America.** Bolivia, Colombia, Ecuador, Peru. Argentina South, Chile South. **Subantarctic islands.** Falkland Is (Malvinas).

Tablelands.

### **Hierochloe repens** (Host) Beauv. *Agrost.* 62 (1812).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980) (& as *H. stepporum*).

**TYPE** from Austria. **Basionym or Replaced Name:** *Holcus repens* Host, *Icon. Descr. Gram. Austriac.* 3: 3 (1805)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: LT: *Host* 2386, Austria: Pannonia (W). LT designated by Weimarck, Bot. Not. 124: 154 (1971).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. repo*, crawl. Rhizome well developed.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, mat forming. Rhizomes elongated. Butt sheaths grey. Culms 20–50 cm long. Ligule an eciliate membrane, 2–3.5 mm long. Leaf-blades 7–9 mm wide, pruinose, aromatic.

**Inflorescence.** Inflorescence a panicle, comprising 120–160 fertile spikelets. Panicle open, ovate, 6.5–10 cm long. Primary panicle branches 1–2 -nate. Panicle axis 11–12 noded. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, puberulous, hairy at tip, with 0.1–0.3 mm long hairs.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 3.4–4.2 mm long, breaking up at maturity, disarticulating below each fertile floret. Floret callus pubescent. Floret callus hairs 0.3–0.6 mm long.

**Glumes.** Glumes persistent, similar, reaching apex of florets, thinner than fertile lemma, shiny. Lower glume ovate, 3.4–4.2 mm long, 1 length of upper glume, membranous, 1-keeled. Lower glume apex acute. Upper glume ovate, 3.4–4.7 mm long, 1.2–1.4 length of adjacent fertile lemma, membranous, 1-keeled. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 3.3–3.8 mm long, chartaceous, 1-keeled, 5 -veined, ciliate on margins, entire or dentate, 2 -fid, mucronate or awned. Awn of lower sterile floret terminal or subapical, 0.2–0.5 mm long. Lemma of upper sterile floret oblong, 3.3–3.8 mm long, chartaceous, ciliate on margins, entire or dentate, 2 -fid, mucronate or awned. Awn of upper sterile floret terminal or subapical, straight, 0.2–0.5 mm long. Fertile lemma ovate, 2.5–3.5 mm long, cartilaginous, without keel, more than 3-veined. Lemma surface pubescent, hairy above. Lemma margins convolute, covering most of palea. Lemma apex acute. Palea 1 -veined, without keels.

**Flower and Fruit.** Anthers 2 (bisexual) or 3 (male), 1.6–2.7 mm long. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Europe and Temperate Asia.

**Region. Middle Europe, Southeastern Europe, and Eastern Europe.**

**Country /Province /State.** Belarus, East European Russia, Ukraine. Siberia and **Caucasus.** Altay. Chiloe, Aisen, Magellanes.

**Hierochloe sorianoi** De Paula de Brooks. *Bol. Soc. Argent. Bot.*, 15(4): 396 (1974).

**TYPE** from Argentina. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Argentina: Chubut: Depto. Futaleufu, Lago Futalaufquen, orilla este; 18 Feb 1960, A. Soriano 4172 (HT: BAA).

**Illustrations (Books):** M.N.Correra, *Flora Patagonica* Parte III, Gramineae (1978) (Fl. Pat. 3: 280, Fig. 183 (1978)).

**Derivation** (Clifford & Bostock 2007): in honor of Alberto Soriano (fl. 1960) Argentinian agriculturalist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Basal innovations extravaginal. Culms erect, 40–50 cm long. Ligule an eciliate membrane. Leaf-blades convolute, 3–4 mm wide, stiff.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, 7 cm long, contracted about primary branches. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 5–6.5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma. Lower glume ovate, 4.5–6 mm long, 0.9 length of upper glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume ovate, 5–6.5 mm long, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 4.5–5.5 mm long, chartaceous, 1-keeled, 5 -veined, truncate, awned. Awn of lower sterile floret subapical, 1–2 mm long. Lemma of upper sterile floret oblong, 1 length of lower sterile floret, chartaceous, truncate, awned. Awn of upper sterile floret subapical, straight, 2–2.5 mm long. Fertile florets female. Fertile lemma ovate, 3.2–3.5 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma margins convolute, covering most of palea. Lemma apex acute. Palea linear, 1 -veined, without keels.

**Flower and Fruit.** Anthers 3, 2.8–3 mm long. Staminodes two present. Ovary glabrous. Caryopsis with adherent pericarp, fusiform, 1 mm long.

**Distribution (TDWG). Continent.** South America.

**Country /Province /State.** Southern South America. Argentina South.

Chubut.

**Hierochloe spicata** L. Parodi. *Rev. Mus. La Plata, n. s., Secc. Bot.*, iii. 196 (1941).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Chile. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Philippi s.n.*, Chile: Magellanes (BAA-13646; IT: US- (fragm. ex BAA-13646)).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. spica*, a point; hence, in particular, an ear or spike of grain; - *ata*, possessing. Inflorescence a spike or spicate panicle.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes short. Culms 100–130 cm long, 3–4 -noded. Leaf-sheaths mostly shorter than adjacent culm internode, striately veined, antrorsely scabrous, glabrous on surface. Ligule an eciliate membrane, 4–5 mm long, acute. Leaf-blades flat or convolute, 23–35 cm long, 8–10 mm wide, aromatic. Leaf-blade surface glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle spiciform, linear, continuous or interrupted, 15 cm long, 1–1.5 cm wide. Primary panicle branches appressed, 1–2 -nate. Panicle axis glabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, laterally compressed, 6.5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma. Lower glume elliptic, 5.5 mm long, 0.8–0.9 length of upper glume, hyaline, 1-keeled, 1 -veined. Lower glume

lateral veins absent. Upper glume ovate, 6.5 mm long, 1.6 length of adjacent fertile lemma, hyaline, 1-keeled, 3 -veined.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret oblong, 5 mm long, 1.2 length of fertile lemma, chartaceous, dark brown, 1-keeled, scaberulous, rough above, ciliate on midvein (at base), ciliolate on margins, truncate or obtuse, awned. Awn of lower sterile floret subapical, 1–1.5 mm long. Lemma of upper sterile floret oblong, 5 mm long, 1 length of lower sterile floret, chartaceous, scabrous, ciliolate on margins, truncate or obtuse, awned. Awn of upper sterile floret subapical, 1–1.5 mm long. Fertile lemma oblong, 4 mm long, cartilaginous, without keel, more than 3-veined. Lemma surface pubescent, hairy above. Lemma margins convolute, covering most of palea, ciliate. Lemma apex acute. Palea 1 -veined, 1-keeled.

**Flower and Fruit.** Lodicules 2. Anthers 2 (bisexual) or 3 (male), 3 mm long. Stigmas plumose. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. South America.

**Country /Province /State.** Southern South America. Chile South.

### **Hierochloe submutica** F. Muell. *Trans. Vict. Inst.* i. 48 (1855).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

**TYPE** from Australia. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: HT: *Mueller s.n.*, Australia: Victoria: Cobberas Mts (MEL; IT: K).

**Illustrations (Books):** S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (274), A.Wilson (ed.), *Flora of Australia*, Vol 44A. *Poaceae* (2009) (148, Fig 22), D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002);

**Derivation** (Clifford & Bostock 2007): L. *sub-*, almost; *mutica*, blunt. Apices of glumes or lemmas rounded.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Basal innovations extravaginal. Culms erect, 30–60 cm long. Culm-nodes glabrous. Lateral branches lacking. Ligule an eciliate membrane, 4–9 mm long, erose, truncate. Leaf-blades 5–25 cm long, 4–8 mm wide, stiff, aromatic. Leaf-blade surface ribbed (lightly), scaberulous, rough adaxially. Leaf-blade margins scabrous. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate, 5–18 cm long. Primary panicle branches 2 -nate. Panicle branches capillary, pilose. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 5–6 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet or reaching apex of florets or exceeding apex of florets, thinner than fertile lemma, shiny, gaping. Lower glume ovate, 5–6 mm long, 1 length of upper glume, hyaline, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume apex obtuse or acute. Upper glume ovate, 5–6 mm long, 1.1–1.8 length of adjacent fertile lemma, hyaline, 1-keeled, 3 -veined. Upper glume apex obtuse or acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 5.5 mm long, 1.5 length of fertile lemma, chartaceous, 1-keeled, 5 -veined, scaberulous, ciliolate on margins, obtuse, muticous or mucronate. Fertile lemma ovate, 3.5 mm long, cartilaginous, shiny, without keel, 5 -veined, more than 3-veined. Lemma surface pubescent, hairy above. Lemma margins convolute, covering most of palea. Lemma apex acute. Palea elliptic, 1 -veined, 1-keeled.

**Flower and Fruit.** Lodicules 2. Anthers 2 (bisexual) or 3 (male). Stigmas plumose. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. Australasia.

**Country /Province /State.** Australia. New South Wales, Victoria, Tasmania.

Tablelands.

## **Hierochloe tibetica** Bor. *Kew Bull.* 1953, 271 (1953).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.L.Bor, Grasses of Burma, Ceylon, India and Pakistan (1960).

**TYPE** from China. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: China: Xizang: Kongbo Province, Pero La, 5000 m, 19 July 1935, *Ludlow, Sherriff & Taylor* 5188 (HT: BM).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ica*, belonging to. From Tibet Autonomous Region, China.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Culms 9–18 cm long. Culm-nodes glabrous. Leaf-sheaths glabrous on surface. Ligule an eciliate membrane, 2–2.5 mm long, truncate. Leaf-blades flat or involute, 3–5 cm long, 2 mm wide. Leaf-blade surface glabrous. Leaf-blade margins scaberulous. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle, comprising 10 fertile spikelets. Panicle open, dense, 2.5 cm long, 1 cm wide, bearing few spikelets. Panicle branches pubescent in axils. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile floret, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic or cuneate, laterally compressed, truncate, 5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma. Lower glume elliptic, 5 mm long, 1 length of upper glume, membranous, much thinner above, purple, 1-keeled, 3-veined. Lower glume apex acute. Upper glume elliptic, 5 mm long, 1.2 length of adjacent fertile lemma, membranous, much thinner above, purple, 1-keeled, 3-veined. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, dissimilar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 4 mm long, 1 length of fertile lemma, membranous, glabrous or pubescent, bearing yellow hairs, lobed, 2-fid, obtuse. Palea of lower sterile floret pubescent (at apex). Lemma of upper sterile floret oblong, 4 mm long, 1 length of lower sterile floret, membranous, pubescent, lobed, 2-fid, awned. Awn of upper sterile floret 3 mm long. Fertile lemma elliptic or oblong, 2.5 mm long, cartilaginous, without keel. Lemma surface pubescent, hairy above. Lemma margins convolute, covering most of palea. Lemma hairs yellow. Lemma apex obtuse or acute. Palea 1-veined, without keels.

**Flower and Fruit.** Lodicules 2. Anthers 2 (bisexual) or 3 (male), 1–1.25 mm long. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** China. Tibet.

## **Hierochloe wendelboi** G. Weimarck. *Publ. Cairo Univ. Herb.*, 78: 299 (1977).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Afghanistan. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Wendelbo & Ekberg* W-9669, 15 Jul 1969, Afghanistan: Laghman, Alishang, 2900–3200 m (GB).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): In honor of Per Erland Berg Wendelbo (1927–1981) Norwegian botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 20–60 cm long. Ligule an eciliate membrane, 2–4 mm long. Leaf-blades 3–12 cm long, 3.5–9 mm wide, aromatic.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong or ovate, dense, 3.5–7.5 cm long. Primary panicle branches bearing spikelets almost to the base. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 basal sterile florets, 1 fertile floret, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 4.5–5.5 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet or reaching apex of florets or exceeding apex of florets, thinner than fertile lemma, shiny, gaping. Lower glume ovate, 3–5.5 mm long, 1 length of upper

glume, membranous, 1-keeled, 3 -veined. Lower glume apex acute. Upper glume ovate, 3–5.5 mm long, 1–1.4 length of adjacent fertile lemma, membranous, 1-keeled, 3 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 2 or more, similar, male, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret elliptic, 3.5–5 mm long, 1.2–1.3 length of fertile lemma, membranous, 1-keeled, 5 -veined, ciliolate on margins, dentate, 2 -fid, obtuse, awned. Awn of lower sterile floret 0.5–2 mm long. Fertile lemma ovate, 3–4 mm long, cartilaginous, shiny, without keel, 5 -veined, more than 3-veined. Lemma surface pubescent, hairy above. Lemma margins convolute, covering most of palea, ciliolate. Lemma apex acute, muticous or mucronate. Palea elliptic, 1 -veined, 1-keeled.

**Flower and Fruit.** Lodicules 2. Anthers 2 (bisexual) or 3 (male). Stigmas plumose. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. Tropical Asia.

**Country /Province /State.** Indian Subcontinent. Pakistan.

**Hilaria annua** J.R. & C.G. Reeder. *Madrono*, 35(1): 7 (1988).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Mexico. T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: HT: *J.R. Reeder & C.G. Reeder* 6333, 24 Sep 1974, Mexico: Colima (ARIZ; IT: MEXU, MICH, RM, US-3206089).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. annuus*, lasting a year. Annuals.

**Classification.** Subfamily Chloridoideae. Tribe: Cynodonteae.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms erect or geniculately ascending, slender, 40–50(–60) cm long, rooting from lower nodes. Culm-nodes bearded. Lateral branches ample. Ligule a ciliolate membrane, 2–3 mm long. Leaf-blades 10–20(–30) cm long, 3.5–5 mm wide. Leaf-blade surface glabrous or pilose, hairy adaxially, with tubercle-based hairs. Leaf-blade margins scabrous.

**Inflorescence.** Inflorescence composed of racemes. Racemes borne along a central axis, closely spaced, in a multilateral false spike, cuneate, unilateral, 0.3–0.5 cm long, bearing a triad of spikelets. Central inflorescence axis (3.5)–4–5 cm long, flattened, puberulous. Rhachis obsolete, deciduous from axis. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets sessile, 2 in the cluster.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, oblong, asymmetrical, dorsally compressed, 3.5–4.5 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes united below, coriaceous, 7 -veined, scabrous, ciliolate on margins, muticous. Companion sterile spikelet lemmas 1(–3), exserted from glumes, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 3.5–4.5 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes connate along margins below, shorter than spikelet. Lower glume oblong, asymmetrical, 3.5–4.5 mm long, 1 length of upper glume, coriaceous, pallid, 1-keeled, 7 -veined. Lower glume surface scabrous. Lower glume margins ciliolate. Lower glume apex lobed, 2 -fid, awned, 1 -awned, awn 1 mm long. Upper glume oblong, asymmetrical, 3.5–4.5 mm long, 1 length of adjacent fertile lemma, coriaceous, pallid, 1-keeled, 7 -veined. Upper glume surface scabrous. Upper glume margins ciliolate. Upper glume apex lobed, 2 -fid, awned, 1 -awned, awn 1 mm long.

**Florets.** Fertile florets female. Fertile lemma ovate, laterally compressed, 3.5–4.5 mm long, cartilaginous, keeled, 3 -veined, 0–3 -veined. Lemma apex caudate.

**Flower and Fruit.** Anthers 3, 2 mm long. Caryopsis 1.8–2 mm long. Embryo 1 length of caryopsis.

$2n = 36$  (1 ref TROPICOS).

**Distribution (TDWG).** Continent. North America.

**Country /Province /State.** Mexico. Southwest Mexico.

Colima.

**Hilaria belangeri** (Steud.) Nash. *N. Amer. Fl.* xvii. 135. (1912).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Mexico/USA. **Basionym or Replaced Name:** *Anthephora belangeri* Steud., *Syn. Pl. Glumac.* 1: 111 (1854)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *C.P. Belanger* 1428, no date, Mexico / USA (?; IT: US-A865423 (fragm. ex hb Delessert)).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 25 *Poaceae*, part 2 (2003) (279 as var. *belangeri* & *longifolia*), F.W.Gould, *The Grasses of Texas* (1975) (369, Fig. 195).

**Derivation** (Clifford & Bostock 2007): in honor of Charles Paulus Bilanger (1805–1881) French botanist.

**Classification.** Subfamily Chloridoideae. Tribe: Cynodonteae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Stolons present. Culms erect, 10–30 cm long. Culm-nodes bearded. Ligule an eciliate membrane, 0.5–1 mm long, lacerate. Leaf-blades 3–20 cm long, 1–4 mm wide. Leaf-blade apex filiform.

**Inflorescence.** Inflorescence composed of racemes. Racemes 4–8, borne along a central axis, closely spaced, in a multilateral false spike, oblong, unilateral, 0.5–0.6 cm long, bearing a triad of spikelets. Central inflorescence axis 2–3.5 cm long, flattened. Rhachis obsolete, deciduous from axis. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets sessile, 2 in the cluster.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, flabellate, dorsally compressed, 4.5–6 mm long, longer than fertile, deciduous with the fertile. Companion sterile spikelet glumes united below, coriaceous (pallid with purple spots), 7 -veined, scabrous, glabrous, lobed (asymmetrically bilobed), truncate, awned, both glumes awned, with 1–3 mm long awn. Companion sterile spikelet lemmas 2, exserted from glumes, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, compressed strongly, 4.5–6 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes connate along margins below, similar, shorter than spikelet, firmer than fertile lemma. Lower glume oblong, 1.5 mm long, 0.5 length of upper glume, coriaceous, 1-keeled, 7 -veined. Lower glume apex lobed, 2 -fid, awned, 1 -awned, awn 1–3 mm long. Upper glume oblong, 3.5 mm long, 0.6–0.8 length of adjacent fertile lemma, coriaceous, 1-keeled, 7 -veined. Upper glume apex lobed, 2 -fid, awned, 1 -awned, awn 2–5 mm long.

**Florets.** Fertile lemma ovate, laterally compressed, 4.5–6 mm long, cartilaginous, keeled, 3 -veined, 0–3 -veined. Lemma apex caudate.

**Flower and Fruit.** Anthers 3, 3–3.5 mm long.

**Distribution (TDWG). Continent.** North America.

**Country /Province /State.** **Southwestern USA, South-central USA, Mexico.** Arizona. New Mexico, Texas. Central Mexico, Northeast Mexico, Northwest Mexico, Southwest Mexico.

Mexico State, Morelos, Puebla. Aguascalientes, Coahuila, Chihuahua, Guanajuato, Neuvo Leon, Queretaro, Tamaulipas. Baja California, Baja California Sur, Sonora. Guerrero, Michoacan, Oaxaca.

**Hilaria cenchroides** H. B. & K. *Nov. Gen. et Sp.* i. 117. (1815).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Mexico. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Humboldt & Bonpland s.n.*, Mexico: inter Zelaya et Guanaxuato (P; IT: LE-TRIN-0379.01 (fragm.), US-81367 (fragm.)).

**Illustrations (Books):** R.McVaugh, *Flora Nova-Galliciana* Vol.14 *Gramineae* (1983).

**Derivation** (Clifford & Bostock 2007): Gk. *-oides*, resembling. Resembling *Cenchrus* usually with respect to the inflorescence.

**Classification.** Subfamily Chloridoideae. Tribe: Cynodonteae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Stolons present. Culms erect, 5–60 cm long. Culm-nodes bearded. Leaf-sheaths longer than adjacent culm internode, striately veined, outer margin hairy. Ligule an eciliate membrane, 1.5–2 mm long, lacerate. Leaf-blades flat or involute, 3–10 cm long, 2–4 mm wide, stiff. Leaf-blade surface ribbed, scaberulous, rough on both sides, glabrous or pilose. Leaf-blade margins scabrous.

**Inflorescence.** Inflorescence composed of racemes. Racemes borne along a central axis, closely spaced, in a multilateral false spike, cuneate, unilateral, 0.4–0.8 cm long, bearing a triad of spikelets. Central inflorescence axis 2–6 cm long. Rhachis obsolete, deciduous from axis. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets sessile, 2 in the cluster.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, oblong, asymmetrical, dorsally compressed, 3–5 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes united below, coriaceous, 1.5–4 mm long, 5–11 -veined, scabrous, lobed, 2 -fid, truncate or obtuse, awned, both glumes awned, with 1–2 mm long awn. Companion sterile spikelet lemmas 2–4, exserted from glumes, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 4–7.5 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes connate along margins below, shorter than spikelet, firmer than fertile lemma. Lower glume ovate, 4–5 mm long, coriaceous, black, 1-keeled, 7 -veined. Lower glume surface scabrous. Lower glume apex lobed, 2 -fid, truncate or obtuse, awned, 1 -awned, awn 3 mm long. Upper glume ovate, 4–5 mm long, coriaceous, black, 1-keeled, 7 -veined. Upper glume surface scabrous. Upper glume apex lobed, 2 -fid, truncate or obtuse, awned, 1 -awned, awn 3 mm long.

**Florets.** Fertile florets female. Fertile lemma ovate, laterally compressed, 5–6 mm long, cartilaginous, keeled, 3 -veined, 0–3 -veined. Lemma apex caudate.

**Flower and Fruit.** Anthers 3, 3–3.5 mm long.

**Distribution (TDWG). Continent.** North America, South America.

**Country /Province /State. Mexico.** Central Mexico, Northeast Mexico, Gulf (Mexico), Southwest Mexico. **Mesoamerica.** Guatemala.

Distrito Federal, Mexico State, Puebla, Tlaxcala. Guanajuato, Queretaro, San Luis Potosi, Zacatecas. Jalisco, Michoacan, Oaxaca.

### **Hilaria ciliata** (Scribn.) Sohns. *Journ. Wash. Acad. Sci.* xlvi. 317 (1956).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Mexico. **Basionym or Replaced Name:** *Hilaria cenchroides* var. *ciliata* Scribn., *Proc. Acad. Nat. Sci. Philadelphia* 43(2): 293–294, t. 13, f. 2, 2a (1891)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: HT: *Pringle* 3128, 17 May 1898, Mexico: Jalisco: valley of the Rmo Grande de Santiago at Atequiza (US-70845; IT: CM, NY). despite the difference in citation in the protologue, based on the same collection.--gd.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *cilium*, eyelid; -*ata*, possessing. Plant hairy overall or in part.

**Classification.** Subfamily Chloridoideae. Tribe: Cynodonteae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Stolons present. Culms erect, 25–45 cm long. Culm-nodes bearded. Leaf-sheaths striately veined, glabrous on surface or pilose, with tubercle-based hairs. Leaf-sheath oral hairs ciliate. Ligule an eciliate membrane, 2.5 mm long. Leaf-blades 1.5–15 cm long, 2–4 mm wide. Leaf-blade surface scabrous, rough adaxially, glabrous or pilose, hairy adaxially, with tubercle-based hairs. Leaf-blade margins scabrous.

**Inflorescence.** Inflorescence composed of racemes. Racemes borne along a central axis, closely spaced, in a multilateral false spike, cuneate, unilateral, 0.3–0.4 cm long, bearing a triad of spikelets. Central inflorescence axis 3–5 cm long, pilose. Rhachis obsolete, deciduous from axis. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets sessile, 2 in the cluster.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, oblong, asymmetrical, laterally compressed, 3–4 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes

united below, coriaceous, 5 -veined, scabrous, ciliolate on margins, muticous. Companion sterile spikelet lemmas 3, exserted from glumes, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 3–4 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes connate along margins below, shorter than spikelet. Lower glume oblong, asymmetrical, 1.2–2 mm long, 0.5 length of upper glume, coriaceous, pallid, 1-keeled, 3 -veined. Lower glume surface scabrous. Lower glume margins ciliolate. Lower glume apex lobed, 2 -fid, awned, 1 -awned, awn 1 mm long. Upper glume oblong, asymmetrical, 2.8–3.8 mm long, 0.9 length of adjacent fertile lemma, coriaceous, pallid, 1-keeled, 5 -veined. Upper glume surface scabrous. Upper glume margins ciliolate. Upper glume apex lobed, 2 -fid, awned, 1 -awned, awn 1 mm long.

**Florets.** Fertile florets female. Fertile lemma ovate, laterally compressed, 3–4 mm long, cartilaginous, keeled, 3 -veined, 0–3 -veined. Lemma apex caudate.

**Flower and Fruit.** Anthers 3, 2.8–3 mm long.

$2n = 72$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** North America.

**Country /Province /State. Mexico.** Northeast Mexico, Gulf (Mexico), Northwest Mexico, Southwest Mexico.

Chihuahua, Guanajuato, Queretaro, San Luis Potosi. Veracruz. Baja California, Baja California Sur, Sonora. Colima, Jalisco, Michoacan, Nayarit, Oaxaca.

### **Hilaria hintonii** Sohns. *Journ. Wash. Acad. Sci.* xlvi. 319 (1956).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Mexico. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: HT: G.B. Hinton 4502, 9 Aug 1933 or 8 Sep 1933, Mexico: Temascaltepec (US-1840874).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of George Bode Hinton (1882–1943) United States botanist.

**Classification.** Subfamily Chloridoideae. Tribe: Cynodonteae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Stolons present. Culms erect, 5–20 cm long. Culm-nodes bearded. Leaf-sheaths glabrous on surface. Ligule an eciliate membrane, 0.5–1 mm long. Leaf-blades 2–6 cm long, 2–4 mm wide. Leaf-blade surface scabrous, rough abaxially, pilose, hairy adaxially, with tubercle-based hairs. Leaf-blade margins scabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes. Racemes borne along a central axis, closely spaced, in a multilateral false spike, cuneate, unilateral, 0.4–0.7 cm long, bearing a triad of spikelets. Central inflorescence axis 2–4 cm long, pilose. Rhachis obsolete, deciduous from axis. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets sessile, 2 in the cluster.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, cuneate, asymmetrical, dorsally compressed, 4.5–6 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes united below, coriaceous, eglandular or glandular, 7 -veined, scaberulous, lobed, 2–4 -fid, awned, several-awned (2–4 per glume), with 1–3 mm long awn. Companion sterile spikelet lemmas 2–3, exserted from glumes, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 4–6.5 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes connate along margins below, shorter than spikelet, firmer than fertile lemma. Lower glume oblong, 2–3 mm long, coriaceous, pallid, 1-keeled, 7 -veined. Lower glume apex lobed, 2–3 -fid, awned, 2–3 -awned, awn 2–3 mm long. Upper glume oblong, 3–5 mm long, coriaceous, pallid, 1-keeled, 7 -veined. Upper glume apex lobed, 2–3 -fid, awned, 2–3 -awned, awn 2–3 mm long.

**Florets.** Fertile florets female. Fertile lemma ovate, laterally compressed, 4–6 mm long, cartilaginous, keeled, 3 -veined, 0–3 -veined. Lemma apex caudate.

**Flower and Fruit.** Anthers 3, 2.8–3 mm long.

**Distribution (TDWG).** Continent. North America.

**Country /Province /State.** Mexico. Central Mexico, Northeast Mexico, Southwest Mexico. Mexico State, Morelos. Queretaro. Guerrero, Michoacan.

**Hilaria jamesii** (Torr.) Benth. *Journ. Linn. Soc.* xix. 62. (1881).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online (as *Pleuraphis*), W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE from USA. Basionym or Replaced Name:** *Pleuraphis jamesii* Torr., *Ann. Lyceum Nat. Hist. New York* 1(1): 148–150, t. 10 (1824)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: HT: *James s.n.*, 1852, USA: Texas or New Mexico: sources of the Canadian Rover (NY).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 25 Poaceae, part 2 (2003) (277), F.W.Gould, *The Grasses of Texas* (1975) (369, Fig. 194).

**Images:** R.Darke, *Ornamental Grasses* (2004); (as *Pleuraphis*), R.Darke, *The Encyclopaedia of Grasses for Liveable Landscapes* (2007); (as *Pleuraphis*).

**Derivation** (Clifford & Bostock 2007): in honor of Edwin James (1797–1861) United States physician and botanist.

**Classification.** Subfamily Chloridoideae. Tribe: Cynodonteae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Culms erect, 20–65 cm long. Culm-internodes distally glabrous. Culm-nodes pubescent. Leaf-sheaths smooth or scaberulous. Leaf-sheath oral hairs ciliate. Ligule an eciliate membrane, 2–3 mm long, lacerate. Leaf-blades involute, 2–20 cm long, 2–4 mm wide, stiff. Leaf-blade surface ribbed, scabrous, rough on both sides.

**Inflorescence.** Inflorescence composed of racemes. Racemes numerous, borne along a central axis, closely spaced, in a multilateral false spike, oblong, unilateral, 0.6–0.8 cm long, bearing a triad of spikelets. Central inflorescence axis 2–6 cm long, pubescent. Rhachis obsolete, deciduous from axis. Raceme-bases brief, pilose. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, oblong, asymmetrical, dorsally compressed, 5–7 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes free, membranous, 3–7 -veined, ciliolate on margins, lobed, 2 -fid, awned, one glume awned, with 6–8 mm long awn. Companion sterile spikelet lemmas 3, exserted from glumes, 5–7 mm long, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 6–8 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes free, shorter than spikelet. Lower glume lanceolate, asymmetrical, chartaceous, pallid, 1-keeled, 7 -veined. Lower glume primary vein ciliate. Lower glume surface pubescent. Lower glume margins ciliate. Lower glume apex lobed, 5 -fid, awned, 7 -awned, awn 3–5 mm long. Upper glume lanceolate, asymmetrical, 0.75 length of adjacent fertile lemma, chartaceous, pallid, 1-keeled, 7 -veined. Upper glume primary vein ciliate. Upper glume surface puberulous. Upper glume margins ciliate. Upper glume apex lobed, 5 -fid, awned, 7 -awned, awn 3–5 mm long.

**Florets.** Fertile florets bisexual. Fertile lemma lanceolate, laterally compressed, 6–8 mm long, cartilaginous, keeled, 3 -veined, 0–3 -veined. Lemma apex dentate, 2 -fid, obtuse, awned, 1 -awned. Principal lemma awn from a sinus, 2–3 mm long overall.

**Flower and Fruit.** Lodicules 2, 0.1–0.2 mm long. Anthers 3, 3 mm long.

*n* = 36 (1 ref TROPICOS).

**Distribution (TDWG).** Continent. North America.

**Country /Province /State.** Northwest USA, Southwestern USA, South-central USA. Colorado, Wyoming, Arizona, California, Nevada, Utah, New Mexico, Texas.

**Hilaria mutica** (Buckl.) Benth. *Journ. Linn. Soc.* xix. 62 (1881).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online (as *Pleuraphis*), W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from USA. **Basionym or Replaced Name:** *Pleuraphis mutica* Buckley, *Proc. Acad. Nat. Sci. Philadelphia* 14: 95 (1862)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: ST: *Wright 760*, USA: New Mexico (PH).

ST: *Wright 2108*, USA: New Mexico (PH).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 25 Poaceae, part 2 (2003) (277), F.W.Gould, *The Grasses of Texas* (1975) (367, Fig. 193).

**Derivation** (Clifford & Bostock 2007): L. blunt. Lacking awns or lemmas and/or glumes truncate.

**Classification.** Subfamily Chloridoideae. Tribe: Cynodonteae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Culms erect, 30–50 cm long. Culm-internodes distally glabrous. Culm-nodes pubescent. Leaf-sheaths longer than adjacent culm internode, striately veined, antrorsely scabrous, outer margin glabrous or hairy. Ligule an eciliate membrane, 1 mm long, lacerate. Leaf-blades flat or involute, 5–10 cm long, 2–4 mm wide, stiff. Leaf-blade surface ribbed, scabrous, rough on both sides, glabrous or pilose, hairy on both sides.

**Inflorescence.** Inflorescence composed of racemes. Racemes borne along a central axis, closely spaced, in a multilateral false spike, cuneate, unilateral, 0.6–0.9 cm long, bearing a triad of spikelets. Central inflorescence axis 4–8 cm long. Rhachis obsolete, deciduous from axis. Raceme-bases brief, pilose. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets sessile, 2 in the cluster.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, cuneate, asymmetrical, dorsally compressed, 4–8 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes free, membranous, 4–7 -veined, dentate, 2–7 -fid, muticous. Companion sterile spikelet lemmas 1–2, exserted from glumes, dentate, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, laterally compressed, 6–8 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes free, shorter than spikelet. Lower glume oblong, asymmetrical, membranous, pallid, 1-keeled, 7 -veined. Lower glume margins ciliolate. Lower glume apex lobed, 5 -fid, awned, 7 -awned, awn terminal or dorsal, awn 1–2 mm long, awn ciliolate. Upper glume oblong, asymmetrical, 0.6–0.75 length of adjacent fertile lemma, membranous, pallid, 1-keeled, 7 -veined. Upper glume margins ciliolate. Upper glume apex lobed, 5 -fid, awned, 7 -awned, awn terminal or dorsal, awn 1–2 mm long, awn ciliolate.

**Florets.** Fertile florets bisexual. Fertile lemma lanceolate, laterally compressed, 6–8 mm long, cartilaginous, keeled, 3 -veined, 0–3 -veined. Lemma apex dentate, 2 -fid, obtuse, mucronate or awned, 1 -awned. Principal lemma awn from a sinus, 1 mm long overall.

**Flower and Fruit.** Lodicules 2, 0.1–0.2 mm long. Anthers 3.

n = 36 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** North America.

**Country /Province /State. North-central USA, Southwestern USA, South-central USA, Mexico.** Oklahoma. Arizona. New Mexico, Texas. Northeast Mexico, Northwest Mexico.

Coahuila, Chihuahua, Durango, Neuvo Leon, Zacatecas. Baja California Sur, Sonora.

**Hilaria rigida** (Thurb.) Benth. ex Scribn. *Bul. Tor. Bot. Club* 9: 86. (1882).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online (as *Pleuraphis*), W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from USA. **Basionym or Replaced Name:** *Pleuraphis rigida* Thurb., *Bot. California* 2: 293–294 (1880)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *J.G. Cooper 2230*, 24 Feb 1861, USA: California: Fort Mojave (US-323096).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico Vol 25 Poaceae*, part 2 (2003) (277).

**Derivation** (Clifford & Bostock 2007): L. stiff. Culms, spikelets or inflorescence branches held stiffly erect.

**Classification.** Subfamily Chloridoideae. Tribe: Cynodonteae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Culms decumbent, 50–100 cm long. Culm-internodes distally woolly. Culm-nodes glabrous or pubescent. Leaf-sheaths longer than adjacent culm internode, smooth or antrorsely scabrous. Leaf-sheath oral hairs woolly. Ligule an eciliate membrane, 1 mm long, pubescent on abaxial surface (woolly). Leaf-blades involute, 2–5 cm long, 2–4 mm wide, coriaceous, stiff. Leaf-blade surface ribbed, smooth or scabrous, glabrous or woolly. Leaf-blade apex pungent.

**Inflorescence.** Inflorescence composed of racemes. Racemes borne along a central axis, closely spaced, in a multilateral false spike, cuneate, unilateral, 0.6–1.2 cm long, bearing a triad of spikelets. Central inflorescence axis 4–7 cm long. Rhachis obsolete, deciduous from axis. Raceme-bases brief, pilose. Spikelets in threes. Fertile spikelets pedicelled, 1 in the cluster. Companion sterile spikelets sessile, 2 in the cluster. Pedicels present.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, cuneate, asymmetrical, dorsally compressed, 6–12 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes free, membranous, 5–9 mm long, 5–7 -veined, ciliate on margins, lobed, 2–4 -fid, mucronate. Companion sterile spikelet lemmas 2–4, exserted from glumes, 2–4 mm long, dentate, 1-awned, with 2 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 6–12 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes free, shorter than spikelet. Lower glume oblong, asymmetrical, membranous, pallid, 1-keeled, 7 -veined. Lower glume margins ciliate. Lower glume apex lobed, 2 -fid, awned, 1–3 -awned, awn dorsal, awn 3–6 mm long. Upper glume oblong, asymmetrical, 0.75 length of adjacent fertile lemma, membranous, pallid, 1-keeled, 7 -veined. Upper glume margins ciliate. Upper glume apex lobed, 2 -fid, awned, 1–3 -awned, awn dorsal, awn 3–6 mm long.

**Florets.** Fertile florets bisexual. Fertile lemma lanceolate, laterally compressed, 6–12 mm long, membranous, keeled, 3 -veined, 0–3 -veined. Lemma apex lobed, 2 -fid, incised 0.25 of lemma length, acute, awned, 1 -awned. Principal lemma awn from a sinus, 4 mm long overall.

**Flower and Fruit.** Lodicules 2, 0.1 mm long. Anthers 3, 4–4.5 mm long.

**Distribution (TDWG). Continent.** North America.

**Country /Province /State. Southwestern USA, South-central USA, Mexico.** Arizona, California, Nevada, Utah. New Mexico. Northeast Mexico, Northwest Mexico, Southwest Mexico.

Chihuahua. Baja California, Sonora. Oaxaca.

### ***Hilaria semplei* Sohns. *Journ. Wash. Acad. Sci.* xlvi. 319 (1956).**

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Mexico. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: A.T. Semple s.n., Nov 1955, Mexico: Michoacan: Llanos de Antuquez, ca. 12 mi E of Apatzingan, elev. 1000 ft (US-2183565; IT:US-2378480).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): In honor of A. T. Semple (fl.1955) who collected in Mexico.

**Classification.** Subfamily Chloridoideae. Tribe: Cynodonteae.

**Habit, Vegetative Morphology.** Perennial. Stolons present. Culms erect, 20–35 cm long. Culm-nodes bearded. Leaf-sheaths striately veined, pilose, with tubercle-based hairs. Ligule an eciliate membrane, 0.5–1 mm long. Leaf-blades 2.5–15 cm long, 1–2.5 mm wide. Leaf-blade surface pilose, hairy on both sides, with tubercle-based hairs. Leaf-blade margins scabrous.

**Inflorescence.** Inflorescence composed of racemes. Racemes borne along a central axis, closely spaced, in a multilateral false spike, cuneate, unilateral, 0.8–1 cm long, bearing a triad of spikelets. Central

inflorescence axis 2–4 cm long. Rhachis obsolete, deciduous from axis. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets sessile, 2 in the cluster.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, cuneate, asymmetrical, dorsally compressed, 4.5–6 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes united below, coriaceous, 7 -veined, pilose, lobed, 2 -fid, muticous. Companion sterile spikelet lemmas 2, exserted from glumes, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 8–10 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes connate along margins below, shorter than spikelet, firmer than fertile lemma. Lower glume oblong, 4–5 mm long, coriaceous, pallid, 1-keeled, 7 -veined. Lower glume apex lobed, 2 -fid, awned, 1 -awned, awn 6–7 mm long. Upper glume oblong, 6–7 mm long, coriaceous, pallid, 1-keeled, 7 -veined. Upper glume apex lobed, 2 -fid, awned, 1 -awned, awn 6–7 mm long.

**Florets.** Fertile florets female. Fertile lemma ovate, laterally compressed, 8–10 mm long, cartilaginous, keeled, 3 -veined, 0–3 -veined. Lemma apex caudate.

**Flower and Fruit.** Anthers 3.

**Distribution (TDWG). Continent.** North America.

**Country /Province /State.** Mexico. Southwest Mexico.

Michoacan.

### **Hilaria swallenii** Cory. *Wrightia*, i. 215 (1948).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from USA. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: TYPE: O.R. Sperry T778, 28 Jul 1938, USA: Texas: Jeff Davis Co.: Musquiz Canyon (US-1839917).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 25 Poaceae, part 2 (2003) (279).

**Derivation** (Clifford & Bostock 2007): in honor of Jason Richard Swallen (1903–1991) United States botanist.

**Classification.** Subfamily Chloridoideae. Tribe: Cynodonteae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Stolons present. Culms erect, 10–30 cm long. Culm-internodes distally glabrous. Culm-nodes bearded. Leaves mostly basal. Leaf-sheaths scaberulous. Ligule an eciliate membrane, 2–2.2 mm long. Leaf-blades flat or involute, 4–8 cm long, 1–2 mm wide. Leaf-blade surface ribbed, scabrous, rough on both sides.

**Inflorescence.** Inflorescence composed of racemes. Racemes 2–8, borne along a central axis, closely spaced, in a multilateral false spike, oblong, unilateral, 0.6–0.8 cm long, bearing a triad of spikelets. Central inflorescence axis 1–4 cm long. Rhachis obsolete, deciduous from axis. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets sessile, 2 in the cluster.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, oblong, asymmetrical, dorsally compressed, 6.5–8 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes united below, coriaceous, thinner on margins, glandular, 7 -veined, tuberculate, lobed, 2 -fid, obtuse, muticous. Companion sterile spikelet lemmas 2, exserted from glumes, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 6.5–8 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes connate along margins below, shorter than spikelet, firmer than fertile lemma. Lower glume oblong, asymmetrical, coriaceous, much thinner above, much thinner on margins, black, glandular, 1-keeled, 7 -veined. Lower glume surface tuberculate. Lower glume apex lobed, 2 -fid, awned, 1 -awned, awn 5–6 mm long. Upper glume oblong, asymmetrical, coriaceous, much thinner above, with membranous margins, black, glandular, 1-keeled, 7 -veined. Upper glume surface tuberculate. Upper glume apex lobed, 2 -fid, awned, 1 -awned, awn 5–6 mm long.

**Florets.** Fertile florets female. Fertile lemma ovate, laterally compressed, 6–7.5 mm long, cartilaginous, keeled, 3 -veined, 0–3 -veined. Lemma apex caudate.

**Flower and Fruit.** Anthers 3, 3–3.5 mm long.

$n = 36$  (1 ref TROPICOS).  $2n = 54$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** North America.

**Country /Province /State. South-central USA, Mexico.** New Mexico, Texas. Northeast Mexico.

Coahuila, Chihuahua, Durango, Neuvo Leon, San Luis Potosi, Zacatecas.

### **Himalayacalamus asper** C.M.A.Stapleton. *Edinburgh J. Bot.*, 51(3): 310 (1994).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Nepal. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Nepal: Kaski Distr.: Karuwa, Pipar, 28.26N 83.57E, 2000 m, 16 Nov 1983, C.M.A. Stapleton 314 (HT: E).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. rough. Plants with rough pedicels or leaf-blades.

**Classification.** Subfamily Bambusoideae. Tribe: Arundinarieae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo, caespitose. Rhizomes short, pachymorph. Butt sheaths absent. Culms drooping at the tip, 500–600 cm long, 10–20 mm diam., woody, without nodal roots. Culm-internodes terete, thin-walled, 20–30 cm long, striate, smooth, distally pruinose. Lateral branches dendroid. Branch complement many. Culm-sheaths present, deciduous, 25 cm long, 2 times as long as wide, coriaceous, without auricles, glabrous on shoulders. Culm-sheath ligule 6 mm high, lacerate. Culm-sheath blade triangular, demarcated but persistent, reflexed, 5–7 cm long, 4–6 mm wide, pubescent. Leaves 5–6 per branch. Leaf-sheaths glabrous on surface, outer margin glabrous. Leaf-sheath oral hairs scanty or setose. Ligule an eciliate membrane, 1 mm long, with a secondary abaxial membrane, obtuse. Collar with external ligule. Leaf-blade base with a brief petiole-like connection to sheath, petiole glabrous. Leaf-blades lanceolate, 10–17 cm long, 10–20 mm wide. Leaf-blade venation without cross veins. Leaf-blade surface glabrous. Leaf-blade margins scabrous. Leaf-blade apex acuminate. Flowering specimens unknown.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State. Indian Subcontinent.** Nepal.

### **Himalayacalamus brevinodus** C.M.A.Stapleton. *Edinburgh J. Bot.*, 51(3): 312 (1994).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Nepal. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Nepal: Dhankuta District: Pakhribas, 27:03'N, 87:17'E, 1500 m, 11 Jan 1990, C.M.A. Stapleton 908 (HT: E).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *brevis*, short; *nodus*, knot. Culms with short internodes.

**Classification.** Subfamily Bambusoideae. Tribe: Arundinarieae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo, caespitose, clumped densely. Rhizomes short, pachymorph. Butt sheaths absent. Culms drooping at the tip, 500–900 cm long, 10–25 mm diam., woody, without nodal roots. Culm-internodes terete, thin-walled, 10–19 cm long, yellow, smooth, distally pruinose. Culm-nodes flush with internodes or swollen. Lateral branches dendroid. Bud complement 3. Branch complement many. Culm-sheaths present, deciduous, 25 cm long, 2 times as long as wide, glabrous, without auricles, glabrous on shoulders. Culm-sheath ligule 2 mm high, dentate. Culm-sheath blade triangular, demarcated but persistent, erect, 8 cm long, 4 mm wide, glabrous on surface. Leaves 5–6 per branch. Leaf-sheaths glabrous on surface, outer margin glabrous. Leaf-sheath oral hairs lacking. Ligule an eciliate membrane, 1 mm long, pubescent on abaxial surface, truncate. Collar with external ligule. Leaf-blade base with a brief petiole-like connection to sheath, petiole glabrous or pubescent. Leaf-blades lanceolate, 10–20 cm long, 15–25 mm wide. Leaf-blade venation without cross veins. Leaf-blade surface glabrous. Leaf-blade margins scabrous. Leaf-blade apex acuminate. Flowering specimens unknown.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State. Indian Subcontinent.** Nepal.

**Himalayacalamus collaris** (T.P. Yi) D.Ohrnberger. *Bamboos of the World Intro.* 3: 14 (1996).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**TYPE** from China. **Basionym or Replaced Name:** *Fargesia collaris* T.P. Yi, *J. Bamboo Res.*, 2(2): 21 (1983). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: China, Nyalam xian,Zhangmu: Zhou Mingliang 01.

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 127).

**Derivation** (Clifford & Bostock 2007): L. *collum*, neck; -*are*, pertaining to. The apices of the culm leaf-sheaths contract to a small collar.

**Classification.** Subfamily Bambusoideae. Tribe: Arundinarieae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo. Rhizomes short (3–4.5cm), pachymorph. Butt sheaths absent. Culms 200–600 cm long, 10–35 mm diam., woody. Culm-internodes terete, thin-walled, 17–28 cm long, glaucous, ridged, distally mealy. Lateral branches dendroid. Branch complement many. Culm-sheaths present, deciduous but leaving a persistent girdle, coriaceous, brown, glabrous, hairy on margins, asymmetrical at apex, without auricles, glabrous on shoulders. Culm-sheath ligule 1 mm high, entire. Culm-sheath blade triangular, reflexed, hispid. Leaves 3–4 per branch. Leaf-sheaths glabrous on surface. Leaf-sheath oral hairs lacking. Leaf-sheath auricles absent. Ligule an eciliate membrane, 1 mm long, purple, obtuse. Leaf-blade base cuneate or broadly rounded, with a brief petiole-like connection to sheath. Leaf-blades linear, 2–12.5 cm long, 3–19 mm wide. Leaf-blade venation with 6–8 secondary veins, without cross veins. Leaf-blade surface scaberulous, rough abaxially. Leaf-blade margins scabrous. Flowering specimens unknown.

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State.** China. Tibet. **Indian Subcontinent.** Nepal.

**Himalayacalamus cupreus** C.M.A.Stapleton. *Edinburgh J. Bot.*, 51(3): 314 (1994).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Nepal. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Nepal: Kaski District: Karuwa, Pipar, 286N, 83:57'E, 2500 m, 12 Nov 1983, C.M.A. Stapleton 306 (HT: E).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. coppery. Cilia of leaf-blades copper-colored.

**Classification.** Subfamily Bambusoideae. Tribe: Arundinarieae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo, caespitose, clumped densely. Rhizomes short, pachymorph. Butt sheaths absent. Culms drooping at the tip or pendulous at the tip, 500–800 cm long, 20–30 mm diam., woody, without nodal roots. Culm-internodes terete, thin-walled, 30–40 cm long, smooth, distally pruinose. Lateral branches dendroid. Branch complement many. Culm-sheaths present, deciduous, 25–34 cm long, 4 times as long as wide, glabrous, without auricles, glabrous on shoulders. Culm-sheath ligule 0.5–1 mm high, ciliate (coppery hairs). Culm-sheath blade linear, demarcated but persistent, erect, 10–15 cm long, 7–8 mm wide. Leaves 5–66 per branch. Leaf-sheaths glabrous on surface, outer margin glabrous. Leaf-sheath oral hairs lacking. Ligule an eciliate membrane, 1–1.5 mm long, pubescent on abaxial surface. Collar with external ligule. Leaf-blade base with a brief petiole-like connection to sheath, petiole glabrous. Leaf-blades lanceolate, 10–20 cm long, 15–25 mm wide. Leaf-blade venation with obscure cross veins. Leaf-blade surface glabrous. Leaf-blade margins scabrous. Leaf-blade apex acuminate. Flowering specimens unknown.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State.** **Indian Subcontinent.** Nepal.

**Himalayacalamus falconeri** (Hook.f. ex Munro) P.C. Keng. *J. Bamboo Res.*, 2(1): 24: (1983).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae* 5 (2000), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**TYPE** from Nepal. **Basionym or Replaced Name:** *Thamnochalamus falconeri* Munro, *Trans. Linn. Soc. London* 26(1): 34 (1868)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *N. Wallich* 5040, 1821, Nepal: Kathmandu, Sheopore [Shivapuri], 8000 ft (K; IT: E, US-79433).

ST: *Strachey & Winterbottom s.n.*, Himalaya: Kumaon, Madhari Pass, alt. 8000 ft

ST: *Hooker* 1326, Kalapanee alt. 5,300 ped.

**Recent Synonyms:** *Arundinaria falconeri* (Hook. f. ex Munro) Duthie, *Grasses N.-W. Ind.* 46 (1883).

**Illustrations (Books):** H.J.Noltie, *The Grasses of Bhutan* (2000) (506, Fig. 5 & 508, Fig. 6), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 101).

**Derivation** (Clifford & Bostock 2007): in honor of Hugh Falconer (1808–1865) Scots-born Indian physician and botanist.

**Classification.** Subfamily Bambusoideae. Tribe: Arundinarieae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo, caespitose. Rhizomes short, pachymorph. Butt sheaths absent. Culms 400–500 cm long, 15–20 mm diam., woody, without nodal roots. Culm-internodes terete, thin-walled, 20–35 cm long, smooth, distally pruinose. Lateral branches dendroid. Branch complement many. Culm-sheaths present, 20–30 cm long, 4 times as long as wide, chartaceous, yellow, pubescent, truncate at apex. Culm-sheath ligule brown. Culm-sheath blade linear, reflexed, 7–13 cm long. Leaf-sheaths glabrous on surface, outer margin hairy. Leaf-sheath oral hairs pubescent. Ligule an eciliate membrane, obtuse. Collar with external ligule. Leaf-blade base with a brief petiole-like connection to sheath, petiole 0.2 cm long. Leaf-blades linear or oblong, 7–15 cm long, 12–20 mm wide, dark green. Leaf-blade midrib evident. Leaf-blade venation with 6–8 secondary veins, without cross veins. Leaf-blade surface smooth. Leaf-blade margins scabrous.

**Inflorescence.** Inflorescence composed of racemes, subtended by a spatheole, embraced at base by subtending leaf. Racemes 1, single, 2.5 cm long, bearing few fertile spikelets, bearing 5–7 fertile spikelets on each. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension or with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, laterally compressed, 10–12 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet. Lower glume oblong, chartaceous, without keels, 3–5 -veined. Lower glume apex acute, muticous or mucronate. Upper glume oblong, 7–9 mm long, chartaceous, without keels, 3–5 -veined. Upper glume apex acute, muticous or mucronate.

**Florets.** Fertile lemma ovate, 8–9 mm long, chartaceous, without keel, 5–7 -veined, more than 3-veined. Lemma margins ciliolate, hairy above. Lemma apex mucronate. Palea 1 length of lemma, 4 -veined. Palea apex pubescent, with excurrent keel veins. Rhachilla extension pilose, hairy at tip. Apical sterile florets distinct from fertile, 1 in number, rudimentary.

**Flower and Fruit.** Lodicles 3, veined, ciliate. Anthers 3, purple. Stigmas 3. Ovary glabrous. Caryopsis with adherent pericarp, oblong, sulcate on hilar side, apex unappendaged.

**Distribution (TDWG). Continent.** Europe (\*), Temperate Asia, Tropical Asia, Australasia (\*).

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **China.** Tibet. **Indian Subcontinent.** Eastern Himalaya, India, Nepal. **New Zealand** (\*). New Zealand North I.

Arunachal Pradesh, Bhutan, Sikkim. Uttah Pradesh, West Bengal. Himachal Pradesh.

### **Himalayacalamus fimbriatus** C.M.A.Stapleton. *Edinburgh J. Bot.*, 51(3): 316 (1994).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Nepal. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Nepal: Kathmandu, 1200 m, 16 Jan 1990, *Stapleton* 910 (HT: E).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. fimbriae*, fringe; -ata, possessing. With ligule fringed.

**Classification.** Subfamily Bambusoideae. Tribe: Arundinarieae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo, caespitose, clumped densely. Rhizomes short, pachymorph. Butt sheaths absent. Culms drooping at the tip, 400–700 cm long, 10–18 mm diam., woody, without nodal roots. Culm-internodes terete, thin-walled, 20–27 cm long, estriate, smooth, distally pruinose. Culm-nodes swollen. Lateral branches dendroid. Bud complement 3. Branch complement many. Culm-sheaths present, deciduous, 19 cm long, 4 times as long as wide, green and purple, distinctly mottled

with last colour, pubescent, hairy at the base, with tawny hairs, hairy on margins, without auricles, glabrous on shoulders. Culm-sheath ligule 5 mm high, fimbriate. Culm-sheath blade linear, demarcated but persistent, erect, 3–5 cm long, 2–4 mm wide. Leaves 6–7 per branch. Leaf-sheaths glabrous on surface, outer margin hairy. Leaf-sheath oral hairs setose, spreading, 2 mm long. Leaf-sheath auricles absent or falcate. Ligule an eciliate membrane, 5 mm long, pubescent on abaxial surface, obtuse or acute. Collar with external ligule. Leaf-blade base with a brief petiole-like connection to sheath, petiole glabrous or pubescent. Leaf-blades lanceolate, 10–20 cm long, 10–20 mm wide. Leaf-blade venation without cross veins. Leaf-blade surface glabrous. Leaf-blade margins scabrous. Leaf-blade apex acuminate. Flowering specimens unknown.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State. Indian Subcontinent.** Nepal.

**Himalayacalamus hookerianus** (Munro) C.M.A. Stapleton. *Bamboo Soc. Newslett.*, 17: 21: (1993).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online (as *Sinarundinaria*), W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from India. **Basionym or Replaced Name:** *Arundinaria hookeriana* Munro, *Trans. Linn. Soc. London* 26(1): 29 (1868)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: LT: *Hooker f. s.n.*, Dec 1848, India: Sikkim, Neongong, 6800 ft, Praong, 4000–6000 ft, eaten seed (K). LT designated by Stapleton, Edinb. J. Bot. 51: 318 (1995).

**Recent Synonyms:** *Sinarundinaria hookeriana* (Munro) C.S.Chao & S.A.Renvoize, *Kew Bull.*, 44(2): 358 (1989). *Chimonobambusa hookeriana* (Munro) Nakai, *Journ. Arnold Arb.* 6: 151 (1925).

**Illustrations (Books):** H.J.Noltie, *The Grasses of Bhutan* (2000) (506, Fig. 5 & 508, Fig. 6).

**Derivation** (Clifford & Bostock 2007): L. -*ana*, indicating connection. In honor of Joseph Dalton Hooker (1817–1911), English botanist, traveller and Garden's Director.

**Classification.** Subfamily Bambusoideae. Tribe: Arundinarieae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo, caespitose. Rhizomes short, pachymorph. Butt sheaths absent. Culms 500–900 cm long, 17–36 mm diam., woody, without nodal roots. Culm-internodes terete, thin-walled, 15–20 cm long, glaucous, distally pruinose. Lateral branches dendroid. Branch complement many. Culm-sheaths present, 30–40 cm long, 4 times as long as wide, chartaceous, truncate at apex. Culm-sheath ligule 3–5 mm high, dentate. Culm-sheath blade linear, 7–15 cm long. Leaf-sheaths striately veined, glabrous on surface, outer margin hairy. Leaf-sheath oral hairs lacking. Ligule an eciliate membrane, acute. Collar dark, with external ligule. Leaf-blade base with a brief petiole-like connection to sheath, petiole 0.3–0.5 cm long. Leaf-blades linear or lanceolate, 15–30 cm long, 12–36 mm wide, glaucous, glandular. Leaf-blade midrib prominent beneath. Leaf-blade venation with 8–16 secondary veins, without cross veins. Leaf-blade surface scabrous, rough adaxially. Leaf-blade margins scabrous. Leaf-blade apex acuminate, filiform, antrorsely scabrous.

**Inflorescence.** Synflorescence on a separate leafless culm.

Inflorescence composed of racemes, subtended by bracts. Racemes 1, single, arcuate. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension or with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, laterally compressed, 8–9 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet. Lower glume oblong, 2–3 mm long, chartaceous, without keels, 3 -veined. Lower glume surface pubescent, hairy at apex. Lower glume apex acute. Upper glume oblong, 5 mm long, chartaceous, without keels, 5 -veined. Upper glume apex acute, mucronate.

**Florets.** Fertile lemma ovate, 7 mm long, chartaceous, without keel, 3 -veined, 0–3 -veined. Lemma lateral veins prominent. Lemma surface scabrous, rough between veins. Palea 2 -veined. Palea apex ciliate. Apical sterile florets distinct from fertile, 1 in number, rudimentary.

**Flower and Fruit.** Lodicles 3, veined, ciliate. Anthers 3. Ovary glabrous. Caryopsis with adherent pericarp, ellipsoid, 7.5 mm long, apex unappendaged.

**Distribution (TDWG). Continent.** Europe (\*), Tropical Asia.

**Region.** Northern Europe (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Indian Subcontinent.** Assam, Eastern Himalaya. Darjeeling, Bhutan, Sikkim. Andhra Pradesh.

### **Himalayacalamus planatus** Stapleton. J. Bot. Res. Inst. Texas 1(1): 137–138, 140, f. 1 (2007).

**Basionym or Replaced Name:** Nepal. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Rasuwa District: Syabru (ca. 28°2'N, 85°8'E), elev. ca. 8000 ft., 7 Oct 1984, Stapleton 328 (HT: K).

**Illustrations:** None found.

**Classification.** Subfamily Bambusoideae. Tribe: Arundinarieae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo, caespitose, clumped densely. Rhizomes short, pachymorph. Butt sheaths absent. Culms drooping at the tip or pendulous at the tip, 200–500 cm long, 5–15 mm diam., woody, without nodal roots. Culm-internodes terete, thick-walled, 15–20 cm long, smooth. Culm-nodes flush with internodes, without obvious supra-nodal ridge. Lateral branches dendroid. Branch complement several. Culm-sheaths present, deciduous, 18 cm long, 1 length of internode, smooth, hairy on margins, convex at apex, without auricles, glabrous on shoulders. Culm-sheath ligule 5 mm high, lacerate. Culm-sheath blade lanceolate, demarcated but persistent or deciduous, reflexed, 2–4 cm long, 1–2 mm wide. Leaf-sheaths glabrous on surface, outer margin glabrous or hairy. Leaf-sheath oral hairs scanty. Ligule an eciliate membrane, 1 mm long, pubescent on abaxial surface, obtuse. Collar without external ligule. Leaf-blade base with a brief petiole-like connection to sheath, petiole glabrous. Leaf-blades lanceolate, 7–13 cm long, 5–10 mm wide. Leaf-blade venation with 4–6 secondary veins, without cross veins. Leaf-blade surface glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Synflorescence bractiferous, clustered at the nodes, in untidy tufts, with glumaceous subtending bracts, with axillary buds at base of spikelet, prophyllate below lateral spikelets.

**Fertile Spikelets.** Spikelets comprising 1(–2) fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets, or of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, laterally compressed, 7–9 mm long, breaking up at maturity, disarticulating below each fertile floret. Floret callus woolly.

**Glumes.** Glumes persistent, similar, shorter than spikelet. Lower glume lanceolate, 3.5–4.5 mm long, 1 length of upper glume, membranous. Lower glume margins ciliolate. Upper glume lanceolate, 3.5–4.5 mm long, 0.5 length of adjacent fertile lemma, membranous. Upper glume margins ciliolate.

**Florets.** Fertile lemma lanceolate, 7–9 mm long. Lemma surface smooth, woolly, hairy at base. Lemma margins ciliolate, hairy above. Palea keels smooth. Rhachilla extension 4 mm long. Apical sterile florets 1 in number, rudimentary.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State. Indian Subcontinent.** Nepal.

### **Himalayacalamus porcatus** C.M.A. Stapleton. *Edinburgh J. Bot.*, 51(3): 318 (1994).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Nepal. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Nepal: Rasuwa Distr.: Syabru, 28°08'N, 85°21'E, 7500 ft, 8 Oct 1984, C.M.A. Stapleton 332 (HT: E).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. porca*, ridge between two furrows; *-ata*, possessing. Ridged as of culms or glumes.

**Classification.** Subfamily Bambusoideae. Tribe: Arundinarieae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo, caespitose, clumped densely. Rhizomes short, pachymorph. Butt sheaths absent. Culms drooping at the tip, 300–600 cm long, 10–25 mm diam., woody, without nodal roots. Culm-internodes terete, thin-walled, 15–30 cm long, mid-green, ridged, distally pruinose. Culm-nodes swollen. Lateral branches dendroid. Bud prophyll 1-keeled. Branch complement many. Culm-sheaths present, deciduous, 5 times as long as wide, coriaceous, glabrous, without auricles, setose on shoulders, shoulders with straight hairs, shoulders with 6 mm long hairs. Culm-sheath ligule 1–4 mm high, lacerate. Culm-sheath blade linear, demarcated but persistent, erect, 2–5 cm long, 2

mm wide. Leaf-sheaths striately veined, glabrous on surface, outer margin glabrous or hairy. Leaf-sheath oral hairs setose, erect, 2–4 mm long, pale. Ligule an eciliate membrane, 1–4 mm long, glabrous on abaxial surface or pubescent on abaxial surface, truncate or acute. Collar with external ligule. Leaf-blade base with a brief petiole-like connection to sheath, petiole pubescent. Leaf-blades lanceolate, 9–19 cm long, 6–12 mm wide. Leaf-blade surface glabrous or pubescent, hairy abaxially.

**Inflorescence.** Inflorescence a panicle. Panicle open, contracted about primary branches. Panicle branches with insignificant pulvini. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 3–9 mm long.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, laterally compressed, 9–11 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet. Lower glume lanceolate, 7–9 mm long, chartaceous, without keels. Lower glume apex acute. Upper glume elliptic, 7–9 mm long, chartaceous, without keels. Upper glume apex acute.

**Florets.** Fertile lemma 8–10 mm long, chartaceous, without keel, more than 3-veined. Lemma surface scabrous, inner surface glabrous or pubescent. Lemma margins ciliolate, hairy above. Palea 9–11 mm long, 1.1 length of lemma, 2 -veined, without keels. Palea apex entire. Rhachilla extension 2–4 mm long. Apical sterile florets distinct from fertile, 1 in number, rudimentary.

**Flower and Fruit.** Lodicules 3. Anthers 3. Caryopsis with adherent pericarp, 6.5 mm long, apex unappendaged.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State. Indian Subcontinent.** Nepal.

### **Hitchcockella baronii** A. Camus. *Compt. Rend.* cl i. 253 (1925).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Madagascar. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database:  
**TYPE MATERIAL:** *Baron* 6108, no date, Madagascar (US-79099).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Richard Baron (1847–1907) English cleric who collected in Madagascar.

**Classification.** Subfamily Bambusoideae.

**Habit, Vegetative Morphology.** Perennial. Butt sheaths absent. Culms scandent, zigzag, 1–1.5 mm diam., woody. Culm-internodes terete. Lateral branches suffrutescent. Branch complement three or several. Culm-sheaths present. Ligule a ciliolate membrane. Leaf-blades lanceolate, 2.5–3 cm long, 5–7 mm wide. Leaf-blade venation without cross veins.

**Inflorescence.** Synflorescence bractiferous, scanty, with foliaceous subtending bracts, without axillary buds at base of spikelet, with ultimate bract subtending a compact bracteolate fascicle of spikelets.

Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, laterally compressed, 12 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet. Lower glume lanceolate, 6 mm long, 0.7–0.8 length of upper glume, chartaceous, 1-keeled, 7 -veined. Lower glume apex acuminate, awned, 1 -awned, awn 2 mm long. Upper glume lanceolate, 7–8 mm long, 0.6–0.9 length of adjacent fertile lemma, chartaceous, 1-keeled, 7–9 -veined. Upper glume apex acuminate, awned, 1 -awned, awn 2 mm long.

**Florets.** Basal sterile florets 1, barren, without significant palea, persisting on inflorescence. Lemma of lower sterile floret similar to upper glume, elliptic, 7–9 mm long, chartaceous, without keels, 7 -veined, pubescent on midvein, ciliolate on margins, acuminate, awned. Awn of lower sterile floret 1–1.5 mm long. Fertile lemma ovate, laterally compressed, 8–12 mm long, chartaceous, keeled, 13 -veined, more than 3-veined. Lemma midvein pubescent. Lemma margins pubescent. Lemma apex acuminate. Palea ovate, chartaceous, 8 -veined. Palea keels approximate, pubescent. Palea surface pubescent, hairy on flanks. Palea apex acuminate.

**Flower and Fruit.** Lodicules 3, membranous. Anthers 6. Stigmas 2. Ovary glabrous. Caryopsis with adherent pericarp.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State. Western Indian Ocean.** Madagascar.

### **Holcolemma canaliculatum** (Nees ex Steud.) Stapf & C.E. Hubb. *Kew Bull.* 1929, 246 (1929).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. **Basionym or Replaced Name:** *Panicum canaliculatum* Nees ex Steud., *Syn. Pl. Glumac.* 1: 55 (1854)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: HT: *Wright 1624*, India (P; IT: K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *canalis*, channel; *-ula*, diminutive; *-ata*, possessing.

**Classification.** Subfamily Panicoideae. Tribe: Paniceae. Subtribe Cenchrinae.

**Habit, Vegetative Morphology.** Perennial. Culms rambling, slender, 20–60 cm long. Ligule a ciliolate membrane. Leaf-blades 3–8 cm long, 2–5 mm wide, flaccid. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, interrupted, 3–14 cm long. Primary panicle branches appressed, 0.3–1 cm long, bearing spikelets almost to the base, sterile at the tips (2–2.5mm bristle). Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, acute, 2.5–3 mm long, falling entire.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume oblate, 0.25 length of spikelet, hyaline, without keels, 3 -veined. Lower glume apex acute. Upper glume ovate, 0.33 length of spikelet, hyaline, without keels, 3 -veined. Upper glume apex obtuse.

**Florets.** Basal sterile florets 1, male, with palea. Lemma of lower sterile floret ovate, 1 length of spikelet, membranous, 7 -veined, sulcate, acute. Palea of lower sterile floret becoming indurate on keels at maturity, winged on keels. Fertile lemma elliptic, 2–2.5 mm long, indurate, without keel. Lemma surface granulose, rugulose. Lemma margins involute. Lemma apex acute. Palea involute, indurate. Palea surface rugose.

**Flower and Fruit.** Anthers 3, 1 mm long.

**Distribution (TDWG).** Continent. Tropical Asia.

**Country /Province /State. Indian Subcontinent.** India, Sri Lanka.

Tamilnadu.

### **Holcolemma dispar** W.D. Clayton. *Kew Bull.*, 42(2): 402 (1987).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

**TYPE** from Australia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: LT: *F. Mueller s.n.*, Australia: ad flumen Dawsoni (MEL; ILT: K). LT designated (as holotype) by ?; cited by Webster, *Sida* 16: 443 (1995).

**Illustrations:** None found.

**Images:** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002);

**Derivation** (Clifford & Bostock 2007): L. unequal. Glumes unequal in length or nerve number.

**Classification.** Subfamily Panicoideae. Tribe: Paniceae. Subtribe Cenchrinae.

**Habit, Vegetative Morphology.** Perennial. Culms geniculately ascending or decumbent, slender, 10–50 cm long. Ligule a ciliolate membrane. Leaf-blades 2–10 cm long, 1–2 mm wide. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate, 5–12 cm long, contracted about primary branches. Primary panicle branches ascending or spreading, simple, 2 cm long or 3 cm long, sterile at the tips (1.5–3mm bristle). Panicle branches secund. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 0.1–0.2 mm long.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, acute, 3–4 mm long, falling entire.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume oblate, gibbous, 0.25 length of spikelet, membranous, without keels, 7 -veined. Lower glume lateral veins ribbed. Lower glume apex obtuse. Upper glume oblong, 0.6–0.7 length of spikelet, membranous, without keels, 11 -veined. Upper glume lateral veins ribbed. Upper glume apex obtuse.

**Florets.** Basal sterile florets 1, male, with palea. Lemma of lower sterile floret oblong, 1 length of spikelet, membranous, 7 -veined, sulcate, acute. Palea of lower sterile floret becoming indurate on keels at maturity, winged on keels. Fertile lemma elliptic, 1.5–1.7 mm long, indurate, without keel. Lemma surface granulose, rugose. Lemma margins involute. Lemma apex acute, mucronate. Palea involute, indurate. Palea surface rugose.

**Flower and Fruit.** Anthers 3.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State. Australia.** Queensland.

North, Central.

### **Holcolemma inaequale** W.D. Clayton. *Kew Bull.*, 32(4): 773 (1978).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Kenya. **Basionym or Replaced Name:** *Panicum inaequale* F. Muell. *Fragm.* 8: 189 (1874). T:<Type of Basionym>; fide TROPICOS and Kew Synonymy Database: HT: Polhill & Paulo 564, 25 Sept 1961, Kenya: Kurawa (K).

**Illustrations (Books):** T.A.Cope, in M.Thulin, *Poaceae* (Gramineae). *Flora of Somalia* (1995) (236, Fig 136).

**Derivation** (Clifford & Bostock 2007): L. *in-*, not; *aequalis*, equal.

**Classification.** Subfamily Panicoideae. Tribe: Paniceae. Subtribe Cenchrinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rootstock evident. Culms decumbent, 30–60 cm long. Ligule a ciliolate membrane. Leaf-blades 4–15 cm long, 2–4 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, interrupted, 5–17 cm long, contracted about primary branches. Primary panicle branches simple, 0.2–1.3 cm long, bearing 1–12 fertile spikelets on each lower branch, bearing spikelets almost to the base, sterile at the tips. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 2.5–3.5 mm long, falling entire.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume oblate, 0.3 length of spikelet, membranous, without keels, 3 -veined. Lower glume apex obtuse. Upper glume ovate, 0.5 length of spikelet, membranous, without keels, 3–5 -veined. Upper glume apex obtuse.

**Florets.** Basal sterile florets 1, male, with palea. Lemma of lower sterile floret unlike other scales, oblong, 1 length of spikelet, herbaceous, 5–7 -veined, sulcate, obtuse. Palea of lower sterile floret becoming indurate on keels at maturity, winged on keels. Fertile lemma ovate, gibbous, 1–1.3 mm long, indurate, without keel, 5 -veined, more than 3-veined. Lemma surface granulose, rugose. Lemma margins involute. Lemma apex obtuse. Palea involute, indurate.

**Flower and Fruit.** Anthers 3. Caryopsis with adherent pericarp, ellipsoid, dorsally compressed. Embryo 0.5 length of caryopsis. Hilum punctiform.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. Northeast Tropical Africa, East Tropical Africa.** Somalia. Kenya, Tanzania.

### **Holcolemma transiens** (K.Schum.) Stapf & C. E. Hubbard. *Kew Bull.* 1929, 246. (1929).

**Accepted by:** U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Kenya. **Basionym or Replaced Name:** *Setaria transiens* K. Schum., *Pflanzenw. Ost-Afrikas* 5C: 105 (1895)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Fischer I* 92, Kenya: Masai Highlands (B).

**Illustrations (Books):** R.M.Polhill, F.T.E.A., *Gramineae* (3)(1982):519, Fig.126).

**Derivation** (Clifford & Bostock 2007): L. *transeō*, pass by. Annual species.

**Classification.** Subfamily Panicoideae. Tribe: Paniceae. Subtribe Cenchrinae.

**Habit, Vegetative Morphology.** Annual. Culms erect, 60 cm long. Ligule a ciliolate membrane. Leaf-blades 5–20 cm long, 3–5 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear, interrupted, 5–12 cm long, contracted about primary branches. Primary panicle branches simple, 0.2–0.6 cm long, bearing 1–10 fertile spikelets on each lower branch, bearing spikelets almost to the base, sterile at lowest node or sterile at the tips. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets oblong, dorsally compressed, 2.5–3 mm long, falling entire.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume oblate, 0.3 length of spikelet, hyaline, without keels, 3 -veined. Lower glume apex obtuse. Upper glume ovate, 0.5 length of spikelet, hyaline, without keels, 3 -veined. Upper glume apex obtuse.

**Florets.** Basal sterile florets 1, barren, with palea. Lemma of lower sterile floret unlike other scales, oblong, 1 length of spikelet, herbaceous, 9–13 -veined, sulcate, obtuse. Palea of lower sterile floret becoming indurate on keels at maturity, winged on keels. Fertile lemma ovate, gibbous, 1–1.3 mm long, indurate, without keel, 5 -veined, more than 3-veined. Lemma surface granulose. Lemma margins involute. Lemma apex obtuse. Palea involute, indurate.

**Flower and Fruit.** Anthers 3. Caryopsis with adherent pericarp, ellipsoid, dorsally compressed. Embryo 0.5 length of caryopsis. Hilum punctiform.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. East Tropical Africa.** Tanzania.

### **Holcus annuus** Salzm. ex C.A. Mey. *Verz. Pfl. Cauc.* :17 (1831).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980) (as *H. setiglumis*), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. **Basionym or Replaced Name:** *Holcus setigumis* Boiss. & Reut., *Diagn. Pl. Nov. Hisp.* 27 (1842). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Russia, Saratov Is.: Meyer (LE holo).

**Recent Synonyms:** *Holcus setosus* Trin., *Mem. Acad. Imp. Sci. St. Petersbourg, ser. 6, Sci. Math., Seconde Pt. Sci. Nat.* 3: 87 (1839).

**Illustrations (Books):** N.Feinbrun-Dothan, *Flora Palaestina* 4 (1986) (Pl. 268), L.Boulos, *Flora of Egypt* 4 (2005) (166, Fig 46), J.P.Jessop, G.R.M. Dashorst & F.M.James, *Grasses of South Australia* (2006) (as *H. setosus*).

**Images:** D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia. CD-Rom Version 1.0.* (2002); (as *H. setosus*).

**Derivation** (Clifford & Bostock 2007): L. annual. Annuals.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect or geniculately ascending, 20–100 cm long. Culm-nodes pubescent. Leaf-sheaths pubescent. Ligule an eciliate membrane. Leaf-blades 2–8 cm long, 1–4 mm wide. Leaf-blade surface pubescent, densely hairy, hairy on both sides.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, elliptic, 5–8 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 3–5 mm long, falling entire. Rhachilla internodes elongated below proximal fertile floret.

**Glumes.** Glumes similar, exceeding apex of florets, thinner than fertile lemma. Lower glume lanceolate, 3–5 mm long, 1 length of upper glume, chartaceous, 1-keeled, 1 -veined. Lower glume primary vein ciliate. Lower glume lateral veins absent. Lower glume surface pubescent. Lower glume apex acute, awned, 1 -awned, awn 0.5–1 mm long. Upper glume elliptic, 3–5 mm long, 2 length of adjacent fertile lemma, chartaceous, 1-keeled, 3 -veined. Upper glume primary vein ciliate. Upper glume lateral veins ribbed. Upper glume surface pubescent. Upper glume apex acute, awned, 1 -awned, awn 1.5–6 mm long.

**Florets.** Fertile lemma elliptic, 1.5–2 mm long, cartilaginous, shiny, 3–5 -veined, 0–3 -veined or more than 3-veined. Lemma lateral veins obscure. Lemma apex obtuse. Palea 1 length of lemma. Apical sterile florets 1 in number, male, elliptic, 1.5–2 mm long. Apical sterile lemmas awned, 1 -awned. Apical sterile lemma awns dorsal, hooked, 2–3 mm long (exserted).

**Flower and Fruit.** Anthers 3, 1.5 mm long. Ovary glabrous.

$n = 7$  (1 ref TROPICOS).  $2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG).** Continent. Europe, Africa, Temperate Asia, Australasia.

**Region.** Northern Europe (\*), Southwestern Europe, Southeastern Europe.

**Country /Province /State.** : GB Aliens (Ryves et al.) : Spain. : Greece, Italy. Northern Africa. Egypt (\*), Morocco, Tunisia. Caucasus, Western Asia. Transcaucasus. East Aegean Is, Lebanon-Syria, Palestine, Israel & Jordan, Turkey. Australia (\*). South Australia (as *H. setosus*), Victoria (as *H. setosus*).

Southern.

### **Holcus gayanus** Boiss. *Voy. Bot. Espagne*, 637. t. 173 C. (1845).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from Spain. **Basionym or Replaced Name:** *Holcus tenuis* Gay, non Trin(1821), *Journ. Bot.* 67: 109 (1929). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: : Based on *H. tenuis* Gay ; Spain, Pena de Santa Anna: Durieu (K iso).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Jacques Gay (1786–1864) French civil servant and botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Annual. Culms geniculately ascending or decumbent, 8–40(–75) cm long. Culm-nodes glabrous. Leaf-sheaths loose, pubescent. Ligule an eciliate membrane, 1–2.5 mm long, pubescent on abaxial surface, erose or lacerate. Leaf-blades flat or convolute, 3–40 cm long, 0.5–3 mm wide, mid-green or grey-green. Leaf-blade surface pubescent.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, oblong, 1–6 cm long, 1–2 cm wide. Panicle branches pubescent. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 2 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic or oblong, laterally compressed, 6–11 mm long, falling entire, readily shedding fertile florets. Floret callus pubescent.

**Glumes.** Glumes similar, exceeding apex of florets, thinner than fertile lemma. Lower glume lanceolate, 5.5–8.5 mm long, 0.75–1 length of upper glume, chartaceous, 1-keeled, 1 -veined. Lower glume primary vein scaberulous. Lower glume lateral veins absent. Lower glume apex setaceously acuminate. Upper glume lanceolate or ovate, 6–11 mm long, 2.5–3.5 length of adjacent fertile lemma, chartaceous, 1-keeled, 3 -veined. Upper glume primary vein scabrous. Upper glume surface scabrous, rough on veins. Upper glume apex setaceously acuminate.

**Florets.** Fertile florets all alike or with the lowest dissimilar. Lowest fertile lemma muticous or awned. Fertile lemma ovate, 2.4–3 mm long, cartilaginous, shiny, without keel, 5 -veined, more than 3-veined. Lemma apex acute, awned, 1 -awned. Principal lemma awn subapical, geniculate, 6–8 mm long overall, clearly exserted from spikelet, with twisted column. Palea 1 length of lemma. Rhachilla extension 0.3 mm long, pubescent.

**Flower and Fruit.** Anthers 3, 2–2.5 mm long. Ovary glabrous. Caryopsis 2 mm long.

$n = 4$  (1 ref TROPICOS).  $2n = 8$  (8 refs TROPICOS).

**Distribution (TDWG).** Continent. Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** : Portugal.

## **Holcus grandiflorus** Boiss. & Reut. *Pugill. Pl. Nov.* 119. (1852).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from Spain. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Spain, Algeciras: Boissier & Reuter (K iso).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. grandis*, large; *flos*, flower. Spikelets with more florets than those of related species.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Culms erect or geniculately ascending, 60–75 cm long. Culm-internodes distally glabrous. Leaf-sheaths glabrous on surface. Ligule an eciliate membrane, 1–2 mm long. Leaf-blades 3–7 mm wide. Leaf-blade surface glabrous. Leaf-blade margins glabrous or ciliate.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate or oblong, loose, 5–15 cm long, 1–3 cm wide. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 7–8 mm long, falling entire. Rhachilla internodes elongated below proximal fertile floret.

**Glumes.** Glumes similar, exceeding apex of florets, thinner than fertile lemma. Lower glume elliptic, 7–8 mm long, 1 length of upper glume, chartaceous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume surface pubescent, hairy on veins. Lower glume apex acuminate. Upper glume elliptic, 7–8 mm long, 2 length of adjacent fertile lemma, chartaceous, 1-keeled, 3 -veined. Upper glume surface pubescent, hairy on veins. Upper glume apex acuminate.

**Florets.** Fertile lemma elliptic, 3.5–4 mm long, cartilaginous, shiny, keeled, keeled above, 3–5 -veined, 0–3 -veined or more than 3-veined. Lemma lateral veins obscure. Lemma apex obtuse, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5 way up back of lemma, geniculate, 1.5–2 mm long overall, with twisted column. Palea 1 length of lemma. Apical sterile florets 1 in number, male, elliptic, 3.5–4 mm long. Apical sterile lemmas awned, 1 -awned. Apical sterile lemma awns subapical, geniculate, 1–2 mm long.

**Flower and Fruit.** Anthers 3. Ovary glabrous.

*n* = 7 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe.

**Region.** Southwestern Europe.

**Country /Province /State.** : Spain.

## **Holcus lanatus** Linn. *Sp. Pl.* 1048. (1753).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae* 5 (2000), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), T.G.Tutin et al, *Flora Europaea* 5 (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983), T.Koyama, *Grasses of Japan and its neighboring regions* (1987), W.D.Clayton & N.Snow, *Key to Pacific Grasses* (2010).

**TYPE** from Europe. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Habitat in Europae pasenisis arenosis, typ. cons.

LT: *Anon.*, (LINN-1212.10). LT designated by Cope in Jarvis et al., *Regnum Veg.* 127: 54 (1993), typ. cons.. ST: *van Royen s.n.*, (L).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 2 Pooideae (2012) (254), C.E.Hubbard, *Grasses* (1968) (262), T. Cope & A. Gray, *Grasses of the British Isles* (78), N.N.Tsvelev, *Grasses of the Soviet Union* (1983) (437 (295), Pl.5), L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (86, Fig. 57), G.E.Gibbs Russell el al, *Grasses of Southern Africa* (1990) (180, Fig. 106), T.Koyama, *Grasses of Japan and its neighbouring regions* (1987) (162, Fig 55), H.J.Noltie, *The Grasses of Bhutan* (2000) (591, Fig. 23), J.P.Jessop, G.R.M. Dashorst & F.M.James, *Grasses of South Australia* (2006) (225, Fig. 169), C.A.Gardner, *Flora of Western Australia*, Vol 1, Part 1, *Gramineae* (1952)

(40, Pl 10), N.Walsh & T.Entwistle, *Flora of Victoria* Vol 2 (1994) (458, Fig. 89), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (275), J.C.Tothill,& J.B.Hacker. *The grasses of southern Queensland* (1983) (264), T.D.Stanley & E.Ross, *Flora of South East Queensland, Gramineae* (1989) (123, Fig. 19), A.Wilson (ed.), *Flora of Australia*, Vol 44A. *Poaceae* (2009) (138, Fig. 21), D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia*. CD-Rom Version 1.0. (2002), W.L.Wagner et al., *Manual of the Flowering Plants of Hawai'i*, Vol. 2 (1990) (1549, Pl. 229), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 *Poaceae*, part 1 (2007) (740), S.A.Renvoize, *Gramineas de Bolivia* (1998) (167, Fig. 40), E.G.Nicora, *Los Generos de Gramineas de America Austral* (1987) (233, Fig. 71), L.B. Smith, D.C. Wasshausen, R.M. Klein *Flora Illustrada Catarinensis Gramineas* (1981–1982) (445, Fig. 94 & 451, Fig. 96), W.Burger, *Flora Costaricensis* 15, *Gramineae: Fieldiana Botany New Series* 4 (1980) (258, Fig. 92), A.L.Cabrera, *Flora de la Provincia de Buenos Aires, IV Pt 2 Gramineas* (1970) (152, Fig. 40), M.N.Correa, *Flora Patagonica Parte III, Gramineas* (1978) (215, Fig. 141), B.Rosengurtt, *Gramineas Uruguayas I* (1970), S-L Chen et al, *Flora of China, Illustrations, Poaceae* (2007) (Fig. 452), E.Hafliger & E.Schultz, *Grass Weeds*, CIBA-GEIGY (2:83(1980)).

**Illustrations (Journals):** *Ruizia* (13:160, Fig 17i-k (1993)).

**Images:** D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia*. CD-Rom Version 1.0. (2002);, R.Darke, *Ornamental Grasses* (2004);, R.Darke, *The Encyclopaedia of Grasses for Liveable Landscapes* (2007);, F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999).

**Derivation** (Clifford & Bostock 2007): *L. lana*, wool; -*ata*, possessing. Leaf-blades densely pubescent.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect or geniculately ascending, 20–80(–120) cm long, 2–5-noded. Culm-internodes distally pubescent. Culm-nodes pubescent. Leaf-sheaths pilose, with reflexed hairs. Ligule an eciliate membrane, 1–2.5(–4) mm long. Leaf-blades 4–20 cm long, 3–10 mm wide, mid-green or grey-green. Leaf-blade surface pubescent, densely hairy, hairy on both sides.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate or oblong or ovate, dense or loose, (3–)7–14(–17) cm long, 1–8 cm wide. Panicle branches pubescent. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 1–4 mm long.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 4–6 mm long, falling entire. Rhachilla internodes elongated below proximal fertile floret. Floret callus pilose.

**Glumes.** Glumes similar, exceeding apex of florets, thinner than fertile lemma. Lower glume lanceolate, 4–6 mm long, 1 length of upper glume, chartaceous, 1-keeled, 1-veined. Lower glume primary vein ciliate. Lower glume lateral veins absent. Lower glume surface asperulous. Lower glume apex obtuse or acute. Upper glume elliptic, 4–6 mm long, 2 length of adjacent fertile lemma, chartaceous, 1-keeled, 3-veined. Upper glume primary vein ciliate. Upper glume surface asperulous, pubescent, hairy on veins. Upper glume apex obtuse, mucronate.

**Florets.** Fertile lemma elliptic, 2–2.5 mm long, cartilaginous, shiny, keeled, keeled above, 3–5-veined, 0–3-veined or more than 3-veined. Lemma lateral veins obscure. Lemma apex obtuse. Palea 1 length of lemma. Apical sterile florets 1 in number, male, elliptic, 2–2.5 mm long. Apical sterile lemmas awned, 1-awned. Apical sterile lemma awns subapical, hooked, 1–2 mm long (enclosed by glumes).

**Flower and Fruit.** Anthers 3, 1.6–2.5 mm long. Ovary glabrous.

$n = 7$  (6 refs TROPICOS).  $2n = 14$  (12 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa, Temperate Asia, Tropical Asia, Australasia (\*), Pacific, North America, South America, Antarctica.

**Region. Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe.**

**Country /Province /State.** : Denmark, Finland, Foroyar, Great Britain, Iceland, Ireland, Northern Ireland, Norway, Svarlbad, Sweden. : Austria, Liechtenstein, Belgium, Luxembourg, Czechoslovakia, Germany, Hungary, Netherlands, Poland, Switzerland. : Baleares, Corsica, Channel Islands, France, Monaco, Portugal, Sardinia, Andorra, Gibralter, Spain. : Albania, Bulgaria, Greece, Italy, San Marino, Vatican, Crete, Romania, Malta, Sicily, Turkey Europe, Yugoslavia. Belarus, Estonia, Kalingrad, Latvia, Lithuania, Baltic States, Krym, Central European Russia, East European Russia, South European Russia, Northwest European Russia, Moldova, Ukraine. **Northern Africa, Macaronesia, Southern Africa (\*)**, **Middle Atlantic Ocean.** Algeria, Morocco, Tunisia. Azores, Canary Is, Madeira, Selvagens. Northern

Cape, Western Cape. Russian Far East, **Caucasus, Western Asia, China, Eastern Asia**. Amur, Kuril Is. China South Central, China Southeast. Japan Hokkaido, or Honshu, or Shikoku, or Kyushu. Japan, Taiwan. **Indian Subcontinent, Malesia.** Eastern Himalaya. Borneo, Java. **Australia** (\*), **New Zealand** (\*). Western Australia (\*), South Australia (\*), Queensland (\*), New South Wales (\*), A.C.T. (\*), Victoria (\*), Tasmania (\*). Chatham Is, Kermadec Is, New Zealand North I, New Zealand South I, Stewart Is, Campbell Is, Auckland Is. **North-central Pacific.** Hawaii (\*). **Subarctic America, Western Canada, Eastern Canada, Northwest USA, North-central USA, Northeast USA, Southwestern USA, Southeastern USA, Mexico.** Aleutian Is. British Columbia. New Brunswick, Nova Scotia, Ontario. Colorado, Idaho, Montana, Oregon, Washington, Wyoming. Illinois, Iowa, Kansas, Nebraska, Oklahoma, Wisconsin. Connecticut, Indiana, Maine, Massachusetts, Michigan, Ohio, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia. Arizona, California, Nevada, Utah. Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, District of Columbia. Central Mexico, Northeast Mexico, Gulf (Mexico), Southwest Mexico, Southeast Mexico. **Mesoamerica, Caribbean, Northern South America, Western South America, Brazil, Southern South America.** Costa Rica, Panama. Haiti, Jamaica. Venezuela. Bolivia, Colombia, Ecuador, Peru. Brazil Southeast, Brazil South. Argentina Northeast, Argentina South, Chile Central, Uruguay. **Subantarctic islands.** Amsterdam-St Paul Is, Falkland Is (Malvinas), Tristan de Cunha.

Jiangxi. Yunnan. Darjeeling, Bhutan. Meghalaya. West Bengal. South-West. Southern. Central, South East. Coast, Tablelands. Sao Paulo. Rio Grande do Sul, Santa Catarina. Buenos Aires, Chaco. Chubut, Neuquén, Río Negro, Santa Cruz, Tierra del Fuego. La Araucania. Mexico State, Puebla. Chihuahua. Veracruz. Michoacan. Chiapas.

### **Holcus mollis** Linn. *Syst. ed. X.* 1305. (1759).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae 5* (2000), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), T.G.Tutin et al, *Flora Europaea 5* (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Europe. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: LT: (LINN-1212.9). LT designated by Cope in Cafferty et al., *Taxon* 49(2): 251 (2000).

**Illustrations (Books):** C.E.Hubbard, *Grasses* (1968) (264), T. Cope & A. Gray, *Grasses of the British Isles* (79), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler, *Grasses of New South Wales*, 4th edn (2008) (275), E.Hafliger & E.Schultz, *Grass Weeds*, CIBA-GEIGY (2:84(1980)).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. *Grasses of Australia*. CD-Rom Version 1.0. (2002);, R.Darke, *Ornamental Grasses* (2004);, R.Darke, *The Encyclopaedia of Grasses for Liveable Landscapes* (2007);,

**Derivation** (Clifford & Bostock 2007): L. soft. Softly hairy usually of leaf-blades.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect or geniculately ascending, 20–110 cm long, 4–7 -noded. Culm-internodes distally glabrous. Culm-nodes bearded. Leaf-sheaths pilose, with reflexed hairs. Ligule an eciliate membrane, 1–5 mm long. Leaf-blades 4–20 cm long, 3–12 mm wide, mid-green or grey-green. Leaf-blade surface glabrous or pubescent.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong or ovate, dense or loose, 4–12(–22) cm long. Panicle branches pubescent. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 1–4 mm long.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, (3.5–)5–7 mm long, falling entire. Rhachilla internodes elongated below proximal fertile floret. Floret callus bearded.

**Glumes.** Glumes similar, exceeding apex of florets, thinner than fertile lemma. Lower glume lanceolate, (3.5–)5–7 mm long, 1 length of upper glume, chartaceous, 1-keeled, 1 -veined. Lower glume primary vein ciliolate. Lower glume lateral veins absent. Lower glume surface asperulous. Lower glume apex acute. Upper glume elliptic, (3.5–)5–7 mm long, 2 length of adjacent fertile lemma, chartaceous, 1-keeled, 3 -veined. Upper glume primary vein ciliolate. Upper glume surface asperulous, pubescent, hairy on veins. Upper glume apex acute, mucronate.

**Florets.** Fertile lemma elliptic, (2.2–)2.5–3 mm long, cartilaginous, shiny, keeled, keeled above, 5 - veined, more than 3-veined. Lemma lateral veins obscure. Lemma surface glabrous or puberulous, hairy above. Lemma apex obtuse. Palea 1 length of lemma. Apical sterile florets 1 in number, male, elliptic, 2.5–3 mm long. Apical sterile lemmas awned, 1 -awned. Apical sterile lemma awns subapical, straight, 3.5–5 mm long (exserted).

**Flower and Fruit.** Anthers 3, 1.6–2.7 mm long. Ovary glabrous.

$n = 14$  (1 ref TROPICOS).  $2n = 21$  (1 ref TROPICOS), or 28 (1 ref TROPICOS), or 35 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa, Tropical Asia, Australasia (\*), North America.

**Region. Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe.**

**Country /Province /State.** : Denmark, Finland, Foroyar, Great Britain, Ireland, Northern Ireland, Norway, Sweden. : Austria, Liechstenstein, Belgium, Luxembourg, Czechoslovakia, Germany, Hungary, Netherlands, Poland, Switzerland. : Corsica, Channel Islands, France, Monaco, Portugal, Andorra, Gibralter, Spain. : Albania, Bulgaria, Greece, Italy, San Marino, Vatican, Romania, Malta, Turkey Europe, Yugoslavia. Belarus, Estonia, Kalingrad, Latvia, Lithuania, Baltic States, Central European Russia, South European Russia, Northwest European Russia, Moldova, Ukraine. **Northern Africa, Macaronesia, West-Central Tropical Africa.** Morocco. Azores, Madeira. **Indian Subcontinent.** Sri Lanka. **Australia (\*)**, **New Zealand (\*)**. New South Wales (\*), Victoria (\*), Tasmania (\*). Chatham Is, New Zealand South I, Stewart Is. **Western Canada, Northwest USA, Northeast USA, Southwestern USA.** Oregon, Wyoming. New York. California.

Meghalaya. Coast, Tablelands.

### **Holcus notarisii** Nym. Syll. 441 (1855).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from Italy. **Basionym or Replaced Name:** *Holcus setiger* DeNot. ex Parl., non Nees(1832), *Fl. Ital.* 1: 65 (1848). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: : Based on *H. setiger* Parl. ; Italy, Genoa: De Notaris.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Giuseppe de Notaris (1805–1872) Italian botanist.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect or geniculately ascending, 20–80 cm long. Culm-internodes distally pubescent. Culm-nodes pubescent. Leaf-sheaths pilose, with reflexed hairs. Ligule an eciliate membrane, 1–2.5(–4) mm long. Leaf-blades 3–10 mm wide, mid-green or grey-green. Leaf-blade surface pubescent, densely hairy, hairy on both sides.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate or oblong, dense or loose, 7–14 cm long, 1–8 cm wide. Panicle branches pubescent. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 4–6 mm long, falling entire. Rhachilla internodes elongated below proximal fertile floret. Floret callus pilose.

**Glumes.** Glumes similar, exceeding apex of florets, thinner than fertile lemma. Lower glume lanceolate, 4–6 mm long, 1 length of upper glume, chartaceous, 1-keeled, 1 -veined. Lower glume primary vein ciliate. Lower glume lateral veins absent. Lower glume surface asperulous. Lower glume apex obtuse or acute, awned, 1 -awned, awn 1–2 mm long. Upper glume elliptic, 4–6 mm long, 2 length of adjacent fertile lemma, chartaceous, 1-keeled, 3 -veined. Upper glume primary vein ciliate. Upper glume surface asperulous, pubescent, hairy on veins. Upper glume apex obtuse, awned, 1 -awned, awn 1.5–2.5 mm long.

**Florets.** Fertile lemma elliptic, 2–2.5 mm long, cartilaginous, shiny, keeled, keeled above, 3–5 -veined, 0–3 -veined or more than 3-veined. Lemma lateral veins obscure. Lemma apex obtuse, muticous. Palea 1 length of lemma. Apical sterile florets 1 in number, male, elliptic, 2–2.5 mm long. Apical sterile lemmas awned, 1 -awned. Apical sterile lemma awns subapical, geniculate, 1–2 mm long (exserted fromn glumes).

**Flower and Fruit.** Anthers 3. Ovary glabrous.

**Distribution (TDWG). Continent.** Europe.

**Region.** Southeastern Europe.

**Country /Province /State.** : Italy.

### **Holcus rigidus** Hochst. ex Seub. *Fl. Azor.* 17. (1844).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.G.Tutin et al, *Flora Europaea* 5 (1980).

**TYPE** from Azores. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Azores, Fayal Is.: Hochstetter 127 (K iso).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. stiff. Culms, spikelets or inflorescence branches held stiffly erect.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Culms 15–40 cm long. Culm-nodes pubescent. Leaves distichous. Leaf-sheaths longer than adjacent culm internode, pubescent. Ligule an eciliate membrane, 2 mm long. Leaf-blades spreading, 3–8 cm long, 2–5 mm wide, stiff. Leaf-blade surface glabrous.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, lanceolate or oblong, 2–7 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 4–5 mm long, falling entire. Rhachilla internodes elongated below proximal fertile floret. Floret callus pilose.

**Glumes.** Glumes similar, exceeding apex of florets, thinner than fertile lemma. Lower glume elliptic, 4–5 mm long, 1 length of upper glume, chartaceous, 1-keeled, 1 -veined. Lower glume primary vein ciliolate. Lower glume lateral veins absent. Lower glume apex acuminate. Upper glume elliptic, 4–5 mm long, 2 length of adjacent fertile lemma, chartaceous, 1-keeled, 3 -veined. Upper glume primary vein ciliolate. Upper glume apex acuminate, mucronate.

**Florets.** Fertile lemma ovate, 2.5 mm long, cartilaginous, shiny, keeled,keeled above, 3–5 -veined, 0–3 -veined or more than 3-veined. Lemma lateral veins obscure. Lemma apex obtuse. Palea 1 length of lemma. Apical sterile florets 1 in number, male, ovate, 2.5 mm long. Apical sterile lemmas awned, 1 -awned. Apical sterile lemma awns dorsal, straight, 3.5–4 mm long.

**Flower and Fruit.** Anthers 3. Ovary glabrous.

**Distribution (TDWG). Continent.** Europe, Africa.

**Region.** Southwestern Europe.

**Country /Province /State.** Macaronesia. Azores.

### **Holcus setiger** Nees. *Linnaea*, vii. 278. (1832).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

**TYPE** from Italy. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Italy, Genoa: De Notaris.

**Illustrations:** None found.

**Images:** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002);.

**Derivation** (Clifford & Bostock 2007): L. *seta*, bristle; *gero*, carry. Glumes shortly aristate.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Annual, culms solitary or caespitose. Culms 15–30 cm long. Culm-nodes pubescent. Leaf-sheaths pubescent. Ligule an eciliate membrane. Leaf-blades 7.5–14 cm long, 1–4.5 mm wide. Leaf-blade surface puberulous.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, lanceolate or elliptic, 3–10 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, pubescent.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 3–4 mm long, falling entire. Rhachilla internodes elongated below proximal fertile floret. Floret callus pilose.

**Glumes.** Glumes similar, exceeding apex of florets, thinner than fertile lemma. Lower glume elliptic, 3–4 mm long, 1 length of upper glume, chartaceous, 1-keeled, 1 -veined. Lower glume lateral veins absent. Lower glume surface puberulous. Lower glume apex acuminate, awned, 1 -awned, awn 0.5–1 mm long. Upper glume oblong, 3–4 mm long, 2 length of adjacent fertile lemma, chartaceous, 1-keeled, 3 -veined. Upper glume surface puberulous. Upper glume apex entire or dentate, 2 -fid, acuminate, awned, 1 -awned, awn 2–6 mm long.

**Florets.** Fertile lemma ovate, 1.7 mm long, cartilaginous, shiny, keeled, keeled above, 3–5 -veined, 0–3 -veined or more than 3-veined. Lemma lateral veins obscure. Lemma apex obtuse. Palea 1 length of lemma. Apical sterile florets 1 in number, barren, linear, 1 mm long. Apical sterile lemmas awned, 1 -awned. Apical sterile lemma awns dorsal, geniculate, 2 mm long.

**Flower and Fruit.** Anthers 3. Ovary glabrous.

**Distribution (TDWG). Continent.** Europe (\*), Africa, Australasia (\*).

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Southern Africa, Middle Atlantic Ocean.** Northern Cape, Western Cape. St Helena. **Australia** (\*). Western Australia (\*).

South-West.

### **Holttumochloa korbuensis** K.M. Wong. *Kew Bull.*, 48(3): 520 (1993).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Malaysia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Malaya, Gunung Korbu: Symington KEP 31496 (KEP holo).

**Illustrations (Journals):** *Kew Bulletin* (48 (3): 522, Fig. 3 (1993)).

**Derivation** (Clifford & Bostock 2007): L. -*ensis*, denoting origin. From Gunong Korbu, Malaysia.

**Classification.** Subfamily Bambusoideae. Tribe: Bambuseae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo, caespitose. Rhizomes short, pachymorph. Butt sheaths absent. Culms 40 mm diam., woody, without nodal roots. Culm-internodes terete, thin-walled. Lateral branches dendroid. Branch complement many. Culm-sheaths present. Leaves cauline. Ligule a ciliolate membrane, 0.5 mm long. Collar with external ligule. Leaf-blade base with a brief petiole-like connection to sheath, petiole 0.1–0.2 cm long. Leaf-blades lanceolate, 3.5–7.5 cm long, 6–10 mm wide. Leaf-blade apex acuminate.

**Inflorescence.** Synflorescence bractiferous, linear, with glumaceous subtending bracts, with axillary buds at base of spikelet, prophyllate below lateral spikelets.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, laterally compressed, 10–12 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes definite, 2 mm long.

**Glumes.** Glumes several, comprising 1–2 gemmiferous bracts, 1 empty glumes.

**Florets.** Fertile lemma ovate, 4–5 mm long, without keel, more than 3-veined. Lemma margins ciliolate. Lemma apex acute. Palea 3–4 mm long, 10 -veined. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Lodicles 3, membranous, glabrous. Anthers 6, 1–1.5 mm long, anther tip smooth. Filaments free. Stigmas 3. Ovary umbonate, pubescent on apex.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State.** Malesia. Malaya.

### **Holttumochloa magica** (Ridl.) K.M. Wong. *Kew Bull.*, 48(3): 520: (1993).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Malaysia. **Basionym or Replaced Name:** *Bambusa magica* Ridl., *J. Straits Branch Roy. Asiat. Soc.* 44: 208 (1905)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Wray 1560*, Malay Peninsula: Pahang, Gunong Brumbun (SING; IT: CAL, K).

**Illustrations (Journals):** *Kew Bulletin* (48 (3): 519, Fig. 1 and 521, Fig. 2 (1993)).

**Derivation** (Clifford & Bostock 2007): Gk *magos*, Persian dream interpreter; *-ica*, belonging to. Here a reference to the occult, the species being used to make love charms.

**Classification.** Subfamily Bambusoideae. Tribe: Bambuseae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo, caespitose. Rhizomes short, pachymorph. Butt sheaths absent. Culms 300–500 cm long, woody, without nodal roots. Culm-internodes terete, thin-walled, 30–60 cm long. Lateral branches dendroid. Branch complement many, in a clump. Culm-sheaths present, 15–25 cm long, hispid, with dark brown hairs, convex at apex, auriculate, setose on shoulders. Culm-sheath blade lanceolate, reflexed, 10 cm long, 3 mm wide. Leaf-sheath oral hairs lacking or ciliate. Ligule an eciliate membrane. Collar with external ligule. Leaf-blade base with a brief petiole-like connection to sheath. Leaf-blades lanceolate, 8–16 cm long, 8–15 mm wide, mid-green and glaucous, discolored with last colour beneath. Leaf-blade surface glabrous.

**Inflorescence.** Synflorescence bractiferous, clustered at the nodes, in untidy tufts, with glumaceous subtending bracts and foliaceous subtending bracts, bracts 20–30 mm long, with axillary buds at base of spikelet, prophylate below lateral spikelets.

**Fertile Spikelets.** Spikelets comprising 4 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, laterally compressed, 20–25 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes definite, flattened, 3–5 mm long, pubescent.

**Glumes.** Glumes several, 1 empty glumes.

**Florets.** Fertile lemma lanceolate, 10–15 mm long, without keel, more than 3-veined. Lemma margins ciliolate. Lemma apex apiculate. Palea keels ciliolate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Lodicles 3, 4–5 mm long, ciliate. Anthers 6, 4–5 mm long. Ovary umbonate.

**Distribution (TDWG).** Continent. Tropical Asia.

**Country /Province /State.** Malesia. Malaya.

### **Holttumochloa pubescens** K.M. Wong. *Kew Bull.*, 48(3): 523 (1993).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Malaysia. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: HT: Whitmore FRI-12444, Malay Peninsula: Kelantan, Gunong Stong, summit (KEP).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. pubesco*, become hairy. Plant whole or in part hairy.

**Classification.** Subfamily Bambusoideae. Tribe: Bambuseae.

**Habit, Vegetative Morphology.** Perennial, woody bamboo, caespitose. Rhizomes short, pachymorph. Butt sheaths absent. Culms 46 mm diam., woody, without nodal roots. Culm-internodes terete, thin-walled, distally glabrous. Lateral branches dendroid. Branch complement many, with subequal branches. Culm-sheaths present. Leaves cauline. Leaf-sheath oral hairs ciliate, 2–3 mm long. Leaf-sheath auricles falcate. Ligule a ciliolate membrane, 0.1–1.5 mm long. Collar with external ligule. Leaf-blade base with a brief petiole-like connection to sheath, petiole 0.1–0.15 cm long. Leaf-blades lanceolate, 5–11 cm long, 4–10 mm wide. Leaf-blade surface puberulous, hairy abaxially. Leaf-blade apex acuminate. Flowering specimens unknown.

**Distribution (TDWG).** Continent. Tropical Asia.

**Country /Province /State.** Malesia. Malaya.

### **Homolepis aturensis** (Kunth) Chase. *Proc. Biol Soc. Washington*, 24: 146 (1911).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Venezuela. **Basionym or Replaced Name:** *Panicum aturense* H. B. & K., *Nov. Gen. et Sp.* 1: 103. t. 33. (1815). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: HT: F.W.H.A. von Humboldt & A.J.A. Bonpland s.n., May, Venezuela: Amazonas: cataractas Atures (P-Bonpl.; IT: US-80535 (fragm. ex P-Bonpl.)).

**Illustrations (Books):** S.A.Renvoize, *Gramineas de Bolivia* (1998) (414, Fig 88), J.A.Steyermark et al, *Flora of the Venezuelan Guayana* Vol. 8 (2004) (119, Fig. 79), W.Burger, *Flora Costaricensis* 15, Gramineae: *Fieldiana Botany New Series* 4 (1980) (260, Fig 93), G.Harling & C.Persson, *Flora of Ecuador* (2006) (78: 33, Fig. 2 (2006)), E.Judziewicz, *Flora of the Guianas*, 187. *Poaceae* (1990) (261, Fig 44).

**Illustrations (Journals):** *Kew Bulletin* (974, Fig.2 (2002)), *Ruizia* (13:328, Fig. 40e-f (1993)), *Rodriguesia* (63: 937, Fig.3 (2012)).

**Derivation** (Clifford & Bostock 2007): L. *-ense*, denoting origin. From "cataractus Aturensis" on the Atabapo river, Venezuela.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Arthropogoninae.

**Habit, Vegetative Morphology.** Perennial, short-lived. Stolons present. Culms erect or geniculately ascending, 20–50 cm long, 1–2 mm diam. Ligule a ciliolate membrane, 0.4–0.7 mm long. Leaf-blade base broadly rounded. Leaf-blades linear or lanceolate, 4–12 cm long, 7–20 mm wide. Leaf-blade surface glabrous or pubescent.

**Inflorescence.** Inflorescence a panicle. Panicle open, elliptic, 6–9 cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, filiform.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 7–8 mm long, falling entire.

**Glumes.** Glumes similar, exceeding apex of florets, thinner than fertile lemma. Lower glume ovate, 1 length of upper glume, 1 length of spikelet, membranous, without keels, 7–9 -veined. Lower glume lateral veins ribbed. Lower glume apex acute. Upper glume ovate, membranous, without keels, 7 -veined. Upper glume lateral veins without ribs. Upper glume margins ciliate (near base). Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, with palea. Lemma of lower sterile floret ovate, 5–7 mm long, membranous, 7 -veined, ciliate on margins, acute. Fertile lemma lanceolate, 5–6 mm long, cartilaginous, without keel, 5 -veined, more than 3-veined. Lemma margins flat. Lemma apex acute. Palea 1 length of lemma, cartilaginous.

**Flower and Fruit.** Anthers 3, 1.3–1.6 mm long.

$2n = 20$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** North America, South America.

**Country /Province /State. Mexico.** Central Mexico, Gulf (Mexico), Southwest Mexico, Southeast Mexico. **Mesoamerica, Caribbean, Northern South America, Western South America, Brazil.** Belize, Costa Rica, Guatemala, Honduras, Nicaragua, Panama. Trinidad-Tobago. French Guiana, Venezuela. Bolivia, Colombia, Ecuador, Peru. Brazil Northeast, Brazil North, Brazil Southeast.

Para, Amapa, Amazonas, Acre, Rondonia. Pernambuco. Acre, Amapa, Amazonas, Pará. Minas Gerais, Sao Paulo. Puebla. Veracruz. Oaxaca. Chiapas, Tabasco.

### **Homolepis glutinosa** Lam., nonSw.(1788). *Smithsonian Contr. Bot.* 59: 19 (1985).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Jamaica. **Basionym or Replaced Name:** *Panicum glutinosum* Sw., *Prodr.* 24 (1788)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *O.P. Swartz s.n.*, Jamaica (S; IT: BAA (fragm.), BM, US-80678 (fragm. ex M,S & photo)).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 1, Aristidoideae a Pharoideae (2012) (322), A.S.Hitchcock, *Manual of the Grasses of the West Indies* (1936) (275, Fig. 244 as *Panicum glutinosum*), S.A.Renvoize, *Gramineas de Bolivia* (1998) (405, Fig. 86 as *Panicum glutinosum*), J.A.Steyermark et al, *Flora of the Venezuelan Guayana* Vol. 8 (2004) (119, Fig. 80 as *Homolepis glutinosa*), L.B. Smith, D.C. Wasshausen, R.M. Klein *Flora Illustrada Catarinensis Gramineas* (1981–1982) (703, Fig. 150 as *Homolepis glutinosa*), F.O.Zuloaga et al, *Flora del Paraguay* 23 (1994) (161, Fig. 45 as *Homolepis glutinosa*), E.Judziewicz, *Flora of the Guianas*, 187. *Poaceae* (1990) (261 Fig 44).

**Derivation** (Clifford & Bostock 2007): L. *gluten*, glue; *-osa*, abundance. Spikelets sticky.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Arthropogoninae.

**Habit, Vegetative Morphology.** Perennial. Culms decumbent, 100–200 cm long. Leaf-sheaths glabrous on surface or pilose. Ligule a ciliate membrane. Leaf-blades linear or lanceolate, 15–50 cm long, 15–25 mm wide. Leaf-blade surface glabrous or pubescent.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, 15–30 cm long. Primary panicle branches whorled at lower nodes. Panicle branches stiff. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets obovate, dorsally compressed, subacute, 3 mm long, falling entire.

**Glumes.** Glumes similar, reaching apex of florets, thinner than fertile lemma. Lower glume ovate, 1 length of spikelet, membranous, viscid, without keels, 5 -veined. Lower glume apex acute. Upper glume ovate, 1 length of spikelet, membranous, viscid, without keels, 5 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, with palea. Lemma of lower sterile floret similar to upper glume, ovate, 1 length of spikelet, membranous, 5 -veined, acute. Fertile lemma oblong, dorsally compressed, 3 mm long, indurate, pallid, shiny, without keel, more than 3-veined. Lemma margins involute. Lemma apex obtuse. Palea involute, indurate.

**Flower and Fruit.** Hilum linear, 0.5 length of caryopsis.

**Distribution (TDWG). Continent.** North America, South America.

**Country /Province /State. Mexico.** Central Mexico, Northeast Mexico, Gulf (Mexico), Southwest Mexico, Southeast Mexico. **Mesoamerica, Caribbean, Northern South America, Western South America, Brazil, Southern South America.** Costa Rica, Guatemala, Honduras, Nicaragua, Panama. Cuba, Dominican Republic, Haiti, Jamaica, Puerto Rico. Venezuela. Bolivia, Colombia, Ecuador, Galapagos, Peru. Brazil West Central, Brazil Northeast, Brazil Southeast, Brazil South. Paraguay.

Minas Gerais, Rio de Janeiro, Espírito Santo, São Paulo Paraná, Catarina, Rio Grande do Sul. Distrito Federal. Bahia. Minas Gerais, Rio de Janeiro, São Paulo. Paraná. Corrientes, Misiones. Puebla. Hidalgo. Veracruz. Oaxaca. Chiapas, Tabasco.

### **Homolepis isocalycina** (Meyer) Chase. *Proc. Biol Soc. Washington*, 24: 117 (1911).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Guyana. **Basionym or Replaced Name:** *Panicum isocalycinum* G. F. W. Mey., *Prim. Fl. Esseq.* 59. (1818). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Guyana, Essequibo: Meyer (LE holo).

**Illustrations (Books):** S.A.Renvoize, *The Grasses of Bahia*, 1984 (110, Fig. 39), J.A.Steyermark et al, *Flora of the Venezuelan Guayana* Vol. 8 (2004) (119, Fig. 81), E.Judziewicz, *Flora of the Guianas*, 187. *Poaceae* (1990) (261, Fig 44).

**Derivation** (Clifford & Bostock 2007): Gk. *isos*, equal; *kalyx*, cup; *-ina*, belonging to. Glumes similar in size and shape.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Arthropogoninae.

**Habit, Vegetative Morphology.** Annual or perennial, short-lived. Culms decumbent or rambling, 40–140(–200) cm long, rooting from lower nodes. Ligule a ciliolate membrane. Leaf-blade base cordate. Leaf-blades lanceolate, 10–23 cm long, 10–25 mm wide. Leaf-blade surface glabrous or pubescent or pilose. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle open, elliptic or ovate, 7–17 cm long. Panicle branches pubescent in axils. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, acute, 5–6 mm long, falling entire.

**Glumes.** Glumes similar, exceeding apex of florets, thinner than fertile lemma. Lower glume ovate, 1 length of upper glume, 1 length of spikelet, membranous, without keels, 9 -veined. Lower glume apex acute. Upper glume ovate, membranous, without keels, 7 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, with palea. Lemma of lower sterile floret ovate, 1 length of spikelet, membranous, 7 -veined, eciliate on margins or ciliate on margins (above), acute. Fertile lemma ovate, 4–5 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma margins flat. Lemma apex obtuse. Palea 1 length of lemma, coriaceous.

**Distribution (TDWG). Continent.** South America.

**Country /Province /State.** Mesoamerica, Northern South America, Western South America, Brazil. Panama. French Guiana, Guyana, Surinam, Venezuela. Colombia, Ecuador, Peru. Brazil Northeast, Brazil North.

Roraima, Bahia, Mato Grosso do Sul. Bahia, Ceará, Maranhão, Pernambuco. Acre, Amapá, Amazonas, Pará, Roraima, Rondonia, Tocantins. Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Trindade.

### **Homolepis longispicula** (Doell) Chase. *Proc. Biol Soc. Washington*, 24: 117 (1911).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Brazil. **Basionym or Replaced Name:** *Panicum longiflorum* Trin., non Gmel.(1796), *Mem. Acad. Petersb. Ser. VI. 3: 11. 317 (1835)*; *Panicum longispiculum* Doell, nom nov, *Mart. Fl. Bras. 2: II. 261 (1877)*. T:<Type of Basionym>: fide TROPICOS and Kew Synonomy Database: : Based on *P. longiflorum* Trin.; Brazil: Riedel 147 (LE holo, K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. longus*, long; *spica*, thorn; *-ula*, tendency. Spikelets long.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Arthropogoninae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Butt sheaths coriaceous. Culms erect, 40–90 cm long. Culm-internodes thin-walled, 6–26 cm long. Culm-nodes flush with internodes, glabrous. Lateral branches lacking. Leaves without demarcation between sheath and blade. Leaf-sheaths 6–21 cm long, keeled, glabrous on surface, outer margin glabrous or hairy. Ligule a fringe of hairs, 0.3–0.6 mm long. Leaf-blades linear or lanceolate, involute, 6–20 cm long, 2–6 mm wide, stiff. Leaf-blade surface glabrous or pubescent, hairy on both sides. Leaf-blade apex acute or acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear or lanceolate, 6–20 cm long, 1–7 cm wide. Primary panicle branches appressed. Panicle axis smooth. Panicle branches glabrous in axils. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, clavate, 5–25 mm long, smooth, glabrous.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, acuminate, 9–11 mm long, 2–2.9 mm wide, falling entire.

**Glumes.** Glumes similar, exceeding apex of florets, thinner than fertile lemma. Lower glume ovate, 1 length of upper glume, 1 length of spikelet, membranous, without keels, 5–7 -veined. Lower glume surface glabrous or villous. Lower glume apex acute. Upper glume ovate, 1 length of spikelet, membranous, with hyaline margins, without keels, 5 -veined. Upper glume surface pilose. Upper glume apex acuminate.

**Florets.** Basal sterile florets 1, male, with palea. Lemma of lower sterile floret ovate, 1 length of spikelet, membranous, 5–7 -veined, pubescent, acute. Palea of lower sterile floret 1 length of lemma. Fertile lemma elliptic, 6.7–7.8 mm long, cartilaginous, pallid, without keel. Lemma surface glabrous or pubescent, hairy above. Lemma margins flat, covering most of palea. Lemma apex acute. Palea 1 length of lemma, cartilaginous.

**Flower and Fruit.** Caryopsis with adherent pericarp, oblong, 2.9 mm long. Embryo 0.4 length of caryopsis. Hilum linear, 1 length of caryopsis.

**Distribution (TDWG). Continent.** South America.

**Country /Province /State.** Brazil. Brazil West Central, Brazil Southeast.

Goiás, Minas Gerais, Rio de Janeiro, Espírito Santo. Distrito Federal, Goiás. Minas Gerais.

### **Homolepis villaricensis** (Mez) Zuloaga & Soderstr. *Smithsonian Contrib. Bot.*, 59: 29: (1985).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online (as *Panicum*), W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Paraguay. **Basionym or Replaced Name:** *Panicum villaricense* Mez, *Bot. Jahrb. Syst.* 56 (Beibl. 125): 1 (1921)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *B. Balansa* 2, 25 Feb 1876, Paraguay: Guair? Villa Rica (B; IT: BAA (fragm.), BAF, P, US-2808940 (fragm. ex L, P)).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 1, Aristidoideae a Pharoideae (2012) (322), E.G.Nicora, *Los Generos de Gramineas de America Austral* (1987) (440, Fig. 154), F.O.Zuloaga et al, *Flora del Paraguay* 23 (1994) (164, Fig. 46).

**Illustrations (Journals):** *Darwiniana* (22: 15, Fig.3 (1979) as *Panicum*).

**Derivation** (Clifford & Bostock 2007): L. -ense, denoting origin. From Vaillari, Paraguay.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Arthropogoninae.

**Habit, Vegetative Morphology.** Perennial. Stolons present. Culms geniculately ascending, 15–40 cm long. Culm-internodes thin-walled, 1.5–11 cm long. Culm-nodes flush with internodes, glabrous. Lateral branches sparse, arising from lower culm. Leaf-sheaths 2–8 cm long, outer margin glabrous or hairy. Ligule an eciliate membrane, 0.4–0.8 mm long, lacerate. Collar dark, glabrous or pilose. Leaf-blades lanceolate or oblong, 4–12 cm long, 6–9 mm wide. Leaf-blade surface pilose, hairy on both sides. Leaf-blade margins scaberulous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle open, elliptic, effuse, 5–11 cm long, 1.5–5.5 cm wide. Panicle axis scabrous. Panicle branches pubescent in axils. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, filiform, 3–18 mm long, scabrous.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic or obovate, dorsally compressed, acute, 3.2–3.7 mm long, 1.2–1.5 mm wide, falling entire. Spikelet callus square.

**Glumes.** Glumes similar, exceeding apex of florets, thinner than fertile lemma. Lower glume ovate, 1 length of upper glume, 1 length of spikelet, membranous, viscid, without keels, 5–9 -veined. Lower glume apex acute. Upper glume ovate, 1 length of spikelet, membranous, viscid, without keels, 7–9 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, with palea. Lemma of lower sterile floret ovate, 1 length of spikelet, membranous, 5–7 -veined, scaberulous, rough at apex, acute. Palea of lower sterile floret 0.7–0.8 length of lemma. Fertile lemma elliptic, 2.8–3.2 mm long, indurate, pallid, shiny, without keel. Lemma margins flat. Lemma apex acute. Palea 1 length of lemma, indurate.

**Flower and Fruit.** Caryopsis with adherent pericarp, obovoid, 1.8–2 mm long. Embryo 0.5 length of caryopsis. Hilum linear, 0.5 length of caryopsis.

**Distribution (TDWG). Continent.** South America.

**Country /Province /State. Brazil, Southern South America.** Brazil Southeast, Brazil South. Paraguay.

Sao Paulo Parana. Sao Paulo. Paraná. Corrientes, Misiones.

### **Homopholis belsonii** C. E. Hubbard. *Kew Bull.* 1934, 127. (1934).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

**TYPE** from Australia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: IT: *E. Belson s.n.*, Nov 1930, Australia: Queensland: Darling Downs Dist. (US-1611720).

**Illustrations (Books):** S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (276), J.C.Tothill,& J.B.Hacker. *The grasses of southern Queensland* (1983) (266), T.D.Stanley & E.Ross, *Flora of South East Queensland, Gramineae* (1989) (235, Fig. 37), D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002).

**Illustrations (Journals):** *Hooker's Icones Plantarum* (t.3231 (1934)).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002);

**Derivation** (Clifford & Bostock 2007): in honor of E. Belson (fl. 1930).

**Classification.** Subfamily Panicoideae. Tribe: Paniceae. Subtribe Sorghinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Stolons present. Culms 30–40 cm long. Ligule an eciliate membrane, 1–1.5 mm long. Leaf-blades 3–8 cm long, 2–2.5 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate to globose, 15–25 cm long. Primary panicle branches spreading, simple, 5–15 cm long, bearing 1–3 fertile spikelets on each lower branch. Panicle branches stiff. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4.5–6 mm long, falling entire.

**Glumes.** Glumes dissimilar, exceeding apex of florets, thinner than fertile lemma. Lower glume lanceolate, 1.1 length of upper glume, 1 length of spikelet, without keels, 7 -veined. Lower glume apex acute. Upper glume lanceolate, membranous, without keels, 7 -veined. Upper glume lateral veins ribbed. Upper glume surface pubescent, hairy between veins. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, with palea. Lemma of lower sterile floret similar to upper glume, lanceolate, 0.9 length of spikelet, membranous, 7 -veined, ribbed, pubescent, hairy between veins, acute. Fertile lemma elliptic, 3–3.5 mm long, cartilaginous, shiny, 5–7 -veined, more than 3-veined. Lemma margins flat, covering most of palea. Lemma apex rostrate. Palea cartilaginous, without keels.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State. Australia.** Queensland, New South Wales.

South East. Western Slopes.

### **Homozeugos conciliatum** Guala. *Novon* 12:196 (2002).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Angola. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: Angola: Huambo: Chianga, frequente no terreno que ladeia, a esquerda, a estrada para a Chianga, ca. 1700 m, 14 Apr 1969, B. Teixeira 13216 (HT: LISC; IT: LISJC).

**Illustrations (Journals):** *Novon* (12: 197, Fig. 1 (2002)).

**Derivation** (Clifford & Bostock 2007): *L. concilio*, unite in sentiment. An expression of hope by the author that peace will come to Angola which at the time was suffering from civil strife.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Saccharinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short, knotty. Culms 65–190 cm long, 0.6–4 mm diam. Culm-internodes distally glabrous or pubescent. Culm-nodes bearded. Lateral branches lacking. Leaf-sheath auricles erect. Ligule an eciliate membrane, 0.5–48 mm long, entire or erose, truncate or obtuse. Leaf-blades linear or lanceolate, flat or involute, 10–72 cm long, 0.2–6.3 mm wide. Leaf-blade midrib conspicuous. Leaf-blade margins smooth or scaberulous.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1–5, single or paired or digitate, 8.5–30 cm long, bearing 18–51 fertile spikelets on each. Rhachis fragile at the nodes, subterete. Rhachis internodes linear, 2.2–14.3 mm long. Rhachis internode tip oblique, flat. Spikelets appressed, in pairs. Fertile spikelets sessile and pedicelled, 2 in the cluster, subequal. Pedicels present, linear, 3.2–10 mm long, villous, with white hairs, with 5–8.5 mm long hairs, tip oblique.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 5–12 mm long, falling entire, deciduous from the base and with accessory branch structures. Spikelet callus cuneate, 0.8–4.2 mm long, pilose, base pungent, attached obliquely. Spikelet callus hairs 2–5 mm long.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 5.4–11 mm long, 1 length of spikelet, coriaceous, much thinner above, without keels, keel-less except near apex. Lower glume surface glabrous or villous. Lower glume hairs 0–7 mm long. Lower glume apex obtuse. Upper glume oblong, 5.2–12 mm long, coriaceous, without keels. Upper glume surface glabrous or villous. Upper glume hairs 0–5 mm long.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret linear to ovate, 4.8–10.2 mm long, hyaline, 2-keeled, 2 -veined, ciliate on margins, emarginate or acute. Fertile lemma linear, 3.5–10 mm long, hyaline, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 14–83 mm long overall, with twisted column. Column of lemma awn glabrous to pubescent, with 0–2 mm long hairs. Palea 0.5–2.5 mm long.

**Flower and Fruit.** Lodicules 2, cuneate, 0.4–0.9 mm long. Anthers 5, 3–7.2 mm long.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** South Tropical Africa. Angola.

### **Homozeugos eylesii** C. E. Hubbard. *Kew Bull.* 1936, 295. (1936).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Zambia. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Zambia, Mufulira: Eyeles 8369 (K holo).

**Illustrations (Books):** R.M.Polhill, F.T.E.A., *Gramineae* (3:712, Fig 164), G.V.Pope et al., *Flora Zambesiaca* 10.

**Derivation** (Clifford & Bostock 2007): in honor of Frederick Eyles (1864–1937) English-born botanist in Zimbabwe.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Saccharinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 100–200 cm long. Leaf-sheaths glabrous on surface. Leaf-sheath auricles erect. Ligule an eciliate membrane, 4–20 mm long. Leaf-blades flat, 10–40 cm long, 1–4 mm wide. Leaf-blade apex attenuate, filiform.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1–4, single or paired or digitate, 8–20 cm long. Rhachis fragile at the nodes, subterete, villous on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile and pedicelled, 2 in the cluster, subequal. Pedicels present, linear, villous, tip oblique.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 8–10 mm long, falling entire, deciduous from the base or with accessory branch structures. Spikelet callus cuneate, 1.5–2 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 1 length of spikelet, coriaceous, much thinner above, without keels, keel-less except near apex, 7–8 -veined. Lower glume surface villous. Lower glume apex obtuse.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, hyaline, 2 -veined, ciliate on margins. Fertile lemma linear, 5–6 mm long, hyaline, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 15–25 mm long overall, with twisted column. Column of lemma awn hispidulous. Palea absent or minute.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West-Central Tropical Africa, East Tropical Africa, South Tropical Africa. DRC. Tanzania. Malawi, Zambia.

### **Homozeugos fragile** Stapf. *Hook. Ic. Pl. t.* 3033 . (1915).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Angola. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Angola, Benguela: Gossweiler 4029 (K holo).

**Illustrations (Journals):** *Hooker's Icones Plantarum* (t.3303 (1915)).

**Derivation** (Clifford & Bostock 2007): L. weak. Inflorescences readily disarticulating.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Saccharinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with compacted dead sheaths. Basal innovations intravaginal. Culms 100–200 cm long. Culm-nodes bearded. Leaf-sheaths pubescent. Leaf-sheath auricles erect, 1–3 mm long. Ligule a ciliolate membrane, 1–3 mm long. Leaf-blades linear, convolute, 20–35 cm long, 2–5 mm wide. Leaf-blade surface pubescent, hairy adaxially. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence composed of racemes. Racemes 3–5, digitate, 7–10 cm long. Rhachis fragile at the nodes, subterete, setose on margins. Rhachis hairs white, 3–5 mm long. Rhachis internodes

filiform, 10–12 mm long. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile and pedicelled, 2 in the cluster, subequal. Pedicels present, filiform, ciliate, tip oblique.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 14–18 mm long, falling entire, deciduous from the base or with accessory branch structures. Spikelet callus cuneate, 3–4 mm long, pilose, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 11–14 mm long, 0.8 length of spikelet, coriaceous, much thinner above, without keels, keel-less except near apex, 3 -veined. Lower glume surface villous. Lower glume apex truncate. Upper glume linear, 1 length of spikelet, coriaceous, 3 -veined. Upper glume surface pilose. Upper glume margins ciliate.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret linear, 7 mm long, 0.5 length of spikelet, hyaline, 2 -veined, pubescent, ciliolate on margins, acute. Fertile lemma linear, 6 mm long, hyaline, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma margins ciliate. Lemma apex dentate, 2 -fid, with linear lobes, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 70–80 mm long overall, with twisted column. Column of lemma awn hirtellous, with 1–2 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Anthers 3, 6 mm long.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** South Tropical Africa. Angola.

### ***Homozeugos gossweileri* Stapf. *Prain, Fl. Trop. Afr.* ix. 103. (1917).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Angola. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Angola, Benguela: Gossweiler 2586 (K holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of John Gossweiler (1873–1952) Swiss-born Angolan botanist.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Saccharinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with compacted dead sheaths. Basal innovations intravaginal. Culms 60–75 cm long, 2 -noded. Culm-nodes bearded. Leaf-sheaths pubescent. Leaf-sheath auricles absent. Ligule an eciliate membrane, 0.5–1 mm long. Leaf-blades filiform, terete, 15–30 cm long, 0.5–1 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, 10–12 cm long. Rhachis fragile at the nodes, subterete, glabrous on margins. Rhachis hairs white. Rhachis internodes filiform, 7–8 mm long. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile and pedicelled, 2 in the cluster, subequal. Pedicels present, filiform, ciliate, with 4–6 mm long hairs, tip oblique.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 13 mm long, falling entire, deciduous from the base or with accessory branch structures. Spikelet callus cuneate, 3 mm long, pilose, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 10 mm long, 0.8 length of spikelet, coriaceous, much thinner above, without keels, keel-less except near apex, 7–9 -veined. Lower glume surface villous. Lower glume apex truncate or obtuse. Upper glume linear, 1 length of spikelet, coriaceous, 3 -veined. Upper glume surface pilose, hairy above. Upper glume margins ciliolate. Upper glume apex obtuse.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret linear, 4 mm long, 0.33 length of spikelet, hyaline, 2 -veined, pubescent, ciliolate on margins, acute. Fertile lemma linear, 5 mm long, hyaline, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma margins ciliolate. Lemma apex lobed, 2 -fid, with linear lobes, incised 0.33 of lemma length, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 25–30 mm long overall, with twisted column. Column of lemma awn hirtellous. Palea 0.1 length of lemma.

**Flower and Fruit.** Anthers 3.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** South Tropical Africa. Angola.

**Homozeugos huillense** (Rendle) Stapf. *Hook. Ic. Pl. sub t.* 3033 . (1915).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Angola. **Basionym or Replaced Name:** *Pollinia huillensis* Rendle, *Cat. Welw. Afr. Pl.* 2: 136 (1899). T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: Angola, Empalanca: Welwitsch 2669 (K iso).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *-ense*, denoting origin. From Huilla, Angola.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Saccharinae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes short. Culms slender, 30–50 cm long, 4–5 -noded. Culm-nodes bearded. Leaf-sheaths glabrous on surface. Leaf-sheath auricles absent. Ligule an eciliate membrane, 2 mm long. Leaf-blades filiform, terete, 30–45 cm long, 1.5–3 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 3, digitate, 11 cm long. Rhachis fragile at the nodes, subterete, setose on margins. Rhachis hairs white, 3–4 mm long. Rhachis internodes filiform, 4 mm long. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile and pedicelled, 2 in the cluster, subequal. Pedicels present, filiform, ciliate, tip oblique.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 8–10 mm long, falling entire, deciduous from the base or with accessory branch structures. Spikelet callus cuneate, 1.5–2 mm long, pilose, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 6–8 mm long, 0.8 length of spikelet, cartilaginous, much thinner above, without keels, keel-less except near apex, 5–6 -veined. Lower glume surface villous. Lower glume apex truncate. Upper glume lanceolate, 1 length of spikelet, cartilaginous, 3 -veined. Upper glume margins ciliolate.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, 7 mm long, 0.8 length of spikelet, hyaline, 2 -veined, ciliolate on margins, obtuse. Fertile lemma linear, 6 mm long, hyaline, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex entire, acute, awned, 1 -awned. Principal lemma awn apical, geniculate, 25–30 mm long overall, with twisted column. Column of lemma awn hirtellous. Palea absent or minute.

**Flower and Fruit.** Anthers 3.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** South Tropical Africa. Angola.

**Homozeugos katakton** Clayton. *Garcia de Orta, Ser. Bot.* 1 (1–2): 11. (1973).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Angola. T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: Angola, Munhangao: Gossweiler 11260 (K holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): Gk *katakton*, capable of being broken. The spikelets deciduous from the base, falling entire or with accessory branch structures attached.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Saccharinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 100–150 cm long. Culm-nodes bearded. Leaf-sheaths glabrous on surface. Leaf-sheath auricles erect, 10–25 mm long. Ligule an eciliate membrane, 10–25 mm long. Leaf-blades linear, flat or convolute, 30–60 cm long, 2–6 mm wide. Leaf-blade surface glabrous or pilose. Leaf-blade apex attenuate, filiform.

**Inflorescence.** Inflorescence composed of racemes. Racemes 3–4, digitate, 10–20 cm long. Rhachis fragile at the nodes, subterete, setose on margins. Rhachis hairs white. Rhachis internodes filiform, 8–12 mm long. Rhachis internode tip oblique, flat. Spikelets in pairs. Fertile spikelets sessile and pedicelled, 2 in the cluster, subequal. Pedicels present, filiform, ciliate, tip oblique.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 10–14 mm long, falling entire, deciduous from the base or with accessory branch structures. Spikelet callus cuneate, 3–4 mm long, pilose, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 7–10 mm long, 0.8 length of spikelet, coriaceous, much thinner above, without keels, keel-less except near apex, 9–11 -veined. Lower glume surface villous. Lower glume apex obtuse. Upper glume lanceolate, 1 length of spikelet, coriaceous, 3 -veined. Upper glume surface pilose, hairy above.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, 0.9 length of spikelet, hyaline, 2 -veined, ciliolate on margins. Fertile lemma linear, hyaline, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma margins ciliate. Lemma apex dentate, 2 -fid, with linear lobes, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 35–60 mm long overall, with twisted column. Column of lemma awn hirtellous. Palea 0.1 length of lemma.

**Flower and Fruit.** Anthers 3.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. South Tropical Africa.** Angola, Zambia.

### **Hookerochloa eriopoda** (Vickery) S.W.L. Jacobs. *Telopea* 12(2): 277 (2008).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online (as *Austrostipa*), D.Sharp, D. & B.K.Simon, *AusGrass* (2002) (as *Austrostipa*).

**TYPE** from Australia. **Basionym or Replaced Name:** *Festuca eriopoda* Vickery, *Contr. New South Wales Natl. Herb.* 1: 10 (1939). T:<Type of Basionym>: fide TROPICOS and Kew Synonomy Database: New South Wales: Blue Mountains, Kanimbla Valley (Mt. Victoria) 24 Dec 1892, J.J. Fletcher s.n. (HT: K; IT: Sydney).

**Recent Synonyms:** *Festucella eriopoda* (Vickery) E.B.Alekseev, *Byull. Mosk. Obshch. Ispyt. Prir., Biol.*, 90(5): 104 (1985). *Austrostipa eriopoda* (Vickery) S.W.L. Jacobs, *Telopea* 3(4): 602. 1990.

**Illustrations (Books):** S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (277).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002);

**Derivation** (Clifford & Bostock 2007): Gk. *erion*, wool; *pous*, foot. Basal leaf-sheaths wooly.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Butt sheaths withering or persistent and investing base of culm. Culms erect, 50–90 cm long, 2–3 -noded. Culm-nodes brown, glabrous. Ligule an eciliate membrane, 2–3 mm long, pubescent on abaxial surface. Leaf-blades filiform, conduplicate, 10–25 cm long, 0.5 mm wide, coriaceous, stiff. Leaf-blade surface scaberulous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, 30–40 cm long. Primary panicle branches 2–3 -nate. Panicle axis smooth. Panicle branches scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 2–10 mm long, scabrous.

**Fertile Spikelets.** Spikelets comprising 3–5 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 10–13 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 2 mm long, villous. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, similar to fertile lemma in texture. Lower glume linear, 7–8 mm long, 0.9 length of upper glume, coriaceous, 1-keeled, 3 -veined. Lower glume primary vein scabrous. Lower glume surface asperulous. Lower glume margins ciliolate. Lower glume apex acute. Upper glume lanceolate, 7–8 mm long, 1 length of adjacent fertile lemma, coriaceous, 1-keeled, 3–5 -veined. Upper glume primary vein scabrous. Upper glume surface asperulous. Upper glume margins ciliolate. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 7–8 mm long, coriaceous, much thinner above, keeled, 5 -veined. Lemma surface scabrous. Lemma apex erose or dentate, 2 -fid, truncate, awned, 1 -awned. Principal lemma awn from a sinus, 1 mm long overall. Palea 1 length of lemma. Palea keels scabrous. Palea surface scaberulous. Palea apex dentate, 2–3 -fid, truncate. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Lodicules 2, membranous. Anthers 3, 5 mm long. Ovary glabrous. Caryopsis with adherent pericarp. Hilum elliptic.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State. Australia.** New South Wales, A.C.T., Victoria.  
Coast, Tablelands, Western Slopes.

**Hookerochloa hookeriana** (F. Muell. ex Hook. f.) E.B. Alexeev. *Byull. Moskovsk. Obshch. Isp. Prir., Otd. Biol.* 90(5): 106–107, f. 1, 22–31 (1985).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online (as *Austrofestuca*), D.Sharp, D. & B.K.Simon, *AusGrass* (2002) (as *Austrofestuca*), U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Australia. **Basionym or Replaced Name:** *Festuca hookeriana* F. Muell. ex Hook. f., *Fl. Tasman.* 2: 127, t. 165 (1858). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Tasmania: Cheshunt, *Archer s.n.*.

**Recent Synonyms:** *Austrofestuca hookeriana* (F. Muell. ex Hook. f.) S.W.L. Jacobs, *Telopea* 3(4): 602 (1990).

**Illustrations (Books):** N.Walsh & T.Entwistle, *Flora of Victoria* Vol 2 (1994) (437, Fig 85 as *Austrofestuca hookeriana*), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (277), A.Wilson (ed.), *Flora of Australia*, Vol 44A. *Poaceae* (2009) (273, Fig 36 as *Austrofestuca hookeriana*), D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia. CD-Rom Version 1.0.* (2002).

**Derivation** (Clifford & Bostock 2007): L. -*ana*, indicating connection. As for hookeri, usually in honor of Joseph Dalton Hooker (1817–1911), English botanist, traveller and Garden's Director.

**Classification.** Subfamily Pooideae. Tribe: Poae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths withering or persistent and investing base of culm. Culms erect, 70–120 cm long, 2–3 -noded. Culm-nodes brown, glabrous. Leaf-sheaths loose. Leaf-sheath auricles absent or falcate. Ligule an eciliate membrane, 2–3.5 mm long, obtuse. Leaf-blades flat or conduplicate, 5–40 cm long, 2–4 mm wide, coriaceous, stiff. Leaf-blade surface ribbed, scaberulous, rough on both sides. Leaf-blade margins scabrous. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, effuse, 30 cm long. Primary panicle branches spreading or drooping, 2–3 -nate, 10–22 cm long. Panicle branches angular, scabrous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 2–6 mm long.

**Fertile Spikelets.** Spikelets comprising 4–5 fertile florets, with diminished florets at the apex. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets oblong, laterally compressed, 9–13 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1.5 mm long, villous. Floret callus pilose.

**Glumes.** Glumes persistent, similar, shorter than spikelet, similar to fertile lemma in texture. Lower glume linear, 6–8 mm long, 0.9 length of upper glume, coriaceous, 1-keeled, 3 -veined. Lower glume primary vein scabrous. Lower glume surface asperulous. Lower glume margins ciliolate. Lower glume apex acute. Upper glume lanceolate, 6–8 mm long, 0.75–1 length of adjacent fertile lemma, coriaceous, 1-keeled, 5 -veined. Upper glume primary vein scabrous. Upper glume surface asperulous. Upper glume margins ciliolate. Upper glume apex acute.

**Florets.** Fertile lemma elliptic, 8 mm long, coriaceous, keeled, 5–11 -veined. Lemma midvein scabrous. Lemma surface scaberulous. Lemma apex entire or dentate, 2 -fid, acute, awned, 1 -awned. Principal lemma awn subapical, 0.5–3 mm long overall. Palea 1 length of lemma. Palea keels scabrous. Palea surface scaberulous. Palea apex dentate, 2 -fid. Apical sterile florets resembling fertile though underdeveloped.

**Flower and Fruit.** Lodicules 2, membranous. Anthers 3, 5 mm long. Ovary glabrous. Caryopsis with adherent pericarp. Hilum elliptic.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State. Australia.** New South Wales, A.C.T., Tasmania, Victoria.  
Tablelands.

**Hopia obtusa** (Zuloaga & Morrone) Kunth. *Taxon* 56 (1): 151 (2007).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online (as *Panicum*).

**TYPE** from Mexico. **Basionym or Replaced Name:** *Panicum obtusum* Kunth., *Nov. Gen. et Sp.* 1: 98. (1815). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Mexico, Guanajuato: Humboldt & Bonpland (P holo).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 25 Poaceae, part 2 (2003) (483 as *Panicum obtusum*), F.W.Gould, *The Grasses of Texas* (1975) (453, Fig. 241), R.McVaugh, *Flora Nova-Galicianae* Vol.14 Gramineae (1983), E.Hafliger & E.Schultz, *Grass Weeds*, CIBA-GEIGY (1:85(1980) as *Panicum obtusum*).

**Illustrations (Journals):** *Taxon* (56: 152, Fig.3 (2007)).

**Derivation** (Clifford & Bostock 2007): L. blunt. Glumes or lemmas apically rounded.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Paspalinae.

**Habit, Vegetative Morphology.** Perennial. Rootstock evident. Stolons present. Butt sheaths pubescent. Culms erect, 20–60 cm long. Culm-nodes glabrous. Leaf-sheaths glabrous on surface or hispid. Ligule an eciliate membrane, 1–2 mm long. Leaf-blades flat or involute, 2–7 mm wide, glaucous.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1–4, single or borne along a central axis, appressed, 1–2 cm long. Central inflorescence axis 3–10(–14) cm long. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets oblong or obovate, dorsally compressed, 3.4–4 mm long, falling entire.

**Glumes.** Glumes similar, reaching apex of florets, thinner than fertile lemma. Lower glume ovate, 0.9–1 length of spikelet, membranous, without keels, 5 -veined. Lower glume apex obtuse. Upper glume ovate, 1 length of spikelet, membranous, without keels, 7 -veined. Upper glume apex obtuse.

**Florets.** Basal sterile florets 1, male, with palea. Lemma of lower sterile floret similar to upper glume, ovate, 1 length of spikelet, membranous, 7 -veined, obtuse. Fertile lemma oblong, dorsally compressed, 3.4–4 mm long, indurate, pallid, shiny, without keel, more than 3-veined. Lemma surface reticulate. Lemma margins involute. Lemma apex obtuse. Palea involute, indurate.

**Distribution (TDWG). Continent.** North America.

**Country /Province /State.** **Northwest USA, North-central USA, Southwestern USA, South-central USA, Southeastern USA, Mexico.** Colorado. Iowa, Kansas, Missouri, Oklahoma. Arizona, Utah. New Mexico, Texas. Arkansas. Central Mexico, Northeast Mexico, Gulf (Mexico), Northwest Mexico, Southwest Mexico, Southeast Mexico.

Distrito Federal, Mexico State, Puebla. Aguascalientes, Coahuila, Chihuahua, Durango, Guanajuato, Hidalgo, Neuvo Leon, Queretaro, San Luis Potosi, Tamaulipas, Zacatecas. Veracruz. Sinaloa, Sonora. Colima, Jalisco, Michoacan, Oaxaca. Chiapas.

### ***Hordelymus europaeus* (L.) Jessen ex Harz. *Samenk.* ii. 1148 (1885).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Germany. **Basionym or Replaced Name:** *Elymus europaeus* L., *Syst. Nat. (ed. 12)* 2: 101 (1767)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: LT: (LINN-100.13). LT designated by Cope in Cafferty et al., *Taxon* 49(2): 250 (2000).

**Illustrations (Books):** C.E.Hubbard, *Grasses* (1968) (108), T. Cope & A. Gray, *Grasses of the British Isles* (161).

**Derivation** (Clifford & Bostock 2007): L. -eum, belonging to. From Europa now Europe.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect or decumbent, 40–120 cm long, 3–4 -noded. Culm-nodes pubescent. Leaf-sheaths pilose, with simple hairs or reflexed hairs. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane, 0.5–1 mm long. Leaf-blades 10–30 cm long, 5–14 mm wide. Leaf-blade surface scaberulous, rough adaxially, pilose, sparsely hairy. Leaf-blade margins scaberulous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, drooping or erect, bilateral, 5–10 cm long. Spikelet packing abaxial. Spikelets appressed, in threes. Fertile spikelets pedicelled, 3 in the cluster. Pedicels present, oblong.

**Fertile Spikelets.** Spikelets comprising 1(–2) fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets, or of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 8–10 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes collateral, connate along margins below (briefly), persistent, similar, reaching apex of florets or shorter than spikelet. Lower glume linear, 1 length of upper glume, coriaceous, without keels, 3 -veined. Lower glume apex acuminate, awned, 1 -awned, awn 5–7 mm long. Upper glume linear, 8–10 mm long, coriaceous, without keels, 3 -veined. Upper glume apex acuminate, awned, 1 -awned, awn 5–7 mm long.

**Florets.** Fertile lemma lanceolate, 8–10 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous, rough above. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 15–25 mm long overall, limb scabrous. Palea 1 length of lemma, 2 -veined. Rhachilla extension 0.33 length of fertile floret.

**Flower and Fruit.** Lodicules 2, membranous. Anthers 3, 3–4 mm long. Ovary with a fleshy appendage below style insertion, pubescent on apex. Caryopsis with adherent pericarp, fusiform, sulcate on hilar side, 7 mm long, hairy at apex. Embryo 0.2 length of caryopsis. Hilum linear, 1 length of caryopsis.

$2n = 28$  (2 refs TROPICOS).

**Distribution (TDWG).** Continent. Europe, Africa, Temperate Asia.

**Region.** Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe.

**Country /Province /State.** : Denmark, Great Britain, Sweden. : Austria, Belgium, Czechoslovakia, Germany, Netherlands, Poland, Switzerland. : Corsica, France, Spain. : Bulgaria, Italy, Romania, Sicily, Yugoslavia, Belarus, Estonia, Latvia, Lithuania, Baltic States, Krym, Central European Russia, Northwest European Russia, Ukraine. **Northern Africa.** Algeria, Morocco, Tunisia. **Caucasus, Western Asia.** North Caucasus, Transcaucasus. Turkey.

### **Hordeum aegiceras** Nees ex Royle. *Illustr. Bot. Himal.* :418 (1839).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: India, Himalayas: Royle (K iso).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): Gk. *aix*, goat; *keras*, horn. The lemma terminates in a long awn bearing accessory spikelets.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual. Culms erect, 40–80 cm long. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane. Leaf-blades 10–20 cm long, 11–25 mm wide. Leaf-blade margins scaberulous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear or oblong, bilateral, 6–8 cm long, 10–15(–20) mm wide. Rhachis tough, flattened, ciliate on margins. Spikelet packing broadside to rhachis, regular, 6 -rowed. Rhachis internodes cuneate. Spikelets in threes. Fertile spikelets sessile, 3 in the cluster.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets ovate, dorsally compressed, 8–12 mm long, persistent on plant.

**Glumes.** Glumes collateral, similar, shorter than spikelet, gaping. Lower glume linear, 6–7 mm long, 1 length of upper glume, coriaceous. Lower glume surface hispidulous. Lower glume apex acuminate, awned, 1 -awned, awn 7–10 mm long. Upper glume linear, 7–10 mm long, 0.6–0.8 length of adjacent fertile lemma, coriaceous. Upper glume surface hispidulous. Upper glume apex acuminate, awned, 1 -awned, awn 7–10 mm long.

**Florets.** Fertile lemma elliptic, 8–12 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous, rough above. Lemma apex dentate, 3 -fid, with a trilobate appendage (on middle lobe).

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State. Middle Asia, Western Asia, China, Mongolia.** Kazakhstan, Turkmenistan, Tadzhikistan. Iran. **Indian Subcontinent.** West Himalaya.

Punjab, Uttah Pradesh.

### **Hordeum agriocrithon** Aberg. *Ann. Agric. Coll. Sweden*, 6: 159–216 (1938).

**Accepted by:** U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from China. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: China: Xizang: Taofu (Dawo), 3000 m, *H. Smith* (HT: ?) "two specimens grown from the seed collection no. 13064".

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): Gk *agros*, field; *krithe*, barley. A barley raised from seed collected in the wild.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State. Western Asia, China.** China South Central, Qinghai, Tibet. Sichuan.

### **Hordeum arizonicum** Covas. *Madrono*, x. 16 (1949).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from USA. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *J.J. Thornber* 536, 3 Apr-4 Mar 1903, USA: Arizona: Fort Lowell (US-661515; IT: DS, MINN, MO).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (249).

**Derivation** (Clifford & Bostock 2007): L. *-ica*, belonging to. From Arizona, USA.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual. Culms 20–60 cm long. Leaf-sheaths pubescent. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane. Leaf-blades 3–5 mm wide. Leaf-blade surface pubescent, sparsely hairy.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 3–12 cm long. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes oblong, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate. Companion sterile spikelet lemmas 1, exserted from glumes, 1-awned.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 8–9 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets, gaping. Lower glume subulate, 15–20 mm long, 1 length of upper glume. Upper glume subulate, 15–20 mm long.

**Florets.** Fertile lemma lanceolate, 8–9 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 15–22 mm long overall.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 42$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** North America.

**Country /Province /State.** **Southwestern USA, South-central USA, Mexico.** Arizona, California, Nevada. New Mexico. Northeast Mexico, Northwest Mexico.  
Durango. Baja California.

**Hordeum bogdanii** Wilensky. *Izv. Saratovsk. Op. Stan. i. II. 13* (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), T.G.Tutin et al, *Flora Europaea* 5 (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: Russia: Volga region, Lake Elton, near farm Smutnev, 27 March 1917, D. Wilensky 374a (LT: LE).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 552).

**Derivation** (Clifford & Bostock 2007): in honor of Vassilij S. Bogdan, Russian botanist.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect or geniculately ascending, 15–100 cm long. Culm-nodes pubescent. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane, 0.2–0.6 mm long. Leaf-blades 9–18 cm long, 2–6.5 mm wide. Leaf-blade surface scabrous.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear, bilateral, (2–)3.5–9 cm long, 5–7 mm wide. Rhachis tough or fragile at the nodes (above), flattened, scabrous on margins, glabrous on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1–1.5 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile or sessile and pedicelled, 1 in the cluster or 3 in the cluster, 1 sessile. Companion sterile spikelets pedicelled, 0 in the cluster or 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets absent or well-developed, male, lanceolate, dorsally compressed, 4–11 mm long, shorter than fertile, persistent or deciduous with the fertile. Companion sterile spikelet glumes subulate. Companion sterile spikelet lemmas 1, 4–7 mm long, 1-awned, with 2.5–6 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 4–11 mm long, falling entire or breaking up at maturity, deciduous when tough with accessory branch structures, disarticulating when fragile below each fertile floret.

**Glumes.** Glumes collateral, similar. Lower glume subulate, 4–11 mm long, 1 length of upper glume. Upper glume subulate, 4–11 mm long.

**Florets.** Fertile lemma lanceolate, 4.3–7.5 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface glabrous or puberulous. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn straight, 4–13 mm long overall, limb scabrous. Rhachilla extension 3.5–8 mm long.

**Flower and Fruit.** Anthers 3, 1.4–2.4 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, hairy at apex. Hilum linear.

$2n = 14$  (6 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, Temperate Asia, Tropical Asia.

**Region. Northern Europe (\*), Eastern Europe.**

**Country /Province /State.** : GB Aliens (Ryves et al). East European Russia, South European Russia. Siberia, Middle Asia, Western Asia, China, Mongolia, Russia. Kazakhstan, Kirgizistan, Turkmenistan, Tadzhikistan, Uzbekistan. Afghanistan, Iran. China North-Central, Qinghai, Xinjiang. Mongolia. **Indian Subcontinent.** Pakistan, West Himalaya.

Gansu. Jammu Kashmir.

**Hordeum brachyantherum** Nevski. *Acta Inst. Bot. Acad. Sc. URSS, Ser. I. Fasc. 2*, 61 (1936).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), W.D.Clayton & N.Snow, *Key to Pacific Grasses* (2010).

**TYPE** from Aleutian Islands. **Basionym or Replaced Name:** *Hordeum boreale* Scribn. & J. G. Sm., non Gand.(1881), *U.S. Dept. Agric. Bull. Agrost.* 4: 24 (1897). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: : Based on H. boreale Scribn. & Sm. ; Aleutian Is., Behring Is.: Gribnitsky.

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (246, as subspecies *brachyantherum* & *californicum*).

**Derivation** (Clifford & Bostock 2007): Gk. *brachys*, short; *antherix*, ear or spike of wheat. Inflorescence or inflorescence branches short and spicate.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 40–80 cm long. Leaf-sheaths glabrous on surface to pubescent. Leaf-sheath auricles absent. Ligule an eciliate membrane, 0.5 mm long. Leaf-blades 5–15 cm long, 2–6 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, erect, linear, bilateral, 5–10 cm long. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes oblong, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, linear, 10–12 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate, 10–12 mm long. Companion sterile spikelet lemmas 1, enclosed by glumes, 3–4 mm long, 1-awned, with 3–4 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 7–12 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets. Lower glume subulate, 7–12 mm long, 1 length of upper glume. Upper glume subulate, 7–12 mm long, 1.2–1.7 length of adjacent fertile lemma.

**Florets.** Fertile lemma lanceolate, 6–7 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 6–7 mm long overall.

**Flower and Fruit.** Anthers 3, 1–1.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe (\*), Temperate Asia, Pacific, North America.

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). Russian Far East. Kamchatka. **North-central Pacific.** Hawaii (\*). **Subarctic America, Western Canada, Northwest USA, Southwestern USA, South-central USA, Mexico.** Aleutian Is, Alaska, Yukon, Northwest Territories. Alberta, British Columbia, Saskatchewan. Colorado, Idaho, Montana, Oregon, Washington, Wyoming. Arizona, California, Nevada, Utah. Northwest Mexico.

Baja California.

### ***Hordeum brachyatherum* R. Phil. *Anal. Univ. Chil.* xciv. 346. (1896).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Chile. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: T: *P. Ortega s.n.*, Chile: Andes de Linares (SGO-37245; IT: US-1939379 (fragm. ex SGO-37245)).

**Illustrations (Books):** M.N.Correa, *Flora Patagonica* Parte III, Gramineae (1978) (419, Fig 277).

**Derivation** (Clifford & Bostock 2007): Gk. *brachys*, short; *ather*, ear or spike of wheat.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial. Culms 30–60 cm long. Leaf-sheath auricles absent. Ligule an eciliate membrane. Leaf-blades 4–5 mm wide. Leaf-blade surface scabrous, rough abaxially, pilose, hairy adaxially.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 4–8 cm long. Rhachis fragile at the nodes, flattened, ciliate on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 2 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets sessile or pedicelled, 2 in the cluster. Pedicels absent or present, oblong, 0–1.5 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, 5.5–8 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes coriaceous, 5.5–8 mm long. Companion sterile spikelet lemmas 1, enclosed by glumes, 2.5–6 mm long, 1-awned, with 2.5 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 7.5–9 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, shorter than spikelet, gaping. Lower glume lanceolate, 6–7 mm long, 1 length of upper glume. Upper glume lanceolate, 6–7 mm long, 0.75 length of adjacent fertile lemma.

**Florets.** Fertile lemma lanceolate, 7.5–9 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface smooth or scabrous, rough above. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 2–3.5 mm long overall. Palea 1 length of lemma. Rhachilla extension 3–4 mm long. Apical sterile florets distinct from fertile, rudimentary.

**Flower and Fruit.** Lodicules 2, 1.4–1.5 mm long, membranous, ciliate, acute. Anthers 3, 2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$n = 28$  (1 ref TROPICOS).  $2n = 28$  (9 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe (\*), South America.

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Southern South America.** Argentina South, Chile Central, Chile South.

Chubut. Rest of Chile- Biobio, La Auracania, Maule, O'Higgins, Santado, Valpariso. Coquimbo, Valparaiso, Maule. Magellanes.

### **Hordeum brevisubulatum** (Trin.) Link. *Linnaea*, xvii. 391 (1843).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960) (as *H. turkestanicum*), T.G.Tutin et al, *Flora Europaea* 5 (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. **Basionym or Replaced Name:** *Hordeum secalinum* var. *brevisubulatum* Trin., *Sp. Gram. Ic.* 1:t. 4 (1828). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Russia, Irkuts: Coll?.

**Recent Synonyms:** *Hordeum violaceum* Boiss. & Hohen., *Diagn. Ser. I. xiii.* 70. (1854). *Hordeum turkestanicum* Nevski, *Acta Univ. As. Med. Ser. VIII b*, Bor. Fasc. 17, 45 (1934).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Figs. 553/554 as *Hordeum brevisubulatum* ssp. *brevisubulatum* & *Hordeum brevisubulatum* ssp. *turkestanicum*).

**Derivation** (Clifford & Bostock 2007): *L. brevis*, short; *subula*, awl; *-ata*, possessing. Glumes or lemma shortly awned.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect or geniculately ascending, 15–100 cm long. Culm-nodes pubescent. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane, 0.2–0.7 mm long. Leaf-blades 9–18 cm long, 1–7 mm wide. Leaf-blade surface scabrous.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear, bilateral, 2.5–9.5 cm long, 3–4.5 mm wide. Rhachis fragile at the nodes, flattened, ciliate on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1–1.5 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, 0.9–2.3 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 3–11 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate. Companion sterile spikelet lemmas 1, 3–6.5 mm long, 1-awned, with 1 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then

both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 4–10 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar. Lower glume subulate, 4–10 mm long, 1 length of upper glume. Lower glume surface scabrous. Upper glume subulate, 4–10 mm long. Upper glume surface scabrous.

**Florets.** Fertile lemma lanceolate, 4.5–9 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface scabrous, glabrous or puberulous. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 1–7 mm long overall, limb scabrous. Rhachilla extension 1.3–6 mm long.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe, Temperate Asia, Tropical Asia.

**Region.** Northern Europe (\*), Eastern Europe.

**Country /Province /State :** GB Aliens (Ryves et al). Central European Russia, East European Russia, North European Russia, South European Russia. Siberia, Russian Far East, Middle Asia, Caucasus, Western Asia, China, Mongolia, Russia. Altay, Buryatiya, Chita, Irkutsk, Krasnoyarsk, Tuva. Amur, Magadan, Primorye. Kazakhstan, Kirgizistan, Turkmenistan, Tadzhikistan, Uzbekistan. Afghanistan, Iran. Inner Mongolia, Manchuria, China North-Central, Qinghai, Tibet, Xinjiang. Mongolia. Indian Subcontinent. Nepal, Pakistan, West Himalaya.

Gansu, Hebei, Shaanxi. Jammu Kashmir.

### **Hordeum bulbosum** Linn. *Cent. Pl.* ii. 8. (1756).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), T.G.Tutin et al, *Flora Europaea* 5 (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Italy. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: Italy: Herb. Linn. 103/3 (LINN lecto).

**Illustrations (Books):** N.Feinbrun-Dothan, *Flora Palaestina* 4 (1986) (Pl 221), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (253), B.Rosengurtt, *Gramineas Uruguayas I* (1970) (146, Fig. 56).

**Derivation** (Clifford & Bostock 2007): L. *bulbus*, onion; -*osa*, abundance. Culm-bases swollen.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 50–100 cm long, swollen at the base. Culm-internodes glaucous. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane. Leaf-blades 10–20 cm long, 3–7 mm wide. Leaf-blade surface scabrous, glabrous or pilose, hairy adaxially.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear, bilateral, 6–13 cm long, 6–10 mm wide. Rhachis fragile at the nodes, flattened, ciliate on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 3 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, dorsally compressed, 13–25 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate. Companion sterile spikelet lemmas 1, 10 mm long, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 8–11 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar. Lower glume lanceolate, 5–8 mm long, 1 length of upper glume. Lower glume margins eciliate or ciliate. Lower glume apex awned, 1 -awned, awn 10–18 mm long. Upper glume lanceolate, 5–8 mm long. Upper glume margins eciliate or ciliate. Upper glume awned, 1 -awned, awn 10–18 mm long.

**Florets.** Fertile lemma lanceolate, 8–11 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 20–35 mm long overall, limb scabrous.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, hairy at apex. Hilum linear.

$n = 7$  (2 refs TROPICOS), or 14 (1 ref TROPICOS).  $2n = 14$  (9 refs TROPICOS), or 28 (7 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa, Temperate Asia, North America, South America.

**Region. Southwestern Europe, Southeastern Europe, Eastern Europe.**

**Country /Province /State.** : France, Portugal, Sardinia, Spain. : Albania, Bulgaria, Greece, Italy, Crete, Romania, Sicily, Turkey Europe, Yugoslavia. Krym. **Northern Africa.** Algeria, Libya, Morocco, Tunisia. **Middle Asia, Western Asia, China.** Kazakhstan, Turkmenistan, Tadzhikistan, Uzbekistan. Iran, Iraq. China North-Central, Qinghai. Hawaii (\*). **Southwestern USA.** Arizona, California. **Western South America, Southern South America.** Bolivia, Ecuador. Uruguay.

Beijing.

### **Hordeum californicum** Covas & Stebbins. *Madrono*, x. 5 (1949).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from USA. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: HT: G.L. Stebbins 3944, 15 May 1948, USA: California: Monterey Co.: Hastings Reservation, Haystack Hill (UC; IT: BAA, DS, GH, K, NY, SI, UC-D, US-1935670, US-1935669).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ica*, belonging to. From California, USA.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Culms slender, 30–55 cm long. Leaf-sheaths glabrous on surface to pubescent. Leaf-sheath auricles absent. Ligule an eciliate membrane. Leaf-blades 2–3 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, erect, linear, bilateral, 2.5–6 cm long, 5 mm wide. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes oblong, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets represented by awns, comprising a tuft of awns (3 awns), 9–10 mm long, deciduous with the fertile.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension or with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 9–10 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets. Lower glume subulate, 9–10 mm long, 1 length of upper glume. Upper glume subulate, 9–10 mm long, 1.4–1.5 length of adjacent fertile lemma.

**Florets.** Fertile lemma lanceolate, 6–7 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 4–10 mm long overall.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (4 refs TROPICOS).

**Distribution (TDWG). Continent.** North America.

**Country /Province /State.** Northwest USA, Southwestern USA. Oregon. California.

### **Hordeum capense** Thunb. *Prod. Pl. Cap.* 23 (1794).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: South Africa, Cape: Thunberg.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ense*, denoting origin. From the Cape of Good Hope, South Africa.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with fibrous dead sheaths. Culms 20–60 cm long, 3–5 -noded. Culm-nodes glabrous. Leaf-sheath

auricles absent. Ligule an eciliate membrane, 0.3–0.9 mm long. Leaf-blades 6–17 cm long, 3–6 mm wide, stiff. Leaf-blade surface scabrous, glabrous or pubescent, hairy adaxially.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear, bilateral, 5–9 cm long, 8–17 mm wide. Rhachis fragile at the nodes, flattened, scabrous on margins, ciliate on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1.3–2.3 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, 1.7–2.6 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 13–23 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate. Companion sterile spikelet lemmas 1, 7–9 mm long, 1-awned, with 2–9 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 11–23 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar. Lower glume subulate, 11–23 mm long, 1 length of upper glume. Upper glume subulate, 11–23 mm long.

**Florets.** Fertile lemma lanceolate, 6–9.8 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 7–22 mm long overall, limb scabrous. Rhachilla extension 3–7 mm long.

**Flower and Fruit.** Anthers 3, 1.6–4.3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Southern Africa. North-West, Free State, Lesotho, Northern Cape, Western Cape, Eastern Cape.

### **Hordeum chilense** Roem. & Schult. *Syst. ii.* 796 (1817).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Chile. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Chile: Zea ; In Chili. Dedit amiciss. Zea inscriptum Hordeum sp. nov. e Chili.

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina 3 – 2 Pooideae* (2012) (60), M.N.Corrêa, *Flora Patagonica Parte III*, Gramineae (1978) (424, Fig 280).

**Derivation** (Clifford & Bostock 2007): L. *-ense*, denoting origin. From Chile.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths pubescent, persistent and investing base of culm, with compacted dead sheaths or fibrous dead sheaths. Culms geniculately ascending, 20–80 cm long. Leaf-sheath auricles absent. Ligule an eciliate membrane, 0.4–1.8 mm long. Leaf-blades 4–17 cm long, 2–5 mm wide. Leaf-blade surface smooth or scaberulous, glabrous or pilose.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear, bilateral, 4–8 cm long, 4–7 mm wide. Rhachis fragile at the nodes, narrowly winged, flattened, ciliate on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1.2–2.3 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, 10–22 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate. Companion sterile spikelet lemmas 1, 1.3–1.7 mm long, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 6.5–11.7 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, gaping. Lower glume linear, 4.2–7.5 mm long, 1 length of upper glume. Lower glume surface scabrous. Lower glume apex awned, 1 -awned, awn 4–18 mm long. Upper

glume linear, 4.3–7.5 mm long. Upper glume surface scabrous. Upper glume awned, 1 -awned, awn 4–18 mm long.

**Florets.** Fertile lemma lanceolate, 6.5–11.7 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma lateral veins obscure. Lemma surface scabrous, rough above. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 4–12.5 mm long overall, limb scabrous. Rhachilla extension 2–7 mm long.

**Flower and Fruit.** Anthers 3, 1.3–3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, hairy at apex. Hilum linear.

$2n = 14$  (5 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe (\*), South America.

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Southern South America.** Argentina South, Chile North, Chile Central, Chile South, Juan Fernandez Is.

Neuquén, Río Negro, Santa Cruz. Rest of Chile- Biobio, La Araucania, Maule, O'Higgins, Santado, Valpariso, Chiloe, Aisen, Magallanes. Tarapaca, Antofagasta. Coquimbo, Valparaiso, Santiago, O'Higgins, Maule. Magallanes.

### **Hordeum comosum** J. & C. Presl. *Rel. Haenk.* i. 327. (1830).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Chile. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: LT: *Haenke s.n.*, 1790, Chile (MO-2506394; ILT: BAA, BM, MO-2506395 (line drawing), PR, US-799904 (fragnm. ex PR)). LT designated by Baden & von Bothmer, *Nordic J. Bot.* 14: 126 (1994).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina 3 – 2 Pooideae* (2012) (70), M.N.Corréa, *Flora Patagonica Parte III, Gramineae* (1978) (430, Fig 287).

**Derivation** (Clifford & Bostock 2007): *L. coma*, hair of the head; *-osa*, abundance. Upper spikelets of the spike awned thereby forming an apical tuft.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths purple, persistent and investing base of culm, with compacted dead sheaths. Culms 10–70 cm long. Leaf-sheaths pubescent. Leaf-sheath auricles absent or falcate. Ligule a ciliolate membrane, 0.5 mm long, truncate. Leaf-blades flat or convolute, 3–5 cm long, 1–2 mm wide. Leaf-blade surface pubescent, hairy on both sides.

**Inflorescence.** Inflorescence composed of racemes, exserted or embraced at base by subtending leaf. Racemes 1, single, bilateral, 4–10 cm long. Rhachis fragile at the nodes, flattened, glabrous on margins or ciliate on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1–2 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, 1–1.5 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, 20–30 mm long, shorter than fertile or as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes similar in width, subulate, 20–30 mm long. Companion sterile spikelet lemmas 1, 10–17 mm long, 1-awned, with 7–12 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 20–35 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets, gaping. Lower glume subulate, 20–35 mm long, 1 length of upper glume, coriaceous. Lower glume surface scabrous. Upper glume subulate, 20–35 mm long, coriaceous. Upper glume surface scabrous.

**Florets.** Fertile lemma lanceolate, 7–15 mm long, coriaceous, yellow or purple, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous, rough above. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 15–25 mm long overall. Palea 6–10.5 mm long. Palea surface scabrous. Rhachilla extension 2.5–6 mm long.

**Flower and Fruit.** Lodicules 2, 1–2 mm long, ciliate. Anthers 3, 2–4.3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (3 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe (\*), South America.

**Region. Northern Europe (\*)**.

**Country /Province /State.** : GB Aliens (Ryves et al). **Western South America, Southern South America.** Bolivia, Ecuador. Argentina South, Chile North, Chile Central, Chile South. Falkland Is (Malvinas).

La Rioja, Mendoza, San Juan. Chubut, Neuquén, Río Negro, Santa Cruz, Tierra del Fuego. Tarapaca, Antofagasta, Atacama, Coquimbo, Rest of Chile- Biobio, La Auracania, Maule, O'Higgins, Santado, Valpariso, Chiloe, Aisen, Magellanes. Tarapaca, Antofagasta, Atacama. Coquimbo, Valparaiso, Santiago, O'Higgins, Biobio, La Araucania. Magellanes.

**Hordeum cordobense** R. von Bothmer, N. Jacobsen & E. Nicora. *Bot. Notiser*, 133(4): 544 (1980).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Argentina. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Argentina, Estancia San Teodora: Kneucker 415 (W holo, B, G, GH, MISS, US, WU).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina 3 – 2 Pooideae* (2012) (70).

**Derivation** (Clifford & Bostock 2007): L. *-ensis*, denoting origin. From Cordoba, Argentina.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths persistent and investing base of culm, with fibrous dead sheaths. Culms erect, 70–80 cm long, 3–6 -noded. Culm-nodes glabrous. Leaf-sheath auricles absent. Ligule an eciliate membrane, 0.4–1.5 mm long. Leaf-blades 5–13 cm long, 1.7–4.4 mm wide. Leaf-blade surface scabrous, glabrous or pubescent, hairy adaxially.

**Inflorescence.** Inflorescence composed of racemes, exserted or embraced at base by subtending leaf. Racemes 1, single, linear, bilateral, 5–10 cm long, 3–4 mm wide. Rhachis fragile at the nodes, narrowly winged, flattened, scabrous on surface, ciliate on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1.2–1.8 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, 1–2.5 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male (rarely), lanceolate, dorsally compressed, 3.7–7 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate. Companion sterile spikelet lemmas 1, 4 mm long, muticous (mucronate).

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 5–8 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar. Lower glume linear, 4–6.5 mm long, 1 length of upper glume. Lower glume surface scabrous. Upper glume linear, 4–6.5 mm long. Upper glume surface scabrous.

**Florets.** Fertile lemma lanceolate, 5–8 mm long, coriaceous, without keel, 7–9 -veined, more than 3-veined. Lemma lateral veins prominent. Lemma apex acuminate, muticous or awned, 1 -awned. Principal lemma awn 1.5–5 mm long overall, limb scabrous.

**Flower and Fruit.** Anthers 3, 1.8–3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, hairy at apex. Hilum linear.

$n = 14$  (1 ref TROPICOS).  $2n = 14$  (4 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe (\*), South America.

**Region. Northern Europe (\*)**.

**Country /Province /State.** : GB Aliens (Ryves et al). **Southern South America.** Argentina Northwest, Argentina Northeast, Uruguay.

San Juan, San Luis, Tucuman. Chaco, Cordoba, Corrientes, Entre Rios, La Pampa, Santa Fe.

## **Hordeum depressum** (Scribn. & Smith) Rydb. *Bull. Torr. Bot. Club*, vi. 539. (1909).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from USA. **Basionym or Replaced Name:** *Hordeum nodosum* var. *depressum* Scribn. & J.G. Sm., *Bull. Div. Agrostol.*, U.S.D.A. 4: 24 (1897)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: LT: *J.B. Lieberg* 39, 8 May 1894, USA: Oregon: Morrow Co.: near Lexington (US; ILT: GH, UC, US-404665). LT designated by Hitchcock, *Man. Grass. U.S.* p.? (1935).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (244).

**Derivation** (Clifford & Bostock 2007): L. broad and dwarf the growth having taken place horizontally. With spreading geniculate culms.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms decumbent, 6–45 cm long. Leaf-sheath auricles absent. Ligule an eciliate membrane. Leaf-blades 2–5 cm long, 2–4 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 4–7 cm long. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes oblong, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate. Companion sterile spikelet lemmas 1, exserted from glumes, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 7–8 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets, gaping. Lower glume subulate, 20 mm long, 1 length of upper glume. Upper glume subulate, 20 mm long.

**Florets.** Fertile lemma lanceolate, 7–8 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 10 mm long overall.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 28$  (7 refs TROPICOS).

**Distribution (TDWG). Continent.** North America.

**Country /Province /State.** Western Canada, Northwest USA, Southwestern USA, Mexico. British Columbia. Oregon, Washington, Wyoming, California, Nevada.

Baja California.

## **Hordeum distichon** Linn. *Sp. Pl.* 85. (1753).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), T.G.Tutin et al, *Flora Europaea* 5 (1980), T.Koyama, *Grasses of Japan and its neighboring regions* (1987).

**TYPE** from France. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: France: 'pl. de l'ouest de la France', 29 June 1879, *Gadecau s.n.* (HT: ?; NT: BM).

**Illustrations (Books):** J.P.Jessop, G.R.M. Dashorst & F.M.James, *Grasses of South Australia* (2006) (268, Fig 207), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (278), A.Burkat, *Flora Ilustrada de Entre Ríos (Argentina)*, Pt II, Gramineas (1969).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. *Grasses of Australia*. CD-Rom Version 1.0. (2002);

**Derivation** (Clifford & Bostock 2007): Gk. *distichos*, in two rows. Spikelets borne in two rows on the spike.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms erect, 60–120 cm long, 3–5 -noded. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane, 1–2 mm long, truncate. Leaf-blades 10–45 cm long, 6–12 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 7–12 cm long. Rhachis tough, flattened, ciliate on margins. Spikelet packing broadside to rhachis, regular, 2 -rowed. Rhachis internodes cuneate. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 10 mm long, as long as fertile, persistent. Companion sterile spikelet glumes subulate, 4–5 mm long, ciliate on margins. Companion sterile spikelet lemmas 1, exserted from glumes, 10 mm long, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 9–12 mm long, persistent on plant.

**Glumes.** Glumes collateral, similar, shorter than spikelet, gaping. Lower glume linear, 4–5 mm long, 1 length of upper glume. Lower glume apex acuminate, awned, 1 -awned, awn 4–10 mm long. Upper glume linear, 4–5 mm long, 0.3–0.5 length of adjacent fertile lemma. Upper glume apex acuminate, awned, 1 -awned, awn 4–10 mm long.

**Florets.** Fertile lemma elliptic, 9–12 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous, rough above. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 12–15 mm long overall, limb scabrous.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa, Temperate Asia, Tropical Asia, Australasia (\*), North America, South America.

**Region.** Northern Europe (\*), Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe.

**Country /Province /State.** : GB Aliens (Ryves et al). Belarus, Estonia, Latvia, Lithuania, Central European Russia, East European Russia, North European Russia, South European Russia, Northwest European Russia, Ukraine. **Northeast Tropical Africa.** Ethiopia (inc. Eritrea). Siberia, Russian Far East, **Middle Asia, Western Asia, China, Mongolia, Eastern Asia.** Altay, Buryatiya, Chita, Irkutsk, Krasnoyarsk, Tuva. Amur, Kamchatka, Khabarovsk, Kuril Is, Magadan, Primorye, Sakhalin. Kazakhstan, Turkmenistan, Tadzhikistan, Uzbekistan. Iran, Iraq. China North-Central, Qinghai, China Southeast, Tibet. Japan Hokkaido, or Honshu, or Shikoku, or Kyushu. Japan, Nansei-Shoto. **Indian Subcontinent.** Pakistan. **Australia (\*).** Western Australia (\*), South Australia (\*), Queensland (\*), New South Wales (\*), Victoria (\*), Tasmania (\*). New Caledonia. **Subarctic America.** Greenland. **Southern South America.** Argentina Northeast.

Hebei. Anhui, Fujian, Henan. South-West. NW & Lake Eyre, Southern. North, South East. Coast, Western Slopes. Entre Rios.

**Hordeum erectifolium** R. von Bothmer, N. Jacobsen & R.B. Jorgensen. *Willdenowia*, 15(1): 85 (1985).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Argentina. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: FTIT: R. V. Bothman & Jacobsen s.n. BAA 4600, 27 Dec 1978, Argentina: Prov. Buenos Aires, Bahia Blanca (SI).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. erectus*, tending towards being erect; *folium*, leaf. With at least some leaf-blades erect.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Culms erect, 40–80 cm long, 4–5 -noded. Culm-nodes glabrous. Leaf-sheaths 10–12 cm long, glabrous on surface. Ligule an eciliate

membrane. Leaf-blades erect, flat or involute, 3–17 cm long, 1.5–3.5 mm wide, glaucous. Leaf-blade surface smooth or scaberulous, rough abaxially, pubescent, hairy adaxially.

**Inflorescence.** Inflorescence composed of racemes. Peduncle 35–40 cm long. Racemes 1, single, bilateral, 4–5 cm long, 5–6 mm wide, bearing 45 fertile spikelets on each. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes cuneate, 0.9–1 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, curved, 2 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, 11.5–11.8 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes similar in width, subulate, 11.5–11.8 mm long. Companion sterile spikelet lemmas 1, 1.9–2 mm long, 1-awned, with 0.5 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 8.8–10.5 mm long, 1.2–1.3 mm wide, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets, gaping. Lower glume subulate, 8.8–10.5 mm long, 1 length of upper glume, coriaceous. Upper glume subulate, 8.8–10.5 mm long, coriaceous.

**Florets.** Fertile lemma lanceolate, 6.5–7 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface pubescent, hairy above. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 8.5–11.5 mm long overall. Rhachilla extension 2.8–3.4 mm long.

**Flower and Fruit.** Lodicles 2, 1 mm long, ciliate. Anthers 3, 2–2.9 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (2 refs TROPICOS).

**Distribution (TDWG).** Continent. South America.

**Country /Province /State. Southern South America.** Argentina Northeast.

Buenos Aires.

### **Hordeum euclaston** Steud. *Syn. Pl. Gram.* 353. (1854).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE from Unknown. Basionym or Replaced Name:** *Hordeum fragile* Godr., *Mem. Acad. Montp. (Sect. Medic.)*, 1: 455 (1853)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: : Based on *H. fragile* Godr. ; Unknown, Adventive. in France, Port Juvenal: Coll?.

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina 3 – 2 Pooideae* (2012) (71), A.Burkat, *Flora Ilustrada de Entre Ríos (Argentina)*, Pt II, Gramineas (1969) (103, Fig 31), M.N.Corréa, *Flora Patagonica Parte III*, Gramineae (1978) (414, Fig 274).

**Derivation** (Clifford & Bostock 2007): as for *Euclasta*. The spike breaks up readily at maturity.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual. Culms geniculately ascending, 50–60 cm long, 2–4 -noded. Culm-nodes glabrous. Leaf-sheaths glabrous on surface or pubescent. Ligule an eciliate membrane, 1 mm long, truncate. Leaf-blades flat or conduplicate, 3–10 cm long, 2–3 mm wide. Leaf-blade surface pubescent, hairy on both sides.

**Inflorescence.** Inflorescence composed of racemes, subtended by an inflated leaf-sheath, exserted or embraced at base by subtending leaf. Racemes 1, single, bilateral, 2–8 cm long, 5–8 mm wide. Rhachis fragile at the nodes, flattened, scabrous on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1–1.5 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes markedly unequal in width (subulate & lanceolate), coriaceous or subulate, entire, awned. Companion sterile spikelet lemmas 1, 1-awned.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then

both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 8–12 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets, gaping. Lower glume lanceolate, 8–12 mm long, 1 length of upper glume, coriaceous. Lower glume surface scabrous. Lower glume apex setaceously acuminate. Upper glume lanceolate, 8–12 mm long, coriaceous. Upper glume apex setaceously acuminate.

**Florets.** Fertile lemma lanceolate, 8–9 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 8–10 mm long overall. Palea 6–7 mm long.

**Flower and Fruit.** Lodicules 2. Anthers 3, 0.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, ovoid, 2.5–3 mm long, hairy at apex. Hilum linear.

$2n = 14$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe (\*), South America.

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Brazil, Southern South America.** Brazil South. Argentina Northeast, Argentina South, Uruguay.

Catarina, Rio Grande do Sul. Rio Grande do Sul. Mendoza, Tucuman. Buenos Aires, Cordoba, Corrientes, Distrito Federal, Entre Rios, La Pampa, Santa Fe. Chubut, Río Negro, Santa Cruz.

### **Hordeum flexuosum** Steud. *Syn. Pl. Gram.* 353. (1854).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Argentina. **Basionym or Replaced Name:** *Hordeum bonariense* L.R.Parodi & E.G. Nicora, *Hickenia*, 1(11): 55 (1977). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: T: *J. Gillies s.n.*, no date, Argentina (US-2830875).

IT: *F. Tweedy s.n.*, no date, Argentina or Chile: (US-1019091).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina 3 – 2 Pooideae* (2012) (72), M.N.Correa, *Flora Patagonica Parte III, Gramineae* (1978) (414, Fig 273 as *H. bonariense*).

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual or perennial. Culms erect, 15–50 cm long, 2–5 -noded. Leaf-sheaths glabrous on surface. Ligule an eciliate membrane, 1 mm long, truncate. Leaf-blades flat or convolute, 5–10 cm long, 1–3 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 4–7 cm long, 3–5 mm wide. Rhachis fragile at the nodes, flattened, glabrous on margins or ciliate on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1–1.5 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, 0.5 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, 6–8 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes markedly unequal in width (subulate & lanceolate), coriaceous or subulate, 6–8 mm long, dentate, 2 -fid, awned. Companion sterile spikelet lemmas 1, 1-awned.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension or with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 6–8 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, reaching apex of florets, gaping. Lower glume lanceolate, 6–8 mm long, 1 length of upper glume, coriaceous. Lower glume surface scabrous. Lower glume apex setaceously acuminate. Upper glume lanceolate, 6–8 mm long, coriaceous. Upper glume apex setaceously acuminate.

**Florets.** Fertile lemma lanceolate, 6–8 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface glabrous or puberulous. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 2–4 mm long overall. Palea 1 length of lemma. Rhachilla extension 0–0.2 mm long.

**Flower and Fruit.** Lodicules 2. Anthers 3, 3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, ovoid, sulcate on hilar side, 3 mm long, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG).** Continent. Europe (\*), South America.

**Region.** Northern Europe (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Brazil, Southern South America.** Argentina South, Uruguay.

Mendoza. Buenos Aires, Chaco, Corrientes, Distrito Federal, Entre Ríos, La Pampa. Chubut, Santa Cruz.

**Hordeum fuegianum** R. von Bothmer, N. Jacobsen & R.B. Jorgensen. *Nordic J. Bot.*, 6(4): 404 (1986).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Argentina. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Argentina: Tierra del Fuego, Dept. Ushuaia, 27 Jan 1960, E.M.Grondona 7371 (HT: BAA).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -ana, indicating location. From Fuegia.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Rhizomes absent or short. Butt sheaths persistent and investing base of culm, with fibrous dead sheaths. Culms erect, 19–50 cm long, 3–4 -noded. Culm-nodes glabrous. Leaf-sheaths 6–15 cm long, glabrous on surface. Leaf-sheath auricles absent. Ligule an eciliate membrane, 0.3–0.4 mm long. Leaf-blades 1–10 cm long, 1.3–3.8 mm wide. Leaf-blade surface scabrous, rough adaxially, pubescent, hairy abaxially.

**Inflorescence.** Inflorescence composed of racemes. Peduncle 15–32 cm long. Racemes 1, single, bilateral, 4–7 cm long, 4–5 mm wide, bearing 20–45 fertile spikelets on each. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes cuneate, 0.9–2.3 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, curved, 1.5–3.3 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 15–15.4 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes similar in width, subulate, 10–15.4 mm long. Companion sterile spikelet lemmas 1, 1.8–3.7 mm long, muticous or 1-awned, with 0–1.3 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 10.2–15.4 mm long, 0.9–1.6 mm wide, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets, gaping. Lower glume subulate, 10.2–15.4 mm long, 1 length of upper glume, coriaceous. Upper glume subulate, 10.2–15.4 mm long, coriaceous.

**Florets.** Fertile lemma lanceolate, 6.7–9.3 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface glabrous or pilose. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 3.8–8.4 mm long overall. Rhachilla extension 4.2–6.5 mm long, pilose.

**Flower and Fruit.** Lodicules 2, 0.9–1.4 mm long, glabrous or ciliate, obtuse or acute. Anthers 3, 1.5–2.1 mm long, yellow or purple. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 28$  (1 ref TROPICOS).

**Distribution (TDWG).** Continent. South America.

**Country /Province /State.** Southern South America. Chile South.

Tierra del Fuego. Magellanes.

**Hordeum glaucum** Steud. *Syn. Pl. Gram.* 352 (1854).

**Accepted by:** U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae* 5 (2000) (as *Critesion*), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from France. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: France: 'pl. de l'ouest de la France', 29 June 1879, *Gadecau s.n.* (HT: ?; NT: BM).

**Illustrations (Books):** N.Feinbrun-Dothan, *Flora Palaestina* 4 (1986) (Pl 224), J.P.Jessop, G.R.M. Dashorst & F.M.James, *Grasses of South Australia* (2006) (269, Fig. 208), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (278), D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002), A.L.Cabrera, *Flora de la Provincia de Buenos Aires*, IV Pt 2 Gramineas (1970) (186, Fig. 50), M.N.Correa, *Flora Patagonica Parte III*, Gramineae (1978) (407, Fig. 270).

**Derivation** (Clifford & Bostock 2007): *L. glauca*, bluish-green. Whole plant or any of its parts glaucous.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Flower and Fruit.**  $n = 7$  (1 ref TROPICOS).  $2n = 14$  (3 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, Australasia.

**Region. Northern Europe.**

**Country /Province /State.** : Great Britain. **Australia** (\*), **New Zealand** (\*). Western Australia, Northern Territory, South Australia, Queensland, New South Wales, Victoria, Tasmania.

Eremean, South-West. Central Australia. NW & Lake Eyre, Southern. North, Central, South East, Inland. Coast, Tablelands, Western Slopes, Western Plains.

**Hordeum guatemalense** R. von Bothmer, N. Jacobsen & R.B. Joregensen. *Willdenowia*, 15(1): 86 (1985).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Guatemala. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Guatemala: Huehuetenango: Llano de Paquix, Chinantla, 3130 m, 9 Oct 1976, D.N. Smith 486 (HT: ISC; IT: F).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. -ense*, denoting origin. From Guatemala.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial. Culms 20–70 cm long. Leaf-sheath auricles absent. Ligule an eciliate membrane, 0.5–0.8 mm long. Leaf-blades 4–10 cm long, 3–6 mm wide. Leaf-blade surface glabrous or pubescent.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 3–6 cm long. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes oblong, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, 5–8 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate, 5–8 mm long. Companion sterile spikelet lemmas 1, 1–3 mm long, muticous or 1-awned, with 0–0.7 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 4.8–7.9 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, gaping. Lower glume subulate, 4.8–7.9 mm long, 1 length of upper glume. Lower glume surface scabrous. Upper glume subulate, 4.8–7.9 mm long. Upper glume surface scabrous.

**Florets.** Fertile lemma lanceolate, 7 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 2.5–5.3 mm long overall. Rhachilla extension 2–2.4 mm long.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, ellipsoid, sulcate on hilar side, hairy at apex. Hilum linear, 1 length of caryopsis.

$2n = 27$  (1 ref TROPICOS), or 28 (3 refs TROPICOS).

**Distribution (TDWG). Continent.** South America.

**Country /Province /State.** Mesoamerica. Guatemala.

## **Hordeum halophilum** Griseb. *Goett. Abh.* xix. 249. (1874).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Argentina. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: LT: P.G. Lorentz 441, Argentina: Catamarca: in saltis Laguna Blanca, alt. 10000 ft (K; ILT: BAA, CORD, GOET, US-799910 (fragm. ex GOET)). LT designated by Baden & von Bothmer, Nord. J. Bot. 14(2): 124 (1994).

**Illustrations (Books):** S.A.Renvoize, *Gramineas de Bolivia* (1998) (250, Fig 49), E.G.Nicora, *Los Generos de Gramineas de America Austral* (1987) (260, Fig. 83), M.N.Correa, *Flora Patagonica Parte III, Gramineae* (1978) (434, Fig 289).

**Derivation** (Clifford & Bostock 2007): Gk. *halos*, salt; *phileo*, love. Growing on saline soils.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms geniculately ascending, 20–40 cm long, 1–2 -noded. Leaf-sheaths glabrous on surface or pubescent. Ligule an eciliate membrane, 0.2 mm long. Leaf-blades flat or convolute, 1.5–2.5 mm wide.

**Inflorescence.** Inflorescence composed of racemes, subtended by an inflated leaf-sheath, embraced at base by subtending leaf. Racemes 1, single, bilateral, 3.5–5 cm long. Rhachis fragile at the nodes, flattened, pubescent on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 0.7–1.1 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, 1 mm long, scabrous.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, 10–20 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes similar in width, subulate, 10–20 mm long, scabrous, glabrous. Companion sterile spikelet lemmas 1, 2–4 mm long, 1-awned.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension or with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 10–20 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets, gaping. Lower glume subulate, 10–20 mm long, 1 length of upper glume, coriaceous. Lower glume surface scabrous. Upper glume subulate, 10–20 mm long, coriaceous. Upper glume surface scabrous.

**Florets.** Fertile lemma lanceolate, 5–6.5 mm long, coriaceous, purple, without keel, 5 -veined, more than 3-veined. Lemma surface asperulous, glabrous or puberulous, hairy above. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 6–10 mm long overall. Rhachilla extension 0–2.5 mm long.

**Flower and Fruit.** Lodicules 2, 0.7–1 mm long, glabrous, acute. Anthers 3, 0.8–1 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, 2.5–3.5 mm long, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe (\*), South America.

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Western South America, Southern South America.** Bolivia. Argentina South, Chile Central.

Neuquén. Tarapaca, Antofagasta, Atacama, Coquimbo.

## **Hordeum hystrix** Roth. *Catal. Bot.* 1: 23 (1797).

**Accepted by:** U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae* 5 (2000) (as *Critesion*), T.G.Tutin et al, *Flora Europaea* 5 (1980), T.Koyama, *Grasses of Japan and its neighboring regions* (1987).

**TYPE** from Spain. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: Habitat in Hispania --- Semina hujus graminis ante aliquot annos inter Passulas majores legi --- ex horto amici Roth [Mertens],

HT: (LE). "Hordeum hystrix mihi".

IST: F.C. Mertens, -- *Scrips s.n.*, no date, Spain (US-730911).

IST: (L).

**Illustrations (Books):** N.Feinbrun-Dothan, *Flora Palaestina* 4 (1986) (Pl 226), J.P.Jessop, G.R.M. Dashorst & F.M.James, *Grasses of South Australia* (2006) (270, Fig 209), S.W.L.Jacobs, R.D.B.Whalley &

D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (279), A.Wilson (ed.), *Flora of Australia*, Vol 44A. *Poaceae* (2009) (113, Fig 17).

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Distribution (TDWG). Continent.** Temperate Asia, Australasia, North America.

**Country /Province /State. Eastern Asia.** Japan Honshu. **Australia** (\*), **New Zealand** (\*). Western Australia, South Australia, Queensland, New South Wales, Victoria, Tasmania. **Southwestern USA, Mexico.** California. Northwest Mexico.

Baja California.

### **Hordeum innermongolicum** P.C. Kuo & L.B. Cai. *Acta Biol. Plateau Sin.*, 6: 223 (1987).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (*Poaceae*) (2006).

**TYPE** from China. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: China: Nei Mongol: mountain slopes, ca. 1200 m, *Ziyuanzhu Exped.* 10689 (HT: NWBI).

**Illustrations:** None found.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped loosely. Culms erect or geniculately ascending, 80–140 cm long, 3–5 -noded. Culm-internodes distally glabrous. Leaf-sheaths glabrous on surface. Ligule an eciliate membrane, 0.5–1 mm long. Leaf-blades 6–15 cm long, 4–6 mm wide. Leaf-blade surface pubescent, hairy adaxially.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 7–16 cm long, 5–7 mm wide. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes oblong, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, 0.5–1 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male (rarely), lanceolate, dorsally compressed, 6–8 mm long, shorter than fertile or as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate. Companion sterile spikelet lemmas 1, 5–7 mm long, 1-awned, with 3–4 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with diminished florets at the apex. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 7–10 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar. Lower glume lanceolate, 6–9 mm long, 1 length of upper glume, 2–3 -veined. Lower glume lateral veins obscure. Lower glume apex setaceous acuminate. Upper glume lanceolate, 6–9 mm long, 2–3 -veined. Upper glume lateral veins obscure. Upper glume apex setaceous acuminate.

**Florets.** Fertile lemma lanceolate, 7–10 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface pubescent. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 6–8 mm long overall. Apical sterile florets distinct from fertile, rudimentary.

**Flower and Fruit.** Anthers 3, 2–2.3 mm long, yellow. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, 2.5–3.5 mm long, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State. China.** Inner Mongolia, Qinghai.

### **Hordeum intercedens** Nevski. *Acta Inst. Bot. Acad. Sci. URSS, Ser. 1 (Fl. & Syst. Pl. Vasc.) Fasc. 5*, 222 (1941).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from USA. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: IT: *L. Abrams* 3452, 10 May 1903, USA: California, San Diego Co., mesa 5 mi N of San Diego (PH).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 *Poaceae*, part 1 (2007) (244).

**Derivation** (Clifford & Bostock 2007): *L. intercedo*, come between. Intermediate between two other species.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.  
**Flower and Fruit.**  $2n = 14$  (4 refs TROPICOS).  
**Distribution (TDWG).** Continent. North America.  
**Country /Province /State.** Southwestern USA. California.

**Hordeum jubatum** Linn. *Sp. Pl.* 85. (1753).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae 5* (2000), S-L Chen et al, *Flora of China 22* (Poaceae) (2006), T.G.Tutin et al, *Flora Europaea 5* (1980) (as *Critesion*).

**TYPE** from Canada. **Basionym or Replaced Name:** *Critesion jubatum* (L.) Nevski, Komarov, *Fl. URSS*, 2: 721 (1934). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Kalm*, North America, "6 K jubatum" (LINN). see Hitchcock, *Contr. U.S. Natl. Herb.* 12: 124 (1908).

HT: Habitat in Canada (LINN-103.10). see Baden & Bothmer, *Nordic J. Bot.* 14: 128 (1994).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina 3 – 2 Pooideae* (2012) (73), T. Cope & A. Gray, *Grasses of the British Isles* (165), K.F.Best, et al, *Prairie Grasses* (1971) (147), M.E.Barkworth et al, *Flora of North America north of Mexico Vol 24 Poaceae*, part 1 (2007) (247, as subspecies *jubatum* & *intermedium*), A.L.Cabrera, *Flora de la Provincia de Buenos Aires, IV Pt 2 Gramineas* (1970) (186, Fig. 50), M.N.Correa, *Flora Patagonica Parte III, Gramineae* (1978) (439, Fig 291), S-L Chen et al, *Flora of China, Illustrations*, Poaceae (2007) (Fig. 555), E.Hafliger & E.Schultz, *Grass Weeds, CIBA-GEIGY* (2:85(1980)).

**Images:** H.Duistermaat, *Field Guide to the Grasses of Singapore* (2005);, R.Darke, *Ornamental Grasses* (2004);

**Derivation** (Clifford & Bostock 2007): *L. juba*m, mane; -*ata*, possessing. The inflorescence or awn resembles a fox tail.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, short-lived, caespitose. Culms erect or geniculately ascending, 30–75 cm long. Culm-nodes brown. Ligule an eciliate membrane, 0.2–0.5 mm long, truncate. Leaf-blades 6–15 cm long, 2–4 mm wide. Leaf-blade surface scabrous, glabrous or pubescent.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear, bilateral, 4–10 cm long, 4–6 mm wide. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes oblong, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, comprising 2 subequal glumes without lemmas or containing empty lemmas, linear, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate, 35–80 mm long. Companion sterile spikelet lemmas 0–1, 0.5 mm long, 1-awned, with 35–80 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 4–7 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, shorter than spikelet, gaping. Lower glume subulate, 35–80 mm long, 1 length of upper glume. Lower glume surface scabrous. Upper glume subulate, 35–80 mm long. Upper glume surface scabrous.

**Florets.** Fertile lemma lanceolate, 4–7 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 35–80 mm long overall.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$n = 7$  (2 refs TROPICOS), or 28 (1 ref TROPICOS).  $2n = 28$  (9 refs TROPICOS).

**Distribution (TDWG).** Continent. Europe, Africa, Temperate Asia, Australasia, North America, South America, Antarctica.

**Region. Northern Europe, Middle Europe, Eastern Europe.**

**Country /Province /State.** : Denmark, Finland, Great Britain (\*), Sweden. : Belgium, Germany, Netherlands, Switzerland. Central European Russia, East European Russia, North European Russia, Northwest European Russia, Ukraine. **Southern Africa** (\*). Lesotho. Siberia, Russian Far East, **Middle**

**Asia, Caucasus, China.** Irkutsk, Krasnoyarsk, Tuva. Kamchatka, Kuril Is, Magadan, Primorye, Sakhalin. Manchuria. **New Zealand** (\*). New Zealand South I. **Subarctic America, Western Canada, Eastern Canada, Northwest USA, North-central USA, Northeast USA, Southwestern USA, South-central USA, Southeastern USA, Mexico.** Aleutian Is, Alaska, Yukon, Northwest Territories, Nunavut, Greenland. Alberta, British Columbia, Manitoba, Saskatchewan. Labrador, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward I, Quebec. Colorado, Idaho, Montana, Oregon, Washington, Wyoming. Illinois, Iowa, Kansas, Minnesota, Missouri, North Dakota, Nebraska, Oklahoma, South Dakota, Wisconsin. Connecticut, Indiana, Maine, Massachusetts, Michigan, Ohio, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia. Arizona, California, Nevada, Utah. New Mexico, Texas. North Carolina, South Carolina, Virginia. Central Mexico, Northeast Mexico. **Southern South America.** Argentina Northeast, Argentina South, Chile South. **Subantarctic islands.** Falkland Is (Malvinas).

Mendoza. Buenos Aires, La Pampa. Chubut, Neuquén, Río Negro, Tierra del Fuego. Magellanes. Distrito Federal, Mexico State, Puebla. Hidalgo, Nuevo Leon, Zacatecas.

### **Hordeum lechleri** (Steud.) Schenck. *Engl. Jahrb. xl.* 108 (1907).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Chile. **Basionym or Replaced Name:** *Elymus lechleri* Steud., *Syn. Pl. Glumac.* 1: 430 (1854)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: LT: *W. Lechler 1235*, Jan. m., Chile: Ad terminus fluctus maris pr. Sandy Point (G; BAA, CAEN, CONC, K, LE, NY, P, S, UPS, US-556534 (frgm. ex CAEN, CONC & photo, K), W). LT designated by Baden & von Bothmer, Nordic J. Bot. 14: 130 (1994); *Pl. magellanicae*. Ed. R.F.hohenacker..

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina 3 – 2 Pooideae* (2012) (73), M.N.Corra, *Flora Patagonica Parte III, Gramineae* (1978) (434, Fig 288).

**Derivation** (Clifford & Bostock 2007): in honor of Willibald Lechler (1814–1856) German apothecary and traveller who collected in South America.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms geniculately ascending, 25–65 cm long. Ligule an eciliate membrane. Leaf-blades flat or convolute, 1–3 mm wide. Leaf-blade surface pilose, hairy on both sides.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 5–12 cm long. Rhachis fragile at the nodes, flattened, pubescent on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1–1.5 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, 1 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 27–55 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes similar in width, subulate, 27–55 mm long, scabrous. Companion sterile spikelet lemmas 1, 7 mm long, 1-awned, with 2–12 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 27–55 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets, gaping. Lower glume subulate, 27–55 mm long, 1 length of upper glume, coriaceous. Lower glume surface scabrous. Upper glume subulate, 27–55 mm long, coriaceous. Upper glume surface scabrous.

**Florets.** Fertile lemma lanceolate, 8–10 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface asperulous, rough above. Lemma margins scabrous. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 20–45 mm long overall. Palea 8 mm long. Rhachilla extension 4.5–6.5 mm long.

**Flower and Fruit.** Lodicules 2, 1–1.5 mm long, ciliate. Anthers 3, 1–1.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, 5 mm long, hairy at apex. Hilum linear.

$n = 42$  (1 ref TROPICOS).  $2n = 42$  (8 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe (\*), South America.

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Southern South America.** Argentina South, Chile South.

Mendoza. Chubut, Neuquén, Río Negro, Santa Cruz, Tierra del Fuego. Chiloe, Aisen, Magallanes. Magallanes.

### **Hordeum leporinum** Link. *Linnaea*, 9: 133 (1834).

**Accepted by:** U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from Greece. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Frequens in Graecia, HT: (B (destroyed)).

**Illustrations (Books):** J.P.Jessop, G.R.M. Dashorst & F.M.James, *Grasses of South Australia* (2006) (271, Fig. 210), N.Walsh & T.Entwistle, *Flora of Victoria Vol 2* (1994) (as *Critesion murinum* subsp. *glaucum*), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (279), J.C.Tothill,& J.B.Hacker. *The grasses of southern Queensland* (1983) (268), T.D.Stanley & E.Ross, *Flora of South East Queensland, Gramineae* (1989) (133, Fig. 20 as *Critesion murinum*), A.Wilson (ed.), *Flora of Australia, Vol 44A. Poaceae* (2009) (113, Fig. 17), D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia. CD-Rom Version 1.0.* (2002), E.Edgar. & H.E.Connor, *Flora of New Zealand 5, Gramineae* (2000) (384, Fig. 14 as *Critesion murinum*), W.L.Wagner et al., *Manual of the Flowering Plants of Hawai'i*, Vol. 2 (1990) (1553, Pl. 230), F.W.Gould, *The Grasses of Texas* (1975) (161, Fig. 81), A.L.Cabrera, *Flora de la Provincia de Buenos Aires, IV Pt 2 Gramineas* (1970) (186, Fig. 50), M.N.Correa, *Flora Patagonica Parte III, Gramineae* (1978) (414, Fig. 275), B.Rosengurtt, *Gramineas Uruguayas I* (1970) (148, Fig. 57), E.Hafliger & E.Schultz, *Grass Weeds*, CIBA-GEIGY (2:86(1980)).

**Images:** D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia. CD-Rom Version 1.0.* (2002);.

**Derivation** (Clifford & Bostock 2007): *L. lepus*, hare; -ina, indicating resemblance. Inflorescence resembles a hare's tail.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Flower and Fruit.**  $n = 7$  (1 ref TROPICOS), or 14 (2 refs TROPICOS).  $2n = 28$  (3 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe.

**Region. Northern Europe.**

**Country /Province /State.** : Great Britain. **Australia** (\*). Western Australia, Northern Territory, South Australia, Queensland, New South Wales, Victoria, Tasmania. Hawaii (\*). **Brazil.** Brazil South.

Eremean, South-West. Central Australia. NW & Lake Eyre, Southern. Inland. Coast, Tablelands, Western Slopes, Western Plains. Rio Grande do Sul.

### **Hordeum marinum** Huds. *Fl. Angl. ed. II. i. 57* (1778).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae 5* (2000), T.G.Tutin et al, *Flora Europaea 5* (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983) (as *Critesion*).

**TYPE** from UK. **Basionym or Replaced Name:** *Critesion marinum* (Huds.) ?Löve, *Taxon*, 29(2–3): 350 (1980). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: T: Morison, Hist. Oxon. 3: 179, t. 6, f. 5 (1699).

**Recent Synonyms:** *Hordeum hystris* Roth, *Catal. Bot.* 1: 23 (1797).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina 3 – 2 Pooideae* (2012) (74), C.E.Hubbard, *Grasses* (1968) (112), T. Cope & A. Gray, *Grasses of the British Isles* (164), N.Feinbrun-Dothan, *Flora Palaestina 4* (1986) (Pl 225 & as *H. hystris*), N.L.Bor, *Gramineae in Flora of Iraq* (1968) (251, Pl. 86), J.P.Jessop, G.R.M. Dashorst & F.M.James, *Grasses of South Australia* (2006) (272, Fig 211 & as *H. hystris*), N.Walsh & T.Entwistle, *Flora of Victoria Vol 2* (1994) (516, Fig 101 as *Critesion marinum* and *Critesion hystris*), A.Wilson (ed.), *Flora of Australia, Vol 44A. Poaceae* (2009) (113, Fig 17), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn

(2008) (280), D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002) (& as *H. hystrix*), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (as subspecies *gussoneanum* & *marinum*), M.N.Correa, *Flora Patagonica* Parte III, Gramineae (1978) (419, Fig 276).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002); (as *H. hystrix*), L.Boulos, *Flora of Egypt* 4 (2005); (as subsp. *marinum*).

**Derivation** (Clifford & Bostock 2007): *L. mare*, sea; *-inum*, belonging to. Growing by the sea.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual, culms solitary or caespitose. Culms 10–40 cm long, 3–4 - noded. Leaf-sheath oral hairs lacking. Leaf-sheath auricles absent or falcate. Ligule an eciliate membrane, 0.5–1 mm long. Leaf-blades 1.5–8 cm long, 1–3.5 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, oblong or ovate, bilateral, 2–6 cm long. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes oblong, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, 3–5 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes markedly unequal in width, subulate, 8–26 mm long, winged on margins (upper glume), eciliate on margins. Companion sterile spikelet lemmas 1, exserted from glumes, 3–5 mm long, 1-awned, with 3–5 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 6–8 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, gaping. Lower glume subulate, 10–24 mm long, 1 length of upper glume. Lower glume margins eciliate. Upper glume subulate, 10–24 mm long. Upper glume margins eciliate.

**Florets.** Fertile lemma ovate, 6–8 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface smooth. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 10–24 mm long overall, limb scabrous.

**Flower and Fruit.** Anthers 3, 1.3–1.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, ellipsoid, sulcate on hilar side, hairy at apex. Embryo 0.2 length of caryopsis. Hilum linear, 1 length of caryopsis.

$n = 7$  (1 ref TROPICOS), or 14 (1 ref TROPICOS).  $2n = 14$  (5 refs TROPICOS).

**Distribution (TDWG).** **Continent.** Europe, Africa, Temperate Asia, Tropical Asia, Australasia (\*), North America, South America.

**Region.** Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe.

**Country /Province /State.** : Denmark, Great Britain. : Austria, Belgium, Czechoslovakia, Germany, Hungary, Netherlands. : Baleares, Corsica, France, Portugal, Sardinia, Spain. : Albania, Bulgaria, Greece, Italy, Crete, Romania, Sicily, Turkey Europe, Yugoslavia. Estonia, Latvia, Lithuania, Krym, East European Russia, South European Russia, Ukraine. Northern Africa, Macaronesia, Southern Africa. Algeria, Egypt, Libya, Morocco, Tunisia. Canary Is, Madeira. Middle Asia, Caucasus, Western Asia, Arabian Peninsula, Eastern Asia. Kazakhstan, Turkmenistan, Tadzhikistan. Iran, Iraq. Kuwait. Japan. Indian Subcontinent. Pakistan, West Himalaya. Australia (\*), New Zealand (\*). Western Australia, South Australia (\*), New South Wales (\*), A.C.T. (\*), Victoria (\*), Tasmania (\*). New Zealand North I, New Zealand South I. Northwest USA, Southwestern USA. Idaho, Montana, Oregon, Washington. Arizona, California, Nevada, Utah. Southern South America. Argentina South, Chile Central, Chile South.

South-West. Southern. Coast, Western Plains. Mendoza. Buenos Aires. Chubut, Neuquén. Coquimbo, Valparaiso, Santiago, Maule, Biobio, La Araucania. Los Lagos, Magellanes. Baja California.

### **Hordeum murinum** Linn. Sp. Pl. 85. (1753).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), E.Edgar, & H.Connor, *Flora of New Zealand*

*Gramineae* 5 (2000) (as *Critesion*), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), T.G.Tutin et al, *Flora Europaea* 5 (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983), T.Koyama, *Grasses of Japan and its neighboring regions* (1987), W.D.Clayton & N.Snow, *Key to Pacific Grasses* (2010).

**TYPE** from Europe. **Basionym or Replaced Name:** *Critesion murinum* (L.) ?Löve, *Taxon*, 29(2–3): 350 (1980), *Critesion glaucum* (Steud.) ?Löve, *Feddes Repert.*, 95: 440 (1984), *Hordeum leporinum* Link, *Linnaea*, 9: 133 (1834), *Hordeum glaucum* Steud., *Syn. Pl. Gram.* 352. (1854). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Habitat in Europae locis ruderatis,

LT: specimen 3 of *Hordeum* in the Clifford Herbarium, LT designated by Baum & Jarvis, *Taxon* 34: 529 (1985). Bowden, *Can. J. Bot.* 40: 1695 (1960) considered LINN-103.8 to be the type.

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina 3 – 2 Pooideae* (2012) (74 & 75), C.E.Hubbard, *Grasses* (1968) (110), T. Cope & A. Gray, *Grasses of the British Isles* (163), G.Hegi, *Flora von Mitteleuropa* 1 (1909), L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (71, Fig. 44), G.E.Gibbs Russell el al, *Grasses of Southern Africa* (1990) (181, Fig. 107), L.Boulos, *Flora of Egypt* 4 (2005) (205, Pl. 59 as subsp. *glaucum*), C.A.Gardner, *Flora of Western Australia*, Vol 1, Part 1, *Gramineae* (1952), N.Walsh & T.Entwistle, *Flora of Victoria* Vol 2 (1994) (516, Fig. 101 as *Critesion murinum* subsp. *leporinum*), E.Edgar. & H.E.Connor, *Flora of New Zealand* 5, *Gramineae* (2000) (as *Critesion*), J.C.Tothill,& J.B.Hacker. *The grasses of southern Queensland* (1983) (as *H. leporinum*), T.D.Stanley & E.Ross, *Flora of South East Queensland, Gramineae* (1989) (as *Critesion murinum* subsp. *glaucum*), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 *Poaceae*, part 1 (2007) (249, as subspecies *glaucum*, *leporinum* & *murinum*), A.L.Cabrera, *Flora de la Provincia de Buenos Aires, IV Pt 2 Gramineas* (1970) (186, Fig. 50), M.N.Correa, *Flora Patagonica Parte III, Gramineae* (1978) (407, Fig. 272), E.Hafliger & E.Schultz, *Grass Weeds*, CIBA-GEIGY (2:87(1980)).

**Images:** D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia*. CD-Rom Version 1.0. (2002);, K.O.Mallett (ed.), *Flora of Australia*, Vol 44 A (2002) & Vol 44B (2004). *Poaceae*; (as *H. leporinum*), E.Edgar & H.E.Connor, *Flora of New Zealand* 5, *Gramineae* (2000); (as *Critesion*), L.Boulos, *Flora of Egypt* 4 (2005); (as subsp. *glaucum*), F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999).

**Derivation** (Clifford & Bostock 2007): *L. murus*, wall; -ina, belonging to. Growing on walls.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms 6–60 cm long, 3–5 -noded. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane, 0.5–1 mm long. Leaf-blades 2–20 cm long, 2–8 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear or oblong, bilateral, 4–12 cm long. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 3–3.5 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 7–11 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate, 16–30 mm long, eciliate on margins or ciliate on margins. Companion sterile spikelet lemmas 1, exserted from glumes, 7–11 mm long, 1-awned, with 10–40 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 7–12 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, gaping. Lower glume subulate, 25–30 mm long, 1 length of upper glume. Lower glume margins ciliate. Upper glume subulate, 25–30 mm long. Upper glume margins ciliate.

**Florets.** Fertile lemma lanceolate, 7–12 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface scabrous, rough above. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 18–50 mm long overall, limb scabrous.

**Flower and Fruit.** Anthers 3, 0.7–1.2 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, ellipsoid, sulcate on hilar side, hairy at apex. Embryo 0.2 length of caryopsis. Hilum linear, 1 length of caryopsis.

$n = 7$  (1 ref TROPICOS), or 14 (2 refs TROPICOS).  $2n = 28$  (5 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa, Temperate Asia, Tropical Asia, Australasia (\*), Pacific, North America, South America, Antarctica.

**Region.** Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe.

**Country /Province /State.** : Denmark, Great Britain, Ireland, Norway, Sweden. : Austria, Belgium, Czechoslovakia, Germany, Hungary, Netherlands, Poland, Switzerland. : Baleares, Corsica, France, Portugal, Sardinia. : Albania, Bulgaria, Greece, Italy, Crete, Romania, Sicily, Turkey Europe, Yugoslavia. Belarus, Krym, Central European Russia, East European Russia, North European Russia, South European Russia, Northwest European Russia, Ukraine. **Northern Africa, Macaronesia, Southern Africa** (\*). Algeria, Egypt, Libya, Morocco, Tunisia. Azores, Canary Is, Madeira, Selvagens. Kwazulu-Natal, Lesotho, Northern Cape, Western Cape, Eastern Cape. **Middle Asia, Caucasus, Western Asia, Arabian Peninsula, Eastern Asia.** Kazakhstan, Turkmenistan, Tadzhikistan, Uzbekistan. Iran. Gulf States, Kuwait. Japan Hokkaido, or Honshu, or Shikoku, or Kyushu. Japan. **Indian Subcontinent.** Pakistan, West Himalaya. **Australia** (\*), **New Zealand** (\*). Tasmania (\*), Lord Howe-Norfolk Is (\*). Chatham Is, Kermadec Is, New Zealand North I, New Zealand South I, Stewart Is. **South-central Pacific, North-central Pacific.** Easter Is (\*). Hawaii (\*). **Western Canada, Northwest USA, North-central USA, Southwestern USA, South-central USA, Southeastern USA, Mexico.** British Columbia. Idaho, Montana, Washington. Oklahoma. Arizona, California, Nevada, Utah. New Mexico, Texas. Louisiana, North Carolina, South Carolina, Virginia. Southwest Mexico, Southeast Mexico. **Mesoamerica, Western South America, Brazil, Southern South America.** Guatemala. Bolivia, Peru. Brazil South. Argentina Northeast, Argentina South, Chile North, Chile Central, Chile South, Juan Fernandez Is, Uruguay. **Subantarctic islands.** Tristan de Cunha.

Jammu Kashmir. Rio Grande do Sul. Mendoza, San Juan. Buenos Aires, Distrito Federal, La Pampa. Chubut, Neuquén, Río Negro, Santa Cruz, Tierra del Fuego. Antofagasta, Atacama. Coquimbo, Valparaíso, Santiago, O'Higgins, Maule, Biobio, La Araucania. Los Lagos. Oaxaca. Chiapas.

### **Hordeum muticum** J. & C. Presl. *Rel. Haenk.* i. 327. (1830).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Peru. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Peru: Haenke.

**Illustrations (Books):** S.A.Renvoize, *Gramineas de Bolivia* (1998) (250, Fig. 49).

**Illustrations (Journals):** *Ruizia* (13:214, Fig 23c (1993)).

**Derivation** (Clifford & Bostock 2007): L. blunt. Lacking awns or lemmas and/or glumes truncate.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths pubescent. Culms erect or geniculately ascending, (6–)15–50(–70) cm long, 2–6 -noded. Leaf-sheath auricles absent. Ligule an eciliate membrane, 0.5–2 mm long. Leaf-blades 3–12 cm long, 1.5–3 mm wide. Leaf-blade surface scabrous, glabrous or pilose.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 20–90 cm long. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis, regular, 2 -rowed. Rhachis internodes cuneate, 0.7–1.5 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, 1–2.5 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 4–8 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes 4–8 mm long. Companion sterile spikelet lemmas 1, exserted from glumes, 3.5–4.5 mm long, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension or with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 4–8 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, reaching apex of florets or shorter than spikelet, gaping. Lower glume subulate, 4–8 mm long, 1 length of upper glume. Upper glume subulate, 4–8 mm long, 1–1.1 length of adjacent fertile lemma.

**Florets.** Fertile lemma elliptic, 4–7 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma lateral veins obscure. Lemma surface scabrous, rough above. Lemma apex acuminate, muticous or awned, 1 -awned. Principal lemma awn 0–4 mm long overall, limb scabrous. Rhachilla extension 0.7–0.9 length of fertile floret.

**Flower and Fruit.** Lodicules 2, ciliate. Anthers 3, 1–3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, 2.9–3.6 mm long, hairy at apex. Hilum linear.

$2n = 14$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe (\*), South America.

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Western South America, Southern South America.** Bolivia, Colombia, Ecuador, Peru. Argentina Northwest, Chile North.

Catamarca, Jujuy, La Rioja, Salta, San Juan, San Luis, Tucuman. Cordoba. Tarapaca, Antofagasta, Atacama.

### **Hordeum parodii** Covas. *Rev. Argent. Agron.* xviii. 74 (1951).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Argentina. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: Argentina: Cobernacisn del Chubut: Sarmiento, 1 Dec 1949, A. *Soreiano* 3995 (HT: Herb. Parodi (now at BAA)).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 2 Pooideae (2012) (76), M.N.Corra, *Flora Patagonica* Parte III, Gramineae (1978) (424, Fig 282).

**Derivation** (Clifford & Bostock 2007): in honor of Lorenzo Raimondo Parodi (1895–1966) Argentinian agrostologist.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 40–100 cm long. Leaf-sheaths pubescent. Leaf-sheath auricles absent or falcate. Ligule an eciliate membrane, 1 mm long, truncate. Leaf-blades 7–11 cm long, 4.5–7 mm wide, glaucous. Leaf-blade surface scabrous.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 8–15 cm long. Rhachis fragile at the nodes, flattened, ciliate on margins. Rhachis hairs 0.1–0.2 mm long. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1–1.5 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, curved, 1–1.5 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, male, lanceolate, dorsally compressed, 5.5–10 mm long, as long as fertile or longer than fertile, deciduous with the fertile. Companion sterile spikelet glumes similar in width, indurate, 5.5–10 mm long. Companion sterile spikelet lemmas 1, 4–6 mm long, muticous or 1-awned.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension or with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 6–9 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, shorter than spikelet or reaching apex of florets, gaping. Lower glume lanceolate, 5.5–8 mm long, 1 length of upper glume, coriaceous. Lower glume surface scabrous. Lower glume apex setaceous acuminate. Upper glume lanceolate, 5.5–8 mm long, coriaceous. Upper glume surface scabrous. Upper glume apex setaceous acuminate.

**Florets.** Fertile lemma lanceolate, 6–9 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface scabrous, rough above. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 2–3.5 mm long overall. Palea 1 length of lemma. Palea surface scabrous. Rhachilla extension 3–5.5 mm long.

**Flower and Fruit.** Lodicules 2, 1–1.8 mm long, ciliate, acute. Anthers 3, 3–4 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 42$  (5 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe (\*), South America.

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Southern South America.** Argentina Northeast, Argentina South.

Mendoza. Buenos Aires, La Pampa. Chubut, Neuquén, Río Negro, Santa Cruz. Chiloe, Aisen, Magellanes.

### **Hordeum patagonicum** (Hauman) Covas. *Rev. Argent. Agron.* xx. 63 (1953).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Argentina. **Basionym or Replaced Name:** *Hordeum maritimum* var. *patagonicum* Hauman, *Anales Mus. Nac. Hist. Nat. Buenos Aires* 28: 288 (1916)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: HT: *Iter Patagonicum* 130, 13.I.1914, Argentina: Prov. Santa Cruz, Puerto Deseado (SI).

**Recent Synonyms:** *Hordeum mustersii* E.G.Nicora, *Hickenia*, 1(20): 113 (1977). *Hordeum santacrucense* L.R. Parodi & E.G. Nicora, *Hickenia* 1(11): 58 (1977).

*Hordeum setifolium* L.R. Parodi & E.G. Nicora, *Hickenia* 1(11): 5 (1977).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 2 Pooideae (2012) (77 & 78), M.N.Correa, *Flora Patagonica* Parte III, Gramineae (1978) (419&424&430, Fig 278&281&284 as *Hordeum patagonicum* & *Hordeum mustersii* & *Hordeum santacrucense* & *Hordeum setifolium*).

**Derivation** (Clifford & Bostock 2007): L. -ica, belonging to. From Patagonia.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms 3–10 cm long, 1–2 -noded. Leaf-sheaths glabrous on surface. Ligule a ciliolate membrane, 0.3–0.4 mm long. Leaf-blades curved, filiform, 1–3 cm long, 0.5–1 mm wide, stiff, glaucous. Leaf-blade surface scabrous.

**Inflorescence.** Inflorescence composed of racemes, exserted or embraced at base by subtending leaf. Racemes 1, single, bilateral, 1.5–2 cm long. Rhachis fragile at the nodes, flattened, ciliate on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 0.5 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, curved, 0.5–0.6 mm long, puberulous.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, 7–9 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes similar in width, subulate, 7–9 mm long. Companion sterile spikelet lemmas 1, 3 mm long, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 7–9 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets, gaping. Lower glume subulate, 7–9 mm long, 1 length of upper glume, coriaceous. Lower glume surface puberulous. Upper glume subulate, 7–9 mm long, coriaceous. Upper glume surface puberulous.

**Florets.** Fertile lemma lanceolate, 5–6 mm long, coriaceous, dull, without keel, 5 -veined, more than 3-veined. Lemma surface puberulous, hairy all along. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 3–4 mm long overall. Palea 4.5–5 mm long. Palea surface scabrous.

**Flower and Fruit.** Lodicules 2, 0.75–0.85 mm long, glabrous. Anthers 3, 1.1–1.3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, 2.5 mm long, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** South America.

**Country /Province /State.** **Southern South America.** Argentina South, Chile South.

Mendoza. Chubut, Río Negro, Santa Cruz, Tierra del Fuego. Chiloe, Aisen, Magellanes. Magellanes.

### **Hordeum procerum** Nevski. *Acta Inst. Bot. Acad. Sci. URSS, Ser. 1 Fasc.* 5, 148 (1941).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Argentina. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *King s.n.*, Argentina: Port Santa Elena (K; IT: BM).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, Flora Argentina 3 – 2 Pooideae (2012) (78), M.N.Corréa, Flora Patagonica Parte III, Gramineae (1978) (434, Fig 290).

**Derivation** (Clifford & Bostock 2007): L. tall. Culms tall.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 40–80 cm long, 3–5 -noded. Leaf-sheaths glabrous on surface or pilose. Leaf-sheath auricles absent or falcate. Ligule an eciliate membrane, 1.5 mm long, truncate. Leaf-blades 3.5–6 mm wide. Leaf-blade surface scabrous, rough abaxially, pubescent, hairy adaxially or on both sides. Leaf-blade margins scabrous.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 7–11 cm long. Rhachis fragile at the nodes, flattened, pubescent on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1–2 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, curved, 1–1.3 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, 17–20 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes similar in width, subulate, 17–20 mm long, scabrous. Companion sterile spikelet lemmas 1, 4–7.5 mm long, muticous or 1-awned.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 15–20 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets, gaping. Lower glume subulate, 15–20 mm long, 1 length of upper glume, coriaceous. Upper glume subulate, 15–20 mm long, coriaceous.

**Florets.** Fertile lemma lanceolate, 7–8 mm long, coriaceous, yellow or mid-green, without keel, 5 -veined, more than 3-veined. Lemma surface asperulous, rough generally. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 11–15 mm long overall. Palea 6.5–7.5 mm long. Rhachilla extension 4–6 mm long.

**Flower and Fruit.** Lodicules 2, lanceolate, 1.6–1.8 mm long, ciliate. Anthers 3, 1.5–2.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, 4.5–5 mm long, hairy at apex. Hilum linear.

**Distribution (TDWG). Continent.** Europe (\*), South America.

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Southern South America.** Argentina Northeast, Argentina South, Chile Central, Uruguay.

Mendoza, San Luis. Buenos Aires, La Pampa. Chubut, Neuquén, Río Negro, Santa Cruz, Tierra del Fuego.

### **Hordeum pubiflorum** Hook. f. *Fl. Antarct.* 388. (1847).

**Accepted by:** R.J.Soreng et al., Catalogue of New World Grasses (2000–2003) and online, W.D.Clayton & K.Harman, GrassBase (2008) and online, U.Quattrocchi, CRC World Dictionary of Grasses (2006).

**TYPE** from Chile. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: LT: *Captain King s.n.*, Chile: Magellanes: Straight of Magellan, Port Famina (K; ILT: BAA, US-314741 (fragm.), US-2942204 (fragm. ex K)). LT designated by Baden & von Bothmer, Nord. J. Bot. 14: 121 (1994).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, Flora Argentina 3 – 2 Pooideae (2012) (79 & 80), M.N.Corréa, Flora Patagonica Parte III, Gramineae (1978) (430, Fi. 285).

**Derivation** (Clifford & Bostock 2007): L. *pubes*, signs of puberty; *flos*, flower. With some or all parts of the inflorescence or spikelets densely hairy.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial. Culms geniculately ascending, 10–40 cm long, 1–3 -noded. Leaf-sheaths glabrous on surface or pubescent. Ligule an eciliate membrane, truncate. Leaf-blades flat or convolute, 1.5–2 mm wide. Leaf-blade surface pubescent.

**Inflorescence.** Inflorescence composed of racemes. Peduncle glabrous or pubescent above. Racemes 1, single, bilateral, 3–6 cm long. Rhachis fragile at the nodes, flattened, pubescent on margins. Rhachis hairs 0.6 mm long. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 0.9–1 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, 0.5–0.7 mm long, ciliate.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, 18–20 mm long, as long as fertile, persistent. Companion sterile spikelet glumes similar in width, subulate, 18–20 mm long, pubescent. Companion sterile spikelet lemmas 1, 4–7 mm long, 1-awned.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 18–25 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, exceeding apex of florets, gaping. Lower glume subulate, 18–25 mm long, 1 length of upper glume, coriaceous. Lower glume surface pubescent. Upper glume subulate, 18–25 mm long, coriaceous. Upper glume surface pubescent.

**Florets.** Fertile lemma lanceolate, 7.5–10 mm long, coriaceous, purple, without keel, 5 -veined, more than 3-veined. Lemma surface pubescent, hairy all along or above. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 10–16 mm long overall. Palea 1 length of lemma. Palea keels ciliate. Rhachilla extension 6–8 mm long, pilose.

**Flower and Fruit.** Lodicules 2, 0.7–1.3 mm long, ciliate. Anthers 3, 1–1.5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, 2.5–3.5 mm long, hairy at apex. Hilum linear.

$2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe (\*), South America.

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Southern South America.** Argentina South, Argentina Northwest, Chile North, Chile Central, Chile South.

Catamarca, Jujuy, La Rioja, Mendoza, Salta, San Juan, Tucuman. Chubut, Neuquén, Río Negro, Santa Cruz, Tierra del Fuego. Rest of Chile- Biobio, La Auracania, Maule, O'Higgins, Santado, Valpariso, Chiloe, Aisen, Magellanes. Antofagasta, Atacama. Biobio. Magellanes.

### **Hordeum pusillum** Nutt. *Gen. Am.* i. 87 (1818).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from USA. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: *T. Nuttall s.n.*, no date, USA: Missouri (PH; IT: US-2830876 (fragm.)).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007), F.W.Gould, *The Grasses of Texas* (1975) (159, Fig. 80), A.L.Cabrera, *Flora de la Provincia de Buenos Aires, IV Pt 2 Gramineas* (1970) (as var. *euclastion*), B.Rosengurtt, *Gramineas Uruguayas I* (1970) (146, Fig. 56).

**Derivation** (Clifford & Bostock 2007): L. very small. Plants of small stature.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms geniculately ascending, 10–40 cm long. Culm-nodes brown, glabrous. Leaf-sheaths glabrous on surface or pubescent. Leaf-sheath auricles absent or falcate. Ligule an eciliate membrane, 0.5 mm long, truncate. Leaf-blades 3–12 cm long, 2–4 mm wide. Leaf-blade surface glabrous or pubescent.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear, bilateral, 4–8 cm long, 4–8 mm wide. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes oblong, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, linear, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate, 8–15 mm long. Companion sterile spikelet lemmas 1, 1.5–3 mm long, 1-awned, with 1–2 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 4–6 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, shorter than spikelet, gaping. Lower glume subulate, 7–15 mm long, 1 length of upper glume. Upper glume subulate, 7–15 mm long.

**Florets.** Fertile lemma lanceolate, 4–6 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface scabrous. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 2–7 mm long overall.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 14$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe (\*), North America, South America.

**Region. Northern Europe** (\*).

**Country /Province /State.** : GB Aliens (Ryves et al). **Western Canada, Northwest USA, North-central USA, Southwestern USA, South-central USA, Southeastern USA, Mexico.** Alberta. Colorado, Idaho, Montana, Oregon, Washington, Wyoming. Illinois, Iowa, Kansas, Minnesota, Missouri, North Dakota, Nebraska, Oklahoma, South Dakota, Wisconsin. Arizona, California, Nevada, Utah. New Mexico, Texas. Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, District of Columbia. Northeast Mexico, Northwest Mexico. **Caribbean, Southern South America.** Bermuda. Argentina Northeast, Chile South.

Mendoza. Buenos Aires, Cordoba, Corrientes, Distrito Federal, Entre Rios, La Pampa, Santa Fe. Río Negro. Chihuahua. Baja California.

### **Hordeum roshevitzii** Bowden. *Canad. Journ. Genet. & Cytol.* vii. 395 (1965).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Russia, Transbaical, Ichoti valley: Smirnov 630 (LE lecto).

**Illustrations (Books):** A.L.Cabrera, *Flora de la Provincia de Buenos Aires, IV Pt 2 Gramineas* (1970) (181, Fig. 49), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 551).

**Derivation** (Clifford & Bostock 2007): in honor of Romain Julievic Roshevitz (1882–1949) Russian agrostologist.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect or geniculately ascending, 25–90 cm long, 3–6 -noded. Culm-nodes glabrous. Leaf-sheaths glabrous on surface or pubescent. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane, 0.3–0.4 mm long. Leaf-blades 4–8 cm long, 2–4 mm wide. Leaf-blade surface scabrous.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear, bilateral, 3–8 cm long, 3–5 mm wide. Rhachis fragile at the nodes, flattened, scabrous on margins, glabrous on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1–1.5 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, 1.2–2 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male (rarely), lanceolate, dorsally compressed, 6–12 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate. Companion sterile spikelet lemmas 1, 4.2 mm long, 1-awned, with 5–9 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 5–9 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, recurved at apex. Lower glume subulate, 5–9 mm long, 1 length of upper glume. Upper glume subulate, 5–9 mm long.

**Florets.** Fertile lemma lanceolate, 4–6 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn curved, spreading, 3–10 mm long overall, limb scabrous. Rhachilla extension 2–4 mm long.

**Flower and Fruit.** Anthers 3, 1–1.7 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, hairy at apex. Hilum linear.

$2n = 14$  (5 refs TROPICOS), or 28 (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** Siberia, Russian Far East, Middle Asia, China, Mongolia, Eastern Asia, Russia. Altay, Buryatiya, Chita, Irkutsk, Tuva. Primorye. Kazakhstan. China South Central, Inner Mongolia, China North-Central, Qinghai, Xinjiang. Mongolia. Japan, Korea.

Gansu, Shaanxi. Sichuan.

### **Hordeum secalinum** Guss., non Schreb.(1771). *Pl. Rar.* 57, 58. t. 11 (1826).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), E.Edgar, & H.Connor, *Flora of New Zealand Gramineae* 5 (2000), T.G.Tutin et al, *Flora Europaea* 5 (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983) (as *Critesion*).

**TYPE** from China. **Basionym or Replaced Name:** *Critesion secalinum* (Schreb.) ?Löve, *Taxon*, 29(2–3): 350 (1980). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: ST?: *T. Thomson*, China: Xizang: western part, 10–15,000 ft.

**Illustrations (Books):** C.E.Hubbard, *Grasses* (1968) (114), T. Cope & A. Gray, *Grasses of the British Isles* (162), G.Hegi, *Flora von Mitteleuropa* 1 (1909) (as *H. pratense*), N.Feinbrun-Dothan, *Flora Palaestina* 4 (1986) (Pl 220), N.Walsh & T.Entwistle, *Flora of Victoria* Vol 2 (1994) (516, Fig 101 as *Critesion*), A.Wilson (ed.), *Flora of Australia*, Vol 44A. *Poaceae* (2009) (113, Fig 17), D.Sharp & B.K.Simon, *AusGrass*. *Grasses of Australia*. CD-Rom Version 1.0. (2002), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 *Poaceae*, part 1 (2007) (251), B.Rosengurtt, *Gramineas Uruguayas I* (1970) (146, Fig. 56).

**Derivation** (Clifford & Bostock 2007): L. *-inus*, belonging to. Growing in fields of rye (*Secale*).

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual. Culms 20–80 cm long, 3–5 -noded. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane, 0.5–1 mm long. Leaf-blades 2–15 cm long, 2–6 mm wide.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear, bilateral, 2–8 cm long. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes oblong, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 4–6 mm long, shorter than fertile or as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate, 7–14 mm long, wingless, eciliate on margins. Companion sterile spikelet lemmas 1, exserted from glumes, 4–6 mm long, 1-awned, with 2–3 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 6–9 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, gaping. Lower glume subulate, 7–14 mm long, 1 length of upper glume. Lower glume margins eciliate. Upper glume subulate, 7–14 mm long. Upper glume margins eciliate.

**Florets.** Fertile lemma lanceolate, 6–9 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface smooth. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 6–12 mm long overall, limb scabrous.

**Flower and Fruit.** Anthers 3, 3–4 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, ellipsoid, sulcate on hilar side, hairy at apex. Embryo 0.2 length of caryopsis. Hilum linear, 1 length of caryopsis.

$2n = 27$  (1 ref TROPICOS), or 28 (4 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa, Temperate Asia, Australasia (\*), South America.

**Region.** Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe.

**Country /Province /State.** : Denmark, Great Britain, Ireland. : Belgium, Czechoslovakia, Germany, Hungary, Netherlands, Switzerland. : Corsica, France, Portugal, Sardinia, Spain. : Bulgaria, Italy, Romania, Sicily, Yugoslavia. **Northern Africa, Macaronesia.** Madeira. **Western Asia. Australia (\*), New Zealand (\*).** Victoria (\*). New Zealand North I, New Zealand South I. **Southern South America.** Juan Fernandez Is.

**Hordeum spontaneum** C. Koch. *Linnaea*, xxi. 430. (1848).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), T.G.Tutin et al, *Flora Europaea* 5 (1980), N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. **Basionym or Replaced Name:** *Hordeum agriocriton* Aberg, *Ann. Agric. Coll. Sweden*, 6: 159–216 (1938). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Russia: Caucasus, 500–1000 ft, C. Koch s.n. (HT: ?).

**Illustrations (Books):** N.Feinbrun-Dothan, *Flora Palaestina* 4 (1986) (Pl 223), L.Boulos, *Flora of Egypt* 4 (2005) (201, Pl. 58), N.L.Bor, *Gramineae in K.H.Rechinger, Flora Iranica*. No. 70/30 (1970) (Tab. 37), N.L.Bor, *Gramineae in Flora of Iraq* (1968) (253, Pl. 87), T.A.Cope, *Flora of Pakistan* 143: *Poaceae* (1982) (636, Fig 75), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 556 as *Hordeum spontaneum* var. *spontaneum* & *H. spontaneum* var. *ischnatherum* & *H. spontaneum* var. *proskowetzii*).

**Derivation** (Clifford & Bostock 2007): L. naturally growing wild. Growing in the wild but closely related to species known in cultivation.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect or geniculately ascending, 35–70 cm long. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane. Leaf-blades 5–16 cm long, 4–8 mm wide. Leaf-blade surface smooth or scabrous.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, linear, bilateral, 4–9 cm long, 6–8 mm wide. Rhachis fragile at the nodes, flattened, ciliate on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 3.5–5 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets sessile, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 4–6 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate. Companion sterile spikelet lemmas 1, 7–9 mm long, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 12–14 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar. Lower glume linear or lanceolate, 4–6 mm long, 1 length of upper glume. Lower glume surface pubescent. Lower glume apex awned, 1 -awned, awn 10–15 mm long. Upper glume linear or lanceolate, 4–6 mm long. Upper glume surface pubescent. Upper glume awned, 1 -awned, awn 10–15 mm long.

**Florets.** Fertile lemma lanceolate or ovate, 12–14 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 40–140 mm long overall, limb scabrous.

**Flower and Fruit.** Anthers 3, 2.5–3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, hairy at apex. Hilum linear.

$n = 7$  (1 ref TROPICOS), or 14 (1 ref TROPICOS).  $2n = 14$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa, Temperate Asia, Tropical Asia.

**Region. Southeastern Europe.**

**Country /Province /State.** : Crete. **Northern Africa.** Egypt, Libya. **Middle Asia, Caucasus, Western Asia, Arabian Peninsula, China, Russia.** Kazakhstan, Kirgizistan, Turkmenistan, Tadzhikistan, Uzbekistan. Afghanistan, Iran, Iraq, Sinai. China South Central, Tibet. **Indian Subcontinent.** India, Pakistan.

Sichuan, Yunnan. Sikkim.

**Hordeum stenostachys** Godr. *Mem. Acad. Montp. (Sect. Medic).* i. 455. (1853).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from France. **Basionym or Replaced Name:** *Hordeum compressum* Griseb., *Goett. Abh.* 19: 249. (1874). T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: T: A. Gordon s.n., France: Oreigem desconhecida naturalizada perto de Montpelier.

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 2 Pooideae (2012) (80), L.B. Smith, D.C. Wasshausen, R.M. Klein *Flora Illustrada Catarinensis Gramineas* (1981–1982) (301, Fig. 67 & 313, Fig. 71), A.Burkart, *Flora Ilustrada de Entre Ríos (Argentina)*, Pt II, Gramineas (1969) (105, Fig. 32 & 106, Fig. 33), A.L.Cabrera, *Flora de la Provincia de Buenos Aires, IV Pt 2 Gramineas* (1970) (181, Fig. 49), M.N.Correa, *Flora Patagonica Parte III, Gramineae* (1978) (419, Fig. 279), B.Rosengurtt, *Gramineas Uruguayas I* (1970) (146, Fig. 56 & 148, Fig. 57).

**Derivation** (Clifford & Bostock 2007): Gk. *stenos*, narrow; *stachys*, ear of corn. Inflorescence narrow.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths pubescent, persistent and investing base of culm, with fibrous dead sheaths. Culms erect, 30–150 cm long, 4–7 -noded. Culm-nodes glabrous. Leaf-sheath auricles absent. Ligule an eciliate membrane, 0.5–3 mm long. Leaf-blades 6–20 cm long, 2–7 mm wide. Leaf-blade surface smooth or scaberulous or scabrous, glabrous or pilose, hairy adaxially.

**Inflorescence.** Inflorescence composed of racemes, exserted or embraced at base by subtending leaf. Racemes 1, single, linear, bilateral, 5–12 cm long, 3–5 mm wide. Rhachis fragile at the nodes, narrowly winged, flattened, scabrous on margins, ciliate on margins. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1.3–2.2 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong, 1.7–3.2 mm long.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas, lanceolate, dorsally compressed, 5–12 mm long, shorter than fertile, deciduous with the fertile. Companion sterile spikelet glumes subulate. Companion sterile spikelet lemmas 1.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension or with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 4–10 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar. Lower glume linear, 4–10 mm long, 1 length of upper glume. Lower glume surface scabrous. Upper glume linear, 4–10 mm long. Upper glume surface scabrous.

**Florets.** Fertile lemma lanceolate, 5–9 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma lateral veins obscure. Lemma surface puberulous or pubescent, hairy all along. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 2–8 mm long overall, limb scabrous. Rhachilla extension 0–5.5 mm long.

**Flower and Fruit.** Anthers 3, 2.2–4.4 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, hairy at apex. Hilum linear.

$2n = 14$  (3 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe (\*), Africa, South America.

**Region. Northern Europe** (\*).

**Country /Province /State :** GB Aliens (Ryves et al). **Southern Africa** (\*). Free State, Eastern Cape. **Brazil, Southern South America.** Brazil South. Argentina Northeast, Argentina South, Argentina Northwest, Paraguay, Uruguay.

Catarina, Rio Grande do Sul. Rio Grande do Sul, Santa Catarina. Catamarca, Jujuy, La Rioja, Mendoza, Santiago del Estero, San Juan, San Luis, Tucuman. Buenos Aires, Chaco, Cordoba, Distrito Federal, Entre Ríos, La Pampa, Misiones, Santa Fe. Chubut, Río Negro.

**Hordeum tetraploidum** Covas. *Rev. Argent. Agron.* 20: 65 (1953).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Argentina. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Argentina, Pilcanyen: Boelcke 4485 (SI holo, BAA, BAB).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, Flora Argentina 3 – 2 Pooideae (2012) (81), M.N.Corréa, Flora Patagonica Parte III, Gramineae (1978) (430, Fig 286).

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, slender, 10–50 cm long. Leaf-sheaths pubescent. Ligule an eciliate membrane, 0.5 mm long, truncate. Leaf-blades 1–4 mm wide. Leaf-blade surface glabrous or puberulous.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 2.5–6 cm long. Rhachis fragile at the nodes, flattened. Spikelet packing broadside to rhachis. Rhachis internodes oblong, 1–1.5 mm long, falling with spikelet above. Spikelets in threes. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 2 in the cluster. Pedicels present, oblong.

**Sterile Spikelets.** Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 6–8 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet glumes similar in width, subulate, 6–8 mm long. Companion sterile spikelet lemmas 1, 1.5–4.5 mm long, muticous.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 6–8 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes collateral, similar, shorter than spikelet or reaching apex of florets, gaping. Lower glume subulate, 6–8 mm long, 1 length of upper glume, coriaceous. Upper glume subulate, 6–8 mm long, coriaceous.

**Florets.** Fertile lemma lanceolate, 5–8 mm long, coriaceous, purple, shiny, without keel, 5 -veined, more than 3-veined. Lemma surface smooth. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 2–4.5 mm long overall. Palea 5.5–6.5 mm long. Rhachilla extension 2.5–5 mm long.

**Flower and Fruit.** Lodicles 2, 1–1.5 mm long, ciliate, acute. Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex. Hilum linear.

$2n = 28$  (3 refs TROPICOS).

**Distribution (TDWG). Continent.** South America.

**Country /Province /State.** Southern South America. Argentina South, Chile South.

Mendoza. Chubut, Neuquén, Río Negro, Santa Cruz. Los Lagos, Aisen.

## Hordeum vulgare Linn. Sp. Pl. 84 (1753).

**Accepted by:** R.J.Soreng et al., Catalogue of New World Grasses (2000–2003) and online, W.D.Clayton & K.Harman, GrassBase (2008) and online, U.Quattrocchi, CRC World Dictionary of Grasses (2006), D.Sharp, D. & B.K.Simon, AusGrass (2002), E.Edgar, & H.Connor, Flora of New Zealand Gramineae 5 (2000), S-L Chen et al, Flora of China 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (Flora Malesiana), N.L.Bor, Grasses of Burma, Ceylon, India and Pakistan (1960), T.G.Tutin et al, Flora Europaea 5 (1980), N.Tsvelev, Grasses of the Soviet Union (1983), T.Koyama, Grasses of Japan and its neighboring regions (1987), W.D.Clayton & N.Snow, Key to Pacific Grasses (2010).

**TYPE** from Ethiopia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: LT: Anon., (LINN-103.11). LT designated by Bowden, Canad. J. Bot. 37: 679 (1959).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, Flora Argentina 3 – 2 Pooideae (2012) (81), T. Cope & A. Gray, Grasses of the British Isles (166), G.Hegi, Flora von Mitteleuropa 1 (1909) (as *H. polystichum*), N.N.Tsvelev, Grasses of the Soviet Union (1983) (199 (139), Pl.2), H.Jacques-Felix, Les Graminees d'Afrique tropicale (1962) (180, Fig. 102), N.L.Bor, Gramineae in Flora of Iraq (1968) (255, Pl. 88), C-C Hsu, Flora of Taiwan, Vol 5 (1978) (360), C-C Hsu, Taiwan Grasses (1975), H.J.Noltie, The Grasses of Bhutan (2000) (637, Fig. 30 & as var. *trifurcatum*), J.P.Jessop, G.R.M. Dashorst & F.M.James, Grasses of South Australia (2006) (273, Fig 212), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, Grasses of New South Wales, 4th edn (2008) (280), D.Sharp & B.K.Simon, AusGrass. Grasses of Australia. CD-Rom Version 1.0. (2002), F.W.Gould, The Grasses of Texas (1975) (162, Fig. 82), L.B. Smith, D.C. Wasshausen, R.M. Klein Flora Illustrada Catarinensis Gramineas (1981–1982) (301, Fig. 67 & 311, Fig. 70), A.Burkat, Flora Ilustrada de Entre Ríos (Argentina), Pt II, Gramineas (1969) (103, Fig. 31), M.N.Corréa, Flora Patagonica Parte III, Gramineae (1978) (439, Fig. 292), B.Rosengurtt, Gramineas

*Uruguayanus*I (1970) (148, Fig. 57), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (253), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 557 as *Hordeum vulgare* var. *vulgare*).

**Illustrations (Journals):** *Ruizia* (13:214, Fig 23a-b (1993)).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002);.

**Derivation** (Clifford & Bostock 2007): *L. vulgus*, public; -*are*, pertaining to. Common in the wild or in cultivation.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms erect, 40–80 cm long, 2.5–4 mm diam., 3–5 -noded. Leaf-sheath oral hairs lacking. Leaf-sheath auricles falcate. Ligule an eciliate membrane, 1–2 mm long, truncate. Leaf-blades 10–45 cm long, 6–15 mm wide. Leaf-blade surface scabrous. Leaf-blade apex acute.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 3–8 cm long. Rhachis tough, flattened. Spikelet packing broadside to rhachis, regular, 6 -rowed. Rhachis internodes cuneate. Spikelets in threes. Fertile spikelets sessile, 3 in the cluster.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets cuneate, dorsally compressed, 10–15 mm long, persistent on plant.

**Glumes.** Glumes collateral, similar, shorter than spikelet, gaping. Lower glume linear, 4–5 mm long, 1 length of upper glume. Lower glume surface hispidulous. Lower glume apex acuminate, awned, 1 -awned, awn 4–10 mm long. Upper glume linear, 4–5 mm long, 0.3–0.5 length of adjacent fertile lemma. Upper glume surface hispidulous. Upper glume apex acuminate, awned, 1 -awned, awn 4–10 mm long.

**Florets.** Fertile lemma elliptic, 9–15 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 8–14 mm long overall, limb scabrous.

**Flower and Fruit.** Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, sulcate on hilar side, hairy at apex. Hilum linear.

$n = 7$  (2 refs TROPICOS).  $2n = 14$  (46 refs TROPICOS), or 28 (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, Africa, Temperate Asia, Tropical Asia, Australasia (\*), Pacific, North America, South America.

**Region.** Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe.

**Country /Province /State.** : Great Britain (\*). Belarus, Estonia, Latvia, Lithuania, Central European Russia, East European Russia, North European Russia, South European Russia, Northwest European Russia, Ukraine. **Northern Africa, West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, South Tropical Africa.** Egypt (+), Libya, Morocco, Tunisia. Nigeria. Rwanda. Ethiopia (inc. Eritrea). Siberia, Russian Far East, **Middle Asia, Caucasus, Western Asia, Arabian Peninsula, China, Mongolia, Eastern Asia.** Altay, Buryatiya, Chita, Irkutsk, Krasnoyarsk, Tuva. Amur, Kamchatka, Khabarovsk, Kuril Is, Magadan, Primorye, Sakhalin. Kazakhstan, Turkmenistan, Tadzhikistan, Uzbekistan. Iran, Iraq. Gulf States, Kuwait, Oman. China South Central, Inner Mongolia, Manchuria, China North-Central, Qinghai, China Southeast, Tibet, Xinjiang. Japan Hokkaido, or Honshu, or Shikoku, or Kyushu. Japan, Nansei-Shoto, Taiwan. **Indian Subcontinent, Indo-China, Malesia.** Bangladesh, Eastern Himalaya, Sri Lanka. Myanmar, Vietnam. Java. **Australia** (\*), **New Zealand** (\*). Western Australia, South Australia, Queensland, New South Wales (\*), Victoria, Tasmania. New Zealand North I, New Zealand South I. **North-central Pacific.** Fiji (\*), New Caledonia (\*). Hawaii (\*). **Subarctic America, Western Canada, Eastern Canada, Northwest USA, North-central USA, Northeast USA, Southwestern USA, South-central USA, Southeastern USA, Mexico.** Yukon, Greenland. Alberta, British Columbia, Saskatchewan. Labrador, Ontario, Quebec. Connecticut, Indiana, Maine, Massachusetts, Michigan, Ohio, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia. Arizona, California, Nevada, Utah. New Mexico, Texas. Kentucky, North Carolina, South Carolina, Tennessee. Central Mexico, Northeast Mexico, Gulf (Mexico), Northwest Mexico, Southwest Mexico, Southeast Mexico. **Mesoamerica, Western South America, Brazil, Southern South America.** El Salvador, Guatemala, Honduras. Bolivia, Colombia, Ecuador, Peru. Brazil South. Argentina Northeast, Argentina South, Argentina Northwest, Chile North, Chile Central, Uruguay.

Hebei, Shaanxi, Shandong. Anhui, Fujian, Henan, Zhejiang. Guizhou, Hubei, Yunnan. Darjeeling, Bhutan, Sikkim. South-West. NW & Lake Eyre, Southern. North, South East. Coast, Western Slopes. Rio Grande do Sul, Santa Catarina. Jujuy, Mendoza, San Luis. Buenos Aires, Chaco, Cordoba, Entre Rios, La

Pampa, Santa Fe. Neuquén, Río Negro, Santa Cruz. Atacama. Santiago, Biobio, La Araucania. Distrito Federal, Mexico State, Morelos, Puebla. Aguascalientes, Coahuila, Chihuahua, Hidalgo, Nuevo Leon, Queretaro, San Luis Potosi, Tamaulipas, Zacatecas. Veracruz. Baja California, Sonora. Jalisco, Michoacan, Oaxaca. Chiapas, Tabasco.

**Hordeum xlagunculciforme** (Bacht.) Nikif. *Afred. Rast. Sredn. Agri.* 1:188 (1968).

**Basionym or Replaced Name:** *Hordeum spontaneum* var. *lagunculciforme* Bacht., *Bot. Zh.* 47:847 (1962).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *lagunus*, flask; *-ula*, diminutive; *forma*, appearance. Diaspores narrow flask-shaped.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State.** Western Asia, China, Russia. Turkmenistan. China South Central, Qinghai, Tibet. Indian Subcontinent. Pakistan.

Sichuan.

**Hubbardia diandra** Chandore, Gosavi & S.R. Yadav. *Kew Bull.* 67 (3): 533–535, f. 1, 2, map 1 (2012).

**TYPE** from India. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Maharashtra, Kolhapur, Tillari Ghat, 15°7.400'N, 74°0.769'E, 15 Sept 2010, *Chandore 1301*, HT: CAL; IT: BSI, K, SUK.

**Illustrations:** None found.

**Habit, Vegetative Morphology.** Annual. Culms prostrate, weak, 3–15 cm long, rooting from lower nodes. Culm-nodes glabrous. Leaf-sheaths 0.3–0.5 cm long, mostly shorter than adjacent culm internode, hirsute. Ligule absent. Leaf-blades elliptic, 0.5–3 cm long, 3–6 mm wide, membranous, flaccid. Leaf-blade venation with 14 secondary veins. Leaf-blade surface hirsute, hairy on both sides, with tubercle-based hairs. Leaf-blade margins scaberulous. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle, comprising 3–5 fertile spikelets, axillary. Panicle open, bearing few spikelets. Panicle axis glabrous. Panicle branches capillary. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, filiform.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 2 fertile florets, without rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate or elliptic, subterete, 2–2.3 mm long, 0.3–0.4 mm wide, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, similar to fertile lemma in texture. Lower glume lanceolate or elliptic, 2–2.3 mm long, 1 length of upper glume, 1 length of spikelet, membranous, without keels, 5–7 -veined. Lower glume lateral veins ribbed. Lower glume margins tuberculately ciliate. Lower glume apex acute. Upper glume lanceolate or elliptic, 2–2.4 mm long, 1.1 length of adjacent fertile lemma, membranous, without keels, 5–7 -veined. Upper glume lateral veins ribbed. Upper glume surface pubescent. Upper glume margins ciliate. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, with palea, attached to and deciduous with the fertile. Lemma of lower sterile floret similar to fertile lemma, lanceolate, 1.8–2.2 mm long, hyaline, 5–7 -veined, acute. Fertile lemma lanceolate or ovate, 1.8–2.2 mm long, 0.3–0.4 mm wide, membranous, without keel, 5–7 -veined, more than 3-veined. Lemma surface glabrous. Lemma apex acute. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, 0.5 mm long. Anthers 2, 0.5 mm long. Filaments 2 mm long. Stigmas 2, plumose. Caryopsis with adherent pericarp, fusiform, 1 mm long, dark brown. Hilum punctiform.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State.** Indian Subcontinent. India.

Karnataka. Maharashtra.

## **Hubbardia heptaneuron** Bor. *Kew Bull.* 1950, 385 (1950).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: India, Gersoppa Falls: Sedgwick 7089 (K holo).

**Illustrations (Books):** N.L.Bor, *The grasses of Burma, Ceylon, India and Pakistan* (1960) (573, Fig 60), G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012) (Fig. 272).

**Derivation** (Clifford & Bostock 2007): Gk. *hepta*, seven, *neuron*, nerve. Upper glume seven-nerved.

**Classification.** Subfamily Micrairoideae. Tribe: Hubbardieae. Tribe Isachneae.

**Habit, Vegetative Morphology.** Annual. Culms prostrate, rooting from lower nodes. Ligule absent. Leaf-blades lanceolate, 1–3 cm long, 2–6 mm wide, flaccid. Leaf-blade surface pubescent. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle, comprising 1–10 fertile spikelets. Panicle open, bearing few spikelets. Panicle branches capillary. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, filiform.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets oblong, dorsally compressed, obtuse or acute, 2–3 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, similar to fertile lemma in texture. Lower glume elliptic, 1 length of upper glume, 1 length of spikelet, membranous, without keels, 5–7 - veined. Lower glume lateral veins ribbed. Lower glume surface pubescent, hairy between veins, with tubercle-based hairs. Lower glume apex obtuse. Upper glume elliptic, 1.1 length of adjacent fertile lemma, membranous, without keels, 5–7 - veined. Upper glume lateral veins ribbed. Upper glume surface pubescent, hairy between veins, with tubercle-based hairs. Upper glume apex obtuse.

**Florets.** Basal sterile florets 1, barren, without significant palea, attached to and deciduous with the fertile. Lemma of lower sterile floret similar to fertile lemma, elliptic, 2–2.5 mm long, membranous, much thinner above, 7–9 -veined, obtuse. Fertile lemma elliptic, 2–2.5 mm long, membranous, much thinner above, without keel, 7–9 -veined, more than 3-veined. Lemma apex obtuse.

**Flower and Fruit.** Caryopsis with adherent pericarp, fusiform, isodiametric, biconvex, 1.25 mm long. Embryo 0.3 length of caryopsis. Hilum elliptic.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State. Indian Subcontinent.** India.

## **Hubbardia sp**

**Images:** G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012) (Pl. 19).

## **Hubbardochloa gracilis** P. Auquier. *Bull. Jard. Bot. Nation. Belg.*, 50(1–2): 242 (1980).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Rwanda. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Rwanda, Butare to Cyangugu: Auquier 3878 (LG holo, K).

**Illustrations (Books):** G.V.Pope et al., *Flora Zambesiaca* 10 (2)(1999):201 t. 57).

**Derivation** (Clifford & Bostock 2007): L. slender. Culms or inflorescences slender.

**Classification.** Subfamily Chloridoideae. Tribe: Chlidoideae incertae sedis.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms erect or decumbent, (4–)8–12(–17) cm long, 0.1–0.3 mm diam., (2–)3–5 -noded. Ligule a fringe of hairs, 0.25 mm long. Leaf-blades (0.6–)1–1.5 cm long, (1–)2–5 mm wide. Leaf-blade margins ciliate, hairy at base. Leaf-blade apex acute.

**Inflorescence.** Inflorescence a panicle. Panicle obovate, 2.5–3 cm long, 2.5–3.5 cm wide. Primary panicle branches whorled at lower nodes. Panicle branches capillary, flexuous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, angular, 1–1.5 mm long.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, laterally compressed, compressed slightly, 1.2–1.4 mm long, breaking up at maturity, disarticulating below each fertile floret. Floret callus pubescent, obtuse.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 0.9–1 length of upper glume, membranous, without keels, 1 -veined. Lower glume primary vein scabrous. Lower glume lateral veins absent. Lower glume apex erose, obtuse. Upper glume lanceolate, membranous, 1-keeled, 1 -veined. Upper glume primary vein scabrous. Upper glume apex acute.

**Florets.** Fertile lemma ovate, 0.7–0.8(–1) mm long, hyaline, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma margins ciliate. Lemma apex truncate, awned. Principal lemma awn flexuous, 3.5–6(–7.5) mm long overall. Palea absent or minute.

**Flower and Fruit.** Lodicules absent. Anthers 3, 0.3–0.4 mm long. Ovary glabrous. Caryopsis with adherent pericarp, fusiform, isodiametric, biconvex, exposed between gaping lemma and palea at maturity, 0.9–1 mm long, dark brown. Embryo 0.25 length of caryopsis. Hilum elliptic.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West-Central Tropical Africa, South Tropical Africa. Burundi, Rwanda, Zambia.

### ***Humbertochloa bambusiuscula* A. Camus & Stapf. *Bull. Soc. Bot. France*, 1 i. 470. (1934).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Madagascar. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: ST: *H. Humbert 12200*, 1933–1936, Madagascar (US-1645636).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -ula, diminutive. Resembling in habit a dwarf *Bambusa*.

**Classification.** Subfamily Ehrhartoideae. Tribe: Phyllorachideae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths absent. Culms decumbent, 50–80 cm long. Culm-internodes retrorsely scabrous, distally glabrous or pubescent. Ligule a ciliolate membrane. Leaf-blade base cordate, with a brief petiole-like connection to sheath. Leaf-blades ovate, 2–5 cm long, 14–18 mm wide. Leaf-blade venation with obscure cross veins. Leaf-blade margins ciliate. Leaf-blade apex acute. Monoecious, with male and female spikelets in different inflorescences.

**Inflorescence.** Inflorescence composed of racemes. Racemes 4–6, borne along a central axis, in a unilateral false spike, appressed, lanceolate, 0.3–0.4 cm long, bearing 1 spikelet. Central inflorescence axis 1.5–3.3 cm long, foliaceous (3–4 mm wide), tip subulate. Rhachis deciduous from axis, broadly winged, terminating in a barren extension, extension flattened. Spikelets solitary. Fertile spikelets sessile.

**Sterile Spikelets.** Apical sterile spikelets absent or rudimentary, 0–2 in number.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets oblong, laterally compressed, compressed slightly, gibbous, 8–9 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume subulate, 0.15 length of spikelet. Upper glume oblong, 0.33 length of adjacent fertile lemma, membranous, without keels, 5–7 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, 1 length of spikelet, coriaceous, 13–17 -veined, without grooves, obtuse. Fertile florets female. Fertile lemma ovate, 9 mm long, chartaceous, 7–11 -veined, more than 3-veined. Lemma margins involute. Lemma apex acuminate. Palea chartaceous, 2 -veined. Rhachilla extension 0.3 length of fertile floret.

**Flower and Fruit.** Lodicules 2. Anthers 4–5.

Male inflorescence terminal, similar to female, of racemes along a central axis. Male spikelets similar to female but less developed, 3.5–4 mm long. Male spikelet glumes 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Western Indian Ocean. Madagascar.

**Humbertochloa greenwayi** C. E. Hubbard. *Hook. Ic. Pl.* iv. t. 3387. (1939).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Tanzania. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: IT: *P. Greenway* 4991, 1 Aug 1937, Tanzania (US-1815402).

**Illustrations (Books):** R.M.Polhill, F.T.E.A., *Gramineae* (1)(1970):37, Fig.13).

**Illustrations (Journals):** *Hooker's Icones Plantarum* (t.3387 (1939)).

**Derivation** (Clifford & Bostock 2007): in honor of Percy James Greenway (1897–1980) English botanist.

**Classification.** Subfamily Ehrhartoideae. Tribe: Phyllorachideae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths absent. Culms decumbent, 60–100 cm long. Culm-internodes distally glabrous or pubescent. Ligule a ciliolate membrane. Leaf-blade base cordate, with a brief petiole-like connection to sheath. Leaf-blades elliptic, 6–9 cm long, 10–30 mm wide. Leaf-blade venation with obscure cross veins. Leaf-blade margins ciliate. Leaf-blade apex acuminate. Monoecious, with male and female spikelets in different inflorescences.

**Inflorescence.** Inflorescence composed of racemes. Racemes 4–6, borne along a central axis, in a unilateral false spike, appressed, lanceolate, 0.6 cm long, bearing 1 spikelet. Central inflorescence axis 4–7 cm long, foliaceous (7–10 mm wide), tip subulate. Rhachis deciduous from axis, broadly winged, 3.5 mm wide, terminating in a barren extension, extension flattened. Spikelets solitary. Fertile spikelets sessile.

**Sterile Spikelets.** Apical sterile spikelets absent or rudimentary, 0–2 in number.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets oblong, laterally compressed, compressed slightly, gibbous, 10–11 mm long, falling entire, deciduous with accessory branch structures.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume subulate, 0.15 length of spikelet. Upper glume oblong, 0.33 length of adjacent fertile lemma, membranous, without keels, 5–7 -veined. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, 1 length of spikelet, coriaceous, 13–17 -veined, without grooves, obtuse. Fertile florets female. Fertile lemma ovate, 10–11 mm long, chartaceous, 7–11 -veined, more than 3-veined. Lemma margins involute. Lemma apex acuminate. Palea chartaceous, 2 -veined. Rhachilla extension 0.3 length of fertile floret.

**Flower and Fruit.** Lodicules 2. Anthers 5–6.

Male inflorescence terminal, similar to female, of racemes along a central axis. Male spikelets similar to female but less developed, 4–5 mm long. Male spikelet glumes 2. Male spikelet lemma 3–7 -veined.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** East Tropical Africa. Tanzania.

**Hydrothauma manicatum** C. E. Hubbard. *Hook. Ic. Pl.* v. 1. 3458 (1947).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Zambia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Zambia, Matonchi Farm: Milne-Redhead 4625 (K holo).

**Illustrations (Books):** H.Jacques-Felix, *Les Graminees d'Afrique tropicale* (1962) (241, Fig. 168), G.V.Pope et al., *Flora Zambesiaca* 10 (3)(1989):47, T. 10).

**Illustrations (Journals):** *Hooker's Icones Plantarum* (t.3458 (1947)).

**Derivation** (Clifford & Bostock 2007): *L. manicae*, long sleeves; -atum, possessing. With long leaf-sheaths the upper of which may enclose the base of the inflorescence.

**Classification.** Subfamily Panicoideae. Tribe: Paniceae. Subtribe Incertae Sedis.

**Habit, Vegetative Morphology.** Annual. Culms decumbent or prostrate, 10–20 cm long, spongy, rooting from lower nodes. Leaf-sheath auricles erect. Ligule an eciliate membrane, 1 mm long. Leaf-blade base with a false petiole. Leaf-blades floating, 5–10 cm long, 2–3 mm wide, flaccid. Leaf-blade surface ribbed, with ribs raised into sinuous lamellae. Leaf-blade apex obtuse.

**Inflorescence.** Inflorescence a panicle. Panicle spiciform, linear, 3–6 cm long. Primary panicle branches accrescent to a central axis, with evident branchlets on axis. Panicle axis flat. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, linear, 1–2 mm long, tip discoid.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets ovate, dorsally compressed, gibbous, 1.8–2.5 mm long, falling entire.

**Glumes.** Glumes dissimilar, reaching apex of florets, thinner than fertile lemma. Lower glume oblate, 0.5 length of spikelet, hyaline, pallid, without keels, 0 -veined. Lower glume lateral veins absent. Lower glume apex truncate. Upper glume elliptic, gibbous, membranous, without keels, 7–9 -veined. Upper glume apex entire or with a unilateral tooth.

**Florets.** Basal sterile florets 1, male or barren, with palea. Lemma of lower sterile floret similar to upper glume, oblong, 1 length of spikelet, membranous, 7 -veined, emarginate. Fertile lemma elliptic, 1–1.2 mm long, cartilaginous, dark brown, without keel. Lemma lateral veins obscure. Lemma margins flat. Lemma apex acute. Palea cartilaginous.

**Flower and Fruit.** Anthers 3, 0.8 mm long.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West-Central Tropical Africa, South Tropical Africa. DRC. Zambia.

### **Hygrochloa aquatica** M. Lazarides. *Brunonia*, 2(1): 87 (1979).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

**TYPE** from Australia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Australia: Northern Territory: Darwin & Gulf Distr.: near Howard Springs, 12.25S 131.05E, 29 Jun 1977, Craven 4462 (HT: CANB; IT: BRI, K, NT).

**Illustrations (Books):** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002);

**Derivation** (Clifford & Bostock 2007): L. *aqua*, water; -*ica*, belonging to. Growing in or close to water.

**Classification.** Subfamily Panicoideae. Tribe: Paniceae. Subtribe Cenchrinae.

**Habit, Vegetative Morphology.** Annual. Culms prostrate (floating), 100–200 cm long (long), spongy, rooting from lower nodes. Ligule a fringe of hairs. Leaf-blades floating, 4–16 cm long, 2.5–6 mm wide, mid-green or glaucous, discolored with last colour beneath (glaucous above). Leaf-blade surface papillose, rough adaxially. Leaf-blade apex obtuse. Monoecious, with male and female spikelets in the same inflorescence.

**Inflorescence.** Inflorescence composed of racemes. Racemes 5–10, borne along a central axis, distant, appressed, unilateral, 1 cm long, bearing few fertile spikelets, bearing 1–4 fertile spikelets on each. Central inflorescence axis 6–10 cm long, tip subulate. Rhachis angular, smooth on margins, terminating in a barren extension, extension subulate. Spikelet packing abaxial. Sexes segregated, on unisexual branches, with male above. Spikelets solitary. Fertile spikelets sessile. Male spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, 2–2.75 mm long, falling entire.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume orbicular, 0.5–0.75 mm long, 0.25 length of spikelet, membranous, without keels, 0 -veined. Lower glume lateral veins absent. Lower glume apex entire or erose or dentate, 2 -fid, obtuse. Upper glume ovate, 1.25–2.25 mm long, 0.66 length of spikelet, membranous, without keels, 5(–7) -veined. Upper glume apex entire or lobed, 2 -fid, obtuse.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret ovate, 2–2.75 mm long, 1 length of spikelet, membranous, 5(–7) -veined, acute. Fertile florets female. Fertile lemma ovate, 2 mm long, coriaceous, much thinner on margins, without keel, 5 -veined, more than 3-veined. Lemma margins flat, covering most of palea. Lemma apex acute. Palea 1 length of lemma, coriaceous, 2 -veined.

**Flower and Fruit.** Anthers 3. Caryopsis with adherent pericarp, obovoid, dorsally compressed. Embryo 0.66 length of caryopsis. Hilum punctiform.

Male spikelets distinct from female (in racemes bearing 1 spikelet), 2 flowered, separately deciduous, oblong, 3.5–4 mm long. Male spikelet glumes 2. Male spikelet lemma 5–7 -veined.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State. Australia.** Northern Territory.

Darwin & Gulf.

### **Hygrochloa cravenii** M. Lazarides. *Brunonia*, 2(1): 89 (1979).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

**TYPE** from Australia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Australia: Northern Territory: Darwin & Gulf Distr.: 17 mi N of Wilton River crossing, 13.29S 134.31E, 15 Jun 1972, Latz 2768 (HT: CANB; IT: NT).

**Illustrations (Books):** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002).

**Derivation** (Clifford & Bostock 2007): in honor of Lyndley Alan Craven (1945-) Australian botanist.

**Classification.** Subfamily Panicoideae. Tribe: Paniceae. Subtribe Cenchrinae.

**Habit, Vegetative Morphology.** Annual. Culms erect, 60–100 cm long. Culm-internodes antrorsely scabrous. Lateral branches fastigiate. Leaf-sheaths loose, longer than adjacent culm internode, antrorsely scabrous. Ligule a fringe of hairs, 1.5 mm long. Leaf-blades involute, 2–22 cm long, 1–1.4 mm wide, concolorous. Leaf-blade surface papillose, rough adaxially. Leaf-blade margins cartilaginous. Leaf-blade apex obtuse. Monoecious, with male and female spikelets in the same inflorescence.

**Inflorescence.** Inflorescence composed of racemes. Racemes 5–10, borne along a central axis, distant, appressed, unilateral, 1–2 cm long, bearing few fertile spikelets, bearing 1–10 fertile spikelets on each. Central inflorescence axis 12.5–25 cm long, tip subulate. Rhachis angular, scabrous on margins, terminating in a barren extension, extension subulate, extension 1–2 mm long. Spikelet packing abaxial. Sexes segregated, on unisexual branches, with male above. Spikelets solitary. Fertile spikelets sessile. Male spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, 2–2.5 mm long, falling entire.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume ovate, 0.75 mm long, 0.3–0.4 length of spikelet, membranous, without keels, 3 -veined. Lower glume apex entire or erose or dentate, 2 -fid, truncate or obtuse. Upper glume ovate, 1.8–2.3 mm long, 0.9 length of spikelet, membranous, without keels, 5(–7) -veined. Upper glume apex obtuse.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret ovate, 1 length of spikelet, membranous, 5–7 -veined, acute. Fertile florets female. Fertile lemma ovate, 2–2.5 mm long, coriaceous, much thinner on margins, without keel, 5 -veined, more than 3-veined. Lemma margins flat, covering most of palea. Lemma apex acute. Palea 1 length of lemma, coriaceous, 2 -veined.

**Flower and Fruit.** Anthers 3, 2.25 mm long. Caryopsis with adherent pericarp, obovoid, dorsally compressed, 1.75 mm long. Embryo 0.66 length of caryopsis. Hilum punctiform.

Male spikelets distinct from female (in racemes bearing 1–5 spikelets), 2 flowered, separately deciduous, oblong, 4–5 mm long. Male spikelet glumes 2. Male spikelet lemma 5–7 -veined.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State. Australia.** Northern Territory.

Darwin & Gulf, Victoria R & Barkly Tableland.

### **Hygroryza aristata** (Retz.) Nees ex Wight & Arn. *Edinb. N. Phil. Journ.* xv. 380. (1833).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), T.Koyama, *Grasses of Japan and its neighboring regions* (1987).

**TYPE** from India. **Basionym or Replaced Name:** *Pharus aristatus* Retz., *Observ. Bot.* 5: 23 (1789)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: India: Coll?.

**Illustrations (Books):** T.Koyama, *Grasses of Japan and its neighbouring regions* (1987) (28, Fig. 4), C-C Hsu, *Flora of Taiwan*, Vol 5 (1978) (216), C-C Hsu, *Taiwan Grasses* (1975) (378, Pl. 1366), N.L.Bor, *The grasses of Burma, Ceylon, India and Pakistan* (1960) (598, Fig. 67), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 *Poaceae*, part 1 (2007) (46), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 251), G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012) (Fig. 285).

**Images:** G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012) (Pl. 19).

**Derivation** (Clifford & Bostock 2007): *L. arista*, bristle; *-ata*, possessing. The apices of lemmas, paleas or glumes drawn out into a distinct awn.

**Classification.** Subfamily Ehrhartoidae. Tribe: Zizaniinae.

**Habit, Vegetative Morphology.** Perennial. Stolons present. Culms prostrate, 5–20 cm long, spongy, rooting from lower nodes. Leaf-sheaths inflated, longer than adjacent culm internode. Ligule an eciliate membrane. Leaf-blade base cordate. Leaf-blades floating, elliptic or oblong or ovate, 2.5–5 cm long, 12–15 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle open, pyramidal, 3–5 cm long. Primary panicle branches whorled at lower nodes. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, laterally compressed, 6–7 mm long, falling entire. Floret callus elongated, 2–10 mm long.

**Glumes.** Glumes both absent or obscure.

**Florets.** Fertile lemma linear, 6–7 mm long, chartaceous, keeled, 5 -veined, more than 3-veined. Lemma midvein ciliate. Lemma margins ciliate. Lemma apex acuminate, awned, 1 -awned. Principal lemma awn 5–10 mm long overall. Palea lanceolate, 1 length of lemma, chartaceous, 3 -veined, 1-keeled. Palea keels ciliate.

**Flower and Fruit.** Lodicules 2. Anthers 6.

$n = 12$  (2 refs TROPICOS).  $2n = 24$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State. China, Eastern Asia.** China South Central, Hainan, China Southeast. Taiwan. **Indian Subcontinent, Indo-China.** Bangladesh, India, Pakistan, Sri Lanka. Laos, Myanmar, Thailand, Vietnam.

Fujian, Guangdong. Yunnan. Assam, Tripura. Bihar, Kerala. Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamilnadu, Uttah Pradesh, West Bengal.

### **Hylebates chlorochloe** (K. Schum.) Napper. *Kirkia*, iii. 130 (1963).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Tanzania. **Basionym or Replaced Name:** *Panicum chlorochloe* K. Schum., *Bot. Jahrb. Syst.* 24(3): 333 (1897)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: IT: *C. Holst* 8798, Jul 1893, Tanzania: Tanga (US-80565 (fragm.)).

**Illustrations (Books):** R.M.Polhill, F.T.E.A., *Gramineae* (3)(1982):661, Fig 150.

**Derivation** (Clifford & Bostock 2007): Gk. *chloros*, green; *chloa*, grass. The dried foliage is dark-green.

**Classification.** Subfamily Panicoideae. Tribe: Paniceae. Subtribe Incertae Sedis.

**Habit, Vegetative Morphology.** Annual. Culms prostrate, 90–120 cm long, rooting from lower nodes. Ligule a fringe of hairs. Leaf-blade base simple or broadly rounded. Leaf-blades linear or lanceolate, 5–30 cm long, 5–40 mm wide, flaccid.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, 10–30 cm long, evenly furnished or contracted about primary branches. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, linear.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the

lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, 2–3 mm long, falling entire.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume ovate, 0.5–0.7 mm long, 0.2–0.3 length of spikelet, membranous, without keels, 0 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 0.8–1 length of adjacent fertile lemma, membranous, without keels, 3 -veined. Upper glume surface glabrous or pilose (sparsely). Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret elliptic, 1 length of spikelet, membranous, 5 -veined, glabrous or pilose (sparsely), acute, awned. Awn of lower sterile floret 0.3–1 mm long. Fertile lemma elliptic, chartaceous. Lemma margins flat, covering most of palea. Lemma apex acute. Palea chartaceous, without keels.

**Flower and Fruit.** Caryopsis with adherent pericarp, orbicular, isodiametric.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** East Tropical Africa. Kenya, Tanzania.

### **Hylebates cordatus** Chippind. *Journ. S. Afr. Bot.* xi. 128 (1945).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Mozambique. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: IT: A.R. da Torre 4945, Portuguese East Africa: Mocuba to Milange (K, US- (fragm. ex K)).

**Illustrations (Books):** G.V.Pope et al., *Flora Zambesiaca* 10 (3)(1989):127, t. 34).

**Derivation** (Clifford & Bostock 2007): L. *cordus*, heart; -*ata*, possessing. Bases of leaf-blades cordate.

**Classification.** Subfamily Panicoideae. Tribe: Paniceae. Subtribe Incertae Sedis.

**Habit, Vegetative Morphology.** Annual. Culms prostrate, 40–150 cm long, rooting from lower nodes. Ligule a fringe of hairs. Leaf-blade base amplexicaul. Leaf-blades linear or lanceolate, 5–20 cm long, 5–35 mm wide, flaccid.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, effuse, 8–25 cm long, evenly furnished. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, filiform.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, 2.5–3.5 mm long, falling entire. Rhachilla internodes elongated between glumes.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume ovate, 0.5–1 mm long, 0.2–0.3 length of spikelet, membranous, without keels, 0 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume elliptic, 0.8–1 length of adjacent fertile lemma, membranous, without keels, 3 -veined. Upper glume surface glabrous. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret elliptic, 1 length of spikelet, membranous, 5 -veined, scabrous, rough on veins, glabrous, acute, awned. Awn of lower sterile floret 0.5–1 mm long. Fertile lemma elliptic, chartaceous. Lemma margins flat, covering most of palea. Lemma apex acute. Palea chartaceous, without keels.

**Flower and Fruit.** Caryopsis with adherent pericarp, orbicular, isodiametric.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** East Tropical Africa, South Tropical Africa. Tanzania. Mozambique, Zambia, Zimbabwe.

### **Hymenachne acutigluma** (Steud.) Gilliland. *Gard. Bull. Singapore*, xx. 314 (1964).

**Accepted by:** U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002).

**TYPE** from Philippines. **Basionym or Replaced Name:** *Panicum acutiglumum* Steud. *Syn. Pl. Glumac.* 1: 66 (1853). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonymy Database: Philippine Islands:, *Cuming* 2287 (HT: P; IT: L).

**Recent Synonyms:** *Hymenachne pseudointerrupta* C.Muell., *Bot. Zeit.* 19: 333 (1861).

**Illustrations (Books):** C-C Hsu, *Taiwan Grasses* (1975) (559, Pl. 1431 as *H. pseudo-interrupta*), K.M.Matthew, *Illustrations on the Flora of Tamilnadu Carnatic* (1982) (Pl. 878 & 879 as *H. pseudo-interrupta*), H.J.Noltie, *The Grasses of Bhutan* (2000) (683, Fig. 37), J.C.Tothill,& J.B.Hacker. *The grasses*

of southern Queensland (1983) (272), D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002), G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012) (Fig. 147).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002);, H.B.Gilliland et al., *Flora of Malaya Vol. 3 Grasses* (1971);, G.G.Potgar, C.B.Salunkhe & S.R.Yadav, *Grasses of Maharashtra* (2012)

(Pl. 19).

**Derivation** (Clifford & Bostock 2007): *L. acuo*, sharpen; *gluma*, husk. Glumes acuminate.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Otachyriinae.

**Habit, Vegetative Morphology.** Perennial. Stolons present. Culms decumbent, 60–200 cm long, spongy, rooting from lower nodes. Culm-internodes solid. Ligule an eciliate membrane. Leaf-blade base broadly rounded or cordate. Leaf-blades linear or lanceolate, 30–45 cm long, 12–30 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle spiciform, linear, 15–50 cm long, 1–3.5 cm wide. Panicle branches angular. Spikelets appressed, solitary. Fertile spikelets pedicelled. Pedicels present, oblong.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4–5 mm long, falling entire.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume ovate, 1–1.2 mm long, 0.2 length of spikelet, hyaline, without keels, 3–5 -veined. Lower glume apex acute. Upper glume ovate, 3 mm long, membranous, without keels, 3–5 -veined. Upper glume surface asperulous, rough on veins. Upper glume apex acuminate, awned, 1 -awned, awn 0.5 mm long.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret similar to upper glume, ovate, 3.5–5 mm long, 1 length of spikelet, membranous, 5 -veined, scaberulous, rough on veins, acuminate, awned. Awn of lower sterile floret 1–1.5 mm long. Fertile lemma ovate, 3 mm long, cartilaginous, pallid, without keel, 3 -veined, 0–3 -veined. Lemma apex acute. Palea separating from lemma above, 1 length of lemma, 2 -veined.

**Flower and Fruit.** Anthers 3, 1 mm long.

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia, Australasia.

**Country /Province /State. China, Eastern Asia.** Hainan. Taiwan. **Indian Subcontinent, Indo-China, Malesia, Papuasia.** Eastern Himalaya. Myanmar, Thailand. Borneo, Java, Malaya, Philippines, Singapore. New Guinea West Papua (Irian Jaya). New Guinea. **Australia.** Northern Territory, Queensland.

Darwin & Gulf. North, Central.

### **Hymenachne amplexicaulis** (Rudge) Nees. *Agrost. Bras.* 276 (1829).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960) (as *H. pseudointerrupta*), T.Koyama, *Grasses of Japan and its neighboring regions* (1987) (as *H. pseudointerrupta*).

**TYPE** from Brazil. **Basionym or Replaced Name:** *Panicum amplexicaule* Rudge, *Pl. Guian.* 1: 21, pl. 27 (1805). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: T: *Rudge* s.n., Guianas (?). IT: *mis. Nees ab Esenb.*, Brazil, British Guiana (LE-TRIN-0576.01). riliq. specimina Martinicensia Sieber s.no 266. T: *Martin* s.n., French Guiana? (BM). T: British Guiana.

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 1, Aristidoideae a Pharoideae (2012) (324), T.Koyama, *Grasses of Japan and its neighbouring regions* (1987) (316, Fig. 121 as *H. pseudointerrupta*), C-C Hsu, *Flora of Taiwan*, Vol 5 (1978) (538 as *H. pseudointerrupta*), C-C Hsu, *Taiwan Grasses* (1975) (as *H. pseudointerrupta*), K.M.Matthew, Further Illustrations on the *Flora of Tamilnadu Carnatic* (1988) (as *H. pseudointerrupta*), H.Duistermaat, *Field Guide to the Grasses of Singapore* (2005) (75, Fig. 73), E.E.Henty, *A Manual of the Grasses of New Guinea* (1969) (107, Pl. 43), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (281), D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 25 Poaceae, part 2 (2003) (564), A.S.Hitchcock, *Manual of the Grasses of the West Indies* (1936) (314, Fig. 292), S.A.Renvoize, *Gramineas de Bolivia* (1998) (417, Fig. 89), S.A.Renvoize, *The Grasses of Bahia*, 1984 (107, Fig. 38), E.G.Nicora, *Los Generos de Gramineas*

*de America Austral* (1987) (450, Fig. 159), L.B. Smith, D.C. Wasshausen, R.M. Klein *Flora Illustrada Catarinensis Gramineas* (1981–1982) (835, Fig. 172 & 836, Fig. 173), A.Burkart, *Flora Ilustrada de Entre Ríos (Argentina)*, Pt II, *Gramineas* (1969) (273, Fig.105), W.Burger, *Flora Costaricensis* 15, *Gramineae: Fieldiana Botany New Series* 4 (1980) (262, Fig. 94), A.L.Cabrera, *Flora de la Provincia de Buenos Aires, IV Pt 2 Gramineas* (1970) (504, Fig. 131), F.O.Zuloaga et al, *Flora del Paraguay* 23 (1994) (167, Fig. 47), G.Harling & C.Persson, *Flora of Ecuador* (2006) (78: 33, Fig. 2 (2006)), E.Judziewicz, *Flora of the Guianas*, 187. *Poaceae* (1990) (263, Fig 45), R.Pilger, *Die Naturlichen Pflanzenfamilien* 14e (1940) (49, Fig. 26), S-L Chen et al, *Flora of China*, Illustrations, *Poaceae* (2007) (Fig. 716).

**Illustrations (Journals):** *Ruizia* (13:328, Fig 40c-d (1993)).

**Images:** D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia*. CD-Rom Version 1.0. (2002);, K.O.Mallett (ed.), *Flora of Australia*, Vol 44 A (2002) & Vol 44B (2004). *Poaceae*;

**Derivation** (Clifford & Bostock 2007): *L. amplexus*, encircling; *caulis*, stem. The bases of the leaf-blades encircle the stem.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Otachyriinae.

**Habit, Vegetative Morphology.** Perennial. Culms decumbent, robust, 200–350 cm long, spongy, rooting from lower nodes. Culm-internodes solid. Culm-nodes glabrous. Leaf-sheaths glabrous on surface, outer margin glabrous or hairy. Ligule an eciliate membrane, 1–2.5 mm long. Leaf-blade base amplexicaul. Leaf-blades lanceolate, 15–33 cm long, 12–28 mm wide. Leaf-blade surface glabrous. Leaf-blade margins scabrous, tuberculate-ciliate, hairy at base. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle spiciform, linear, 10–40 cm long, 1–2 cm wide. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, oblong.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, acuminate, 3.5–5.5 mm long, falling entire.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume ovate, 1–1.7 mm long, 0.3 length of spikelet, hyaline, without keels, 3 -veined. Lower glume apex cuspidate. Upper glume lanceolate, 2.8–3.9 mm long, 0.7–0.8 length of spikelet, membranous, without keels, 5 -veined. Upper glume apex caudate, awned, 1 -awned, awn 0.5 mm long.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret similar to upper glume, lanceolate, 3.6–4.6 mm long, 1 length of spikelet, membranous, 5 -veined, caudate. Fertile lemma lanceolate, 2.5–3.5 mm long, cartilaginous, pallid, without keel, 3 -veined, 0–3 -veined. Lemma margins involute. Lemma apex acuminate. Palea separating from lemma above, involute, 1 length of lemma, cartilaginous, 2 -veined, without keels. Palea apex acuminate.

**Flower and Fruit.** Anthers 3, 1.1–1.2 mm long. Caryopsis ellipsoid.

$2n = 20$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia, Australasia, North America, South America.

**Country /Province /State. China, Eastern Asia.** China South Central, Hainan. Taiwan. **Indian Subcontinent, Indo-China, Malesia.** Bangladesh, India, Sri Lanka. Myanmar, Thailand, Vietnam. Malaya, Philippines. **Australia** (\*). Northern Territory, Queensland. **Southeastern USA, Mexico.** Florida. Northeast Mexico, Gulf (Mexico), Northwest Mexico, Southwest Mexico, Southeast Mexico. **Mesoamerica, Caribbean, Northern South America, Western South America, Brazil, Southern South America.** Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama. Cuba, Dominican Republic, Haiti, Jamaica, Leeward Is, Windward Islands, Puerto Rico, Trinidad-Tobago. French Guiana, Guyana, Surinam, Venezuela. Bolivia, Colombia, Ecuador, Peru. Brazil West Central, Brazil Northeast, Brazil Southeast, Brazil North. Argentina Northeast, Paraguay, Uruguay.

Yunnan. Assam, Meghalaya, Tripura. Bihar. Tamilnadu, Uttah Pradesh, West Bengal. Darwin & Gulf. North, Central. Roraima, Para, Amapa, Amazonas, Acre, Rondonia, Mato Grosso, Bahia, Maranhao, Piaui, Ceara, Rio Grande do Norte, Paraiba, Penambuco, Alagoas, Sergipe, Minas Gerais, Rio de Janeiro, Espírito Santo, Sao Paulo Parana, Catarina, Rio Grande do Sul. Goiás. Alagoas, Bahia, Ceará, Fernando do Noronha, Maranhão, Pernambuco, Paraíba, Piaui, Rio Grande do Norte (RN), Sergipe. Pará. Sao Paulo. Salta. Buenos Aires, Chaco, Corrientes, Distrito Federal, Entre Ríos, Formosa, Misiones, Santa Fe. Tamaulipas. Veracruz. Sinaloa. Colima, Guerrero, Jalisco, Michoacan, Nayarit, Oaxaca. Campeche, Chiapas, Quintana Roo, Tabasco, Yucatan.

**Hymenachne assamica** (Hook. f.) Hitchcock. *Lingnan Sc. Journ.* vii. 222 (1931).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. **Basionym or Replaced Name:** *Panicum assamicum* Hook. f., *Fl. Brit. India* 7(21): 40 (1897) [1896]

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: India: Assam:, *Masters s.n.* (HT: ?) "nearest P. myurus."

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 717).

**Derivation** (Clifford & Bostock 2007): L. -*ica*, belonging to. From Assam.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Otachyriinae.

**Habit, Vegetative Morphology.** Perennial. Culms decumbent, 20–40 cm long, rooting from lower nodes. Culm-internodes solid. Leaf-sheaths glabrous on surface, outer margin hairy. Ligule an eciliate membrane. Leaf-blade base broadly rounded. Leaf-blades lanceolate, 5–10 cm long, 3–5 mm wide. Leaf-blade surface pubescent, sparsely hairy, hairy abaxially. Leaf-blade margins unthickened, glabrous or ciliate, hairy at base. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle spiciform, linear, continuous or interrupted, 7–10 cm long, 0.7–1 cm wide. Panicle axis scaberulous. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, oblong, scaberulous.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, acute, 3 mm long, falling entire.

**Glumes.** Glumes dissimilar, reaching apex of florets, thinner than fertile lemma. Lower glume ovate, clasping, 1.5 mm long, 0.5 length of spikelet, hyaline, without keels, 3 -veined. Lower glume lateral veins ribbed. Lower glume surface smooth or asperulous, rough on veins. Lower glume apex acute. Upper glume elliptic, 3 mm long, 1 length of spikelet, membranous, without keels, 5 -veined. Upper glume lateral veins ribbed. Upper glume surface smooth. Upper glume apex acute, awned, 1 -awned, awn 0.5 mm long.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret similar to upper glume, oblong, 3 mm long, 1 length of spikelet, membranous, 5 -veined, ribbed, smooth, obtuse. Fertile lemma ovate, 2.5 mm long, cartilaginous, pallid, without keel, 3 -veined, 0–3 -veined. Lemma margins involute. Lemma apex acute. Palea separating from lemma above, involute, 0.8 length of lemma, cartilaginous, 2 -veined, without keels. Palea apex acuminate.

**Flower and Fruit.** Anthers 3, 0.75 mm long.

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State. China.** China South Central, Hainan, China Southeast. **Indian Subcontinent, Indo-China.** India. Thailand.

Guangdong, Guangxi. Yunnan. Assam. Bihar.

**Hymenachne donacifolia** (Raddi) Chase. *Journ. Wash. Acad. Sc.* xiii. 177 (1923).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Brazil. **Basionym or Replaced Name:** *Panicum donacifolium* Raddi, *Agrostogr. Bras.* 44–45 (1823)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *G. Raddi s.n.*, Brazil: Rio de Janeiro (PI; IT: BM, FI, US-80646 (fragm. ex PI & photo), US-80647 (fragm. ex BM)).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 1, Aristidoideae a Pharoideae (2012) (324), S.A.Renvoize, *Gramineas de Bolivia* (1998) (417, Fig. 89), J.A.Steyermark et al, *Flora of the Venezuelan Guayana* Vol. 8 (2004) (120, Fig. 82), L.B. Smith, D.C. Wasshausen, R.M. Klein *Flora Illustrada Catarinensis Gramineas* (1981–1982) (835, Fig. 172), F.O.Zuloaga et al, *Flora del Paraguay* 23 (1994) (167, Fig. 47).

**Derivation** (Clifford & Bostock 2007): Gk. *donax*, reed; L. *folium*, leaf. The leaf-blades resemble those of *Donax* a genus of *Marantaceae*.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Otachyriinae.

**Habit, Vegetative Morphology.** Perennial. Culms decumbent, robust, 300–400 cm long, 4–6 mm diam., rooting from lower nodes. Culm-internodes solid. Lateral branches lacking. Leaf-sheaths glabrous on surface, outer margin hairy. Ligule an eciliate membrane, 0.4–0.5 mm long. Leaf-blade base cordate or amplexicaul. Leaf-blades lanceolate, 25–27 cm long, 27–40 mm wide. Leaf-blade margins scabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, linear or lanceolate, 20–50 cm long, contracted about primary branches. Primary panicle branches appressed, 1–6 cm long, bearing spikelets almost to the base. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, linear.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, acuminate, 2.5–2.9 mm long, falling entire.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume ovate, clasping, 0.9–1.1 mm long, 0.3–0.4 length of spikelet, hyaline, without keels, 1 -veined. Lower glume lateral veins absent. Lower glume apex acute. Upper glume lanceolate, 2–2.1 mm long, 0.7–0.8 length of spikelet, membranous, without keels, 3 -veined. Upper glume apex acute, awned, 1 -awned, awn 0.5 mm long.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret similar to upper glume, lanceolate, 2.3–2.6 mm long, 1 length of spikelet, membranous, 3 -veined, caudate. Fertile lemma ovate, 2–2.2 mm long, cartilaginous, pallid, without keel, 3 -veined, 0–3 -veined. Lemma margins involute. Lemma apex acuminate. Palea separating from lemma above, involute, 1 length of lemma, cartilaginous, 2 -veined, without keels. Palea apex acuminate.

**Flower and Fruit.** Anthers 3, 0.5 mm long.

$2n = 40$  (2 refs TROPICOS).

**Distribution (TDWG).** Continent. South America.

**Country /Province /State. Mesoamerica, Caribbean, Northern South America, Western South America, Brazil, Southern South America.** Costa Rica, Honduras, Nicaragua, Panama, Cuba, Trinidad-Tobago. French Guiana, Guyana, Surinam, Venezuela. Bolivia, Colombia, Ecuador, Peru. Brazil West Central, Brazil North, Brazil Southeast. Paraguay.

Amazonas, Acre, Rondonia, Minas Gerais, Rio de Janeiro, Espirito Santo, Sao Paulo Parana, Catarina, Rio Grande do Sul. Distrito Federal, Goiás. Acre. Minas Gerais, Sao Paulo. Salta. Misiones.

### **Hymenachne grumosa** (Nees) Zuloaga. *Amer. J. Bot.* 90:817 (2003).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Brazil, Paraguay & Uruguay. **Basionym or Replaced Name:** *Panicum grumosum* Nees, *Agrost. Bras.* 182 (1829). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Brazil: Sellow 174 ; Brazil: Sellow sn (B syn, L, LE, P) ; Paraguay: Sellow (LE syn) ; Uruguay, Montevideo: Sellow s.n. (B syn, P, W).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 1, Aristidoideae a Pharoideae (2012) (325), L.B. Smith, D.C. Wasshausen, R.M. Klein *Flora Illustrada Catarinensis Gramineas* (1981–1982) (623, Fig. 135 & 649, Fig. 139 as *Panicum*), A.Burkat, *Flora Ilustrada de Entre Ríos (Argentina)*, Pt II, Gramineas (1969) (298, Fig. 118 as *Panicum*), A.L.Cabrera, *Flora de la Provincia de Buenos Aires, IV Pt 2 Gramineas* (1970) (551, Fig. 145 as *Panicum*), F.O.Zuloaga et al, *Flora del Paraguay* 23 (1994) (250, Fig. 70 as *Panicum*), B.Rosengurtt, *Gramineas Uruguayas I* (1970) (330, Fig. 139 as *Panicum*).

**Derivation** (Clifford & Bostock 2007): L. broken into grains or small tubercles.

**Classification.** Subfamily Panicoideae. Tribe: Paspalaeae. Subtribe Otachyriinae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Culms erect, 130–200 cm long. Culm-internodes terete, 8–30 cm long, distally glabrous. Culm-nodes purple, glabrous. Lateral branches ample, arising from upper culm. Leaf-sheaths 9–20 cm long, glabrous on surface. Ligule an eciliate membrane, 1.2–2 mm long. Collar dark, glabrous. Leaf-blade base broadly rounded. Leaf-blades lanceolate, 14–44 cm long, 6–30 mm wide. Leaf-blade midrib conspicuous. Leaf-blade surface glabrous. Leaf-blade margins scaberulous.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, 15–45 cm long, 3.5–13 cm wide, contracted about secondary branches. Primary panicle branches ascending. Panicle axis scabrous. Panicle branches scabrous. Spikelets in pairs. Fertile spikelets pedicelled. Pedicels present.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, obtuse, 2.3–3 mm long, 0.5–1 mm wide, falling entire.

**Glumes.** Glumes dissimilar, reaching apex of florets, thinner than fertile lemma. Lower glume ovate, 1–1.7 mm long, 0.5–0.75 length of spikelet, membranous, without keels, 3 -veined. Lower glume primary vein scabrous. Lower glume lateral veins transversely connected at apex. Lower glume apex acute. Upper glume elliptic, 1.8–2.5 mm long, 0.9 length of spikelet, membranous, without keels, 5 -veined. Upper glume primary vein scaberulous. Upper glume apex acute.

**Florets.** Basal sterile florets 1, male, with palea. Lemma of lower sterile floret similar to upper glume, elliptic, 1 length of spikelet, membranous, 5 -veined, acute. Palea of lower sterile floret 1 length of lemma. Fertile lemma elliptic, dorsally compressed, 2–2.6 mm long, 0.5–0.7 mm wide, chartaceous, without keel, 5 -veined, more than 3-veined. Lemma margins involute. Lemma apex acute, scabrous. Palea embraced by lemma, involute, chartaceous.

**Flower and Fruit.** Anthers 3. Caryopsis obovoid, 1.1–1.3 mm long, light brown. Embryo 0.5 length of caryopsis. Hilum elliptic.

**Distribution (TDWG). Continent.** South America.

**Country /Province /State. Western South America, Brazil, Southern South America.** Brazil West Central, Brazil North, Brazil Southeast, Brazil South. Argentina Northeast, Paraguay, Uruguay.

Mato Grosso, Minas Gerais, Rio de Janeiro, Espirito Santo, Sao Paulo Parana, Catarina, Rio Grande do Sul. Mato Grosso. Santa Catarina. Buenos Aires, Chaco, Corrientes, Distrito Federal, Entre Rios, Misiones, Santa Fe.

### **Hymenachne patens** L. Liou. *Bot. Res., Inst. Bot. (Beijing)*, 4: 35 (1989).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**TYPE** from China. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: China: Anhui: Huangshan, wet field margins, 80 m, Y. Zou 1703 (HT: PE).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 717).

**Derivation** (Clifford & Bostock 2007): L. *pateo*, lie open. Panicle branches spreading or reflexed or habit open.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Otachyriinae.

**Habit, Vegetative Morphology.** Perennial. Culms decumbent, 50 cm long, 4–5 -noded, rooting from lower nodes. Culm-nodes bearded. Leaf-sheaths mostly shorter than adjacent culm internode. Ligule an eciliate membrane, 5 mm long. Leaf-blade base amplexicaul. Leaf-blades linear or lanceolate, 19–26 cm long, 5–10 mm wide. Leaf-blade surface glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Inflorescence a panicle. Panicle open, oblong, 15–20 cm long, 5 cm wide, contracted about secondary branches. Primary panicle branches spreading, 5–12 cm long, bearing spikelets almost to the base. Spikelets appressed, in pairs or in threes. Fertile spikelets pedicelled. Pedicels present, linear, 2–3 mm long.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, acute, 3.2–4 mm long, 1 mm wide, falling entire.

**Glumes.** Glumes dissimilar, shorter than spikelet, thinner than fertile lemma. Lower glume ovate, 0.33–0.5 length of spikelet, hyaline, without keels, 3 -veined. Lower glume apex acute. Upper glume lanceolate, 3–3.7 mm long, 0.9 length of spikelet, membranous, without keels. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret similar to upper glume, lanceolate, 3.2–4 mm long, 1 length of spikelet, chartaceous, much thinner on margins, 5 -veined, acute. Fertile lemma ovate, 3 mm long, cartilaginous, much thinner on margins, without keel. Lemma margins involute. Lemma apex acute. Palea cartilaginous.

**Flower and Fruit.** Anthers 3, 1 mm long. Caryopsis with adherent pericarp, oblong, 2 mm long.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State. China.** China Southeast.

Anhui, Fujian, Jiangxi.

**Hymenachne pernambucense** (Spreng.) Zuloaga. *Amer. J. Bot.* 90:817 (2003).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Brazil. **Basionym or Replaced Name:** *Agrostis pernambucensis* Spreng., *Syst. Veg.* 1: 258 (1825). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: T: Brazil: Pernambuco.

**Recent Synonyms:** *Panicum pernambucensis* (Spreng.) Pilger, in Engl. & Prantl, *Nat. Pflanzenfam.*, Aufl. 2, xiv e. 15 (1940). *Panicum urticans* L.B. Smith & D.C. Wasshausen, *Bradea* 2(35): 246 (1978).

*Panicum rivulare* Trin., *Gram. Panic.* 213. (1826).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 1, Aristidoideae a Pharoideae (2012) (326), C-C Hsu, *Flora of Taiwan*, Vol 5 (1978) (538), S.A.Renvoize, *The Grasses of Bahia*, 1984 (138, Fig. 47as *Panicum rivulare*), L.B. Smith, D.C. Wasshausen, R.M. Klein *Flora Illustrada Catarinensis Gramineas* (1981–1982) (623, Fig.135 & as *Panicum urticans*), A.Burkart, *Flora Ilustrada de Entre Ríos (Argentina)*, Pt II, Gramineas (1969) (294, Fig. 115 as *Panicum rivulare*), B.Rosengurt, *Gramineas Uruguayas I* (1970) (as *Panicum rivulare*), F.O.Zuloaga et al, *Flora del Paraguay* 23 (1994) (as *Panicum*).

**Illustrations (Journals):** *Ann. Missouri Bot. Gard.* (79: 805, Fig.22 (1992) as *Panicum*).

**Derivation** (Clifford & Bostock 2007): L. -ense, denoting origin. From Pernambuco, Brazil.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Otachyriinae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Culms robust, 200–300 cm long, 8–10 mm diam. Culm-internodes 8–22 cm long, distally glabrous or pilose. Culm-nodes black, glabrous or pubescent. Lateral branches ample, arising from mid culm or upper culm. Leaf-sheaths 8.7–18 cm long, glabrous on surface or pilose, with tubercle-based hairs. Ligule an eciliate membrane, 0.5–1.3 mm long. Collar dark. Leaf-blade base broadly rounded. Leaf-blades lanceolate, 17–60 cm long, 8–20 mm wide. Leaf-blade midrib conspicuous. Leaf-blade surface glabrous or pilose, sparsely hairy. Leaf-blade margins scaberulous. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence a panicle. Panicle open, lanceolate or elliptic, 27–40 cm long, 8–12 cm wide, contracted about secondary branches. Primary panicle branches ascending. Panicle axis scabrous, glabrous to pubescent. Panicle branches pubescent in axils. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, 0.4–2 mm long, scabrous.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic, dorsally compressed, acute, 1.7–2.2 mm long, 0.4–0.8 mm wide, falling entire.

**Glumes.** Glumes dissimilar, reaching apex of florets, thinner than fertile lemma. Lower glume ovate, 0.8–1.2 mm long, 0.5 length of spikelet, membranous, without keels, 3 -veined. Lower glume primary vein scabrous. Lower glume apex acute. Upper glume elliptic, 1.4–2.1 mm long, 0.8–0.9 length of spikelet, membranous, without keels, 3–5 -veined. Upper glume primary vein scabrous. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret similar to upper glume, oblong, 1 length of spikelet, membranous, 3–5 -veined, scabrous, rough on midvein, acute. Fertile lemma elliptic, dorsally compressed, 1.7–2.2 mm long, 0.4–0.8 mm wide, chartaceous, without keel. Lemma margins involute. Lemma apex acute, scabrous. Palea embraced by lemma, involute, chartaceous.

**Flower and Fruit.** Caryopsis ellipsoid, 0.9–1 mm long.

**Distribution (TDWG). Continent.** South America.

**Country /Province /State. Brazil, Southern South America.** Brazil West Central, Brazil Northeast, Brazil Southeast, Brazil South. Argentina Northeast, Paraguay, Uruguay.

Bahia, Minas Gerais, Rio de Janeiro, Espírito Santo, São Paulo Paraná, Catarina, Rio Grande do Sul. Mato Grosso, Goiás, Mato Grosso do Sul. Bahia, Pernambuco. Minas Gerais, Rio de Janeiro. Paraná. Buenos Aires, Chaco, Corrientes, Entre Ríos, Formosa, Misiones, Santa Fe.

**Hymenachne wombaliensis** Vanderyst ex Robyns. *Bull. Jard. Bot. Brux.* ix. 183 (1932).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from DRC. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Congo Belge: Dist. Kasao: wombali, Feb 1914, *Vanderyst* 3492 (HT: BR).

**Illustrations (Books):** H.Jacques-Felix, *Les Graminees d'Afrique tropicale* (1962) (253, Fig. 184).

**Derivation** (Clifford & Bostock 2007): L. -*ensis*, denoting origin. From Wombali, Zaire.

**Classification.** Subfamily Panicoideae. Tribe: Paspaleae. Subtribe Otachyriinae.

**Habit, Vegetative Morphology.** Perennial. Culms decumbent, 80–150 cm long, rooting from lower nodes. Culm-internodes solid. Lateral branches lacking. Leaf-sheaths outer margin glabrous or hairy. Ligule an eciliate membrane, 1–1.3 mm long. Leaf-blades linear, involute, 20–30 cm long, 5–9 mm wide, stiff. Leaf-blade margins scabrous. Leaf-blade apex acuminate, filiform.

**Inflorescence.** Inflorescence a panicle. Panicle contracted, lanceolate, 20–40 cm long, contracted about primary branches. Primary panicle branches appressed, 1–6 cm long, bearing spikelets almost to the base. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, filiform, 1–2.5 mm long.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, acuminate, 3.5–4 mm long, falling entire.

**Glumes.** Glumes dissimilar, reaching apex of florets, thinner than fertile lemma. Lower glume ovate, clasping, 1–1.25 mm long, 0.3 length of spikelet, hyaline, without keels, 5–7 -veined. Lower glume apex obtuse. Upper glume lanceolate, 3.5–4 mm long, 1 length of spikelet, membranous, without keels, 7 -veined. Upper glume apex acuminate, awned, 1 -awned, awn 0.5 mm long.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret similar to upper glume, lanceolate, 3.5–4 mm long, 1 length of spikelet, membranous, 5 -veined, acuminate. Fertile lemma elliptic, 3–3.5 mm long, cartilaginous, pallid, without keel, 3 -veined, 0–3 -veined. Lemma margins involute. Lemma apex acuminate. Palea separating from lemma above, involute, 1 length of lemma, cartilaginous, 2 -veined, without keels. Palea apex acuminate.

**Flower and Fruit.** Anthers 3.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West-Central Tropical Africa, South Tropical Africa. DRC.

**Hymenachne x calamitosa** J.R.Clarkson. *Telopea* 13: 113 (2011).

**TYPE** from Australia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Cook: Abattoir Swamp, 4,5 km N of Mt Molloy, *J.R.Clarkson* 11796, 12 May 2009 (holo: BRI; iso: CNS, DNA, K, L, MO, NSW, PERTH).

**Illustrations:** None found.

**Hyparrhenia anamesa** W.D.Clayton. *Kew Bull., Addit. Ser., No. 2*, 85 (1969).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Kenya. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Kenya: Narok, Olodungoro, July, *Glover, Gwynne, Samuel & Tucker* 2145 (HT: K).

**Illustrations (Books):** R.M.Polhill, F.T.E.A., *Gramineae* (3)(1982):801, Fig 184), G.V.Pope et al., *Flora Zambesiaca* 10, S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (337, Fig 136).

**Illustrations (Journals):** *Kew Bulletin (Addit. Series 2: 86, Fig.21 (1969))*.

**Images:** F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999).

**Derivation** (Clifford & Bostock 2007): Gk *anamesos*, in the heart of a country. Throughout eastern Africa from the Sudan to South Africa.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous or sparsely hairy. Culms erect, 60–120 cm long. Leaves cauline. Ligule an eciliate membrane, 2 mm long. Leaf-blades 10–40 cm long, 2–4 mm wide, glaucous.

**Inflorescence.** Synflorescence compound, paniculate, 15–45 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear, 4–6 cm long, membranous. Peduncle flexuous, 4–7 cm long, glabrous or pilose above. Racemes 2, paired, erect, 1.5–2.5 cm long, bearing few fertile spikelets, bearing 2–3(–4) fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 3.5–6 mm long, glabrous or hirsute. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 4 in upper racemes, lanceolate, 5–6 mm long, equalling fertile. Basal sterile spikelet glumes villous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, linear or lanceolate, dorsally compressed, 4–6 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, muticous or awned, one glume awned, with 1–2 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear or oblong, dorsally compressed, 5–6.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1–1.8 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface villous. Lower glume hairs white. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 25–40 mm long overall, with twisted column. Column of lemma awn pubescent, with 0.1–0.6 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

*n* = 20 (3 refs TROPICOS), or 30 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa. DRC. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Limpopo, North-West, Gauteng, Mpumalanga, Swaziland, Free State, KwaZulu-Natal, Lesotho, Western Cape, Eastern Cape.

### **Hyparrhenia andongensis** (Rendle) Stapf. *Prain, Fl. Trop. Afr.* ix. 373 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Angola. **Basionym or Replaced Name:** *Cymbopogon andongensis* Rendle, *Cat. Afr. Pl.* 2(1): 159 (1899)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: IT: *Welwitsch* 2728, Angola (K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *-ense*, denoting origin. From Pungo Andongo District, Angola.

**Classification.** Subfamily Panicoideae. Tribe: Saccharae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Butt sheaths pilose. Culms erect, 60–90 cm long, wiry. Leaves caudate. Ligule an eciliate membrane, 2–3 mm long. Leaf-blades 10–22 cm long, 2–4 mm wide. Leaf-blade surface puberulous, hairy adaxially.

**Inflorescence.** Synflorescence compound, paniculate, 25–35 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole linear, 3–4 cm long, membranous, red. Peduncle 2–3 cm long, glabrous. Racemes 2, paired, erect, 2.5 cm long, bearing few fertile spikelets, bearing 2–3 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis

internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 4–5 mm long, glabrous, extended into an oblong appendage, with 1 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 7 mm long, equalling fertile. Basal sterile spikelet glumes glabrous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 8 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, acuminate, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 7 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus oblong, 0.7 mm long, pubescent, base obtuse, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex, 9 -veined. Lower glume lateral veins ribbed. Lower glume surface glabrous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 20 mm long overall, with twisted column, limb puberulous. Column of lemma awn puberulous or pubescent, with 0.1 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** South Tropical Africa. Angola.

### **Hyparrhenia anemopaegma** W. D. Clayton. *Kew Bull., Addit. Ser.*, No. 2, 154. (1969).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Zambia. T:<Type of Basionym>:*fide* TROPICOS and Kew Synchrony Database: Zambia: Luangwa Valley, Kapamba River, April, Astle 4759 (HT: K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): Gk *anemos*, wind. Growing on an island subject to strong breezes during the visit of the collector.

**Classification.** Subfamily Panicoideae. Tribe: Saccharae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Butt sheaths glabrous. Culms erect, slender, 90 cm long. Leaves cauline. Ligule an eciliate membrane. Leaf-blades 5–15 cm long, 1–2 mm wide.

**Inflorescence.** Synflorescence compound, scanty.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole linear, 9–14 cm long, membranous. Peduncle nodding, 6–10 cm long, pilose above (yellow hairs). Racemes 2, paired, deflexed, 2 cm long, bearing few fertile spikelets, bearing 2–3 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 0.5–1 mm long, glabrous. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 2 in upper racemes, lanceolate, 11–16 mm long, larger than fertile. Basal sterile spikelet glumes pilose, with white hairs, setose on margins (pectinately), lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 10–11 mm long, longer than fertile, separately deciduous. Companion sterile spikelet callus oblong, 0.5 mm long, truncate. Companion sterile spikelet glumes chartaceous, pilose, setose on margins, acute, awned, one glume awned, with 11–27 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 9 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 2.5–3 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface hispidulous or villous, hairy generally or on veins. Lower glume hairs dark brown. Lower glume apex dentate, 2-fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2-veined. Fertile lemma linear, membranous, without keel, 1-veined, 0–3-veined, one-veined. Lemma apex dentate, 2-fid, awned, 1-awned. Principal lemma awn from a sinus, geniculate, 90–110 mm long overall, with twisted column. Column of lemma awn hirtellous, with 1–1.5 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. South Tropical Africa.** Zambia.

**Hyparrhenia anthistirioides** (Hochst. ex A.Rich.) Anderss. ex Stapf. *Prain, Fl. Trop. Afr.* 9:331 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Andropogon anthistirioides* Hochst. ex A. Rich., *Tent. Fl. Abyss.* 2: 463 (1850)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: ST: *Schimper, pl. Schimp. Abyss., sect III*, 1832, 10 Oct 1840, Ethiopia: in planitie montana Schire (K; IST: MO, L).

ST: *Schimper, pl. Schimp. Abyss., sect III, 1822*, Ethiopia (Chiri) (K; IST: L).

ST: *Quartin Dillon s.n.*, Abyssinia: crescit in montibus provinciae Chiri (P).

**Illustrations (Books):** S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (342, Fig. 138), R.Pilger, *Die Naturlichen Pflanzenfamilien* 14e (1940) (175, Fig. 93 as *H. pseudocymbaria*).

**Derivation** (Clifford & Bostock 2007): Gk. *-oides*, resembling. Similar to *Anthistiria* in the form of the inflorescence.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Butt sheaths glabrous. Culms geniculately ascending, 30–150 cm long, without nodal roots or with prop roots. Leaves cauline. Ligule an eciliate membrane, 1 mm long. Leaf-blades 15–30 cm long, 5–10 mm wide, firm or flaccid. Leaf-blade surface glabrous or pilose, sparsely hairy.

**Inflorescence.** Synflorescence compound, paniculate, 20–30 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 1.8–3.2 cm long, scarious, yellow or green or brown (streaked), glabrous. Peduncle 0.5–1 cm long, pilose above. Racemes 2, paired, deflexed, 1.1–1.3 cm long, bearing few fertile spikelets, bearing 1–3 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1 mm long, stiffly setose, unappendaged or shortly lobed. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 8–11 mm long, larger than fertile. Basal sterile spikelet glumes ciliate on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5–6 mm long, as long as fertile, separately deciduous. Companion sterile spikelet callus indistinct or square (0.1–0.3mm). Companion sterile spikelet glumes chartaceous, glabrous, ciliate on margins, acute, awned, one glume awned, with 3–6 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 0.5–1 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous or pubescent. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 32–45 mm long overall, with twisted column (dark brown to black). Column of lemma awn hirtellous, with 0.8–1 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Northeast Tropical Africa, East Tropical Africa, South Tropical Africa. Eritrea, Ethiopia (inc. Eritrea), Somalia, Sudan, Tanzania, Malawi, Zambia.

### **Hyparrhenia arrhenobasis** (Hochst. ex Steud.) Stapf. *Prain, Fl. Trop. Afr.* ix. 348 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Andropogon arrhenobasis* Hochst. ex Steud., *Syn. Pl. Glumac.* 1: 385 (1854)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: IT: *Schimper 1821*, 10 Oct 1840, Ethiopia: in planitie montana provinciae Schire (K, L, MO).

**Illustrations (Books):** S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (351, Fig 142).

**Derivation** (Clifford & Bostock 2007): Gk. *arrhen*, male; *basis*, ground. Basal spikelets of racemes male.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms erect, 30–160 cm long. Leaves cauline. Ligule an eciliate membrane. Leaf-blades 10–30 cm long, 2–5 mm wide, glaucous.

**Inflorescence.** Synflorescence compound, scanty.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole lanceolate, 4–6 cm long, scarious, yellow or red or purple. Peduncle nodding, 2–3 cm long, pilose above (yellow hairs). Racemes 2, paired, erect, 1.5–2.5 cm long, bearing few fertile spikelets or many spikelets, bearing 3–9 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1–2 mm long, stiffly setose. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number or 4 in number, 2 in upper racemes or 4 in upper racemes, lanceolate, 7–12 mm long, larger than fertile. Basal sterile spikelet glumes glabrous or pilose, setose on margins (pectinately), lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 7–9 mm long, longer than fertile, separately deciduous. Companion sterile spikelet callus square, 0.2 mm long, truncate. Companion sterile spikelet glumes chartaceous, pubescent or pilose, setose on margins, acuminate, mucronate or awned, one glume awned, with 1–3 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 6–7 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, pallid, without keels, keel-less except near apex. Lower glume surface convex or concave, hispidulous or villous, hairy generally or on veins. Lower glume hairs dark brown. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 25–40 mm long overall, with twisted column. Column of lemma awn hispidulous, with 0.3–0.5 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicles 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Northeast Tropical Africa. Ethiopia (inc. Eritrea).

### **Hyparrhenia bagirmica** (Stapf) Stapf. *Prain, Fl. Trop. Afr.* ix. 319 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Chad. **Basionym or Replaced Name:** *Cymbopogon bagirmicus* Stapf, *J. Bot. (Morot)*, ser. 2, 2: 214 (1909)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: LT: *Chevakier* 9795, Chad (P). LT designated by ?; cited by van der Zon, Wageningen Agric. Univ. Pap. 92–1: 479 (1992).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ica*, belonging to. From Bagirmi District, Republic of Chad.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual, caespitose. Butt sheaths glabrous. Culms erect, 100–200 cm long. Leaves cauline. Ligule an eciliate membrane, 1.5–3 mm long. Leaf-blades 15–30 cm long, 1.5–3 mm wide.

**Inflorescence.** Synflorescence compound, paniculate, 20–80 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear, 5–8 cm long, membranous, red. Peduncle 5–8 cm long, pilose above. Racemes 2, paired, deflexed, 1.5–2.5 cm long, bearing few fertile spikelets, bearing 3–5 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 2–3 mm long, glabrous or pubescent (foot glabrous). Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, toothed (0.3–0.7mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes, linear or lanceolate, 7–8 mm long, larger than fertile. Basal sterile spikelet glumes pubescent, with white hairs or dark brown hairs, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, linear or lanceolate, dorsally compressed, 7–8 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, pubescent, with white hairs or dark brown hairs, acuminate, muticous or mucronate. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear or lanceolate, dorsally compressed, 6–7 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 1.5–2.5 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface pubescent. Lower glume hairs white. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 50–80 mm long overall, with twisted column (dark brown to black). Column of lemma awn hirtellous (white or fulvous), with 1–1.5 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa. Nigeria, Senegal. Central African Republic, Congo. Chad.

### **Hyparrhenia barteri** (Hack.) Stapf. *Prain, Fl. Trop. Afr.* ix. 321 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Nigeria. **Basionym or Replaced Name:** *Andropogon barteri* Hack., *Flora* 68(7): 124 (1885)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: HT: *C. Barter s.n.*, 1857, Nigeria (W; IT: K, P, US-76447 (fragm. ex B)).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Charles Barter (-1859) who collected in Nigeria.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual, caespitose. Butt sheaths glabrous. Culms erect, 100–200 cm long. Leaves cauline. Ligule an eciliate membrane, 1 mm long. Leaf-blades 15–30 cm long, 2–4 mm wide. Leaf-blade surface scaberulous.

**Inflorescence.** Synflorescence compound, fasciculate, 30–40 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole linear, 3–4 cm long, membranous, brown or red. Peduncle 1–2 cm long, glabrous or pilose above. Racemes 2, paired, erect, 0.8–1 cm long, bearing few fertile spikelets, bearing 1 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 4–7 mm long, glabrous. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 2 in upper racemes, lanceolate, 3–5 mm long, smaller than fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, linear or lanceolate, dorsally compressed, 3.5–5 mm long, shorter than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, acute, mucronate. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 5.5–6.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 1.5–2 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex, 9 -veined. Lower glume lateral veins ribbed. Lower glume surface scabrous, rough on veins, glabrous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 40–45 mm long overall, with twisted column. Column of lemma awn hirsute (rufously), with 3–5 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, East Tropical Africa, South Tropical Africa. Nigeria, Togo. Central African Republic. Tanzania. Malawi, Zambia.

## **Hyparrhenia bracteata** (Humb. & Bonpl. ex Willd.) Stapf. *Prain, Fl. Trop. Afr.* ix. 360 (1918).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from Venezuela. **Basionym or Replaced Name:** *Andropogon bracteatus* Humb. & Bonpl. ex Willd., *Sp. Pl.* 4: 914 (1806)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Humboldt & Bonpland s.n.*, Venezuela: Sucre: Cumana (B-W-18655).

**Illustrations (Books):** E.E.Henty, *A Manual of the Grasses of New Guinea* (1969) (103, Pl. 41), S.A.Renvoize, *Gramineas de Bolivia* (1998) (608, Fig. 145), J.A.Steyermark et al, *Flora of the Venezuelan Guayana* Vol. 8 (2004) (122, Fig. 83), W.Burger, *Flora Costaricensis* 15, Gramineae: *Fieldiana Botany New Series* 4 (1980) (264, Fig. 95), R.Pilger, *Die Naturlichen Pflanzenfamilien* 14e (1940) (176, Fig. 94).

**Derivation** (Clifford & Bostock 2007): *L. bractus*, bract; -*ata*, possessing. Panicle or inflorescence branches subtended by leafy bracts.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths woolly. Culms erect, 60–250 cm long. Culm-internodes distally glabrous or hirsute (below nodes). Leaves caudate. Leaf-sheaths glabrous on surface or hirsute. Ligule an eciliate membrane, 1–2 mm long. Leaf-blades 30–60 cm long, 2–4 mm wide, stiff, glaucous. Leaf-blade surface pubescent, hairy abaxially. Leaf-blade margins scabrous.

**Inflorescence.** Synflorescence compound, globose, 20–60 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole lanceolate, 2–3 cm long, membranous, glabrous or pilose. Peduncle 1.5–2.5 cm long, pilose above (yellow hairs). Racemes 2, paired, deflexed, 0.5–1.5 cm long, bearing few fertile spikelets, bearing 1–2 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases linear or flattened, unequal (the longer measured), 1.5–2 mm long, stiffly setose, extended into an oblong appendage, with 1–2.5 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, without appendage.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 4–7 mm long, equalling fertile. Basal sterile spikelet glumes glabrous, scabrous on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 4–6(–7) mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, acute, muticous or mucronate. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered – the lower floret male or barren, the upper fertile. Spikelets linear or oblong, dorsally compressed, 4–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface grooved on either side of midvein, glabrous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 10–25 mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2. Caryopsis 3 mm long.

**Distribution (TDWG). Continent.** Africa, Temperate Asia, Tropical Asia, North America, South America.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa. Burkina, Ivory Coast, Nigeria, Burundi,

Central African Republic, Cameroon, DRC. Kenya, Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. **China.** China Southeast. **Indo-China.** Thailand, Vietnam. **Mexico.** Gulf (Mexico), Southwest Mexico, Southeast Mexico. **Mesoamerica, Northern South America, Western South America, Brazil, Southern South America.** Belize, Costa Rica, El Salvador, Guatemala, Honduras, Panama. Guyana, Surinam, Venezuela. Bolivia, Colombia, Ecuador, Peru. Brazil North, Brazil Southeast. Paraguay.

Guangdong, Guangxi. Distrito Federal, Mato Grosso, Goiás, Mato Grosso do Sul. Minas Gerais, São Paulo. Veracruz. Oaxaca. Chiapas.

**Hyparrhenia claytonii** S.M. Phillips. *Kew Bull.*, 49(3): 540 (1994).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Ethiopia: Shewa Prov.: Bole Canyon, c. 45 km N of Addis Ababa, 6600–7000 ft (2000–3000 m), frequent grass in lower parts of south facing slopes, in grassland with evergreen and deciduous trees and shrubs, Ash 2693 (HT: K; IT: US).

**Illustrations (Books):** S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (342, Fig 138).

**Derivation** (Clifford & Bostock 2007): in honor of William Derek Clayton (1926-) English agrostologist.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Rootstock evident. Butt sheaths pubescent, with white hairs. Culms erect, slender, 100 cm long, 2 mm diam. Leaves cauline. Leaf-sheaths glabrous on surface. Leaf-sheath auricles erect. Ligule an eciliate membrane, 1 mm long, brown, truncate. Leaf-blades 20–30 cm long, 6–8 mm wide, glaucous. Leaf-blade surface scabrous, glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Synflorescence compound, linear, 25 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 2.5–3 cm long, scarious, yellow or brown (striped), glabrous. Peduncle 1–1.5 cm long, hirsute above. Racemes 2, paired, deflexed, bearing few fertile spikelets, bearing 2 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1 mm long, stiffly setose, with 4–5 mm long hairs, shortly lobed, with 1 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, toothed (0.3mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, elliptic, 9 mm long, larger than fertile. Basal sterile spikelet glumes villous, ciliate on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 7–8.5 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, villous, eciliate on margins, acuminate, awned, one glume awned, with 4–5.5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets elliptic or ovate, dorsally compressed, 4.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface villous. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 34–37 mm long overall, with twisted column. Column of lemma awn pubescent, with 0.3–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Northeast Tropical Africa. Ethiopia (inc. Eritrea).

**Hyparrhenia coleotricha** (Steud.) Anderss. ex W.D.Clayton. *Kew Bull., Addit. Ser.*, No. 2, 136 (1969).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Andropogon comosus* Hochst. ex A. Rich., non Spreng.(1819), *Tent. Fl. Abyss.* 2:461 (1850). T:<Type of Basionym>: fide TROPICOS and Kew Synonomy Database: : Based on A.comosus Hochst. ex A.Rich. ; Ethiopia: Schimper1458 (K iso).

**Illustrations (Books):** S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (349, Fig 141).

**Derivation** (Clifford & Bostock 2007): Gk. *koleos*, sheath; *thrix*, hair. Leaf-sheath with spreading tubercle-based hairs.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Butt sheaths glabrous or pilose. Culms erect, 100–250 cm long, with prop roots. Culm-nodes glabrous or bearded (fulvously). Leaves cauline. Ligule an eciliate membrane, 2–4 mm long. Leaf-blades tapering towards sheath, 15–30 cm long, 7–15 mm wide. Leaf-blade surface glabrous.

**Inflorescence.** Synflorescence compound, paniculate, 20–30 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole lanceolate, 4.5–7 cm long, membranous, glabrous. Peduncle pilose above. Racemes 2, paired, deflexed, 2–2.5 cm long, bearing few fertile spikelets, bearing 4–7 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 0.5–1.5 mm long, stiffly setose, extended into an oblong appendage, with 1–2 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, toothed (0.3–0.6mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 10–12 mm long, larger than fertile. Basal sterile spikelet glumes glabrous or pubescent, scabrous on margins, lower glume muticous or awned (0–3mm).

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 8–12 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, pubescent, acute, awned, one glume awned, with 6–8 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 7–9 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1.5–3 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface villous. Lower glume hairs white. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 50–70 mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa, Temperate Asia.

**Country /Province /State.** Northeast Tropical Africa, East Tropical Africa. Eritrea, Ethiopia (inc. Eritrea), Sudan. Tanzania. Arabian Peninsula. Yemen.

**Hyparrhenia collina** (Pilger) Stapf. *Prain, Fl. Trop. Afr.* ix. 337 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Rwanda & Tanzania. **Basionym or Replaced Name:** *Andropogon collinus* Pilg., *Wiss. Erg. Deut. Zentr.-Afr. Exped., Bot.* 2: 43 (1910)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: ST: *Volkens n.* 352, [Africa]: Kilimandscharo

ST: *Mildbraed n.* 375, [Afirca]: "Ost-Ruanda".

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *collis*, a hill; -*ina*, belonging to. Mountain species.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short, scaly. Butt sheaths glabrous. Culms erect or geniculately ascending, slender, 30–130 cm long, 1–3 mm diam., wiry. Leaves culine. Ligule an eciliate membrane, 1–2 mm long. Leaf-blades 15–30 cm long, 2–5 mm wide. Leaf-blade surface scaberulous. Leaf-blade margins scabrous.

**Inflorescence.** Synflorescence compound, paniculate, 15–40 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 2–4 cm long, membranous, brown or red, glabrous or hirsute. Peduncle 1–2.5 cm long, pilose above. Racemes 2, paired, deflexed, 1–2 cm long, bearing few fertile spikelets, bearing 2–4 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1–1.5 mm long, stiffly setose. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 5–6 mm long, larger than fertile. Basal sterile spikelet glumes villous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 4–7 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, villous, acute, awned, one glume awned, with 1–3 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4.5–5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 0.5 mm long, pubescent, base obtuse, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, purple, without keels, keel-less except near apex. Lower glume surface villous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 15–25 mm long overall, with twisted column. Column of lemma awn puberulous or pubescent, with 0.2–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa. Nigeria. Cameroon, Rwanda, DRC. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Malawi, Zambia, Zimbabwe. Mpumalanga, Kwazulu-Natal.

**Hyparrhenia confinis** (Hochst. ex A.Rich.) Anderss. ex Stapf. *Prain, Fl. Trop. Afr.* 9:353 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Andropogon confinis* Hochst., *Tent. Fl. Abyss.* 2: 461 (1850)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: ST: *Schimper, pl. Schimp. Abyss., sect. III*, 1456, 1845, Ethiopia: sine locali indicatione (?; IST: L, S-G389, US-945743).

ST: *Quartin Dillon s.n.*, Ethiopia: crescit in montosis provinciae Chire.

**Illustrations (Books):** S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (337, Fig 136).

**Derivation** (Clifford & Bostock 2007): L. adjoining. Growing gregariously.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Butt sheaths glabrous. Culms erect, 100–250 cm long, with prop roots. Leaves caudate. Leaf-sheath auricles absent or erect. Ligule an eciliate membrane, 5–20 mm long. Leaf-blade base tapering to the midrib, without a false petiole or with a false petiole, petiole 0–8 cm long. Leaf-blades 15–30 cm long, 7–15 mm wide. Leaf-blade surface glabrous or pilose, hairy abaxially.

**Inflorescence.** Synflorescence compound, paniculate, 25–35 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted or embraced at base by subtending leaf. Spatheole lanceolate, 3–4.5 cm long, membranous, glabrous. Peduncle 1.5–5.5 cm long, pilose above. Racemes 2, paired, deflexed, 2 cm long, bearing few fertile spikelets, bearing 1 fertile spikelet on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 0.5–1.5 mm long, stiffly setose (white hairs), extended into an oblong appendage, with 1–4 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate or villous, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 6.5–13 mm long, equalling fertile or larger than fertile. Basal sterile spikelet glumes glabrous or pubescent, ciliate on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 6–14 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, acute, awned, one glume awned, with 9–17 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets oblong, dorsally compressed, 7–10 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1.5–3 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface flat or concave, glabrous or pubescent or villous. Lower glume hairs white. Lower glume apex dentate, 2 - fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 40–90 mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Flower and Fruit.** Lodicles 2, cuneate, fleshy. Anthers 3. Stigmas 2. Caryopsis 3–4 mm long.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Northeast Tropical Africa. Ethiopia (inc. Eritrea), Sudan.

### **Hyparrhenia coriacea** M. Mazade. *Adansonia*, 18(1): 147 (1978).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Central African Republic. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Rep. Centr. Afr., Bokolobo: Mazade 217 (P holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *corium*, leather; *-acea*, indicating resemblance. Lemmas or glumes leathery in texture.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Culms erect, 250 cm long. Leaves caudate. Leaf-sheaths mostly shorter than adjacent culm internode, glabrous on surface. Leaf-sheath auricles erect. Ligule an eciliate membrane, 3 mm long. Leaf-blades 40–70 cm long, 7–14 mm wide. Leaf-blade surface glabrous or puberulous, hairy abaxially.

**Inflorescence.** Synflorescence compound, paniculate.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole linear, 9 cm long, scarious, glabrous. Peduncle 2.5 cm long, pilose above. Racemes 2, paired, deflexed, bearing few fertile spikelets, bearing 1 fertile spikelets on each. Rhachis fragile at the nodes. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 4 in number, 4 in upper racemes, forming an involucro about the fertile, lanceolate, 13–17 mm long, equalling fertile. Basal sterile spikelet lower glume muticous.

Companion sterile spikelets well-developed, lanceolate, dorsally compressed, separately deciduous. Companion sterile spikelet glumes chartaceous, acute.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets oblong or oblanceolate, dorsally compressed, 10–15 mm long, 2 mm wide, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 3.5–4.5 mm long, pilose, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, 9–11 -veined. Lower glume surface pubescent. Lower glume hairs white, 1 mm long. Upper glume linear, coriaceous, without keels, 3 -veined. Upper glume primary vein scaberulous. Upper glume surface pubescent. Upper glume margins ciliolate. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, hyaline, 2 -veined, ciliolate on margins, dentate, 2 -fid. Fertile lemma linear, membranous, without keel. Lemma apex dentate, 2 -fid, with lobes 1–1.5 mm long, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 120–160 mm long overall, with twisted column. Column of lemma awn pubescent, with 1–1.2 mm long hairs. Palea 2–2.6 mm long.

**Flower and Fruit.** Caryopsis oblong, dorsally compressed, 6.5–7.5 mm long.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West-Central Tropical Africa. Central African Republic.

### **Hyparrhenia cyanescens** (Stapf) Stapf. *Prain, Fl. Trop. Afr.* 9:351 (1919).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Mali. **Basionym or Replaced Name:** *Cymbopogon cyanescens* Stapf, *J. Bot. (Morot)*, ser. 2, 2: 209 (1909)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: *Chevalier* 2359, Mali (P; IT: K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. cyanesco, become blue. Fertile spikelets bluish-green.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes short. Butt sheaths glabrous. Culms erect or geniculately ascending, robust, 200–300 cm long, 4–8 mm diam., without nodal roots or with prop roots. Leaves caudate. Leaf-sheath auricles absent or erect, 1–6 mm long. Ligule an eciliate membrane, 2–3 mm long. Leaf-blade base tapering to the midrib. Leaf-blades 15–50 cm long, 3–8 mm wide, glaucous. Leaf-blade surface glabrous.

**Inflorescence.** Synflorescence compound, paniculate, 30–60 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted or embraced at base by subtending leaf. Spatheole linear or lanceolate, 3.5–5 cm long, membranous, glaucous or purple, glabrous. Peduncle 1–5 cm long, pilose above. Racemes 2, paired, deflexed, 1.7–2.5 cm long, bearing few fertile spikelets, bearing 3–6 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on

margins. Rhachis hairs white. Spikelet packing lax. Rhachis internodes linear, 2.5–4 mm long. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1 mm long, stiffly setose (sparsely), scariously rimmed. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 6–8 mm long, larger than fertile. Basal sterile spikelet glumes glabrous, ciliate on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 6–8 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous or puberulous, acute, awned, one glume awned, with 1–2 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4.5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus oblong to cuneate, 0.5–1.2 mm long, pubescent, base obtuse, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, grey, without keels, keel-less except near apex. Lower glume surface glabrous to pubescent. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 28–34 mm long overall, with twisted column. Column of lemma awn puberulous or pubescent, with 0.2–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, South Tropical Africa.** Gambia, Ghana, Guinea, Nigeria, Senegal, Sierre Leone. Congo, Gabon, DRC.

### **Hyparrhenia cymbaria** (L.) Stapf. *Prain, Fl. Trop. Afr.* 9:332 (1919).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from ?Comoros. **Basionym or Replaced Name:** *Andropogon cymbarius* L., *Mant. Pl.* 2: 303 (1771)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Kvnig s.n.*, India: probably Comoro Islands (LINN-1211.6).

**Illustrations (Books):** G.V.Pope et al., *Flora Zambesiaca* 10 (4)(2002):115, t. 36), L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (Plt. 16), J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969) (253, Fig 92), S.Phillips, *Poaceae (Gramineae)* in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (344, Fig 139), N.L.Bor, *The grasses of Burma, Ceylon, India and Pakistan* (1960), R.Pilger, *Die Naturlichen Pflanzenfamilien* 14e (1940).

**Images:** F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999).

**Derivation** (Clifford & Bostock 2007): Gk. *kymbe*, boat; *-aria*, pertaining to inflorescence with boat-like spathes.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes elongated, scaly. Butt sheaths glabrous or pubescent. Culms erect or decumbent, robust, 200–400 cm long, 4–8 mm diam., with prop roots. Leaves cauline. Leaf-sheaths outer margin glabrous or hairy. Ligule an eciliate membrane, 1 mm long. Leaf-blades 25–45 cm long, 6–20 mm wide, stiff or firm.

**Inflorescence.** Synflorescence compound, paniculate, 20–40 cm long, dense.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole ovate, 0.8–1.8(–2.1) cm long, membranous, red, glabrous. Peduncle 0.3–0.8 cm long, hispid above. Racemes 2, paired, deflexed, 0.7–1.3 cm long, bearing few fertile spikelets, bearing 1–3 fertile

spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 0.5–1 mm long, stiffly setose. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 4–6(–7) mm long, equalling fertile. Basal sterile spikelet glumes glabrous or pubescent, ciliate on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 4–5 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous or puberulous, ciliate on margins, acuminate, muticous or mucronate or awned, one glume awned, with 0–1.5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 3.8–4.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus square, 0.2–0.3 mm long, pubescent, base obtuse (broadly), attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous or pubescent. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, mucronate (rarely) or awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 0.5–1.6(–2) mm long overall, with twisted column. Column of lemma awn puberulous, with 0.2–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicles 2, cuneate, fleshy. Anthers 3. Stigmas 2. Caryopsis with adherent pericarp, ellipsoid, 3 mm long.

**Distribution (TDWG).** Continent. Africa, North America.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean. Nigeria. Cameroon, Rwanda, DRC. Eritrea, Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Limpopo, Gauteng, Mpumalanga, Swaziland, Kwazulu-Natal, Eastern Cape. Madagascar. Mexico. Southwest Mexico.

Tamilnadu. Jalisco, Michoacan.

### **Hyparrhenia dichroa** (Steud.) Stapf. *Prain, Fl. Trop. Afr.* ix. 302 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from South Africa. **Basionym or Replaced Name:** *Andropogon bicolor* Nees, non Roxb.(1820), *Fl. Afr. Austr.* 1:113 (1841). T:<Type of Basionym>: fide TROPICOS and Kew Synonomy Database: : Based on *Andropogon bicolor* Nees ; South Africa: Drege.

**Illustrations:** None found.

**Images:** F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999).

**Derivation** (Clifford & Bostock 2007): Gk. *dis*, twice; *chroia*, color. Two-colored as with callus hairs white, glume hairs fulvous.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistirinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms erect, robust, 150–300 cm long. Leaves caudate. Ligule an eciliate membrane, 1 mm long. Leaf-blades 30–60 cm long, 4–8 mm wide, stiff.

**Inflorescence.** Synflorescence compound, paniculate, 20–60 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole lanceolate, 2–3.5 cm long, membranous. Peduncle 1–2.5 cm long, glabrous or pilose above. Racemes 2, paired, erect, 1–1.5(–2) cm long, bearing few fertile spikelets, bearing 3–5 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 1.5–2.5 mm long, glabrous or pilose. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster.

Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes or 2 in upper racemes, lanceolate, equaling fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 3–5 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, muticous or mucronate. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered – the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4–5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 0.4–0.8 mm long, pubescent, base obtuse, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma, shiny. Lower glume lanceolate, 1 length of spikelet, coriaceous, dark brown, without keels, keel-less except near apex. Lower glume surface pubescent. Lower glume hairs red. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 20–30 mm long overall, with twisted column. Column of lemma awn pubescent (rufously). Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa. Rwanda, DRC. Ethiopia (inc. Eritrea), Sudan. Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Namibia, Botswana, Limpopo, Mpumalanga, Swaziland, Free State, KwaZulu-Natal.

### **Hyparrhenia diplandra** (Hack.) Stapf. *Prain, Fl. Trop. Afr.* ix. 368 (1918).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*).

**TYPE** from Sudan. **Basionym or Replaced Name:** *Andropogon diplandrus* Hack., *Flora* 68(7): 123 (1885)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: ST: *Schweinfurth* 2094, Sudan: prope Tondj in terra Bongo (W; IST: K). A. Chase (note on US-76463) indicates that, in opposition to Hackel's protologue, 2094 has pubescent nodes, and 2002 has glabrous nodes..

ST: *G.A. Schweinfurth* 2002 [2602], 1869, Africa centralis: ad Seriba Ghattas in terra Djur (W; IST: K, P, US-76463 (fragm. ex W)).

**Illustrations (Books):** W. Robyns (1929 and 1934). *Flora Agrostologique du Congo Belge et du Ruanda-Urundi*, I. Maydees et Andropogonees and II. Panicees. Bruxelles, Goemaere (195, Pl. 14), G.V.Pope et al., *Flora Zambesiaca* 10 (as var. *mutica*), S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (337, Fig 136).

**Derivation** (Clifford & Bostock 2007): Gk. *diploos*, double; *aner*, man. Bisexual floret with two anthers.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms erect, robust, 200–300 cm long. Leaves caudate. Leaf-sheaths glabrous on surface or pilose. Leaf-sheath oral hairs bearded (grey hairs). Ligule an eciliate membrane, 1–2 mm long. Leaf-blades 20–60 cm long, 3–10 mm wide. Leaf-blade surface glabrous or hirsute, sparsely hairy, hairy abaxially.

**Inflorescence.** Synflorescence compound, panicle, 20–40 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 2–4.5 cm long, membranous, brown or red, glabrous. Peduncle 0.3–1.5 cm long, glabrous or hirsute above. Racemes 2, paired, deflexed, 1.5–2(–2.5) cm long, bearing few fertile spikelets, bearing (1–)2–3(–5) fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1–2 mm long, pubescent. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 4 in number, 4 in upper racemes, forming an involucre about the fertile, lanceolate, 7–9 mm long, larger than fertile. Basal sterile spikelet glumes scabrous on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5–7.5 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, muticous or awned, one glume awned, with 0–5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 6–8 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1.5 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous or pubescent. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 20–55 mm long overall, with twisted column. Column of lemma awn pubescent, with 0.2–0.5 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

$n = 20$  (1 ref TROPICOS).  $2n = 40$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Africa, Temperate Asia, Tropical Asia, South America.

**Country /Province /State.** **West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Western Indian Ocean.** Guinea, Ivory Coast, Liberia, Nigeria, Sierra Leone. Cameroon, Congo, Gabon, Rwanda, DRC. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Madagascar. **China.** China South Central, Hainan, China Southeast. **Indo-China, Malesia.** Laos, Thailand, Vietnam. Sulawesi. **Brazil.** Brazil Northeast.

Guangdong, Guangxi. Yunnan. Pernambuco.

### **Hyparrhenia dregeana** (Nees) Stapf ex Stent. *Bothalia* 1:249 (1923).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), W.D.Clayton & N.Snow, *Key to Pacific Grasses* (2010).

**TYPE** from South Africa. **Basionym or Replaced Name:** *Andropogon dregeanus* Nees, *Fl. Afr. Austral. Ill.* 112 (1841)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: IST: *Drige s.n.*, South Africa (L, MO-2103097).

**Illustrations (Books):** S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (346, Fig 140).

**Derivation** (Clifford & Bostock 2007): L. *-ana*, indicating connection. In honor of Johann Franz Drhge (1794–1881) German horticulturalist and plant collector in South Africa.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths pubescent. Culms erect, robust, 150–200 cm long, 2–4 mm diam. Leaves caudate. Ligule an eciliate membrane, 2–4 mm long. Leaf-blades 30–60 cm long, 3–8 mm wide, stiff, glaucous. Leaf-blade surface scaberulous, glabrous.

**Inflorescence.** Synflorescence compound, paniculate, 20–50 cm long, dense.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted or embraced at base by subtending leaf. Spatheole lanceolate, 2.5–5 cm long, membranous, brown or red, glabrous or hirsute. Peduncle 1.5–5 cm long, pilose above. Racemes 2, paired, deflexed, 2–3 cm long, bearing 5–13 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear, 1.5–2 mm long. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1–1.5 mm long, stiffly setose, scariously rimmed or extended into an oblong appendage, with 0–0.5 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 5–7 mm long, larger than fertile. Basal sterile spikelet glumes glabrous or villous, ciliate on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5–6 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous or pubescent or villous, acute, muticous or mucronate or awned, one glume awned, with 0.5–1.5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4–5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1 mm long, pubescent, base obtuse or acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, yellow or dark brown or purple, without keels, keel-less except near apex. Lower glume surface glabrous or hispidulous or villous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, (1)8–20(–28) mm long overall, with twisted column. Column of lemma awn puberulous or pubescent, with 0.2–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa, Temperate Asia, Pacific.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa. Eritrea, Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Angola, Malawi, Zimbabwe. Namibia, Limpopo, North-West, Gauteng, Mpumalanga, Swaziland, Free State, Kwazulu-Natal, Lesotho, Eastern Cape. Arabian Peninsula. Yemen. North-central Pacific. Hawaii (\*).

### Hyparrhenia dybowskii (Franch.) Roberty. *Monogr. Syst. Andropog. du Globe*: 107 (1960).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Central African Republic. **Basionym or Replaced Name:** *Andropogon dybowskii* Franch., *Bull. Soc. Hist. Nat. Autun* 8: 334 (1895)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Congo Francais: Hab.- Au voisinage du camp de Balao, en pays Langouanis, a 100 ou 150 kil. des rives de l'Oubangui, Dybowski 585.

**Illustrations (Books):** H.Jacques-Felix, *Les Graminees d'Afrique tropicale* (1962) (305, Fig. 243 as *Dybowskia seretii*).

**Derivation** (Clifford & Bostock 2007): in honor of Jean Dybowski (1858–1928) French botanist.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Butt sheaths glabrous. Culms erect, robust, 100–200 cm long. Culm-nodes glabrous or bearded. Leaves caudate. Leaf-sheaths outer margin hairy. Ligule an eciliate membrane, 1–4 mm long. Leaf-blades 25–35 cm long, 6–12 mm wide. Leaf-blade surface glabrous or hirsute, sparsely hairy.

**Inflorescence.** Synflorescence compound, paniculate, 30 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 6–9 cm long, membranous, glabrous or hirsute (at base). Peduncle 0.5–4 cm long, glabrous or pilose above. Racemes 2, paired, deflexed, 3.5 cm long, bearing few fertile spikelets, bearing 1

fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1.5 mm long, pubescent. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 4 in number, 4 in upper racemes, forming an involucre about the fertile, lanceolate, 15–25 mm long, equalling fertile. Basal sterile spikelet glumes scabrous on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 15–19 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, awned, one glume awned, with 2–5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear or oblong, dorsally compressed, 16–20 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 6 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, yellow, without keels, keel-less except near apex. Lower glume surface glabrous to villous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 120–190 mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West-Central Tropical Africa. DRC.

### **Hyparrhenia exarmata** (Stapf) Stapf. *Prain, Fl. Trop. Afr.* ix. 308 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Central African Republic. **Basionym or Replaced Name:** *Cymbopogon exarmatus* Stapf, *J. Bot. (Morot)*, ser. 2, 2: 210 (1909)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Chevalier 10509*, Central African Republic (K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *ex*, without; *arma*, instrument of war; *-ata*, possessing. Lemma unawned.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms erect, 150 cm long. Leaves cauline. Ligule an eciliate membrane, 1–2 mm long. Leaf-blades 30–60 cm long, 4–9 mm wide. Leaf-blade surface glabrous or pilose.

**Inflorescence.** Synflorescence compound, paniculate, 20–40 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear or lanceolate, 3–6 cm long, membranous, red. Peduncle pubescent above or pilose above. Racemes 2, paired, erect, 1.5–2.5 cm long, bearing 6–10 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs red. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 3 mm long, glabrous. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, with red hairs, tip oblique, toothed (0.1–0.2mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes, lanceolate, 3.5–5 mm long, equalling fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 3 mm long, shorter than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 3.5–4 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus square, 0.25 mm long, pubescent, base obtuse, attached obliquely. Spikelet callus hairs red.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma, shiny. Lower glume lanceolate, 1 length of spikelet, coriaceous, red, without keels, keel-less except near apex. Lower glume surface pubescent. Lower glume hairs red. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 3 mm long, 1 length of fertile lemma, hyaline, 0 -veined, without midvein, without lateral veins, ciliate on margins. Fertile lemma ovate, 3 mm long, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma margins ciliate. Lemma apex entire, truncate, mucronate. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa.** Burkina. Central African Republic, DRC. Sudan. Kenya.

### **Hyparrhenia familiaris** (Steud) Stapf. *Prain, Fl. Trop. Afr.* ix. 325 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Guinea. **Basionym or Replaced Name:** *Andropogon familiaris* Steud., *Syn. Pl. Glumac.* 1: 385 (1854)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Jardin* 277, Guinie (P).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *familia*, family; -*aris*, pertaining to. Of wide-spread distribution.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms erect, slender, 50–150 cm long. Culm-internodes distally glabrous. Leaves caudate. Leaf-sheaths outer margin glabrous or hairy. Ligule an eciliate membrane, 1.5 mm long. Leaf-blades 15–30 cm long, 2.5–5 mm wide.

**Inflorescence.** Synflorescence compound, paniculate, 30–60 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear, 6–10 cm long, membranous, brown or red. Peduncle 6–10 cm long, pilose above. Racemes 2, paired, deflexed, 1–2 cm long, bearing few fertile spikelets, bearing 1–3 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 4–5 mm long, pubescent or hirsute (fulvously), hairy in axils. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, toothed (0.5mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 4 in upper racemes, linear or lanceolate, 6–6.5 mm long, smaller than fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, linear or lanceolate, dorsally compressed, 6–9 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, acute, awned, one glume awned, with 2–10 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear or oblong, dorsally compressed, 7.5–8.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 2.5–3 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous or pubescent. Lower glume hairs white. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 60–90 mm long overall, with twisted column. Column of lemma awn hirtellous (fulvously), with 0.5–1 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicles 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa, Tropical Asia.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, East Tropical Africa, South Tropical Africa. Ghana, Nigeria. Burundi, Central African Republic, Cameroon, Congo, Gabon, Rwanda, DRC. Tanzania, Uganda. Angola. Indo-China. Vietnam.

### Hyparrhenia figariana (Chiov.) W.D.Clayton. *Kew Bull., Addit. Ser., No. 2*, 94 (1969).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Sudan. **Basionym or Replaced Name:** *Cymbopogon figarianus* Chiov., *Boll. Soc. Bot. Ital.* 1917: 59 (1917)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: HT: *Figari s.n.*, Sudan (FI).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ana*, denoting connection. In honor of Antonio bey Figari (1804–1870) Italian physician and naturalist.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Butt sheaths glabrous. Culms erect, 60–200 cm long. Leaves caudate. Leaf-sheaths outer margin glabrous or hairy. Ligule an eciliate membrane, 2 mm long. Leaf-blades 15–30 cm long, 2–4 mm wide. Leaf-blade surface scaberulous.

**Inflorescence.** Synflorescence compound, fastigiate, 20–60 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf or enclosed. Spatheole linear, 3–7 cm long, membranous. Peduncle 1–3.5 cm long, glabrous or pilose above. Racemes 2, paired, erect, 1–1.2 cm long, bearing few fertile spikelets, bearing 1 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 6.5–10 mm long, glabrous. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 4 in upper racemes, linear or lanceolate, 5–8 mm long, smaller than fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, linear or lanceolate, dorsally compressed, 6–7 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, acute, awned, one glume awned, with 1–4 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 6.5–10 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 2–3 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex, 9 -veined. Lower glume lateral veins without ribs or ribbed. Lower glume surface convex or concave, glabrous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1

-veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, (40–)50–75 mm long overall, with twisted column. Column of lemma awn hirtellous (fulvously), with 0.7–1 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa. Nigeria. DRC. Sudan. Tanzania, Uganda.

**Hyparrhenia filipendula** (Hochst.) Stapf. *Prain, Fl. Trop. Afr.* ix. 322 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from South Africa. **Basionym or Replaced Name:** *Andropogon filipendulus* Hochst., *Flora* 29(8): 115 (1846). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: Krauss 28, South Africa: Natal (B; IT: K, MO-2103102).

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955), J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969) (245, Fig 88), S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (339, Fig 137), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (282), J.C.Tothill,& J.B.Hacker. *The grasses of southern Queensland* (1983) (274), D.Sharp & B.K.Simon, *AusGrass*. *Grasses of Australia*. CD-Rom Version 1.0. (2002), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (fig. 883 as *H. filipendula* var. *filosa*).

**Images:** F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999).

**Derivation** (Clifford & Bostock 2007): *L. filum*, thread; *pendo*, hang down; *-ula*, indicating tendency. Spikelet borne on slender pedicels or peduncles.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short, scaly. Butt sheaths glabrous or sparsely hairy. Culms erect, 60–200 cm long. Leaves cauline. Ligule an eciliate membrane, 0.5–1 mm long. Leaf-blades 15–30 cm long, 2–4 mm wide.

**Inflorescence.** Synflorescence compound, paniculate, 30–80 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear, 4.5–5.5 cm long, membranous. Peduncle 4–5.5 cm long, glabrous or pilose above. Racemes 2, paired, side by side or end to end, erect, 1–1.2 cm long, bearing few fertile spikelets, bearing 1–2 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), (4–)4.5–8(–10) mm long, glabrous or pubescent. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 4 in upper racemes, linear or lanceolate, 5–7 mm long, equaling fertile. Basal sterile spikelet glumes glabrous to villous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, linear or lanceolate, dorsally compressed, 5–6 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous to villous, acute, awned, one glume awned, with 1–5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear or oblong, dorsally compressed, 5.5–7 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 1.8–3 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume lateral veins without ribs or ribbed. Lower glume surface flat or concave, glabrous to villous. Lower glume hairs white. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 30–55 mm long overall, with twisted column. Column of lemma awn hirtellous (fulvously), with 0.7–1.2 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

*n* = 20 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Africa, Temperate Asia, Tropical Asia, Australasia.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean. Nigeria. Burundi, Central African Republic, Cameroon, Congo, Gabon, Rwanda, DRC. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Namibia, Botswana, Limpopo, North-West, Gauteng, Mpumalanga, Swaziland, Free State, Kwazulu-Natal, Northern Cape, Eastern Cape. Madagascar. **China.** China South Central. **Indian Subcontinent, Indo-China, Malesia, Papuasia.** Sri Lanka. Laos. Java, Lesser Sunda Is, Philippines, Sulawesi. New Guinea. **Australia.** Queensland, New South Wales.

Yunnan. North, Central, South East. Coast, Tablelands, Western Slopes.

### **Hyparrhenia finitima** (Hochst.) Anderss. ex Stapf. *Prain, Fl. Trop. Afr.* 9:299 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Andropogon finitimus* Hochst. ex A. Rich., *Tent. Fl. Abyss.* 2: 465 (1850)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: IT: *Schimper* 1797, 22 Oct 1840, Ethiopia: in montibus prope Djeladjeranne (K, MO).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. neighboring. Readily confused with another species.

**Classification.** Subfamily Panicoideae. Tribe: Saccharae. Subtribe Anthistirinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms erect, 100–200 cm long. Leaves caudate. Leaf-sheaths outer margin hairy. Ligule an eciliate membrane, 1–2 mm long. Leaf-blades 30–60 cm long, 4–8 mm wide.

**Inflorescence.** Synflorescence compound, paniculate, 30–60 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole lanceolate, 2.5–4 cm long, membranous. Peduncle 1–3 cm long, pilose above. Racemes 2, paired, ascending, 1–1.5 cm long, bearing few fertile spikelets, bearing 1–3 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 1.5–2.5 mm long, pilose or hirsute. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes or 2 in upper racemes, lanceolate, 6–8 mm long, larger than fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5–6 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous or pubescent (hispidulous), acute, awned, one glume awned, with 2–5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 5.5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 1–2 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, yellow, without keels, keel-less except near apex. Lower glume

surface glabrous or hispidulous. Lower glume hairs white. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 25–40 mm long overall, with twisted column. Column of lemma awn puberulous (fulvously). Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa. Sierre Leone. DRC. Ethiopia (inc. Eritrea), Sudan, Kenya, Tanzania, Uganda, Angola, Namibia, Limpopo, Mpumalanga.

### **Hyparrhenia formosa** Stapf. *Prain, Fl. Trop. Afr.* 9:340 (1919).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Schimper 1009*, 14 Oct 1862, Ethiopia: Tigri Nurum, Sari Kesalo (K; IT: US-945471).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. handsome. Attractive in appearance.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms erect, robust, 150–200 cm long, without nodal roots or with prop roots. Leaves cauline. Ligule an eciliate membrane, 2 mm long. Leaf-blades 25–50 cm long, 6–12 mm wide. Leaf-blade surface scaberulous.

**Inflorescence.** Synflorescence compound, paniculate, 30–40 cm long, dense.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 1.8–2.6 cm long, membranous, red, glabrous or pilose (rarely). Peduncle 0.2–1 cm long, pilose above. Racemes 2, paired, deflexed, 1–1.5 cm long, bearing few fertile spikelets, bearing 3–4 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 0.2–0.5 mm long, stiffly setose. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 4.5–5.5 mm long, equalling fertile. Basal sterile spikelet glumes glabrous, ciliate on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 4.5–6 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous or pubescent, acuminate, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4–4.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus oblong to cuneate or square (rarely), 0.5–1 mm long, pubescent, base obtuse, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous or pilose. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 8–18 mm long overall, with twisted column. Column of lemma awn puberulous or pubescent, with 0.2–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa, Temperate Asia.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa. Rwanda, DRC. Ethiopia (inc. Eritrea). Kenya, Tanzania, Uganda. Malawi. Arabian Peninsula. Yemen.

**Hyparrhenia gazensis** (Rendle) Stapf. *Prain, Fl. Trop. Afr.* ix. 301 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Zimbabwe. **Basionym or Replaced Name:** *Cymbopogon gazensis* Rendle, *J. Linn. Soc., Bot.* 40: 226 (1911)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Swynnerton* 1637, Rhodesia (BM; IT: K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *-ense*, denoting origin. Of Gazaland, formerly a Territory extending from coastal Mozambique to the mountains in eastern Zimbabwe at about latitude 20°S. Now largely included in Mozambique.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms geniculately ascending or decumbent, slender, 50–180 cm long, 1–2 mm diam. Leaves cauline. Ligule an eciliate membrane, 0.5–1 mm long. Leaf-blades 8–20 cm long, 2–5 mm wide. Leaf-blade surface glabrous or pilose, sparsely hairy. Leaf-blade apex acuminate.

**Inflorescence.** Synflorescence compound, paniculate, 10–35 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole linear or lanceolate, 3–4 cm long, membranous. Peduncle 1–3.5 cm long, pilose above. Racemes 2, paired, ascending, 1–1.5 cm long, bearing few fertile spikelets, bearing 2–3 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), (2–)2.5–3.5 mm long, pilose. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes or 2 in upper racemes, lanceolate, 5 mm long, equalling fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5–6 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, acute, mucronate or awned, one glume awned, with 1–2 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate or oblong, dorsally compressed, 4.5–5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 0.8–1.5 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface hispidulous. Lower glume hairs red. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 20–30 mm long overall, with twisted column. Column of lemma awn pubescent (fulvously). Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West-Central Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa. DRC. Kenya, Tanzania, Uganda. Zambia, Zimbabwe. Limpopo, Mpumalanga, Kwazulu-Natal.

**Hyparrhenia glabriuscula** (Hochst. ex A.Rich.) Anderss. ex Stapf. *Prain, Fl. Trop. Afr.* ix. 372 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Andropogon glabriusculus* Hochst. ex A. Rich., *Tent. Fl. Abyss.* 2: 468 (1850)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *Schimper 1805*, 10 Oct 1840, Ethiopia (P; IT: K, L, S-G398).

**Illustrations (Books):** G.V.Pope et al., *Flora Zambesiaca* 10 (4)(2002):99, t. 31).

**Derivation** (Clifford & Bostock 2007): L. *glabrius*, smoother; -*ulus*, diminutive. Tending towards being glabrous.

**Classification.** Subfamily Panicoideae. Tribe: Saccharae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms geniculately ascending, 120–200 cm long. Leaves caudate. Ligule an eciliate membrane, 1 mm long. Leaf-blades 15–30 cm long, 5 mm wide. Leaf-blade surface puberulous, hairy abaxially.

**Inflorescence.** Synflorescence compound, paniculate, 15–30 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole linear or lanceolate, 2–3 cm long, membranous, glabrous. Peduncle 1–2 cm long, glabrous. Racemes 2, paired, erect, 1.5–2.5 cm long, bearing few fertile spikelets, bearing 2–4 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, unequal (the longer measured), 2.5–3 mm long, glabrous. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, toothed.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes, lanceolate, 4–6 mm long, equaling fertile. Basal sterile spikelet glumes glabrous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, acuminate, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus brief (semicircular), 0.5 mm long, pubescent, base obtuse (broadly), attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex, 11 -veined. Lower glume surface glabrous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 15–25 mm long overall, with twisted column. Column of lemma awn puberulous, with 0.1 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa. Burkina, Ghana, Nigeria, Senegal. Cameroon. Ethiopia (inc. Eritrea). Tanzania. Malawi, Mozambique.

**Hyparrhenia gossweileri** Stapf. *Prain, Fl. Trop. Afr.* ix. 371. (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Angola. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *J. Gossweiler 3085*, no date, Angola: Benguela (K; IT: US-1037999 (fragm.)).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of John Gossweiler (1873–1952) Swiss-born Angolan botanist.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms erect, 200 cm long. Leaves cauline. Leaf-sheaths glabrous on surface or pubescent. Leaf-sheath oral hairs bearded (grey hairs). Ligule a ciliolate membrane, 1 mm long. Leaf-blades 15–30 cm long, 3–6 mm wide, stiff. Leaf-blade surface glabrous. Leaf-blade margins scabrous.

**Inflorescence.** Synflorescence compound, scanty, 30–60 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 4–7 cm long, membranous, red or purple, glabrous. Peduncle 1.5–3 cm long, glabrous or hirsute above. Racemes 2, paired, deflexed, 2.5–3 cm long, bearing few fertile spikelets, bearing 3–6 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, unequal (the longer measured), 3–4 mm long, pubescent. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 2 in upper racemes, forming an involucre about the fertile, lanceolate, 8–10 mm long, equalling fertile. Basal sterile spikelet glumes scabrous on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 7–8 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 8 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 2 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 35–50 mm long overall, with twisted column. Column of lemma awn pubescent, with 0.2–0.3 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa. DRC. Tanzania. Angola, Zambia.

### **Hyparrhenia griffithii** Bor. *Indian Forest Rec., n. s. Bot.*, i. 92 (1938).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960).

**TYPE** from India. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: India: Assam: ca. 700 m, *Griffith* 6766 (HT: K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of William Griffith (1810–1845), English-born surgeon-botanist in India and southeast Asia.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous or sparsely hairy. Culms erect, 100–200 cm long. Leaves cauline. Ligule an eciliate membrane, 2 mm long. Leaf-blades 20–40 cm long, 4–8 mm wide.

**Inflorescence.** Synflorescence compound, paniculate, 25–35 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted or embraced at base by subtending leaf. Spatheole linear, 4–7 cm long, membranous. Peduncle flexuous, 3–8 cm long, pilose above. Racemes 2, paired, deflexed, 1.5–3.5 cm long, bearing few fertile spikelets, bearing

3–5 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear, 3.5–4.5 mm long. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 3.5–8 mm long, glabrous. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, toothed (0.5mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes or 2 in upper racemes, lanceolate, equaling fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, linear or lanceolate, dorsally compressed, 6–8 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, villous, acute, muticous or awned, one glume awned, with 0–4 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 6–7 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 1.5–2 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, dark brown or purple, without keels, keel-less except near apex. Lower glume surface pilose or villous. Lower glume hairs white. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 40–60 mm long overall, with twisted column. Column of lemma awn pubescent (rufously), with 0.4–0.6 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

*n* = 18 (1 ref TROPICOS).

**Distribution (TDWG).** Continent. Africa, Temperate Asia, Tropical Asia.

**Country /Province /State.** Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Western Indian Ocean. Sudan. Kenya, Tanzania. Zambia. Madagascar. China. China South Central. Indian Subcontinent, Indo-China. India. Myanmar.

Yunnan.

### Hyparrhenia hirta (L.) Stapf. *Prain, Fl. Trop. Afr.* ix. 315 (1918).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), T.G.Tutin et al, *Flora Europaea* 5 (1980), W.D.Clayton & N.Snow, *Key to Pacific Grasses* (2010).

**TYPE** from Italy. **Basionym or Replaced Name:** *Andropogon hirtus* L., *Sp. Pl.* 2: 1046 (1753). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: LT: *Burser I.119*, (UPS). LT designated by Sherif & Siddiqui, *Fl. Libya* 145: 310 (1889). ST: *van Royen s.n.*, (L).

**Illustrations (Books):** G.V.Pope et al., *Flora Zambesiaca* 10 (4(2002):108, t. 34), L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (511, Fig 408), M.A.N.Muller, *Grasses of South West Africa/Namibia* (1984), G.E.Gibbs Russell el al, *Grasses of Southern Africa* (1990) (183, Fig 108), J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969) (247, Fig 89), N.Feinbrun-Dothan, *Flora Palaestina* 4 (1986) (Pl. 431), S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (339, Fig 137), L.Boulos, *Flora of Egypt* 4 (2005) (338, Pl. 99), T.A.Cope, in M.Thulin, *Poaceae* (Gramineae). *Flora of Somalia* (1995) (265, Fig 157), N.L.Bor, *Gramineae in Flora of Iraq* (1968) (533, Pl. 204), J.P.Jessop, G.R.M. Dashorst & F.M.James, *Grasses of South Australia* (2006) (522, Fig 446), N.Walsh & T.Entwistle, *Flora of Victoria* Vol 2 (1994) (622, Fig 125), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (282), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 25 *Poaceae*, part 2 (2003) (679), R.Pilger, *Die Naturlichen Pflanzenfamilien* 14e (1940) (173, Fig. 92).

**Images:** D.Sharp & B.K.Simon, *AusGrass*. Grasses of Australia. CD-Rom Version 1.0. (2002);, F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999).

**Derivation** (Clifford & Bostock 2007): L. hairy. Hairy in part or extensively.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose, clumped densely. Rhizomes short. Butt sheaths glabrous. Culms erect, 30–60(–100) cm long, wiry. Leaves mostly basal. Leaf-sheaths keeled. Ligule an eciliate membrane, 2–4 mm long. Leaf-blades flexuous, filiform or linear, flat or conduplicate, 2–15 cm long, 1–2(–4) mm wide, glaucous. Leaf-blade surface scaberulous.

**Inflorescence.** Synflorescence compound, scanty, 10–30 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear or lanceolate, 3–8 cm long, membranous, red. Peduncle 3–8 cm long, glabrous or pilose above. Racemes 2, paired, erect, 2–4 cm long, bearing 4–7(–8) fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 2.5–5 mm long, glabrous or pubescent or hirsute. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, toothed (0.2–1mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes or 2 in upper racemes, lanceolate, equaling fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 3–7 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, villous, with white hairs, acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear or elliptic, dorsally compressed, 4–6.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 0.5–1.5 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface villous. Lower glume hairs white. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 10–35 mm long overall, with twisted column. Column of lemma awn puberulous, with 0.2–0.3 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

$n = 20$  (5 refs TROPICOS).  $2n = 30$  (2 refs TROPICOS), or 45 (2 refs TROPICOS).

**Distribution (TDWG).** **Continent.** Europe, Africa, Temperate Asia, Tropical Asia, Australasia (\*), Pacific, North America, South America.

**Region.** Northern Europe (\*), Southwestern Europe, Southeastern Europe.

**Country /Province /State :** GB Aliens (Ryves et al). : Baleares, Corsica, France, Portugal, Sardinia, Spain. : Albania, Greece, Italy, Crete, Sicily, Yugoslavia. Northern Africa, Macaronesia, West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Middle Atlantic Ocean, Western Indian Ocean. Algeria, Egypt, Libya, Morocco, Tunisia. Canary Is, Cape Verde, Madeira. Niger. DRC. Eritrea, Ethiopia (inc. Eritrea), Socotra, Somalia, Sudan. Kenya, Tanzania, Uganda. Angola, Zambia, Zimbabwe. Namibia, Botswana, Limpopo, North-West, Gauteng, Mpumalanga, Swaziland, Free State, Kwazulu-Natal, Lesotho, Northern Cape, Western Cape, Eastern Cape. Ascension. Madagascar. Western Asia, Arabian Peninsula. Afghanistan, Iraq, Sinai. Gulf States, Oman, Saudi Arabia. Indian Subcontinent. Pakistan. Australia (\*). Western Australia (\*), South Australia (\*), Queensland (\*), New South Wales (\*), Victoria (\*). North-central Pacific. Hawaii (\*). Mexico. Northeast Mexico, Southwest Mexico, Southeast Mexico. Caribbean, Northern South America, Western South America, Brazil. Cuba, Dominican Republic. Venezuela. Colombia, Peru. Brazil South.

South-West. Central Australia. Southern. North, Central, South East. Coast, Tablelands, Western Slopes. Rio Grande do Sul. Neuvo Leon, San Luis Potosi. Oaxaca. Chiapas, Yucatan.

### **Hyparrhenia involucrata** Stapf. *Prain, Fl. Trop. Afr.* ix. 376 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Nigeria. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: K. Barter 957, no date, Nigeria: Northern Nigeria: Nupe (K; IT: P. US-1038000).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. involucrum*, cover; -*ata*, possessing. Inflorescence subtended by bracts.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Butt sheaths glabrous. Culms erect, robust, 100–200 cm long. Culm-nodes glabrous or bearded. Leaves caudate. Leaf-sheath oral hairs bearded (grey hairs). Ligule a ciliolate membrane, 1–2 mm long. Leaf-blades 20–40 cm long, 4–8 mm wide, flaccid, light green. Leaf-blade surface glabrous or pilose, hairy abaxially. Leaf-blade margins scabrous.

**Inflorescence.** Synflorescence compound, panicle, 20–60 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 4–7 cm long, scarious, yellow or purple, glabrous. Peduncle 2–3 cm long, glabrous or pilose above (at base). Racemes 2, paired, deflexed, 1.5–2.3 cm long, bearing few fertile spikelets, bearing 1–2 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1.5 mm long, pubescent. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 4 in number, 4 in upper racemes, forming an involucre about the fertile, lanceolate, 7–15 mm long, equalling fertile. Basal sterile spikelet glumes scabrous on margins or ciliate on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 7–11 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, awned, one glume awned, with 1–20 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered – the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 7–8 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 2–2.5 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous to pubescent. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 70–110 mm long overall, with twisted column. Column of lemma awn hirsute, with 0.5–1 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicles 2, cuneate, fleshy. Anthers 3. Stigmas 2. Caryopsis 3.5 mm long.

$2n = 20$  (1 ref TROPICOS), or 21 (1 ref TROPICOS), or 40 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. West Tropical Africa, West-Central Tropical Africa.** Benin, Burkina, Ghana, Ivory Coast, Nigeria. Central African Republic.

### **Hyparrhenia madaropoda** W.D. Clayton. *Kew Bull., Addit. Ser., No. 2, 134 .* (1969).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Uganda. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: Uganda: Madi, Metuli, Nov., Thomas 4060 (HT: K).

**Illustrations (Books):** G.V.Pope et al., *Flora Zambesiaca* 10 (4(2002):125, t. 39).

**Illustrations (Journals):** *Kew Bulletin (Addit. Series 2:* 135, Fig.28 (1969)).

**Derivation** (Clifford & Bostock 2007): Gk *madaros*, bare; *pous*, foot. Stalks of upper racemes almost glabrous.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Butt sheaths glabrous. Culms erect or decumbent, robust, 100–300 cm long, 3–5 mm diam., with prop roots. Leaves caudine. Leaf-sheath auricles erect, 5–10 mm long. Ligule an eciliate membrane, 10–25 mm long. Leaf-blade base with a false petiole. Leaf-blades 20–45 cm long, 7–13 mm wide. Leaf-blade surface glabrous.

**Inflorescence.** Synflorescence compound, paniculate, 25–35 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 2.5–4 cm long, membranous. Peduncle deflexed, 0.3–0.5 cm long, pilose above (on one side). Racemes 2, paired, appressed, 1.5 cm long, bearing few fertile spikelets, bearing 1 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases linear, subequal, 2–2.5 mm long, stiffly setose, shortly lobed, with 0.5–0.7 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 8–9 mm long, equaling fertile. Basal sterile spikelet glumes glabrous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 8–9 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, muticous or awned, one glume awned, with 0–6 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 7–9.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1.5–3 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous or hispidulous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 45–65 mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa.** DRC. Sudan. Kenya. Tanzania. Uganda. Mozambique. Zambia.

**Hyparrhenia mobukensis** (Chiov.) Chiov. *Nuov. Giorn. Bot. Ital. n. s.* xxvi. 74 (1919).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Uganda. **Basionym or Replaced Name:** *Andropogon mobukensis* Chiov., *Ann. Bot. (Rome)* 6: 147 (1907)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: *Abruzzi s.n.*, Uganda (TO).

**Illustrations (Books):** G.V.Pope et al., *Flora Zambesiaca* 10 (4(2002):100, t. 32).

**Illustrations (Journals):** *Kew Bulletin (Addit. Series 2:* 51, Fig.16 (1969)).

**Derivation** (Clifford & Bostock 2007): L. -*ensis*, denoting origin. From the Mobuku Valley, Uganda.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial. Butt sheaths glabrous. Culms rambling, slender, 100–160 cm long, wiry. Leaves caudine. Ligule an eciliate membrane, 1 mm long. Leaf-blades linear or lanceolate, tapering towards sheath, 4–8 cm long, 2–5 mm wide, flaccid, light green. Leaf-blade surface glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Synflorescence compound, scanty.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear or lanceolate, 4–5 cm long, membranous. Peduncle flexuous, 5–10 cm long, scaberulous above, glabrous or pilose above. Racemes (1–)2, paired, erect, 1.5–3 cm long, bearing few fertile spikelets, bearing 3–7 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases linear or flattened, unequal (the longer measured), 1.5–3 mm long, pilose or stiffly setose. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes, lanceolate, 5–6 mm long, larger than fertile. Basal sterile spikelet glumes glabrous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 6 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, acuminate, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4–5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus brief (semicircular), 0.5 mm long, pubescent, base obtuse (broadly), attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex, 9 -veined. Lower glume surface smooth or asperulous, glabrous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 7–8 mm long overall, with twisted column. Column of lemma awn glabrous. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa. Rwanda, DRC. Ethiopia (inc. Eritrea). Kenya, Tanzania, Uganda. Malawi, Zambia.

**Hyparrhenia multiplex** (Hochst. ex A.Rich.) Anderss. ex Stapf. *Prain, Fl. Trop. Afr.* 9:374 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Anthistiria multiplex* Hochst. ex A. Rich., *Tent. Fl. Abyss.* 2: 449 (1850)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: *G.H.W. Schimper* 1637, no date, Ethiopia (P; IT: K, US-865416 (fragm.)).

**Illustrations (Books):** S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (352, Fig 143).

**Derivation** (Clifford & Bostock 2007): L. *multus*, many; *plexus*, network. Inflorescence much branched.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Butt sheaths glabrous. Culms erect, slender, 5–36 cm long. Leaves caudine. Ligule an eciliate membrane. Leaf-blades 2–20 cm long, 1–2 mm wide.

**Inflorescence.** Synflorescence compound, scanty.

**Inflorescence** composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole lanceolate, 3–15 cm long, herbaceous or chartaceous, green or yellow, glabrous. Peduncle nodding, glabrous or pilose above. Racemes 2, paired, appressed or deflexed (seldom), 1 cm long, bearing few fertile spikelets or many spikelets, bearing 1–6 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 0.5–1 mm long, glabrous or stiffly setose. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 4 in number, 4 in upper racemes, lanceolate, 7–8 mm long, equalling fertile. Basal sterile spikelet glumes glabrous, setose on margins (pectinately), lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 4–7 mm long, shorter than fertile, separately deciduous. Companion sterile spikelet callus square, 0.2–0.5 mm long, truncate. Companion sterile spikelet glumes chartaceous, glabrous, ciliate on margins, acute, mucronate. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 6–8 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 2–3 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface hispidulous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 45–70 mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Northeast Tropical Africa. Ethiopia (inc. Eritrea), Sudan.

### **Hyparrhenia mutica** W.D. Clayton. *Kew Bull., Addit. Ser., No. 2*, 161 (1969).

**Accepted by:** U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Liberia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Liberia: Nimba, Bracon Rho, Nov., *Adames* 746 (HT: K).

**Illustrations (Books):** F.N.Hepper, *F.W.T.A.* 3(2) (1972) (495, Fig.456), R.M.Polhill, *F.T.E.A., Gramineae* (3)(1982):817, Fig 187).

**Illustrations (Journals):** *Kew Bulletin (Addit. Series 2: 163, Fig.32 (1969))*.

**Derivation** (Clifford & Bostock 2007): L. blunt. Lacking awns or lemmas and/or glumes truncate.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriniinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms erect, robust, 150–250 cm long. Leaves cauline. Leaf-sheaths glabrous on surface or pilose. Leaf-sheath oral hairs bearded (grey hairs). Ligule an eciliate membrane, 1 mm long. Leaf-blades 30–60 cm long, 5–10 mm wide. Leaf-blade surface glabrous or hirsute, sparsely hairy. Leaf-blade margins scabrous.

**Inflorescence.** Synflorescence compound, paniculate, 15–40 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 2–3.5 cm long, membranous, brown, glabrous. Peduncle 0.5–1.5 cm long, pubescent above. Racemes 2, paired, deflexed, 1.2–1.5 cm long, bearing few fertile spikelets, bearing 2–3 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 0.5–1 mm long, pubescent. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 4 in number, 4 in upper racemes, forming an involucre about the fertile, lanceolate, 5–7 mm long, equalling fertile. Basal sterile spikelet glumes scabrous on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5–5.5 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, muticous or awned, one glume awned, with 0–5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 5.5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 0.5–1 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous or pilose. Lower glume apex dentate, 2-fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2-veined. Fertile lemma lanceolate, 4.5 mm long, hyaline, without keel, 1-veined, 0–3-veined, one-veined. Lemma margins ciliate. Lemma apex entire, obtuse, muticous. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa. Ghana, Liberia, Nigeria, Kenya, Tanzania, Uganda.

### Hyparrhenia neglecta S.M. Phillips. *Kew Bull.*, 49(3): 537 (1994).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Ethiopia: without locality or date, *Quartin Dillon & Petit* 66 (HT: K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. neglito*, disregard. Often a segregate from another species with which confusion is likely.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Culms 45–55 cm long. Leaves caudate. Leaf-sheath auricles erect. Ligule an eciliate membrane, 1 mm long, white, truncate. Leaf-blades 3 mm wide.

**Inflorescence.** Synflorescence compound, scanty.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 5–6 cm long, scarious, glabrous. Peduncle 1.7–2 cm long, hirsute above. Racemes 2, paired, deflexed, bearing few fertile spikelets, bearing 2 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1.5 mm long, stiffly setose, with 5 mm long hairs, shortly lobed, with 1–1.5 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, elliptic, 9–11 mm long, larger than fertile. Basal sterile spikelet glumes glabrous, scabrous on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 7 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, scabrous on margins, eciliate on margins, acuminate, awned, one glume awned, with 4–5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets oblong, dorsally compressed, 5 mm long, falling

entire, deciduous with accessory branch structures. Spikelet callus cuneate, 2 mm long, pilose, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume lateral veins ribbed. Lower glume surface glabrous. Upper glume linear, coriaceous, without keels. Upper glume mucronate.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 50 mm long overall, with twisted column. Column of lemma awn hirtellous, with 0.8 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Northeast Tropical Africa. Ethiopia (inc. Eritrea).

### **Hyparrhenia newtonii** (Hack.) Stapf. *Prain, Fl. Trop. Afr.* ix. 363 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*).

**TYPE** from Angola. **Basionym or Replaced Name:** *Andropogon newtonii* Hack., *Bol. Soc. Brot.* 3: 137 (1885)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Angola: Lobango: in arvis siccis, cultis prope Humpata, *Newton* 22 (HT: W; IT: K, US-76594 (ex W)).

**Illustrations (Books):** R.M.Polhill, F.T.E.A., *Gramineae* (3)(1982):815, Fig 186), G.V.Pope et al., *Flora Zambesiaca* 10 (as var. *newtonii*), J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969) (243, Fig 87), S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (fig. 883).

**Derivation** (Clifford & Bostock 2007): in honor of Francisco Newton (1864–1909) Portuguese botanist who collected in Angola.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous or woolly. Culms erect, 60–120 cm long. Leaves caudate. Leaf-sheaths glabrous on surface or woolly. Ligule an eciliate membrane, 1 mm long. Leaf-blades 15–30 cm long, 1.5–3 mm wide, stiff, light green or glaucous. Leaf-blade surface glabrous or pubescent, hairy abaxially. Leaf-blade margins scabrous.

**Inflorescence.** Synflorescence compound, scanty or paniculate, 15–30 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole lanceolate, 2.5–5 cm long, membranous, glabrous or hirsute. Peduncle 2–4 cm long, pilose above (yellow hairs). Racemes 2, paired, deflexed, 1.5–2 cm long, bearing few fertile spikelets, bearing 1–2 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases linear or flattened, unequal (the longer measured), 1.5–3(–4) mm long, stiffly setose, extended into an oblong appendage, with 1–3 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, toothed (0.2–1.5mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 5–10 mm long, equalling fertile. Basal sterile spikelet glumes glabrous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5–10 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous to villous, acute, awned, one glume awned, with 1–5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear or oblong, dorsally compressed, 6–10 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1.5–2 mm long, pubescent, base acute or pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface grooved on either side of midvein, glabrous or pubescent to villous (rarely). Lower glume apex dentate, 2-fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2-veined. Fertile lemma linear, membranous, without keel, 1-veined, 0-3-veined, one-veined. Lemma apex dentate, 2-fid, awned, 1-awned. Principal lemma awn from a sinus, geniculate, 22-55 mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Caryopsis 2.5-3.5 mm long.

**Distribution (TDWG).** Continent. Africa, Temperate Asia, Tropical Asia.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean. Nigeria, Sierra Leone. Cameroon, Congo, Gabon, Rwanda, DRC. Kenya, Tanzania, Uganda. Angola, Mozambique, Zambia, Zimbabwe. Limpopo, Mpumalanga, Swaziland. Madagascar. China. China Southeast. Indo-China, Malesia, Papuasia. Laos, Thailand, Vietnam. Lesser Sunda Is, Philippines. New Guinea.

Guangdong, Guangxi.

### **Hyparrhenia niariensis** (Franch.) W. D. Clayton. *Kew Bull., Addit. Ser.*, No. 2, 140 (1969).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from DRC. **Basionym or Replaced Name:** *Andropogon niariensis* Franch., *Bull. Soc. Hist. Nat. Autun* 8: 330 (1895)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Congo Francais: Hab. - Bouanga, dans la region du Niari, *Thollon* 1037 (HT: P; IT: K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ensis*, denoting origin. From Niari River, Congo.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Butt sheaths glabrous. Culms erect, 100-200 cm long, with prop roots. Leaves caudate. Ligule an eciliate membrane. Leaf-blade base tapering to the midrib, without a false petiole or with a false petiole. Leaf-blades 30-60 cm long, 7-15 mm wide. Leaf-blade surface glabrous or pubescent, hairy abaxially.

**Inflorescence.** Synflorescence compound, paniculate, 30-50 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole lanceolate, 3-5 cm long, membranous, glabrous or pilose. Peduncle 3-5 cm long, pilose above. Racemes 2, paired, deflexed, 1.5-1.8 cm long, bearing few fertile spikelets, bearing 1(-2) fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 0.5-1.5 mm long, stiffly setose (yellow hairs), scariously rimmed (rarely) or extended into an oblong appendage, with (0.2-)0.5-4 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 9-11 mm long, equalling fertile. Basal sterile spikelet glumes glabrous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 8-13 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, awned, one glume awned, with 2-10 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets oblong, dorsally compressed, 7.5-11 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 2-3 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, chartaceous or coriaceous, without keels, keel-less except near apex. Lower

glume surface convex or concave, glabrous. Lower glume apex dentate, 2 -fid. Upper glume linear, chartaceous or coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 65–85(–105) mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2. Caryopsis 4 mm long.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa. Central African Republic, Cameroon, Congo, Sudan, Tanzania, Uganda, Angola, Zambia.

### **Hyparrhenia nyassae** (Rendle) Stapf. *Prain, Fl. Trop. Afr.* 9:313 (1919).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Malawi. **Basionym or Replaced Name:** *Andropogon nyassae* Rendle, *J. Bot.* 31: 358 (1893)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: IT: *J. Buchanan* 1423, 1891, Malawi (K, US-807329).

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (512, Fig 409), J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969).

**Derivation** (Clifford & Bostock 2007): from Nyassaland, now Malawi.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths pubescent or woolly, with white hairs. Culms erect, 50–150 cm long, 1–4 mm diam. Leaves cauline. Ligule an eciliate membrane, 1–1.5 mm long. Leaf-blades 20–45 cm long, 2–5 mm wide, stiff.

**Inflorescence.** Synflorescence compound, paniculate, 15–45 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear, 3–6 cm long, membranous, brown. Peduncle flexuous, pilose above. Racemes 2, paired, erect, 2–3 cm long, bearing 4–7 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 2–3 mm long, glabrous or pilose, hairy generally or at base (white hairs). Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, with white hairs, tip oblique, toothed (0.2–0.5mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes, lanceolate, 5–6 mm long, equalling fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 4.5–7 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate or linear, 0.8–1.2 mm long, pubescent, base acute, attached obliquely. Spikelet callus hairs white.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, mid-green or purple, without keels, keel-less except near apex. Lower glume surface pubescent. Lower glume hairs yellow. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn

from a sinus, geniculate, 20–40 mm long overall, with twisted column. Column of lemma awn pubescent (fulvously), with 0.2–0.5 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa, Tropical Asia.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean. Ghana. Central African Republic, Cameroon, Gabon, DRC. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Botswana, Limpopo, North-West, Mpumalanga. Madagascar. Indo-China. Thailand, Vietnam.

### **Hyparrhenia papillipes** (Hochst. ex A.Rich) Anderss. ex Stapf. *Prain, Fl. Trop. Afr.* 9:347 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Andropogon papillipes* Hochst. ex A. Rich., *Tent. Fl. Abyss.* 2: 460 (1850)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: ST: *Schimper pl. Abyss.*, sect. II, 1055, 13 Nov 1838, Ethiopia: crescit in umbrosis montis Sinai, et in incultis prope Adoua (P; IST: K, L, US-1093947, US-1535360, WAG). [This taken as the type by Clayton].

ST: *Schimper pl. Abyss.*, sect. II, 1054, Ethiopia: crescit in umbrosis montis Sinai, et in incultis prope Adoua

ST: *Quartin Dillon s.n.*, Ethiopia: prope Mai-goua-goua (P).

ST: *Schimp. Abyss.*, sect. III no. 1821, [1821 is cited as basis of *A. arrhenobasis* Hochst., nom. inval., as syn.].

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *papilla*, nipple; pes, foot. Peduncles beset with spreading tubercle-based hairs.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Cataphylls evident. Rhizomes short. Butt sheaths glabrous or sparsely hairy. Culms erect or geniculately ascending, slender, 30–100 cm long, 1–2 mm diam, wiry. Leaves cauline. Ligule an eciliate membrane, 0.5 mm long. Leaf-blades 5–15 cm long, 2–4 mm wide, light green or glaucous. Leaf-blade surface glabrous. Leaf-blade apex attenuate, filiform.

**Inflorescence.** Synflorescence compound, scanty, 10–20 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted or embraced at base by subtending leaf. Spatheole linear or lanceolate, 4–7 cm long, membranous, glabrous. Peduncle flexuous, 3–8 cm long, pilose above. Racemes 2, paired, deflexed, 2–4 cm long, bearing 4–10 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1–2 mm long, stiffly setose, extended into an oblong appendage, with (0.2)–0.5–1.2(–1.7) mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, toothed ((0.2)–0.4–0.8(–1.5)mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 5.5–7 mm long, equalling fertile. Basal sterile spikelet glumes villous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 6–9 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, villous, acute, muticous or mucronate or awned, one glume awned, with 0–1.5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 0.7–1 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface

villous. Lower glume hairs white. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 20–30 mm long overall, with twisted column. Column of lemma awn puberulous or pubescent, with 0.2–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa, Temperate Asia.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, Western Indian Ocean. DRC. Ethiopia (inc. Eritrea). Kenya, Tanzania, Uganda. Madagascar. Arabian Peninsula. Yemen.

### **Hyparrhenia pilgeriana** C. E. Hubbard. *Bull. Misc. Inf. Kew* 1928:39 (1928).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Tanzania. **Basionym or Replaced Name:** *Cymbopogon stolzii* Pilger, non *Hyparrhenia stolzii* Stapf(1918), *Engl., Bot. Jahrb.* 54:286 (1917). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: : Based on *Cymbopogon stolzii* pilger ; Tanzania, Kyimbila: Stolz 960 (K iso).

**Illustrations (Books):** G.V.Pope et al., *Flora Zambesiaca* 10 (4(2002):119, t. 38), S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (337, Fig 136).

**Illustrations (Journals):** *Kew Bulletin (Addit. Series* 2: 116, Fig.27 (1969)).

**Derivation** (Clifford & Bostock 2007): L. -*ana*, indicating connection. In honor of Robert Knuds Friedrich Pilger (1876–1953) German agrostologist, born on Helgoland before its transfer from British to German administration.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes short, scaly. Butt sheaths glabrous. Culms geniculately ascending or decumbent or rambling, slender, 30–60 cm long, 1–2 mm diam. Leaves caulin. Ligule an eciliate membrane, 1–2 mm long. Leaf-blades 5–10(–15) cm long, 2–4 mm wide, light green. Leaf-blade surface pubescent.

**Inflorescence.** Synflorescence compound, paniculate, 6–25 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted or embraced at base by subtending leaf. Spatheole lanceolate, 2–3 cm long, membranous, brown or red, glabrous. Peduncle straight or deflexed, 0.9–3 cm long, pilose above. Racemes 2, paired, spreading or erect, 1–1.5 cm long, bearing few fertile spikelets, bearing (2–)3–4 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal or unequal (the longer measured), 0.5–1.5 mm long, stiffly setose, unappendaged or shortly lobed. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 4–5.5 mm long, equalling fertile. Basal sterile spikelet glumes glabrous, ciliate on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 4–4.5 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, acute, muticous or mucronate or awned, one glume awned, with 0–1.5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus square or oblong, 0.4–0.7 mm long, pubescent, base obtuse, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous or puberulous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 7–17 mm long overall, with twisted column. Column of lemma awn puberulous, with 0.2–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

$n = 10$  (1 ref TROPICOS), or 40 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa. Rwanda, DRC. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Malawi, Zambia, Zimbabwe. Kwazulu-Natal.

### Hyparrhenia pilosa M. Mazade. *Adansonia*, 18(1): 138 (1978).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Central African Republic. T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: Rep. Centr. Afr., Damara-Sibut: Mazade 524 (P holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. pilus*, a hair; *-osa*, abundance. The whole plant or any of its organs invested with long spreading hairs.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial. Culms erect, 150 cm long. Leaves caudate. Leaf-sheaths mostly shorter than adjacent culm internode. Ligule an eciliate membrane, 3 mm long. Leaf-blades 25–45 cm long, 3–6 mm wide.

**Inflorescence.** Synflorescence compound, paniculate.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole linear, 7–8 cm long, membranous. Peduncle pilose above. Racemes 2, paired, deflexed, 2.3 cm long, bearing few fertile spikelets, bearing 2–4 fertile spikelets on each. Rhachis fragile at the nodes, villous on margins. Rhachis hairs red, 2–3 mm long. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 2–2.5 mm long, pilose. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, 3.5–4 mm long, villous, with red hairs, with 2–3 mm long hairs, tip oblique, toothed (0.3–0.6 mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 2 in upper racemes, lanceolate, 5.5–7.5 mm long, smaller than fertile. Basal sterile spikelet glumes hirsute, with red hairs, lower glume muticous.

Companion sterile spikelets well-developed, lanceolate, dorsally compressed, 6–8 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, 13–15 -veined, hirsute, acute, muticous or mucronate.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate or oblong, dorsally compressed, 7–9 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 2–2.5 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface hirsute. Lower glume hairs red, 3–4 mm long. Lower glume apex truncate. Upper glume lanceolate, coriaceous, without keels. Upper glume surface hirsute, hairy above. Upper glume apex acute.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, hyaline, 2 -veined, ciliate on margins, fringed above, truncate. Fertile lemma linear, membranous, without keel. Lemma margins ciliolate. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 40–75 mm long overall, with twisted column. Column of lemma awn ciliate (rufously), with 2 mm long hairs.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West-Central Tropical Africa. Central African Republic.

## **Hyparrhenia poecilotricha** (Hack.) Stapf. *Prain, Fl. Trop. Afr.* ix. 309 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Angola. **Basionym or Replaced Name:** *Andropogon poecilotrichus* Hack., *Bol. Soc. Brot.* 3: 138 (1885)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: *Newton s.n.*, no date, Angola (W; IT: K, US-76601 (fragm. ex W)).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): Gk. *poikilos*, variable; *thrix*, hair. Raceme hairy, whitish proximally fulvous distally.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous or sparsely hairy (rarely). Culms erect, 60–130 cm long. Leaves caudate. Ligule an eciliate membrane, 1.5 mm long. Leaf-blades 15–30 cm long, 1.5–3 mm wide, stiff.

**Inflorescence.** Synflorescence compound, paniculate, 20–30 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear, 4–8 cm long, membranous. Peduncle 4–8 cm long, glabrous or pilose above. Racemes 2, paired, erect, 1.5–2 cm long, bearing few fertile spikelets, bearing 2–4 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 3.5–7 mm long, glabrous. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number or 4 in number (rarely), 4 in upper racemes or 2 in upper racemes (sometimes), lanceolate, equalling fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 4–7 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, mucronate or awned, one glume awned, with 0.5–2 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 5.5–7 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1–2 mm long, pubescent, base acute or pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface pubescent. Lower glume hairs yellow or dark brown. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 25–40 mm long overall, with twisted column. Column of lemma awn pubescent (rufously). Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa. Ghana, Guinea, Nigeria. Cameroon, Congo, Rwanda, DRC. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Namibia, Limpopo, North-West, Swaziland, Kwazulu-Natal.

## **Hyparrhenia praetermissa** Veldkamp. *Blumea*, 19(1): 63 (1971).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, J.F.Veldkamp, Poaceae ms (*Flora Malesiana*).

**TYPE** from Indonesia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: IT: *Bunnemeijer* 11671, 23 May 1921, Indonesia: Celebes I.: Lombasang, Y.W. Celebes, 950 m (US-1295251).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. praetermitto*, make no mention of. Ignored by previous writers.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short, not obviously scaly. Butt sheaths pubescent. Culms erect, 100–160 cm long. Culm-internodes smooth, distally glabrous. Leaves caudate. Leaf-sheaths glabrous on surface or puberulous. Leaf-sheath oral hairs ciliate. Ligule an eciliate membrane, 2–3 mm long, truncate or obtuse. Leaf-blades 20–45 cm long, 2–5 mm wide. Leaf-blade midrib conspicuous. Leaf-blade surface smooth, glabrous. Leaf-blade apex acuminate.

**Inflorescence.** Synflorescence compound, linear, 20–40 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole linear, 3.25–4.75 cm long, membranous, red, pilose. Peduncle 0.6–1.5 cm long, pilose above. Racemes 2, paired, spreading, 2 cm long, bearing few fertile spikelets, bearing 1–2 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 2–4 mm long, pilose. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, without appendage or toothed.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0–2 in upper racemes, male, lanceolate, 7.5–8 mm long, equalling fertile. Basal sterile spikelet glumes pilose, smooth on margins, lower glume mucronate or awned (0.5–1.25mm).

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 7–9 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, pilose, acute, awned, one glume awned, with 2–3.5 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 7.5–8 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 1.25–1.5 mm long, pilose, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface flat or concave, pilose. Lower glume hairs white. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 35–45 mm long overall, with twisted column. Column of lemma awn hirtellous, with 0.33–0.5 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Anthers 3, 1.75–2.5 mm long. Stigmas 2.

**Distribution (TDWG). Continent.** Tropical Asia.

**Country /Province /State.** Malesia. Sulawesi.

### **Hyparrhenia quarrei** Robyns. *Fl. Agrost. Congo Belge*, 171 (1929).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from DRC. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: HT: *P. Quarre* 199, Mar 1927, Zaire: Kafubu (BR (photo, BRI, K); IT: US-80722 (fragm.)).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Paul Quarre (1904–1980) Belgian botanist.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous or woolly. Culms erect, 100–200 cm long. Leaves caudate. Ligule an eciliate membrane, 1–2 mm long. Leaf-blades 20–40 cm long, 2–5 mm wide, stiff, glaucous.

**Inflorescence.** Synflorescence compound, paniculate, 20–30 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear, 3–5 cm long, membranous, brown or red. Peduncle 4–6 cm long, pilose above. Racemes 2, paired, deflexed, 1.5–2 cm long, bearing few fertile spikelets, bearing 3–5 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear, 2–3 mm long. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 2–3.5 mm long, hirsute or glabrous. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, toothed (0.1–0.5mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes or 2 in upper racemes, lanceolate, equaling fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, linear or lanceolate, dorsally compressed, 5–7 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4.5–5.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear or cuneate, 0.7–1.2 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface pubescent to villous. Lower glume hairs white. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 18–36 mm long overall, with twisted column. Column of lemma awn pubescent, with 0.2–0.5 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa, Temperate Asia.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa. Nigeria. DRC. Ethiopia (inc. Eritrea). Kenya, Tanzania. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Limpopo, North-West, Mpumalanga, Free State, Kwazulu-Natal, Eastern Cape. Arabian Peninsula. Yemen.

### **Hyparrhenia rufa** Stapf. *Prain, Fl. Trop. Afr.* ix. 344 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Angola. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: LT: *Gossweiler* 4151, Apr, Angola: Munongue (K). LT designated by Clayton, Kew Bull., Add. Ser. 2: 128 (1969). ST: *Grossweiler* 3129, 22 Apr 1906, Angola: Benguella, country of the Ganguellas and Ambuellas, gregarious near Old Munongue (US-1038003).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. uncultivated. Species whose relatives are often cultivated.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short, scaly. Butt sheaths glabrous. Culms erect, robust, 200–300 cm long, 4–8 mm diam., with prop roots. Leaves cauline. Ligule an eciliate membrane, 2–10 mm long. Leaf-blades 30–60 cm long, 3–18 mm wide, stiff, light green or glaucous. Leaf-blade surface scaberulous, glabrous. Leaf-blade margins scabrous.

**Inflorescence.** Synflorescence compound, paniculate, 30–50 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 2.5–4 cm long, membranous, brown or red, glabrous or pilose. Peduncle 1–2 cm long, pilose above. Racemes 2, paired, deflexed, 1.5 cm long, bearing few fertile spikelets, bearing 2–4 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes

linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1.5 mm long, stiffly setose, scariously rimmed or shortly lobed, with 0.2–0.5 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 5–9 mm long, larger than fertile. Basal sterile spikelet glumes villous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 6–7 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, villous, acuminate, muticous or awned, one glume awned, with 2–6 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus oblong, 0.6 mm long, pubescent, base obtuse, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, dark brown or red, without keels, keel-less except near apex. Lower glume surface villous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 22–40 mm long overall, with twisted column. Column of lemma awn puberulous or pubescent, with 0.2–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean. Ghana, Nigeria, Rwanda, DRC. Ethiopia (inc. Eritrea), Sudan, Kenya, Tanzania, Uganda, Angola, Malawi, Mozambique, Zambia, Zimbabwe. Botswana, Limpopo, Gauteng, Mpumalanga, Kwazulu-Natal. Madagascar.

### Hyparrhenia rufa (Nees) Stapf. *Prain, Fl. Trop. Afr.* ix. 304 (1918).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), D.Sharp, D. & B.K.Simon, *AusGrass* (2002), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), W.D.Clayton & N.Snow, *Key to Pacific Grasses* (2010).

**TYPE** from Brazil. **Basionym or Replaced Name:** *Trachypogon rufus* Nees, *Fl. Bras. Enum. Pl.* 2(1): 345 (1829)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: *Martius s.n.*, Brazil: Piaum (M; IT: L, LE-TRIN-0226.01).

**Illustrations (Books):** F.O.Zuloaga, Z.E.Rugolo & A.M. Anton, *Flora Argentina* 3 – 1, Aristidoideae a Pharoideae (2012) (527), W. Robyns (1929 and 1934). *Flora Agrostologique du Congo Belge et du Ruanda-Urundi*, I. Maydees et Andropogonees and II. Panicees. Bruxelles, Goemaere (167, Pl. 13), F.N.Hepper, *F.W.T.A.* 3(2) (1972) (493, Fig.455), G.V.Pope et al., *Flora Zambesiaca* 10, M.A.N.Muller, *Grasses of South West Africa/Namibia* (1984), J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969) (249, Fig 90), S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995), S.W.L.Jacobs, R.D.B.Whalley & D.J.B.Wheeler,, *Grasses of New South Wales*, 4th edn (2008) (283 as subsp. *altissima*), D.Sharp & B.K.Simon, *AusGrass*. *Grasses of Australia*. CD-Rom Version 1.0. (2002), W.L.Wagner et al., *Manual of the Flowering Plants of Hawai'i*, Vol. 2 (1990) (1553, Pl. 230), M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 25 *Poaceae*, part 2 (2003) (679), A.S.Hitchcock, *Manual of the Grasses of the West Indies* (1936) (405, Fig. 359), S.A.Renvoize, *Gramineas de Bolivia* (1998) (608, Fig 145), S.A.Renvoize, *The Grasses of Bahia*, 1984

(271, Fig. 102), E.G.Nicora, *Los Generos de Gramineas de America Austral* (1987) (555, Fig. 203), L.B. Smith, D.C. Wasshausen, R.M. Klein *Flora Illustrada Catarinensis Gramineas* (1981–1982) (1196, Fig. 234 & 1197, Fig. 235), W.Burger, *Flora Costaricensis* 15, Gramineae: *Fieldiana Botany New Series* 4 (1980) (266, Fig. 96), G.Harling & C.Persson, *Flora of Ecuador* (2006) (78: 196, Fig. 23 (2006)), E.Judziewicz, *Flora of the Guianas*, 187. *Poaceae* (1990) (267, Fig. 46).

**Illustrations (Journals):** *Ruizia* (13:453 Fig 61a-b (1993)).

**Images:** D.Sharp & B.K.Simon, *AusGrass. Grasses of Australia.* CD-Rom Version 1.0. (2002);, K.O.Mallett (ed.), *Flora of Australia*, Vol 44 A (2002) & Vol 44B (2004). *Poaceae*;.

**Derivation** (Clifford & Bostock 2007): L. reddish. Inflorescence purple to red.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Butt sheaths glabrous. Basal innovations intravaginal. Culms erect, 30–250 cm long, 2–6 mm diam. Culm-internodes solid. Lateral branches fastigiate. Leaves culine. Leaf-sheaths wider than blade at the collar. Ligule an eciliate membrane, 2–3 mm long. Leaf-blades 30–60 cm long, 2–8 mm wide. Leaf-blade margins smooth. Leaf-blade apex attenuate, filiform.

**Inflorescence.** Synflorescence compound, paniculate to fasciculate, 5–80 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear to lanceolate, 3–5 cm long, membranous. Peduncle 3–8 cm long, glabrous or pilose above. Racemes 2, paired, erect, unilateral, 2–2.5 cm long, bearing few fertile spikelets, bearing 4–7 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs red. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 2–3.5 mm long, glabrous. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0–2 in upper racemes, equalling fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 3.5–5 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, pilose, with white hairs (rarely) or red hairs, acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 3.5–4.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus oblong to cuneate, 0.2–0.8 mm long, pubescent, base obtuse, attached obliquely. Spikelet callus hairs white or yellow.

**Glumes.** Glumes dissimilar, with lower wider than upper, exceeding apex of florets, firmer than fertile lemma, shiny. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, 5 -veined. Lower glume surface pilose. Lower glume hairs red. Lower glume apex dentate, 2 -fid. Upper glume linear, 1.1 length of adjacent fertile lemma, coriaceous, without keels, 3 -veined. Upper glume apex dentate, 2 -fid, mucronate.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined, entire. Fertile lemma linear, 3–4 mm long, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 20–30 mm long overall, with twisted column. Column of lemma awn pubescent (rufously). Palea absent or minute.

**Flower and Fruit.** Lodicles 2, cuneate, fleshy. Anthers 3, 1 mm long. Stigmas 2.

$n = 15$  (1 ref TROPICOS).  $2n = 20$  (1 ref TROPICOS), or 30 (1 ref TROPICOS), or 40 (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Africa, Temperate Asia, Tropical Asia, Australasia (\*), Pacific, North America, South America.

**Country /Province /State.** Macaronesia, West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean. Canary Is. Benin, Gambia, Ghana, Guinea-Bissau, Guinea, Ivory Coast, Mali, Mauritania, Nigeria, Senegal, Sierre Leone, Togo. Burundi, Central African Republic, Cameroon, Congo, Gabon, Annobon, Principe & Sao Tome, Rwanda, DRC. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Namibia, Botswana, Limpopo, Mpumalanga, Swaziland. Mauritius, Madagascar, Rodrigues, Seychelles. **China.** China South Central. **Indian**

**Subcontinent, Indo-China, Malesia, Papuasia.** Laos, Myanmar, Thailand, Java, Philippines, New Guinea. **Australia** (\*). Northern Territory (\*), Queensland (\*), New South Wales (\*). **Southwestern Pacific, South-central Pacific, North-central Pacific.** Fiji (\*). Marianas (\*). Hawaii (\*). **South-central USA, Southeastern USA, Mexico.** Texas, Florida, Central Mexico, Northeast Mexico, Gulf (Mexico), Northwest Mexico, Southwest Mexico, Southeast Mexico. **Mesoamerica, Caribbean, Northern South America, Western South America, Brazil, Southern South America.** Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Cuba, Leeward Is, Puerto Rico, French Guiana, Guyana, Surinam, Venezuela, Bolivia, Colombia, Ecuador, Peru, Brazil West Central, Brazil Northeast, Brazil North, Brazil Southeast, Brazil South, Paraguay.

Yunnan, Darwin & Gulf, North, Central, South East, Coast, Distrito Federal, Bahia, Ceará, Maranhão, Pernambuco, Paraíba, Piaui, Rio Grande do Norte (RN), Amazonas, Pará, Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Rio Grande do Sul, Santa Catarina, Chaco, Corrientes, Misiones, Mexico State, Morelos, Tamaulipas, Veracruz, Sinaloa, Colima, Guerrero, Jalisco, Michoacan, Nayarit, Campeche, Chiapas, Quintana Roo, Tabasco, Yucatan.

### **Hyparrhenia schimperi** (Hochst. ex A.Rich.) Anderss. ex Stapf. *Prain, Fl. Trop. Afr.* 9:341 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Andropogon schimperi* Hochst. ex A. Rich., *Tent. Fl. Abyss.* 2: 466 (1850)

. T:<Type of Basionym>; fide TROPICOS and Kew Synonomy Database: ILT: *G.H.W. Schimper*, I, 408, 26 Oct 1837, Ethiopia: Mt Sholoda [Selleuda] (US-945243; ILT: P, K, L). "Schimper iter Abyssinicum, Sectio prima: plantae Adoensis. Not described on the label. U.i. 1840, collected in 1837..

ST: *Quartin Dillon s.n.*, Ethiopia: Shire [Chire] (P).

ST: *Schimper, pl Schimp. Abyss., Sect. II*, 1052, Africa: Ethiopia: Mt. Selleuda

ST: *G.H.W. Schimper* 2652, Ethiopia: (L).

T: *G.H.W. Schimper* 21673, 26 Oct 1837, Ethiopia (L).

**Illustrations (Books):** J.Bosser, *Graminees des Paturage et des Cultures à Madagascar* (1969) (247, Fig 89).

**Derivation** (Clifford & Bostock 2007): in honor of Georg Heinrich Wilhelm Schimper (1804–78) German plant collector in Near East and north-eastern Africa.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Butt sheaths glabrous or pubescent. Culms erect, robust, 200–400 cm long, 4–8 mm diam., without nodal roots or with prop roots. Leaves cauline. Ligule an eciliate membrane. Leaf-blades 30–60 cm long, 10–20 mm wide.

**Inflorescence.** Synflorescence compound, paniculate, 30–60 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 2.2–3.2 cm long, membranous, brown, glabrous. Peduncle 1–1.5 cm long, pilose above. Racemes 2, paired, deflexed, 1.2–1.6 cm long, bearing few fertile spikelets, bearing 3–4 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear, 2–2.5 mm long. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 0.5–1.5 mm long, stiffly setose, scariously rimmed. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 5–8 mm long, larger than fertile. Basal sterile spikelet glumes glabrous to pilose, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5–7 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous to pilose, acute, muticous or awned, one glume awned, with 1–6 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered – the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4–5 mm long,

falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 0.5–0.8 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous to pubescent. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 20–33 mm long overall, with twisted column. Column of lemma awn puberulous or pubescent, with 0.2–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicles 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean. DRC. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Limpopo, North-West, Mpumalanga, Kwazulu-Natal, Western Cape. Madagascar.

### Hyparrhenia smithiana (Hook. f.) Stapf. *Prain, Fl. Trop. Afr.* ix. 314 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Cameroon. **Basionym or Replaced Name:** *Andropogon smithianus* Hook. f., *J. Proc. Linn. Soc., Bot.* 7: 232 (1864)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: ST: *G. Mann* 2079, no date, Cameroon: Cameroon Mountains (K, US-1125816 (fragm. ex W)).

ST: *Mann* 1342, Cameroon: Cameroon Mtn. (K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ana*, indicating connection. In honor of Christen Smith (1785–1816) Norwegian botanist.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths woolly, with red hairs or purple hairs. Culms erect, 40–250 cm long, 2–5 mm diam. Leaves cauline. Ligule an eciliate membrane, 2–3 mm long. Leaf-blades 20–75 cm long, 2–6 mm wide, stiff. Leaf-blade margins scabrous.

**Inflorescence.** Synflorescence compound, paniculate, 30–90 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear or lanceolate, 3.5–7 cm long, membranous, red. Peduncle nodding, pilose above. Racemes 2, paired, erect, 2.5–3 cm long, bearing 4–7 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white or yellow. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 2–3 mm long, glabrous or pubescent, hairy generally or at base (rufous hairs). Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, with white hairs or yellow hairs, tip oblique, toothed (0.1–0.5mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes, lanceolate, 5–6 mm long, equalling fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5–6 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4.5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 0.4–0.8(–1) mm long, pubescent, base truncate or obtuse, attached obliquely. Spikelet callus hairs white or yellow.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, purple, without keels, keel-less except near apex. Lower glume

surface pubescent. Lower glume hairs yellow. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 20–35 mm long overall, with twisted column. Column of lemma awn pubescent (fulvously), with 0.2 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

$2n = 40$  (1 ref TROPICOS).

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa. Burkina, Ghana, Guinea, Ivory Coast, Nigeria, Senegal, Sierre Leone, Togo. DRC.

### **Hyparrhenia subplumosa** Stapf. *Prain, Fl. Trop. Afr.* ix. 366 . (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Nigeria. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: LT: *Dalziel 901*, Nigeria: Abinsi and vicinity (K; ILT: US-1038004). LT designated by Clayton, Kew Bull., Add. Ser. 2: 164–165 (1969) [collecting number cited as 190 on p. 164, as 901 on p. 165].

**Illustrations (Books):** H.Jacques-Felix, *Les Graminees d'Afrique tropicale* (1962) (306, Fig. 244).

**Derivation** (Clifford & Bostock 2007): L. *sub*, approaching. Similar to other species with the epithet *plumosa*.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriniæ.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms erect, robust, 200–300 cm long. Leaves caudate. Leaf-sheaths glabrous on surface or pilose. Leaf-sheath oral hairs bearded (grey hairs). Ligule an eciliate membrane, 2–3 mm long. Leaf-blades 20–60 cm long, 3–10 mm wide, glaucous. Leaf-blade surface glabrous or hirsute, sparsely hairy, hairy abaxially. Leaf-blade margins scabrous.

**Inflorescence.** Synflorescence compound, paniculate, 20–50 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 3–7 cm long, membranous, glaucous or purple. Peduncle straight or nodding, 1–3.5 cm long, glabrous or hirsute above. Racemes 2, paired, deflexed, 1.5–2.5 cm long, bearing few fertile spikelets, bearing 1–3 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1.5–2 mm long, pubescent. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 4 in number, 4 in upper racemes, forming an involucro about the fertile, lanceolate, 8–10 mm long, larger than fertile. Basal sterile spikelet glumes glabrous or pubescent, scabrous on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 7–8 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, acute, awned, one glume awned, with 2–7 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 6.5–7.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1.5 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous or pubescent. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn

from a sinus, geniculate, 45–75 mm long overall, with twisted column. Column of lemma awn hirsute, with 0.5–1.3(–1.7) mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicles 2, cuneate, fleshy. Anthers 3. Stigmas 2. Caryopsis 3.5 mm long.

$2n = 40$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa. Burkina, Guinea, Ivory Coast, Liberia, Mali, Nigeria, Sierra Leone, Togo, Niger. DRC. Sudan. Tanzania. Malawi, Zambia.

### **Hyparrhenia tamba** (Hochst. ex Steud.) Anderss. ex Stapf. *Prain, Fl. Trop. Afr.* 9:336 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), J.F.Veldkamp, Poaceae ms (*Flora Malesiana*).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Andropogon tamba* Hochst. ex Steud., *Syn. Pl. Glumac.* 1: 385 (1854)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: ST: *Schimper pl. Abyss.*, sect. II, 911, 29 Dec 1837, Ethiopia: Genniam (?; IST: L, US-1093873).

ST: *Schimper pl. Abyss.*, sect. II, 937, 20 Jul 1838, Ethiopia (?; IT: L).

**Illustrations (Books):** L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (p. 24 as *H. glauca*), G.E.Gibbs Russell et al, *Grasses of Southern Africa* (1990) (187, Fig 109).

**Images:** F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999).

**Derivation** (Clifford & Bostock 2007): vernacular name of the species in Ethiopia.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths pubescent. Culms erect, robust, 100–200 cm long, 2–4 mm diam. Leaves caudate. Ligule an eciliate membrane, 2–4 mm long. Leaf-blades 20–40 cm long, 3–7 mm wide, stiff, glaucous. Leaf-blade surface scaberulous, glabrous. Leaf-blade margins scabrous.

**Inflorescence.** Synflorescence compound, paniculate, 30–60 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf or enclosed. Spatheole lanceolate, 2.6–4 cm long, membranous, brown, glabrous or pilose. Peduncle nodding, 2–3 cm long, pilose above. Racemes 2, paired, deflexed, 1.5 cm long, bearing few fertile spikelets, bearing 2–4 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear, 2–3 mm long. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 0.5–1 mm long, stiffly setose, scariously rimmed, with 0.2–0.5 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 8–9 mm long, larger than fertile. Basal sterile spikelet glumes villous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 7–8 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, villous, acute, muticous or mucronate or awned, one glume awned, with 0–2 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 0.5 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, grey or purple, without keels, keel-less except near apex. Lower glume surface villous. Lower glume apex dentate, 2-fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2-veined. Fertile lemma linear, membranous, without keel, 1-veined, 0–3-veined, one-veined. Lemma apex dentate, 2-fid, awned, 1-awned. Principal lemma awn from a sinus, geniculate, 16–25 mm long overall, with twisted column. Column of lemma awn puberulous or pubescent, with 0.2–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa, Tropical Asia.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa. DRC. Ethiopia (inc. Eritrea), Sudan. Kenya. Zimbabwe. Limpopo, North-West, Gauteng, Mpumalanga, Swaziland, Free State, Kwazulu-Natal, Lesotho. Papua. New Guinea (?).

### **Hyparrhenia tuberculata** W. D. Clayton. *Kew Bull., Addit. Ser., No. 2, 155* . (1969).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Ethiopia: Mt. Yerer, 38.55E 08.50N, Nov., Mooney 6284 (HT: K).

**Illustrations (Books):** S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (351, Fig 142).

**Illustrations (Journals):** *Kew Bulletin (Addit. Series 2: 156, Fig.3` (1969)).*

**Derivation** (Clifford & Bostock 2007): *L. tuberculus*, wart; -ata, possessing. Lemmas or glumes bearing wart-like projections.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous. Culms erect, 60 cm long. Leaves cauline. Ligule an eciliate membrane. Leaf-blades 10–15 cm long, 2–3 mm wide, glaucous.

**Inflorescence.** Synflorescence compound, scanty.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole lanceolate, 5–9 cm long, scarious, brown. Peduncle nodding, 1.5–8 cm long, pilose above (yellow hairs). Racemes 2, paired, erect, 1.5–2 cm long, bearing few fertile spikelets, bearing 3–4 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 2 mm long, stiffly setose. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 4 in number, 4 in upper racemes, lanceolate, 7–12 mm long, equalling fertile or larger than fertile. Basal sterile spikelet glumes tuberculate, pilose, tuberculate on margins or setose on margins (pectinately), lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 7–8 mm long, as long as fertile, separately deciduous. Companion sterile spikelet callus square, 0.2–0.5 mm long, truncate. Companion sterile spikelet glumes chartaceous, smooth or scabrous, setose on margins, acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 7–7.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1.5–2 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface spinose, pilose. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 40–50 mm long overall, with twisted column. Column of lemma awn hirtellous, with 0.7–1.5 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Northeast Tropical Africa. Ethiopia (inc. Eritrea).

**Hyparrhenia umbrosa** (Hochst. ex A. Rich.) Anderss. ex W.D. Clayt. *Kew Bull., Addit. Ser.*, No. 2, 127 (1969).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Ethiopia. **Basionym or Replaced Name:** *Andropogon umbrosus* Hochst., *Schimp. Iter. Abyss. Sectio II* 1116 (1842)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: ST: *Schimper Abyss. II* 1116, 15 Dec. 1838, Ethiopia: Scholoda Mts (P; IST: K, L, S-G411). desc. in sched. U.i. 1842., date on S specimen is 1852.

PT: *Schimper 584 unio It. 1842*, 24 Dec, Abyssinia: Sar Woriar "(= nr. 1116)" (US-945286). [no descr. on 584].

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): *L. umbra*, any shady place; *-osa*, abundance. Growing in shady places.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Butt sheaths glabrous. Culms decumbent, robust, 130–200 cm long, 3–6 mm diam., with prop roots. Leaves cauline. Ligule an eciliate membrane, 2 mm long. Leaf-blades 30–60 cm long, 6–12 mm wide. Leaf-blade surface glabrous.

**Inflorescence.** Synflorescence compound, paniculate, 20–30 cm long, dense.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf or enclosed. Spatheole ovate, 1.2–2.3 cm long, membranous, brown, glabrous or pilose. Peduncle 0.3–1.3 cm long, pilose above. Racemes 2, paired, deflexed, 1 cm long, bearing few fertile spikelets, bearing 2–3 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 0.5 mm long, stiffly setose. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 5–6 mm long, larger than fertile. Basal sterile spikelet glumes villous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5–6 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, villous, acute, muticous or mucronate. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus oblong, 0.4 mm long, pubescent, base obtuse (broadly), attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface villous. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 7–13 mm long overall, with twisted column. Column of lemma awn puberulous or pubescent, with 0.2–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, Southern Africa. Nigeria. Cameroon. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Mpumalanga, Kwazulu-Natal.

**Hyparrhenia variabilis** Stapf. *Prain, Fl. Trop. Afr.* 9:334 (1919).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Zambia. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: LT: Macauley 62, Zambia: Mumbwa, 15:S, 28:E (K). LT designated by Clayton, *Kew Bull.*, Add. Ser. 2: 113 (1969).

**Illustrations (Books):** R.M.Polhill, F.T.E.A., *Gramineae* (3)(1982):806, Fig 184), G.V.Pope et al., *Flora Zambesiaca* 10, J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969) (255, Fig 93).

**Derivation** (Clifford & Bostock 2007): L. *varius*, variable; *-abilis*, indicating capacity. Species polymorphic and usually with many varieties.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short, scaly. Butt sheaths glabrous or pubescent. Culms erect or decumbent, robust, 150–300 cm long, with prop roots. Leaves caudate. Ligule an eciliate membrane, 1–2 mm long. Leaf-blades 25–45 cm long, 6–15 mm wide.

**Inflorescence.** Synflorescence compound, paniculate, 20–40 cm long, dense.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 1.4–2.4 cm long, membranous, yellow or green or purple, glabrous. Peduncle 0.3–0.9 cm long, pilose above. Racemes 2, paired, deflexed, 0.8–1.3 cm long, bearing few fertile spikelets, bearing 1–3 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 0.5–1 mm long, stiffly setose. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 7–9 mm long, larger than fertile. Basal sterile spikelet glumes glabrous or pubescent, ciliate on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5–8 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous or puberulous, ciliate on margins, acute, awned, one glume awned, with 1–4 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 4–5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 0.5–1 mm long, pubescent, base obtuse or acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface glabrous or pubescent. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 18–32 mm long overall, with twisted column. Column of lemma awn puberulous, with 0.2–0.4 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

*n* = 20 (1 ref TROPICOS).

**Distribution (TDWG).** Continent. Africa, Temperate Asia, Tropical Asia, North America.

**Country /Province /State.** West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean. Rwanda, DRC. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Limpopo, Mpumalanga, Swaziland, Kwazulu-Natal. Comoros, Madagascar. Arabian Peninsula. Yemen. Malesia. Java (once cultivated). Mexico. Southwest Mexico.

Jalisco, Michoacan.

**Hyparrhenia violascens** (Stapf) W. D. Clayton. *Kew Bull., Addit. Ser.*, No. 2, 88 (1969).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Nigeria. **Basionym or Replaced Name:** *Hyparrhenia soluta* var. *violascens* Stapf, *Fl. Trop. Afr.* 9: 319 (1918)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: HT: *Dalziel* 263, Nigeria (K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *violesco*, become violet. Anthers, stigmas or glumes blue to purple.

**Classification.** Subfamily Panicoideae. Tribe: Saccharae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual, caespitose. Butt sheaths glabrous. Culms erect, 50–100 cm long. Leaves cauline. Ligule an eciliate membrane, 1 mm long. Collar glabrous or pubescent. Leaf-blades 20–40 cm long, 3–6 mm wide.

**Inflorescence.** Synflorescence compound, scanty, 20–30 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear, 4–7 cm long, membranous. Peduncle flexuous, pilose above. Racemes 2, paired, deflexed or spreading, 1.5–3 cm long, bearing few fertile spikelets, bearing 3–5 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 2–3 mm long, glabrous or pubescent (foot glabrous). Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique, toothed (0.3–0.7mm).

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes, lanceolate, 7–8 mm long, larger than fertile. Basal sterile spikelet glumes pubescent, with white hairs or dark brown hairs, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, linear or lanceolate, dorsally compressed, 6–7 mm long, longer than fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, pubescent, with white hairs or yellow hairs, acute or acuminate, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear or lanceolate, dorsally compressed, 5–6.5 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus linear, 0.8–1.2 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels, keel-less except near apex. Lower glume surface pubescent to villous. Lower glume hairs white. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 25–40 mm long overall, with twisted column. Column of lemma awn pubescent (white or fulvous), with 0.1–0.5 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West Tropical Africa, West-Central Tropical Africa. Nigeria.

**Hyparrhenia welwitschii** (Rendle) Stapf. *Prain, Fl. Trop. Afr.* ix. 356 (1918).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Angola. **Basionym or Replaced Name:** *Cymbopogon welwitschii* Rendle, *Cat. Afr. Pl.* 2(1): 157 (1899)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: ST: *Welwitsch* 2955, Angola (K, LISU).

ST: *Welwitsch* 2956, Angola (K, LISO).

ST: *Welwitsch* 3000, Angola (K).

ST: *Welwitsch* 7190, Angola (K).

ST: *Welwitsch* 7248, Angola (K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Friedrich Martin Josef Welwitsch (1806–72) Austrian-born botanist, physician and traveller.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Butt sheaths glabrous. Culms erect, 20–300 cm long, without nodal roots or with prop roots. Culm-nodes glabrous or bearded. Leaves caudate. Ligule an eciliate membrane, 3 mm long. Leaf-blades tapering towards sheath, 30–60 cm long, 6–12 mm wide, glaucous.

**Inflorescence.** Synflorescence compound, paniculate, 30–60 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole lanceolate, 3–5 cm long, membranous, glabrous. Peduncle 2.5–4 cm long, pilose above. Racemes 2, paired, deflexed, 1.2–1.7 cm long, bearing few fertile spikelets, bearing 1 fertile spikelets on each or 2 fertile spikelets on each (3-awned per pair). Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases flattened, subequal, 1–1.5 mm long, stiffly setose, extended into an oblong appendage, with 0.5–1 mm long appendage. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, on lower raceme 2 in number, 0 in upper racemes, lanceolate, 7–10 mm long, larger than fertile. Basal sterile spikelet glumes glabrous, smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 6–8 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, acute, awned, one glume awned, with 2–11(–14) mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear or oblong, dorsally compressed, 5–7 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1.5 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, grey, without keels, keel-less except near apex. Lower glume surface glabrous or pubescent. Lower glume hairs white. Lower glume apex dentate, 2 -fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2 -veined. Fertile lemma linear, membranous, without keel, 1 -veined, 0–3 -veined, one-veined. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 40–70 mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2. Caryopsis 3 mm long.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Western Indian Ocean.** Benin, Ghana, Guinea, Ivory Coast, Nigeria, Sierra Leone. DRC. Sudan. Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Comoros.

**Hyparrhenia wombaliensis** (Vanderyst ex Robyns) W.D.Clayton. *Kew Bull., Addit. Ser.*, No. 2, 75 (1969).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online.

**TYPE** from Zaire. **Basionym or Replaced Name:** *Andropogon wombaliensis* Vanderyst ex Robyns, *Fl. Agrost. Congo Belge* 1: 128 (1929)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: HT: *Vanderyst 4251*, Zaire (BR; IT: K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *-ensis*, denoting origin. From Wombali, Zaire.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Butt sheaths glabrous or sparsely hairy. Culms erect, slender, 40–60 cm long. Leaves caudate. Ligule an eciliate membrane, 0.5–1 mm long. Leaf-blades filiform or linear, flat or convolute, 15–25 cm long, 1–1.5 mm wide. Leaf-blade surface glabrous or hirsute, sparsely hairy, hairy abaxially.

**Inflorescence.** Synflorescence simple.

Inflorescence composed of racemes, terminal, subtended by a spatheole, exserted. Spatheole linear, 4–10 cm long, membranous. Peduncle 8–10 cm long, glabrous. Racemes 2, paired, erect, 2–3 cm long, bearing 4–6 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis hairs white. Rhachis internodes linear, 3.5–5 mm long. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 5–8 mm long, glabrous. Spikelets appressed, in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, linear, flattened, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, 2 in number (lower raceme), 0 in upper racemes, lanceolate, equalling fertile. Basal sterile spikelet glumes smooth on margins, lower glume muticous.

Companion sterile spikelets well-developed, containing empty lemmas or male, lanceolate, dorsally compressed, 5–6 mm long, as long as fertile, separately deciduous. Companion sterile spikelet glumes chartaceous, glabrous, acute, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered – the lower floret male or barren, the upper fertile. Spikelets lanceolate, dorsally compressed, 5–6 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 1 mm long, pubescent, base acute, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume lanceolate, 1 length of spikelet, coriaceous, without keels. Lower glume surface glabrous or hispidulous. Lower glume hairs white. Lower glume apex dentate, 2-fid. Upper glume linear, coriaceous, without keels.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret lanceolate, 1 length of fertile lemma, hyaline, 2-veined. Fertile lemma linear, membranous, without keel, 1-veined, 0–3-veined, one-veined. Lemma apex entire, emarginate, awned, 1-awned. Principal lemma awn from a sinus, geniculate, 8–15 mm long overall, with twisted column. Column of lemma awn pubescent, with 0.2–0.3 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Lodicules 2, cuneate, fleshy. Anthers 3. Stigmas 2.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West-Central Tropical Africa. DRC.

### **Hyparrhenia yunnanensis** Sun & Wang. *J Yunnan Univ.* 21:95 (1999).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**Illustrations (Books):** S-L Chen et al, *Flora of China*, Illustrations, Poaceae (2007) (Fig. 883).

**Derivation** (Clifford & Bostock 2007): L. *-ense*, denoting origin. From Yunnan Province, China.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State.** China. China South Central. Indo-China. Myanmar, Thailand. Yunnan.

### **Hyperthelia colobantha** W. D. Clayton. *Kew Bull.* xx. 439 . (1966).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Central African Republic. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Central African Republuic, Rafai to Zemio: Clair 16 (K holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): Gk. *kolobos*, mutilated; *anthos*, flower. The upper raceme is reduced to a single male spikelet.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual, caespitose. Culms erect, 200 cm long, 3–4 mm diam. Leaf-sheaths hirsute. Ligule an eciliate membrane, 1–2 mm long. Leaf-blades 20–45 cm long, 2–3 mm wide. Leaf-blade surface pilose, sparsely hairy.

**Inflorescence.** Synflorescence compound, linear, 20 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 2.5 cm long, scarious, hirsute. Peduncle 0.2 cm long, pilose above. Racemes 2, paired, with abortive upper raceme represented by a single sterile spikelet, 1.2 cm long, bearing few fertile spikelets, bearing 1 fertile spikelets on each. Rhachis fragile at the nodes. Rhachis internodes linear. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 6–7 mm long, pilose, extended into an oblong appendage, with 6 mm long appendage. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, filiform, ciliate, tip rectangular.

**Sterile Spikelets.** Basal sterile spikelets well-developed, lower raceme 2 in number, 0 in upper racemes, male, linear, 8 mm long, smaller than fertile. Basal sterile spikelet lower glume muticous.

Companion sterile spikelets well-developed, male, lanceolate, 9 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus cuneate, 0.5 mm long, acute. Companion sterile spikelet glumes coriaceous, muticous. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 9 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 2 mm long, pilose, base acute, attached obliquely. Spikelet callus hairs white.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 1 length of spikelet, coriaceous, much thinner above, without keels. Lower glume surface with a longitudinal median groove, pubescent, hairy above. Lower glume apex dentate, 2 -fid, setaceously acuminate. Upper glume oblong, coriaceous, without keels, 3 -veined. Upper glume apex acute, mucronate.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, hyaline, 2 -veined. Fertile lemma linear, 4.5 mm long, hyaline, without keel, 3 -veined, 0–3 -veined. Lemma apex dentate, 2 -fid, incised 0.15 of lemma length, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 80 mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State. West-Central Tropical Africa.** Central African Republic.

### **Hyperthelia cornucopiae** (Hackel) W. D. Clayton. *Kew Bull.* xx. 446 (1966).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Sudan. **Basionym or Replaced Name:** *Andropogon cornucopiae* Hack., *Flora* 68(7): 126 (1885)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: T: G.A. Schweinfurth 2331, no date, Central Africa: ad Seriba Ghattas in terra Dujr leg (IT: US-1611414 (ex B), US-76461 (fragm. ex W)).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. *cornu*, horn; *copicus*, plenty. The inflorescence is a head encircled by a bell-shaped cover of apical leaves resembling the Horn of Plenty.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Culms 200–450 cm long, 4–9 mm diam., with prop roots. Leaf-sheaths glabrous on surface. Leaf-sheath auricles absent or erect, 0–2 mm long. Ligule an eciliate

membrane, 2–5 mm long, scarious, obtuse. Leaf-blade base tapering to the midrib. Leaf-blades 40–80 cm long, 12–25 mm wide. Leaf-blade surface glabrous.

**Inflorescence.** Synflorescence compound, paniculate, 30–40 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 5.5–9 cm long, scarious, glabrous. Peduncle glabrous or pilose above. Racemes 2, paired, deflexed, 1.5–4 cm long, bearing few fertile spikelets, bearing 1 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes filiform. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 1–3 mm long, glabrous, extended into a flask-like appendage, with 5–10 mm long appendage. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, filiform, 4 mm long, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, lower raceme 2 in number, 0 in upper racemes, male, lanceolate or ovate, 8–25 mm long, equalling fertile. Basal sterile spikelet glumes glabrous, lower glume muticous.

Companion sterile spikelets well-developed, male, lanceolate, 8–25 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus cuneate, 1–2.5 mm long, acute. Companion sterile spikelet glumes coriaceous, awned, one glume awned, with 2–15 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 8–18 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 2.5–5 mm long, bearded, base pungent, attached obliquely. Spikelet callus hairs white or dark brown.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 1 length of spikelet, coriaceous, much thinner above, without keels, 6–10 -veined. Lower glume surface with a longitudinal median groove, pubescent, hairy generally or below. Lower glume hairs dark brown. Lower glume apex dentate, 2 -fid, mucronate, awn 1–2 mm long. Upper glume oblong, coriaceous, without keels, 3 -veined. Upper glume awned, awn 1–9 mm long.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, hyaline, 2 -veined, ciliate on margins. Fertile lemma linear, 4–8 mm long, hyaline, without keel, 3 -veined, 0–3 -veined. Lemma margins ciliate. Lemma apex lobed, 2 -fid, incised 0.25 of lemma length, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 60–150 mm long overall, with twisted column. Column of lemma awn hirtellous. Palea absent or minute.

**Flower and Fruit.** Caryopsis 6 mm long.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Northeast Tropical Africa. Sudan.

### **Hyperthelia dissoluta** (Nees ex Steud.) W. D. Clayton. *Kew Bull.* xx. 441 (1966).

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online, W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from ?Ghana. **Basionym or Replaced Name:** *Anthistiria dissoluta* Nees ex Steud., *Syn. Pl. Glumac.* 1: 400 (1854)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: HT: *Herb. Lindley s.n.*, Tropical Africa: probably Ghana (CGE).

**Illustrations (Books):** H.Jacques-Felix, *Les Graminees d'Afrique tropicale* (1962) (as *Hyparrhenia*), R.M.Polhill, F.T.E.A., *Gramineae* (3)(1982):787, Fig 183), G.V.Pope et al., *Flora Zambesiaca* 10, L.K.A. Chippindall, *Grasses and Pastures of South Africa* (1955) (513, Fig.410, as *Hyparrhenia*), G.E.Gibbs Russell el al, *Grasses of Southern Africa* (1990) (188, Fig 110), J.Bosser, *Graminees des Paturage et des Cultures a Madagascar* (1969) (243, Fig 87), S.Phillips, *Poaceae* (Gramineae) in I.Hedberg & S.Edwards, *Flora of Ethiopia and Eritrea* (1995) (334, Fig 135).

**Images:** F.van Oudtshoorn, *Guide to Grasses of Southern Africa* (1999).

**Derivation** (Clifford & Bostock 2007): L. lax. The inflorescence consists of racemes pendant on filiform peduncles.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Culms erect, 100–300 cm long, without nodal roots or with prop roots. Leaf-sheath auricles absent or erect. Ligule an eciliate membrane, 2–3(–24) mm long. Leaf-blades 15–30 cm long, 3–6 mm wide.

**Inflorescence.** Synflorescence compound, fastigiate.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole lanceolate, 5–7 cm long, scarious, glabrous or hirsute. Peduncle 3–5 cm long, glabrous or pilose above. Racemes 2, paired, erect, 2–3 cm long, bearing few fertile spikelets, bearing 1 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes filiform. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 2–3 mm long, glabrous, extended into an oblong appendage (4–11 mm), with 4–11 mm long appendage. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, filiform, 4 mm long, setose, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, lower raceme 2 in number, 0 in upper racemes, male, lanceolate, 8–15 mm long, equalling fertile. Basal sterile spikelet lower glume muticous.

Companion sterile spikelets well-developed, male, lanceolate, 9–14 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus cuneate, 0.3–0.8 mm long, acute. Companion sterile spikelet glumes coriaceous, muticous or awned, one glume awned, with 0–6 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 10–14 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 3–6 mm long, pilose, base pungent, attached obliquely. Spikelet callus hairs white.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 1 length of spikelet, coriaceous, much thinner above, yellow, without keels, 10–14 -veined. Lower glume surface with a longitudinal median groove. Lower glume apex dentate, 2 -fid, setaceously acuminate. Upper glume oblong, coriaceous, without keels, 3 -veined. Upper glume apex emarginate, muticous or mucronate.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, 5–6 mm long, hyaline, 2 -veined, ciliate on margins. Fertile lemma linear, 6 mm long, hyaline, without keel, 3 -veined, 0–3 -veined. Lemma margins ciliate. Lemma apex dentate, 2 -fid, incised 0.1 of lemma length, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 50–100 mm long overall, with twisted column. Column of lemma awn hirtellous. Palea absent or minute.

**Flower and Fruit.**  $n = 10$  (1 ref TROPICOS), or 20 (1 ref TROPICOS).

**Distribution (TDWG).** Continent. Africa, North America, South America.

**Country /Province /State.** Northern Africa, West Tropical Africa, West-Central Tropical Africa, Northeast Tropical Africa, East Tropical Africa, South Tropical Africa, Southern Africa, Western Indian Ocean. Benin, Gambia, Ghana, Guinea-Bissau, Guinea, Ivory Coast, Mali, Mauritania, Nigeria, Senegal, Togo, Niger. Gabon, Rwanda, DRC. Ethiopia (inc. Eritrea), Sudan. Kenya, Tanzania, Uganda. Angola, Malawi, Mozambique, Zambia, Zimbabwe. Namibia, Botswana, Limpopo, North-West, Gauteng, Mpumalanga, Swaziland, Kwazulu-Natal. Madagascar. Mexico. Central Mexico, Gulf (Mexico), Northwest Mexico, Southwest Mexico, Southeast Mexico. Mesoamerica, Brazil. El Salvador, Guatemala, Honduras, Nicaragua. Brazil Southeast, Brazil South.

Minas Gerais. Rio Grande do Sul. Mexico State. Veracruz. Sinaloa. Colima, Guerrero, Jalisco, Michoacan, Nayarit, Oaxaca. Chiapas, Yucatan.

**Hyperthelia edulis** (C. E. Hubbard) W. D. Clayton. *Kew Bull.* xx. 447 (1966).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Sudan. **Basionym or Replaced Name:** *Hyparrhenia edulis* C.E. Hubb., *Hooker's Icon. Pl.* 35: t. 3495 (1951)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: IT: J.G. Myers 13533, 5 Oct 1940, Sudan: Equatoria (US-2040268, US-2040269, US-2040270).

**Illustrations (Journals):** *Hooker's Icenes Plantarum* (t.3495 (1950) as *Hyparrhenia*).

**Derivation** (Clifford & Bostock 2007): L. edible. Young shoots edible.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Culms 300–570 cm long, 4–9 mm diam., with prop roots. Culm-nodes glabrous or bearded. Leaf-sheaths glabrous on surface. Leaf-sheath auricles erect, 12–24 mm long. Ligule an eciliate membrane, 12–24 mm long, scarious, truncate. Leaf-blade base with a false petiole, petiole 5–16 cm long. Leaf-blades linear or lanceolate, 50–100 cm long, 20–38 mm wide. Leaf-blade surface glabrous.

**Inflorescence.** Synflorescence compound, paniculate, 100–150 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, enclosed. Spatheole lanceolate, 6.5–10 cm long, scarious, purple, glabrous. Peduncle glabrous or pilose above. Racemes 2, paired, deflexed or spreading, 4.5–6 cm long, bearing few fertile spikelets, bearing 1 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes filiform. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 1–4 mm long, glabrous, extended into a flask-like appendage, with 15–20 mm long appendage. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, filiform, 4 mm long, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, lower raceme 2 in number, 0 in upper racemes, male, lanceolate, 25–30 mm long, equalling fertile. Basal sterile spikelet glumes glabrous, lower glume muticous.

Companion sterile spikelets well-developed, male, lanceolate, 25–45 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus cuneate, 1 mm long, acute. Companion sterile spikelet glumes coriaceous, awned, one glume awned, with 5–10 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 25–35 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 8–10 mm long, bearded, base pungent, attached obliquely. Spikelet callus hairs white.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 1 length of spikelet, coriaceous, much thinner above, without keels, 12–14 -veined. Lower glume surface with a longitudinal median groove, pubescent, hairy above. Lower glume apex dentate, 2 -fid. Upper glume oblong, coriaceous, without keels, 3 -veined. Upper glume awned, 1 -awned, awn 1–10 mm long.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, hyaline, 2 -veined, ciliate on margins. Fertile lemma linear, 10–14 mm long, hyaline, without keel, 3 -veined, 0–3 -veined. Lemma margins ciliate. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 90–140 mm long overall, with twisted column. Column of lemma awn hirtellous. Palea absent or minute.

**Flower and Fruit.** Caryopsis with adherent pericarp, fusiform, 10 mm long.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** Northeast Tropical Africa. Sudan.

**Hyperthelia kottoensis** B.-M.Descoings & M.Mazade. *Bull. Soc. Bot. France, Lett. Bot.*, 134(2): 203 (1987).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Central African Republic. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Rep. Centr. Afr., Rafai to Zemio: Mazade 2076 (P holo).

**Illustrations:** None found.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Perennial. Culms erect, 120–180 cm long. Culm-nodes bearded. Leaf-sheaths mostly shorter than adjacent culm internode. Leaf-sheath oral hairs bearded. Ligule an eciliate membrane, 2.5 mm long, obtuse. Leaf-blades 20–40 cm long, 6–10 mm wide. Leaf-blade surface pubescent or pilose, hairy on both sides.

**Inflorescence.** Synflorescence compound, paniculate, 20–50 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole lanceolate, 2–4 cm long, scarious. Peduncle 4–10 cm long, pilose above. Racemes 2, paired,

deflexed, bearing few fertile spikelets, bearing 1 fertile spikelets on each. Rhachis fragile at the nodes. Rhachis internodes filiform. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 1.3–2 mm long, extended into an oblong appendage, with 3.5–5.5 mm long appendage. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, filiform, 1.5–2 mm long, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, lower raceme 2 in number, 0 in upper racemes, lanceolate, 6.5–10 mm long, equalling fertile. Basal sterile spikelet lower glume muticous.

Companion sterile spikelets well-developed, lanceolate, 8–14 mm long, as long as fertile. Companion sterile spikelet callus cuneate, 0.3–0.7 mm long, acute. Companion sterile spikelet glumes coriaceous, 9–11 -veined, puberulous, awned, both glumes awned, with 1–3 mm long awn.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 8–11 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 2 mm long, pubescent, base pungent, attached obliquely.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 1 length of spikelet, coriaceous, much thinner above, without keels, 6 -veined. Lower glume surface with a longitudinal median groove, puberulous, hairy above. Lower glume apex dentate, 2 -fid. Upper glume oblong, coriaceous, without keels, keel-less except near apex, 3 -veined. Upper glume awned, 1 -awned, awn 1–1.5 mm long.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret hyaline. Fertile lemma linear, 5 mm long, hyaline, without keel. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 40–60 mm long overall, with twisted column. Column of lemma awn puberulous, with 0.1–0.2 mm long hairs. Palea absent or minute.

**Flower and Fruit.** Anthers 3, 3 mm long.

**Distribution (TDWG). Continent.** Africa.

**Country /Province /State.** West-Central Tropical Africa. Central African Republic.

### **Hyperthelia macrolepis** (Hackel) W. D. Clayton. *Kew Bull.* xx. 445 (1966).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Sudan. **Basionym or Replaced Name:** *Andropogon macrolepis* Hack., *Flora* 68(7): 125 (1885)

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: ST: *Schweinfurth* 2361, Africa tropica: ad Seriba Ghattas in terra Djur

ST: *Schweinfurth* 2411, Africa tropica: ad Seriba Ghattas in terra Djur

ST: *Bvhm* 130, Tanganyka prope Gonda

ST: *Buchner* 35, Angola ad Malange

ST: *Barte s.n.*, Prope Teba ad fl. Niger, exped. Baikieana.

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): Gk. *makros*, large; *lepis*, scale. Glumes and or lemmas large.

**Classification.** Subfamily Panicoideae. Tribe: Saccharaeae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Culms 120–170 cm long, without nodal roots or with prop roots. Leaf-sheath auricles absent or erect. Ligule an eciliate membrane, 2–3(–24) mm long. Leaf-blades 15–30 cm long, 3–6 mm wide.

**Inflorescence.** Synflorescence compound, fastigiate.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, embraced at base by subtending leaf. Spatheole lanceolate, 5–7 cm long, scarious. Peduncle glabrous or pilose above. Racemes 2, paired, erect, 2–3 cm long, bearing few fertile spikelets, bearing 1 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes filiform. Rhachis internode tip oblique, flat. Raceme-bases filiform, unequal (the longer measured), 2–3 mm long, glabrous, extended into an oblong appendage. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, filiform, 4 mm long, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, lower raceme 2 in number, 0 in upper racemes, male, lanceolate, 8–15 mm long, equalling fertile. Basal sterile spikelet glumes glabrous, lower glume muticous.

Companion sterile spikelets well-developed, male, lanceolate, 9–14 mm long, as long as fertile, deciduous with the fertile. Companion sterile spikelet callus cuneate, 0.3–0.8 mm long, acute. Companion sterile spikelet glumes coriaceous, muticous or awned, one glume awned, with 0–6 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 10–14 mm long, falling entire, deciduous with accessory branch structures. Spikelet callus cuneate, 3–6 mm long, pilose, base pungent, attached obliquely. Spikelet callus hairs white.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 1 length of spikelet, coriaceous, much thinner above, yellow, without keels, 10–14 -veined. Lower glume surface with a longitudinal median groove, pubescent, hairy above. Lower glume apex dentate, 2 -fid. Upper glume oblong, coriaceous, without keels, 3 -veined. Upper glume apex emarginate, muticous.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, hyaline, 2 -veined, ciliate on margins. Fertile lemma linear, 6 mm long, hyaline, without keel, 3 -veined, 0–3 -veined. Lemma margins ciliate. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 50–100 mm long overall, with twisted column. Column of lemma awn hirtellous. Palea absent or minute.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** Northeast Tropical Africa. Sudan.

### **Hyperthelia polychaeta** W. D. Clayton. *Kew Bull.* xx. 441. (1966).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Central African Republic. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: Central African Republuic, Rafai: Clair 34 (K holo).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): Gk. *polys*, several; *chaete*, bristle.

**Classification.** Subfamily Panicoideae. Tribe: Sacchareae. Subtribe Anthistiriinae.

**Habit, Vegetative Morphology.** Annual. Culms 150–200 cm long, 2–4 mm diam. Leaf-sheaths glabrous on surface. Leaf-sheath auricles erect, 3–6 mm long. Ligule an eciliate membrane, 3–6 mm long, scarious, truncate. Leaf-blades 20–40 cm long, 2–4 mm wide. Leaf-blade surface glabrous or pilose, sparsely hairy.

**Inflorescence.** Synflorescence compound, scanty, 30 cm long.

Inflorescence composed of racemes, terminal and axillary, subtended by a spatheole, exserted. Spatheole linear, 6–10 cm long, scarious, glabrous. Peduncle 7–12 cm long, pilose above. Racemes 2, paired, erect, 3–6 cm long, bearing few fertile spikelets, bearing 2–5 fertile spikelets on each. Rhachis fragile at the nodes, ciliate on margins. Rhachis internodes filiform. Rhachis internode tip oblique, flat. Raceme-bases filiform, subequal or unequal (the longer measured), 2–4 mm long, glabrous or pilose, extended into an oblong appendage, with 3–4 mm long appendage. Spikelets in pairs. Fertile spikelets sessile, 1 in the cluster. Companion sterile spikelets pedicelled, 1 in the cluster. Pedicels present, filiform, 4 mm long, ciliate, tip oblique.

**Sterile Spikelets.** Basal sterile spikelets well-developed, lower raceme 2 in number, 0 in upper racemes, male, lanceolate, 12–15 mm long, equalling fertile. Basal sterile spikelet glumes glabrous, lower glume muticous.

Companion sterile spikelets well-developed, male, lanceolate, 14–16 mm long, longer than fertile, deciduous with the fertile. Companion sterile spikelet callus indistinct, acute. Companion sterile spikelet glumes coriaceous, acuminate, muticous or awned, one glume awned, with 1–2 mm long awn. Companion sterile spikelet lemmas 2, enclosed by glumes.

**Fertile Spikelets.** Spikelets comprising 1 basal sterile florets, 1 fertile florets, without rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets two-flowered - the lower floret male or barren, the upper fertile. Spikelets linear, subterete, 12 mm long, falling entire,

deciduous with accessory branch structures. Spikelet callus cuneate, 2 mm long, pilose, base pungent, attached obliquely. Spikelet callus hairs white.

**Glumes.** Glumes dissimilar, exceeding apex of florets, firmer than fertile lemma. Lower glume oblong, 1 length of spikelet, coriaceous, much thinner above, without keels. Lower glume surface with a longitudinal median groove, pubescent, hairy above. Lower glume apex dentate, 2 -fid. Upper glume oblong, coriaceous, without keels, 3 -veined. Upper glume apex setaceous acuminate, muticous or mucronate.

**Florets.** Basal sterile florets 1, barren, without significant palea. Lemma of lower sterile floret oblong, hyaline, 2 -veined, ciliate on margins. Fertile lemma linear, 5 mm long, hyaline, without keel, 3 -veined, 0-3 -veined. Lemma margins ciliate. Lemma apex dentate, 2 -fid, awned, 1 -awned. Principal lemma awn from a sinus, geniculate, 50-70 mm long overall, with twisted column. Column of lemma awn pubescent. Palea absent or minute.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West-Central Tropical Africa. Central African Republic.

### **Hypseochloa cameroonensis** C. E. Hubbard. *Kew Bull.* 1936:165 (1936).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Cameroun. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: HT: J. *Mildbrade* 10881, 22 Dec 1928, Cameroon Mtn., above Buena, frequent between tufts of high grasses in grassland, 2800 m (K-182105).

**Illustrations (Books):** H.Jacques-Felix, *Les Graminees d'Afrique tropicale* (1962) (191, Fig. 114).

**Derivation** (Clifford & Bostock 2007): L. *-ensis*, denoting origin. From Cameroon Mountain or Cameroun, West Africa.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Annual. Culms erect or geniculately ascending, 20-30 cm long. Ligule an eciliate membrane, 2-5 mm long. Leaf-blades flat or convolute, 2.5-9 cm long, 0.5-1 mm wide.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, 3.8-9 cm long, 1.2-3.8 cm wide. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, filiform.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 3 mm long, breaking up at maturity, disarticulating below each fertile floret. Floret callus bearded, obtuse. Floret callus hairs 0.3 length of lemma.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma, gaping. Lower glume elliptic, 3 mm long, 1 length of upper glume, membranous, 1-keeled, keeled above, 5 -veined. Lower glume primary vein scabrous. Lower glume apex acuminate. Upper glume elliptic, 3 mm long, 1.2-1.5 length of adjacent fertile lemma, membranous, with hyaline margins, 1-keeled, keeled above, (3-)5 -veined. Upper glume primary vein scabrous. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 2-2.5 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface asperulous. Lemma margins involute, interlocking with palea keels. Lemma apex dentate, 2 -fid, acute, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5-0.6 way up back of lemma, geniculate, 4-6 mm long overall, with twisted column. Palea 0.8 length of lemma. Palea keels winged, narrowly winged. Rhachilla extension 0.1 length of fertile floret.

**Flower and Fruit.** Lodicles 2, lanceolate, 1 mm long, membranous. Anthers 3, 0.2-0.3 mm long, retained within floret. Caryopsis with adherent pericarp, oblong, 1.3 mm long. Hilum punctiform.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** West-Central Tropical Africa. Cameroon.

### **Hypseochloa matengoensis** C. E. Hubbard. *Kew Bull.*, 36(1): 62 (1981).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from Tanzania. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: Tanzania: Songea Dist.: Matengo Hills, Luiiri Kitesi, damp bank between rock outcrops, 1920 m, 24 May 1956, *Milne-Redhead & Taylor 10435* (HT: K).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ensis*, denoting origin. From Matengo Hills, Tanzania.

**Classification.** Subfamily Pooideae. Tribe: Poeae.

**Habit, Vegetative Morphology.** Annual. Culms erect or geniculately ascending, 4–16 cm long. Ligule an eciliate membrane, 1–2.5 mm long. Leaf-blades flat or convolute, 1–4 cm long, 1 mm wide, flaccid.

**Inflorescence.** Inflorescence a panicle. Panicle open, ovate, 2.5 cm long, 2 cm wide. Spikelets solitary. Fertile spikelets pedicelled. Pedicels present, filiform.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets elliptic, laterally compressed, 2–2.5 mm long, breaking up at maturity, disarticulating below each fertile floret. Floret callus bearded, obtuse. Floret callus hairs 0.3 length of lemma.

**Glumes.** Glumes persistent, similar, exceeding apex of florets, thinner than fertile lemma, gaping. Lower glume elliptic, 2–2.5 mm long, 1 length of upper glume, herbaceous, 1-keeled, keeled above, 3 - veined. Lower glume primary vein scabrous. Lower glume apex acuminate. Upper glume elliptic, 2–2.5 mm long, 1.2–1.5 length of adjacent fertile lemma, herbaceous, with hyaline margins, 1-keeled, keeled above, 3 - veined. Upper glume primary vein scabrous. Upper glume apex acuminate.

**Florets.** Fertile lemma oblong, 1.6–1.9 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface scaberulous (above). Lemma margins involute, interlocking with palea keels. Lemma apex dentate, 2 -fid, acute, awned, 1 -awned. Principal lemma awn dorsal, arising 0.5–0.6 way up back of lemma, geniculate, 4.5–5 mm long overall, with twisted column. Palea 0.8–1 length of lemma. Palea keels winged, narrowly winged. Rhachilla extension 0.1 length of fertile floret.

**Flower and Fruit.** Lodicles 2, lanceolate, 1 mm long, membranous. Anthers 3, 0.2–0.3 mm long, retained within floret. Caryopsis with adherent pericarp, oblong. Hilum punctiform.

**Distribution (TDWG).** Continent. Africa.

**Country /Province /State.** East Tropical Africa. Tanzania.

### **Hystrix coreana** (Honda) Ohwi. *Journ. Jap. Bot.* xii. 653 (1936).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006), S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.Tsvelev, *Grasses of the Soviet Union* (1983), T.Koyama, *Grasses of Japan and its neighboring regions* (1987) (as *Elymus*).

**TYPE** from Korea. **Basionym or Replaced Name:** *Elymus coreanus* Honda, *J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot.* 3(1): 17 (1930). T:<Type of Basionym>: *fide* TROPICOS and Kew Synonomy Database: LT: V. Komarov 197, 1897, Korea: vallis Segel-tu-korani, districtus Musang (TI; ILT: LE). LT designated by Baden, Frederiksen & Seberg, Nord. J. Bot. 17: 462 (1997).

ST: *M. Furume* 71, 1917, Hokori (TI).

**Recent Synonyms:** *Asperella coreana* (Honda) Nevski, Komarov, *Fl. URSS*, ii. 693 (1934).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -*ana*, indicating location. From Korea.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, culms solitary. Rhizomes short. Butt sheaths pubescent. Culms erect, 60–110 cm long, 3–4 -noded. Culm-internodes distally glabrous. Leaves basal and caudine. Leaf-sheaths glabrous on surface. Ligule an eciliate membrane, 1 mm long, truncate. Leaf-blades linear or lanceolate, 15–47 cm long, 6–11 mm wide. Leaf-blade surface scabrous, rough on both sides, pubescent, sparsely hairy or moderately hairy, hairy adaxially.

**Inflorescence.** Inflorescence composed of racemes. Peduncle pubescent above or pilose above. Racemes 1, single, straight or arcuate, bilateral, 8–13 cm long, 10 mm wide. Rhachis pubescent on surface. Spikelet packing broadside to rhachis, lax. Spikelets in pairs. Fertile spikelets sessile, 2 in the cluster.

**Fertile Spikelets.** Spikelets comprising 2–5 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 12–20 mm long, breaking up at maturity, disarticulating above glumes but not between florets. Rhachilla internodes scaberulous.

**Glumes.** Glumes persistent, similar, shorter than spikelet. Lower glume subulate, 7–8 mm long, 0.75–0.8 length of upper glume, 1 -veined. Lower glume lateral veins absent. Lower glume surface scabrous. Upper glume subulate, 8.5–10 mm long, 1 -veined. Upper glume lateral veins absent.

**Florets.** Fertile lemma lanceolate or elliptic, 9–11 mm long, coriaceous, without keel, 5–7 -veined, more than 3-veined. Lemma surface scaberulous, glabrous. Lemma apex attenuate, awned, 1 -awned. Principal lemma awn 2–3 mm long overall. Palea 8–10 mm long, 0.9 length of lemma. Palea keels ciliolate. Palea apex dentate, 2 -fid.

**Flower and Fruit.** Lodicules 2. Anthers 3, 6–7 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex.

$2n = 28$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** Russian Far East, **China, Eastern Asia, Russia.** Primorye. Manchuria. Korea.

### **Hystrix duthiei** (Stapf ex Hook. f.) Bor. *Indian Forester* lxvi. 544 (1940).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.L.Bor, *Grasses of Burma, Ceylon, India and Pakistan* (1960), T.Koyama, *Grasses of Japan and its neighboring regions* (1987) (as *Elymus*).

**TYPE** from India. **Basionym or Replaced Name:** *Asperella duthiei* Stapf ex Hook. f., *Fl. Brit. India* 7(22): 375 (1897) [1896]

. T:<Type of Basionym>; *fide* TROPICOS and Kew Synchrony Database: India: western Himalaya: Tihri-Garwhal, 7–8000 ft, *J.F. Duthie* 14564 (LT: K; ILT: BM).

**Illustrations (Books):** T.Koyama, *Grasses of Japan and its neighbouring regions* (1987) (55, Fig 14 as *Asperella*), S-L Chen et al, *Flora of China, Illustrations, Poaceae* (2007) (Fig. 720).

**Derivation** (Clifford & Bostock 2007): in honor of John Firminger Duthie (1845–1922) English botanist who collected in India.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial. Culms 80–100 cm long, 1.5–3 mm diam., 4–5 -noded. Leaves basal and caudine. Ligule an eciliate membrane, 1–1.5 mm long, truncate. Leaf-blades 10–20 cm long, 6–18 mm wide. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence composed of racemes. Peduncle pilose above. Racemes 1, single, drooping, bilateral, 10–15 cm long. Rhachis pilose on surface. Spikelet packing broadside to rhachis, lax. Spikelets in pairs. Fertile spikelets sessile, 2 in the cluster.

**Fertile Spikelets.** Spikelets comprising 1–2 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets, or of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 9–12 mm long, breaking up at maturity, disarticulating below each fertile floret. Floret callus pilose.

**Glumes.** Glumes persistent, similar. Lower glume subulate, 1–6 mm long, 1 -veined. Lower glume lateral veins absent. Lower glume surface scabrous. Upper glume subulate, 1–6 mm long, 1 -veined. Upper glume lateral veins absent. Upper glume surface scabrous.

**Florets.** Fertile lemma lanceolate, 9–11 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface scabrous, rough generally. Lemma apex acute, awned, 1 -awned. Principal lemma awn 12–25 mm long overall, limb scabrous. Palea lanceolate, 0.9 length of lemma, 2 -veined. Palea keels ciliolate. Palea apex acute. Rhachilla extension 0.33 length of fertile floret.

**Flower and Fruit.** Lodicules 2, scarious, ciliate. Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, linear, hairy at apex.

$n = 14$  (1 ref TROPICOS).  $2n = 28$  (1 ref TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia, Tropical Asia.

**Country /Province /State.** **Western Asia, China, Eastern Asia.** Iran. China South Central, China North-Central, China Southeast, Tibet. Japan Hokkaido, or Honshu, or Shikoku, or Kyushu. Japan. **Indian Subcontinent.** India, Nepal, West Himalaya.

Shaanxi. Anhui, Henan, Hunan, Zhejiang. Hubei, Sichuan, Yunnan. Uttah Pradesh.

**Hystrix japonica** (Hackel) Ohwi. *Acta Phytotax. & Geobot.*, Kyoto v. 185 (1936).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, T.Koyama, *Grasses of Japan and its neighboring regions* (1987) (as *Elymus*).

**TYPE** from Japan. **Basionym or Replaced Name:** *Asperella japonica* Hack., *Bull. Herb. Boissier* 7(9): 715 (1899)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: LT: *Matsumura* 3, 1882, Japan: Buzen: in monte Inugatake (G-BOISS; ILT: TI). LT designated by Baden, Frederiksen & Seberg, Nord. J. Bot. 17: 461 (1997).

**Illustrations (Books):** T.Koyama, *Grasses of Japan and its neighbouring regions* (1987) (56, Fig 15 as *Asperella*).

**Derivation** (Clifford & Bostock 2007): L. -ica, belonging to; Japan, a modified spelling Zhapan introduced into Europe by Marco Polo as a transliteration for the Chinese name for the large islands to the east of that country. From Japan.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, caespitose. Rhizomes short. Culms 60–80 cm long, 1–1.5 mm diam. Culm-internodes distally glabrous. Ligule an eciliate membrane. Leaf-blades 8–20 cm long, 8–15 mm wide, dark green. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence composed of racemes. Peduncle glabrous. Racemes 1, single, arcuate, bilateral, 8–12 cm long. Rhachis glabrous on surface, glabrous on margins. Spikelet packing broadside to rhachis, lax. Spikelets solitary. Fertile spikelets sessile.

**Fertile Spikelets.** Spikelets comprising 1 fertile florets, with a barren rhachilla extension. Spikelets of 1 fertile floret with or without additional sterile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 9–11 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes persistent, similar, shorter than spikelet. Lower glume subulate, 0.5–5 mm long, 1 length of upper glume, 1 -veined. Lower glume lateral veins absent. Lower glume surface scabrous. Upper glume subulate, 0.5–5 mm long, 1 -veined. Upper glume lateral veins absent.

**Florets.** Fertile lemma lanceolate or oblong, 9–11 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma margins pubescent. Lemma apex attenuate, awned, 1 -awned. Principal lemma awn 15–25 mm long overall. Palea 1 length of lemma. Palea keels ciliolate. Palea apex dentate, 2 -fid.

**Flower and Fruit.** Lodicules 2. Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State. Eastern Asia.** Japan Honshu, or Shikoku, or Kyushu. Japan.

**Hystrix komarovii** (Roshev.) Ohwi. *Acta Phytotax. & Geobot.* ii. 31 (1933).

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, S-L Chen et al, *Flora of China* 22 (Poaceae) (2006), N.Tsvelev, *Grasses of the Soviet Union* (1983), T.Koyama, *Grasses of Japan and its neighboring regions* (1987) (as *Asperella*).

**TYPE** from Russia. **Basionym or Replaced Name:** *Asperella komarovii* Roshev., *Bot. Mater. Gerb. Glavn. Bot. Sada SSSR* 5: 152 (1924)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synchrony Database: LT: V. Komarov s.n., 6 Aug 1895, Inter valles Sutar et Chingan fl. Amur medium (LE). LT designated by Baden, Frederiksen & Seberg, Nord. J. Bot. 17: 462 (1997).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): in honor of Vladimir Leontievitch Komarov (1869–1946) Russian botanist.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial, culms solitary. Rhizomes short. Culms erect, 30–130 cm long, 4–6 -noded. Culm-internodes distally glabrous. Leaf-sheaths glabrous on surface or puberulous. Ligule an eciliate membrane, 1.5 mm long, truncate. Leaf-blades linear or lanceolate, 10–20 cm long, 10–25 mm wide, dark green. Leaf-blade surface scaberulous, rough abaxially, pilose, sparsely hairy, hairy adaxially. Leaf-blade apex acute.

**Inflorescence.** Inflorescence composed of racemes. Peduncle pubescent above. Racemes 1, single, arcuate, bilateral, 10–20 cm long, 10–15 mm wide. Rhachis pubescent on surface, ciliate on margins. Spikelet packing broadside to rhachis, lax, with lowest internode elongated. Rhachis internodes linear, 3–7 mm long. Spikelets in pairs. Fertile spikelets sessile, 2 in the cluster.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 9–15 mm long, breaking up at maturity, disarticulating below each fertile floret. Rhachilla internodes 1–2 mm long, sparsely hairy. Floret callus pubescent.

**Glumes.** Glumes persistent, similar, shorter than spikelet. Lower glume subulate, 3–8 mm long, 1 length of upper glume, 1 -veined. Lower glume lateral veins absent. Lower glume surface scabrous, puberulous. Upper glume subulate, 3–8 mm long, 1 -veined. Upper glume lateral veins absent. Upper glume surface puberulous.

**Florets.** Fertile lemma lanceolate, 9–12 mm long, coriaceous, without keel, 5–7 -veined, more than 3-veined. Lemma surface hispidulous. Lemma apex attenuate, awned, 1 -awned. Principal lemma awn 10–15 mm long overall, 1 length of lemma, limb scabrous. Palea 8–9 mm long, 0.75–0.9 length of lemma. Palea keels ciliolate. Palea apex dentate, 2 -fid.

**Flower and Fruit.** Lodicules 2. Anthers 3, 2–3 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, linear, sulcate on hilar side, hairy at apex.

$2n = 28$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** Russian Far East, **China, Mongolia, Eastern Asia, Russia.** Amur, Primorye. Manchuria, China North-Central, China Southeast. Mongolia. Korea.

Hebei, Shaanxi. Heilongjiang, or Jilin, or Liaoning. Henan.

### ***Hystrix kunlunensis* Hao. *Engl. Jahrb.* 68: 580 (1938).**

**Accepted by:** S-L Chen et al, *Flora of China* 22 (Poaceae) (2006).

**TYPE** from China. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: ST: *Hao 1058*, 28 Aug, China: Qinghai: auf dem Plateau Da-ho-ba, 400 m, bis 100–150 m

ST: *Hao 1131*, 2 Sep, China: Qinghai Prov, Amne Matchin, auf dem Gebirge, 4500m.

**Illustrations:** None found.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Distribution (TDWG). Continent.** Temperate Asia.

**Country /Province /State.** **China.** Qinghai.

### ***Hystrix laevis* (Petrie) Allan. *Introd. Grasses N. Z.* : 88,155 (1936).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from New Zealand. **Basionym or Replaced Name:** *Asprella laevis* Petrie, *Trans. & Proc. New Zealand Inst.* 27: 406 (1895)

. T:<Type of Basionym>: *fide* TROPICOS and Kew Synonymy Database: HT: *D. Petrie s.n.*, Mar 1893, New Zealand: Matukituki Valley (WELT-68353). LT designated by Connor, New Zealand J. Bot. 32: 147 (1994).

**Illustrations:** None found.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Distribution (TDWG). Continent.** Australasia.

**Country /Province /State.** **New Zealand.** New Zealand North I, New Zealand South I.

### ***Hystrix patula* Moench. *Meth.* 295 (1794).**

**Accepted by:** R.J.Soreng et al., *Catalogue of New World Grasses* (2000–2003) and online (as *Elymus hystrix*), W.D.Clayton & K.Harman, *GrassBase* (2008) and online, U.Quattrocchi, *CRC World Dictionary of Grasses* (2006).

**TYPE** from USA. **Basionym or Replaced Name:** *Elymus hystrix* L., *Sp. Pl.* 1: 560 (1753). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: LT: *Clayton* 570, USA: Virginia (LINN-100.8; ILT: BM, US (fragm. ex BM)). LT designated by Hitchcock, Contr. U.S. Natl. Herb. 12: 124 (1908).

**Illustrations (Books):** M.E.Barkworth et al, *Flora of North America north of Mexico* Vol 24 Poaceae, part 1 (2007) (317 as *Elymus hystrix*).

**Images:** R.Darke, *Ornamental Grasses* (2004);, R.Darke, *The Encyclopaedia of Grasses for Liveable Landscapes* (2007); (as *elymus hystrix*).

**Derivation** (Clifford & Bostock 2007): L. outspread. Inflorescence an open panicle.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial. Culms 60–120 cm long. Leaf-sheaths smooth or scaberulous, glabrous on surface or pubescent, with reflexed hairs. Ligule an eciliate membrane. Leaf-blades 7–15 mm wide. Leaf-blade apex attenuate.

**Inflorescence.** Inflorescence composed of racemes. Racemes 1, single, bilateral, 8–15 cm long. Spikelet packing broadside to rhachis, lax. Rhachis internodes linear, 5–10 mm long. Spikelets spreading, in threes or clustered at each node. Fertile spikelets sessile, 3–4 in the cluster.

**Fertile Spikelets.** Spikelets comprising 2–4 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 10–15 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes both absent or obscure or one the lower absent or obscure, persistent. Upper glume subulate, 0–1 mm long, 1 -veined. Upper glume lateral veins absent.

**Florets.** Fertile lemma lanceolate, 9–11 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface glabrous or pubescent. Lemma apex attenuate, awned, 1 -awned. Principal lemma awn 10–40 mm long overall.

**Flower and Fruit.** Lodicules 2. Anthers 3. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex.

$2n = 28$  (2 refs TROPICOS).

**Distribution (TDWG). Continent.** Europe, North America.

**Region. Northern Europe** (\*).

**Country /Province /State :** GB Aliens (Ryves et al). **North-central USA, Northeast USA, South-central USA, Southeastern USA.** Illinois, Kansas, North Dakota, Nebraska, Oklahoma, South Dakota, Wisconsin. Connecticut, Indiana, Maine, Massachusetts, Michigan, Ohio, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia. Texas. Alabama, Arkansas, Georgia, North Carolina, South Carolina, Tennessee.

### ***Hystrix sibirica* (Trautv.) Kuntze. *Rev. Gen.* 778 (1891).**

**Accepted by:** W.D.Clayton & K.Harman, *GrassBase* (2008) and online, N.Tsvelev, *Grasses of the Soviet Union* (1983).

**TYPE** from Russia. **Basionym or Replaced Name:** *Asperella sibirica* Trautv., *Trudy Imp. S.-Peterburgsk. Bot. Sada* 5: 132 (1877). T:<Type of Basionym>; *fide* TROPICOS and Kew Synonomy Database: LT: A. Czekanowski & F. Müller s.n., 9 Jul 1874, ad fl. Olenek (LE). LT designated by Baden, Frederiksen & Seberg, Nord. J. Bot. 17: 463 (1997).

**Illustrations:** None found.

**Derivation** (Clifford & Bostock 2007): L. -ica, belonging to. From Siberia.

**Classification.** Subfamily Pooideae. Tribe: Triticeae.

**Habit, Vegetative Morphology.** Perennial. Rhizomes elongated. Culms 25–100 cm long. Ligule an eciliate membrane. Leaf-blades 10–30 cm long, 2–7 mm wide. Leaf-blade surface scabrous, rough adaxially, glabrous or pubescent, sparsely hairy, hairy adaxially.

**Inflorescence.** Inflorescence composed of racemes. Peduncle glabrous or pubescent above. Racemes 1, single, bilateral, 5.5–13 cm long. Rhachis pubescent on surface. Spikelet packing broadside to rhachis, lax. Spikelets solitary or in pairs. Fertile spikelets sessile, 1–2 in the cluster.

**Fertile Spikelets.** Spikelets comprising 2–3 fertile florets, with a barren rhachilla extension. Spikelets of 2 or more fertile florets. Spikelets one-many-flowered - if two-flowered then both fertile or the upper sterile. Spikelets lanceolate, dorsally compressed, 9–12 mm long, breaking up at maturity, disarticulating below each fertile floret.

**Glumes.** Glumes both absent or obscure or two, persistent, similar, shorter than spikelet. Lower glume subulate, 0–5 mm long, 1 length of upper glume, 1 -veined. Lower glume lateral veins absent. Lower glume surface scabrous. Upper glume subulate, 0–5 mm long, 1–3 -veined. Upper glume lateral veins absent or distinct.

**Florets.** Fertile lemma lanceolate, 7–9 mm long, coriaceous, without keel, 5 -veined, more than 3-veined. Lemma surface glabrous or puberulous. Lemma apex attenuate, awned, 1 -awned. Principal lemma awn 3–5 mm long overall. Palea 1 length of lemma. Palea keels ciliolate. Palea apex dentate, 2 -fid.

**Flower and Fruit.** Lodicules 2. Anthers 3, 4–5 mm long. Ovary pubescent on apex. Caryopsis with adherent pericarp, hairy at apex.

**Distribution (TDWG).** Continent. Temperate Asia.

**Country /Province /State.** Siberia, Russian Far East. Buryatiya, Chita, Krasnoyarsk. Magadan.