Taxonomic and nomenclatural notes on *Juncus*

Taxonomické a nomenklatorické poznámky k rodu *Juncus*

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Snogerup S., Zika F. P. & Kirschner J. (2002): Taxonomic and nomenclatural notes on *Juncus*. – Preslia, Praha, 74: 247–266.

New combinations and other nomenclatural notes on the *Juncaceae* (*Juncus* sections *Iridifolii, Steirochloa* and *Juncotypus*) are proposed within the framework of the preparation of the "Flora of the World" monograph of the family. New combinations are proposed in *Juncus prismatocarpus*, *J. arcticus*, *J. balticus* and *J. effusus*. On the basis of the new evaluation of Pacific North American plants examined by H. L. Lint in an unpublished thesis, two names are elevated to the species rank (*J. hesperius* and *J. exiguus*), and a new species is described (*J. laccatus*), all related to *J. effusus*.

K e y w o r d s : Taxonomy, nomenclature, *Juncaceae, Juncus* sect. *Iridifolii*, sect. *Ozophyllum*, sect. *Steirochloa*, sect. *Juncotypus*

Introduction

The monographic account of the *Juncaceae* is being prepared for publication in the series "Species Plantarum – Flora of the World" (Kirschner et al. 2002). Nomenclatural changes (new names, new combinations etc.) are not accepted in the series, and should be published separately, together with explanatory notes. A number of notes were published dealing with taxa of *Luzula* and some groups of *Juncus* (Kirschner & Kaplan 2001). In what follows, new names, combinations and other notes are presented concerning the sections *Iridifolii, Steirochloa* and *Juncotypus*.

The new treatment of *Juncus prismatocarpus* has been prepared by J. Kirschner, most of the work in the *Juncus balticus* group was performed by S. Snogerup, whilst most of the evaluation of the Pacific North American taxa is presented by P. F. Zika. The latter author was inspired by an unpublished thesis of Harold L. Lint (1977) who died before he could publish the results of the thesis. The evaluation revealed that the majority of taxonomic conclusions proposed by H. L. Lint can be accepted without substantial changes. We would like to dedicate this paper to the memory of H. L. Lint; in the cases when the names or descriptions are taken from the thesis almost unaltered, the combinations are attributed to him.

The section *Iridifolii* Kirschner et Snogerup

Juncus prismatocarpus R. Br., Prodr. 1: 259 (1810).

– *Juncus prismatocarpus* var. *genuinus* Buchenau, Bot. Jahrb. Syst. 6: 204 (1885), nom. inval.
Type: 'J' [NSW, Port Jackson area]; R. Brown [Bennett 5784]; holotype: BM; photo: NSW.

Juncus prismatocarpus is a species widely distributed from India to Japan and Kamchatka, and from China and Malesia to Australia and New Zealand. It is the only predominantly lowland species of the family frequent in the tropical regions, mostly found in swampy sites, wet open ground, in and near wet fields, along streams and paths etc. It was found extremely plastic and variable within the limits shown in the following description:

Caespitose perennials to c. 40 cm, stem usually compressed, c. 1–3 mm wide. Cataphylls 0–2, loose, basal leaves 0–3, cauline leaves 2–3 (4), compressed, pluritubular, imperfectly septate, rarely subcompressed, c. 2–8 (–12) cm long, 1.0–3. 2 mm wide, apex acute, sheaths ± loose, auricles obtuse, scarious, to 1 mm long. Lower bract leaf-like, usually shorter than inflorescence. Inflorescence anthelate, decomposite, of 3–25 (–40) cup-shaped to semiglobose, 3–15 (–25)-flowered heads, proliferation not rare. Capitulum bracts ovate-lanceolate, to c. 2 mm long, scarious. Tepals ± equal, narrowly lanceolate to linear-lanceolate, acuminate to acute, c. 2.5–4.0 mm long, greenish to stramineous, often suffused purplish. Stamens 3; anthers 0.3–0.8 mm long, shorter than filaments; style abbreviated, c. 0.1 mm long; stigmas ± patent, 1.0–1.5 mm long. Capsule unilocular, narrow, 3. 3–4.5 mm long, distinctly exceeding to ± equalling perianth, ± golden brown to pale castaneous, shining. Seeds ± ellipsoid, apiculate, c. 0.4–0.5 × 0.2–0.25 mm, pale brown, reticulate; appendages absent.

The overall variation of the species is quite complex but two main entities are usually recognized, often as varieties, sometimes as separate species. They are allopatric although in Japan some plants are intermediate. At the species level, the two taxa would bear the names *J. prismatocarpus* and *J. leschenaultii*, in the rank of variety, the epithets would be var. *prismatocarpus* and var. *nanus* (combination not available for the latter). Both the geographical distributions of the two taxa, and the stability and value of the distinguishing characters support their subspecific treatment. They can be distinguished by means of the following characters:

1a Capsule narrowly prismatic-trigonous to almost cylindric, usually gradually narrowing in an acute apex with rostrum c. 0.3 mm long; sheaths distally with broad margins; stem 1.3–3.0 mm wide... subsp. ***prismatocarpus***
1b Capsule ± narrowly ellipsoid-trigonous, ± abruptly narrowing in ± acute apex with rostrum 0.1–0.2 mm long; sheaths distally with narrow margins; stem to 1.5 (–2.0) mm wide..... subsp. ***leschenaultii***

Juncus prismatocarpus R. Br. subsp. *prismatocarpus*

= *Juncus commutatus* Steud., Syn. Pl. Glumac. 2: 301 (1855).
Type: [Australia] F. W. Sieber [Herb. Nov. Holl.] 431; lectotype: P, fide K. L. Wilson & L. A. S. Johnson, Telopea 9: 384 (2001); isolectotype: BM, K, L, MEL.

Densely caespitose, rhizome short. Stem erect, compressed, acute-edged, 1.3–3.0 mm wide. Leaves ancipiti-compressed, sheaths with distinct, broad membranous margins, auricles c. 0.5–1.0 mm long. Lower bract 3–14 cm long. Inflorescence of 10–25 (–40), usually (3–) 5–20 (–25)-flowered heads. Tepals (2. 2–) 2.5–3.0 (–3. 4) mm long, often slightly recurved

at apex. Anthers 0.5–0.7 mm; filaments c. 1.0 mm. Capsule narrowly prismatic-trigonous to almost cylindric, gradually narrowing in an acute apex, rarely more abruptly narrowed at the very apex with rostrum c. 0.3 mm long, c. 3.5–4.5 mm long, distinctly exceeding perianth.

Distribution: Australia, New Zealand, introduced temporarily in Great Britain and Hawaii.

Selected herbarium specimens: AUSTRALIA, NEW SOUTH WALES: between Port Jackson and Botany Bay, Jan 1908, J. L. Boormann [Kneucker, Cyper. Junc. Exs.] 262 (BRNU, PRA). QUEENSLAND: Brisbane, Coolum, 8 Jan 1984, G.-F. Saltzman (UPS); Windsor Tableland, N of Mt Carbine, A. Bean 4562 (BRI, NSW). TASMANIA: S Esk R. at Perth, 7 Feb 1979, W. Curtis & E. Cameron (HO, NSW). VICTORIA: Warburton, R. Melville 3832 (K, NSW). Nova Hollandia, east coast [probably NSW, locality not indicated], J. P. Verreaux 126 (UPS). NEW ZEALAND, NORTH ISLAND: Auckland, T. F. Cheeseman 26 (W); Waitakere Range, Bethells Swamp, R. Gardner 888 (AKU, NSW). SOUTH ISLAND: Marsden, A. J. Healy 61/73 (CHR).

Juncus prismatocarpus **subsp.** ***leschenaultii*** (Laharpe) Kirschner, **comb. nova**

≡ *Juncus leschenaultii* Gay ex Laharpe, Essai Monogr. Jonc. 49 (1825).
≡ *Juncus prismatocarpus* var. *leschenaultii* (Laharpe) Buchenau, Bot. Jahrb. Syst. 6: 205 (1885).
Type: [India, Nilgiri Mtns] E montibus Nelly-Gerry Indiae orientalis, indigenis Anivoulon, J. B. L. T. Leschenault; holotype: P; isotype: K.

= *Juncus sinensis* Gay ex Laharpe, Essai Monogr. Jonc. 49 (1825).
Type: Chine, G. Staunton; syntype: P, G-DC, W; Japon, C. P. Thunberg; syntype: G-DEL, n. v.

= *Juncus indicus* var. *nanus* Royle in D. Don, Trans. Linn. Soc. London 18: 323 (1840).
Type: [India] in Emodi montibus ad Mussooree, J. F. Royle; syntype: K.

= *Juncus unibracteatus* Griff., Not. Pl. Asiat. 3: 232 (1851) [see also Icon. Pl. Asiat. 3: plate 270, fig 8a-e (1851) or Itin. Pl. Khasyah Mts. (Posthum. Pap.) 232 (1851), n. v.
Type: [citation: Mogur,... in the sands of Brahmaputra] India, 29 Mar 1839, W. Griffith; syntype: K; Khasia, W. Griffith; syntype: K.

= *Juncus leschenaultii* var. *major* Miq., Ann. Mus. Bot. Lugduno-Batavum 3: 164 (1867); Prolus. Fl. Jap. 328 (1867).
Type: [Japan] P. F. Siebold s. n.; lectotype: L 904. 144–388, fide J. F. Veldkamp in K. L. Wilson & L. A. S. Johnson, Telopea 9: 368 (2001).

= *Juncus leschenaultii* var. *radicans* Franch. et Savat., Enum. Pl. Jap. 533 (1879).
Type: [Japan] circa Yokoska, P. A. Savatier 1356 p. p.; holotype: P; isotype: K.

= *Juncus prismatocarpus* subvar. *pluritubulosus* Buchenau, Bot. Jahrb. Syst. 12: 311 (1890).
Type: [Japan] Nagasaki, 1862, R. Oldham 897; **lectotype**: W, **designated here**.

= *Juncus prismatocarpus* subvar. *thermalis* Buchenau, Bot. Jahrb. Syst. 12: 311 (1890).
Type: [Russian Far East, Kamchatka] in den Saanschen heissen Quellen von Kamschatka, 1833, J. G. Rieder; holotype: W.

= *Juncus prismatocarpus* subvar. *viviparus* Koidz., Bot. Mag. (Tokyo) 29: 309 (1915).
Type: Japan, Sinano, Mt. Ontake, 1910, G. Koidzumi; syntype: KYO, n. v.

= *Juncus yakeisidakensis* Satake, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 4/2: 189 (1933).
Type: Honsyu, Mt Yakeisidake, Prov. Rikutyu, 6 Aug 1931, H. Iwabuchi; holotype: TI.

= *Juncus bombonzanensis* Satake, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot., 4/2: 182 (1933).
Type: [Taiwan] Formosa, Mt. Bombon [Bombonzan], 1918, E. Matuda; holotype: TI.

= *Juncus latior* Satake, J. Jap. Bot. 12: 20 [90] (1936).
Type: [Japan] Honsyu, Sagami, Zimmuzi, 6 Jun 1929, Y. Momiyama 454; holotype: TI.

= *Juncus hizenensis* Satake, J. Jap. Bot. 12: 48 [576] (1936).
Type: [Japan] Kyusyu, Prov. Hizen, Nishi-Sonogi-gun, Muramatsu-mura, Jun 1933, Type. Chiba; holotype: TI.

Densely to loosely caespitose, rhizome short to ascending. Stem erect or decumbent and rooting, compressed and acute-edged to subcompressed. Sheaths with narrow membranous margins, auricles 0.2–0.5 mm long. Lower bract usually 1.5–4 cm long. Inflorescence of 3–9 (–12), usually 3–8 (–15)-flowered heads. Tepals (2. 8–) 3.0–3.8 (–4. 2) mm long. Anthers 0.3–0.8 mm; filaments c. 1.0–1.2 mm long. Capsule ± narrowly ellipsoid-trigonous, ± abruptly narrowing in ± acute apex with rostrum 0.1–0.2 mm long, c. 3.3–4.2 mm long, ± equalling to exceeding perianth.

Distribution: Widely distributed in Malesia, Indo-China, Japan, China, the E Himalaya and India, extending to Nepal in the west and to Kamchatka in the northeast. Introduced in Mauritius.

Selected herbarium specimens: KAMCHATKA: South Kamchatka, Siku R., E. Hultén 3046 (K). HAINAN IS. : Tai Hon, 21 Apr 1922, F. A. McClure 9224 (K). CHINA SOUTHEAST: Jiangsu, Nanking, Fang Shan, A. N. Steward 2102 (K); Hunan, Ichang [Yizhang], A. Henry 3894 (K). JAPAN: Honshu, Kyoto, Amino-cho, Takeno-gun, 10 Jun 1994, S. Tsugaru & T. Takahashi 20314 (KYO); Honshu, Miyagi, Mt. Kurikoma, 9 Jul 1932, H. Kiriyama 17 (TI); Ryukyu, Okinawa, Kunigamison, Okunaha, 23 Jan 1924, Z. Tashiro (TI). KOREA: Hallaisan, 12 Aug 1908, E. Taquet 1569 (K). INDIA: Madhya Pradesh, Surguja [Ambikapur], Kamaleswarpur, H. F. Mooney 2228 (K). NEPAL: Dolakha, between Bishnutole and Busti, H. Tabata et al. 10071 (KYO). LAOS: between Tafa and Hosei-Tai, E. Poilane 24425 (K). THAILAND: Chiang-Mai, Doi Inthanon, 1020 m, N. Fukuoka T-62171 (KYO). MALAYA: Pahang [Kuala Pahang], Brinchang, 2 May 1965, B. Stone 5694 (KYO).

The section *Ozophyllum* Dumort.

The South American members of the group of *Juncus scheuchzerioides* Gaudich. include a pair of taxa, usually treated as separate species but sometimes not recognized at all. They usually are referred to as *J. stipulatus* Nees et Meyen and *J. chilensis* Gay. After a detailed study of the material in major herbaria (e. g., K, P), we cannot support the conclusions reached by Lourteig (1968) treating both taxa as separate species. In particular, the seed sculpture characters do not seem to draw a line between the two forms in a clear-cut way. On the other hand, the two taxa that occupy mostly overlapping geographical ranges, differ in characters of capsules and in style length. We consider it as most appropriate to treat the two taxa as varieties.

Juncus stipulatus Nees et Meyen in Meyen [Observ. Bot.] Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 13, suppl. 1: 126, 1843

Type: Chile, Valparaiso, Meyen s. n.; holotype: 'herb. Lucaeno', n. v.

= *Juncus oliganthus* Phil., Linnaea 29: 75 (1857).
Type: Chile, Valdivia, Corral, R. A. Philippi s. n.; holotype: SGO; isotype: BREM, G, K, MO, P.

= *Juncus mandoni* Buchenau, Abh. Naturwiss. Vereine Bremen 4: 121 (1874).
Type: Bolivia, La Paz, Larecaja, 2600–4100 m, G. Mandon 1440; lectotype: GOET, fide H. Balslev, Fl. Neotrop. Monogr. 68: 127 (1996); isolectotype: BM, BR, G, GH, K, LAU, MO, NY, P, S.

Illustration: F. Buchenau, Abh. Naturwiss. Vereine Bremen 4: tab. 3, fig. 1–7 (1874).

Map: H. Balslev, Fl. Neotrop. Monogr. 68: 128, fig. 63 (1996), Neotropical region.

Loosely caespitose perennials c. 2–10 (–20) cm, rhizome creeping, rooting, distally ascending and branched, gradually changing in stem, covered with scarious to stramineous scales to 1 cm long. Leaves mostly clustered along the transition zone between rhizome

and stem, c. 1–8 cm long, ±terete, unitubular, perfectly septate, sheaths 2–15 cm long, with scarious margins, auricles obtuse, 0.2–0.8 mm long. Lower bract leaf-like, to 2 cm long, sheath slightly shorter than inflorescence, blade acicular. Inflorescence of 1 (rarely 2), (1) 2–5-flowered terminal head. Tepals ±equal, 2.0–3.5 mm long, lanceolate, acute, central band green, later castaneous, bordered castaneous or stramineous, margins later scarious. Stamens 6, shorter than tepals; anthers 0.8–1.3 mm; filaments 1.5–2. 4 mm long. Capsule unilocular, broadly ellipsoid to ±ovoid, 2.5–3.5 mm long, light brown to dark, blackish brown, slightly exceeding perianth. Seeds ±ovoid, 0.4–0.6 × c. 0.3 mm, reticulate, brown; appendages absent.

D i s t r i b u t i o n : Widely distributed in W South America, from mountains of Colombia to Bolivia to southern Chile and Argentina. Edges of streams, lake shores, boggy habitats and open ground. Two varieties are recognized but further study is needed.

1a Style 0.4–0.5 mm long. Capsule subabruptly acuminate, distinctly mucronate.....var. ***stipulatus***
1b Style 0.1–0.3 mm long. Capsule subobtuse, shortly mucronate..... var. ***chilensis***

Juncus stipulatus Nees et Meyen var. *stipulatus*

= *Juncus microcephalus* var. *pusillus* E. Mey. in C. Presl, Rel. Haenk. 1: 142 (1827).
Type: Peru, T. Haenke s. n.; holotype: PR, n. v.

= *Juncus corralensis* Phil., *Linnaea* 33: 269 (1864).
≡ *Juncus stipulatus* var. *corralensis* (Phil.) Buchenau, Junc. S. Amer. 394 (1879).
Type: Chile, Valdivia, Corral, 1859, Krause s. n.; holotype: SGO; isotype: SGO, P.

I l l u s t r a t i o n s : M. Barros, Darwiniana 10: 360, fig. 26 (1953); M. Barros, Darwiniana 10: 415, fig. 43 (1953); A. Lourteig, Publ. Comit. Nat. Franc. Rech. Antarct., Biol. 23: 43, fig. 3 (1968); H. Balslev, Fl. Neotrop. Monogr. 68: 125, fig. 61, A–C (1996).

M a p : A. Lourteig, Publ. Comit. Nat. Franc. Rech. Antarct., Biol. 23: 38 (1968).

Style 0.4–0.5 mm long. Capsule subabruptly acuminate, distinctly mucronate. Seeds with scattered tubercules in the reticulation fields.

D i s t r i b u t i o n : In the Andes from Colombia, Bolivia, Ecuador and Peru to southern Argentina and Chile.

S e l e c t e d h e r b a r i u m s p e c i m e n s : COLOMBIA: Caldas, Páramo del Quindio, 3700–4200 m, F. W. Pennell & T. E. Hazen 9963 (GH, K, NY, PH, US). ECUADOR: Imbabura, Laguna Mojanda, 3600–3700 m, H. Balslev & F. Quintana 24122 (AAU, F, K, NY, QCA). **85.** ARGENTINA NORTHWEST: Mendoza, San Carlos de Bariloche, 770 m, 11 Feb 1905, O. Buchtien (L, PR, S, SI). CHILE CENTRAL: Aconcagua, Riecillo, 3000 m, H. Gunckel 3873 (L); Curico, Cordillera Peteroa-Planchon, Cañon Rio Claro, 1700 m, Y. Mexia 7884 (K).

Juncus stipulatus* var. *chilensis (Gay) Kirschner, **comb. nova**

≡ *Juncus chilensis* Gay, Fl. Chil. 6: 146 (1854).
Type: Chile, Colchagua, Cordillera de Talcaregüe, S. Fernando, 1833, C. Gay s. n.; holotype: P; isotype: BREM, MO, P, SGO.

= *Juncus gayanus* Steud., Syn. Pl. Glumac. 2: 300 (1855).
Type: Chile, Colchagua, Cordillera de Talcaregüe, 1833, C. Gay s. n.; holotype: P; isotype: MO.

= *Juncus depauperatus* Phil., Fl. Atacam. 53 (1860), nom. illeg., non Ten.
Type: Antofagasta, Atacama Desert, Cachinal de la Sierra, 2100 m, R. A. Philippi s. n.; lectotype: SGO, fide H. Balslev, Fl. Neotrop. Monogr. 68: 127 (1996); isolectotype: SGO, K.

Illustrations: F. Buchenau, Junc. S.-Amer., tab. 4 (1879); A. Lourteig, Publ. Comit. Nat. Franc. Rech. Antarct., Biol. 23: 46, fig. 4 (1968).

Map: A. Lourteig, Publ. Comit. Nat. Franc. Rech. Antarct., Biol. 23: 38 (1968).

Style 0.1–0.3 mm long. Capsule subobtuse, shortly mucronate. Seeds with lines of fine tubercules across the reticulation fields.

Distribution: Known from Chile and adjacent Argentina, also reported from Bolivia and Peru.

Selected herbarium specimens: ARGENTINA NORTHWEST: Jujuy, Moreno, 3500 m, 21 Dec 1901, R. E. Fries 949 (P, S). CHILE CENTRAL: San Fernando, Feb 1831, C. Gay (P). CHILE SOUTH: Magallanes, R. San Martín, 6 Feb 1896, P. K. H. Dusén (UPS).

The section *Steirochloa* Griseb.

The eastern forms of *Juncus persicus* Boiss. (group of *Juncus gerardii* Loisel.) are usually recognized as a separate subspecies. The taxon was given a name *J. persicus* subsp. *vvedenskyi* by V. S. Novikov. However, there is an earlier epithet available at the subspecific level: *J. gerardii* subsp. *libanoticus*. A new combination is made to make the taxonomic treatment in accordance with nomenclatural rules:

Juncus persicus* subsp. *libanoticus (Thiébaut) Novikov et Snogerup, **comb. nova**

≡ *Juncus libanoticus* Thiébaut, Bull. Soc. Bot. France 95: 20 (1948).
≡ *Juncus gerardii* subsp. *libanoticus* (Thiébaut) Snogerup in K. H. Rechinger, Fl. Iranica 75: 13 (1971).
Type: [Lebanon] Bekoa; syntype: n. v.; [Turkey] marais d'Amik; syntype: n. v.; [Lebanon] de Beskinta à Khan Sannin; syntype: n. v.

= *Juncus vvedenskii* V. Krecz., Bull. Univ. As. Centr. 21: 176 (1935).
≡ *Juncus persicus* subsp. *vvedenskii* (V. Krecz.) Novikov, Nov. Syst. Pl. Vasc. 15: 85 (1979).
≡ *Juncus gerardii* subsp. *vvedenskyi* (V. Krecz.) Novikov, Bull. Soc. Natur. Mosc. 95: 114 (1990).
Type: Uzbekistania, Bajssun, 17 May 1930, S. Lepeschkin; holotype: TAK.

Juncus arcticus Willd.

Juncus arcticus, a species with a large circumarctic distribution is not highly variable but certain morphotypes with a well-defined geographic distribution are recognized as separate taxa. One of them, confined to N Mongolia, Tuva and Yakutiya (probably also found in adjacent regions of Siberia), is characterized primarily by capsules distinctly exceeding perianth. It was described as a separate species, *Juncus grubovii* by V. S. Novikov. When the overall variation of the species is taken into consideration, the rank of subspecies seems to be more appropriate to this variant. The new combination and a detailed description of the subspecies is given below:

Juncus arcticus* subsp. *grubovii (Novikov) Novikov, Kirschner et Snogerup, **comb. nova**

≡ *Juncus grubovii* Novikov, Byull. Moskovsk. Obshch. Isp. Prir., Otd. Biol. 86/5: 103 (1981).
≡ *Juncus muelleri* subsp. *grubovii* (Novikov) Novikov, Byull. Moskovsk. Obshch. Isp. Prir., Otd. Biol. 95/5: 116 (1990).
Type: Mongolia borealis, ditio Chubsugulskij, 120 km ad boreali-occidentem ab opp. Muren, in glareosis humidis ad ripam sinistram fl. Delger-Muren, 20 km supra ostium Beltes-Hola, 14 Aug 1980, A. I. Gubanov 8660; holotype: MW; isotype: LE.

Plants 25–32 cm; stem 1.2–2.5 mm in diam., ± smooth. Lower cataphylls grey-brown to dark brown, not shiny, upper ones stramineous grey-brown, the uppermost one grey-brownish to greenish-stramineous, ± loose, to c. 4–5 cm long. Lower bract 3–5 cm long, c. 1/4–1/6 of stem. Inflorescence 2–5-flowered, of 1–3 subsessile flowers and 1 (–2) branches to 1–1.5 cm long. Bracteoles to c. 2 mm long, ovoid, subobtuse, membranous. Tepals subequal, outer longer, ± acute, oblong-ovoid, 3.5–4. 3 mm long, inner ones ± obtuse, to c. 3.5 mm long, central band greenish pale brown, bordered dark castaneous-brown, margins broad, membranous. Anthers c. 0.6–0.7 mm; filaments 0.7–0.8 mm; style c. 0.2 mm; stigmas to 1.3 mm long. Capsule oblong to ellipsoid-ovoid, c. 3.8–5.2 mm long, the narrower upper part subabruptly narrowing in subacute apex, brown to deep castaneous-brown, conspicuously exceeding perianth. Seeds oblong-ovoid, c. 0.7 × 0.30–0.35 mm, apiculate, pale brown, finely striate and indistinctly transversally reticulate.

Relationships between *Juncus arcticus* Willd. and *J. balticus* Willd.

Juncus arcticus has a wide circumarctic distribution. It occurs closely sympatric with forms of the *J. balticus* complex in several parts of area and keeps its distinct differences in several characters. It is therefore treated as a separate species isolated from its close relatives by genetic as well as ecological barriers. Hylander (1953) included the entire *J. balticus* complex in *J. arcticus* and stated that frequent intermediates existed. His opinion was followed by a number of later authors. However, neither in field nor in the herbaria has it been possible to verify the existence of the frequent intermediates.

Juncus balticus in the narrower circumscription accepted here includes a series of local races, most of them with wide distributions. They have been treated at different ranks, some as species, others as subspecies or varieties. We find that they are of comparable status, and it will then be most logical to treat all under the same rank. For a series of forms of mainly allopatric distributions because of geographical and ecological separation, the rank of subspecies seems to be appropriate. For the majority of them the rank of subspecies was already used, but under different species and different names.

The taxonomy of *Juncus balticus* is summarized below:

Juncus balticus Willd., Ges. Naturf. Freunde Berlin Mag. Neuesten Entdeck. Gesammten Naturk. 3: 298 (1809)

– *Juncus balticus* var. *europaeus* Engelmann, Trans. Acad. Sci. St. Louis 2: 441 (1866), nom. inval.
≡ *Juncus arcticus* subsp. *balticus* (Willd.) Hylander, Bot. Not. 106: 354 (1953).
≡ *Juncus helodes* Link, Enum. Pl. Horti Berol. 1: 305 (1821), nom. illeg.
≡*Juncus glaucus* var. *littoralis* Wahlenb., Fl. Suec. 209 (1824) [*Juncus balticus* cited among syntypes].
Type: [Germany] an den sandigen Meeresufern bei Warnemünde, 1809, Detharding; holotype: B-WILLD.

Perennial, 25–100 (–250) cm, with sparcely branching rhizome with mostly 5–10 mm long nodes. Stem leafless, smooth; 1–10 mm thick, blueish green, smooth or as dry inconspicuously 30–70-striate, lacking subepidermal sclerenchyma strands, epidermis cells uniform, bundles in three variously well defined rows, rarely interspaced with lacunar tubes; pith continuous, rarely finely interrupted (subsp. *andicola*), initially of asterisciform cells, later irregular, arachnoid; cataphylls 3–6, upper ones 3–30 cm, stra-

mineous to light brown, mostly with no or short awnlike blade but in some American races with one or rarely two well developed blades. Inflorescence pseudolateral, diffuse, (5–) 25–66 (–80)-flowered. Lower bract considerably exceeding inflorescence, 1/5–1/3 as long as stem; flowers bracteolate. Tepals 3.2–5.0 mm, subequal, obtuse to apiculate, light to dark brown with broad scarious margin. Stamens 6; anthers 0.8–l. 5 mm, 1.5–2 (–6) times as long as filaments. Style 0.8–1.0 mm; stigmas 1.5–2.0 mm. Capsule 3.0–4.5 mm, equalling or slightly exceeding perianth, trigono-ovoidal, with mucro 0.2–0.3 mm, unilocular, triseptate, usually light brown, shining. Seeds 0.8–1.0 × 0.4 mm, ovoid, faintly striate-reticulate, with two inconspicuous appendages.

Seven geographically and morphologically defined subspecies are recognized to classify the complexity of *J. balticus*. However, the extensive variation in Pacific North America remains to be further studied. Another local form to be evaluated is documented by plants allegedly collected in Turkey, vil. Bursa, Ulu Dađ.

1a Stem usually 3–10 mm in diam.; pith often finely interrupted ..... g. subsp. ***andicola***
1b Stem 1–3 (–4) mm in diam.; pith continuous **2**
2a Uppermost cataphyll usually with a well developed blade; stem usually slightly compressed and twisted ..... e. subsp. ***mexicanus***
2b Uppermost cataphyll without blade or with a minute, acicular blade **3**
3a Inflorescence usually contracted, 6–10-flowered; longest peduncles to 1 cm ..... c. subsp. ***cantabricus***
3b Inflorescence diffuse to subcontracted, usually more than 10-flowered; peduncles usually longer than 1 cm ... **4**
4a Capsule rostrum 0.3–0.7 mm long; main inflorescence branches 0.3–0.5 mm thick **5**
4b Capsule rostrum 0.2–0.3 mm long; main inflorescence branches 0.5–0.8 mm thick **6**
5a Some peduncles and inflorescence branches flexuous; bracteoles to c. 1.5 mm long; E an EC USA and E Canada ..... d. subsp. ***littoralis***
5b Peduncles and inflorescence branches straight; bracteoles usually 1.5–2.5 mm long; Alaska, W North America, Mexico and Guatemala ..... f. subsp. ***ater***
6a Style 0.7–0.9 mm long; anthers 1.1–1.5 mm long; cataphylls abaxially deep yellow-brown to dark brown proximally ..... a. subsp. ***balticus***
6b Style 1.0–1.2 mm long; anthers 1.4–2.0 mm long; cataphylls abaxially red-brown or dark castaneous proximally ..... b. subsp. ***pyrenaeus***

a. *Juncus balticus* Willd. subsp. *balticus*

Mostly 25–80 cm; rhizome ± long-noded, creeping, c. (3–) 4–6 mm in diam.; stems in loose to subdense rows. Cataphylls usually 3, c. 6–12 cm long, abaxially dull stramineous distally, yellowish pale brown, ± dull proximally (later getting almost blackish), adaxially stramineous-silvery. Stem 1.5–3.0 mm in diam., terete, ± light green to mid-green, rigid; pith initially of rounded asterisciform cells. Lower bract usually c. 7–17 cm long, 1/5–1/3 as long as the stem. Inflorescence diffuse, (5–) 25–60 (– c. 80)-flowered, main branches straight, c. 0.5–0.8 mm in diam. Bracteoles ovate, acute, to c. 1.5 mm long, stramineous to pale castaneous. Tepals subequal, lanceolate, outer ± acute, (3.2–) 3.7–4.0 (–4.7) mm, central band greenish, distinct, bordered deep castaneous, margins narrow or absent, inner tepals slightly shorter, acute to mucronate, with distinct membranous margins. Anthers c. 1.1–1.5 mm, 1.5–2 times as long as filaments; filaments c. 0.4–0.6 mm; style 0.7–0.9 mm; stigmas c. 1–2 mm. Capsule oblong-ovoid, trigonous, acute with mucro 0.2–0.3 mm long, pale brown to pale castaneous, c. 3.3–3.8 mm long, usually ± exceeding perianth. Seeds ovoid, c. 0.7–1.0 × 0.35–0.40 mm, pale brown, faintly reticulate. 2n = 80, 84, fide Ö. Nilsson & S. Snogerup, Bot. Not. 124: 315 (1971) [uncertain counts].

D i s t r i b u t i o n : Along the coast of S Scandinavia, S and E Baltic coast, rarely in Iceland and Great Britain.

b. *Juncus balticus* subsp. *pyrenaeus* (Timb.-Lagr. et Jeanb.) Fourn., Quatre Fl. Fr. 146 (1946)

≡ *Juncus pyrenaeus* Timb.-Lagr. et Jeanb., Bull. Soc. Sci. Phys. Nat. Toul. 6: 232 (1884).
≡ *Juncus arcticus* Willd. subsp. *pyrenaeus* (Timb.-Lagr. et Jeanb.) Rivas-Goday et Borja, Anales. Inst. Bot. Cavanilles 19: 512 (1961).
Type: [Spain, the Pyrenees] Montlouis, Llagone, Conangle, la Quillane, Real; syntype: n. v.

Nomenclatural note on the subspecies published by P. Fournier: Heywood (1958) argued against the validity of names published at the subspecific rank by P. Fournier, Quatre Fl. Fr. (1946). Two arguments were given to support his opinion: First, the names did not have a form required by the nomenclatural code (for instance, "*J. Balticus* Willd. S.-E. [sous-espéce = subspecies] *J. Pyrenaeus* Timb.-Jeanb."). In fact, cases similar to the latter example are explicitly treated in Art. 24.4, Ex. 4 of the Code, and the argument of Heywood is no longer relevant nowadays; such names are to be cited as *J. balticus* subsp. *pyrenaeus*, and must be considered as validly published. The other argument is not easy to understand. Heywood analysed a rather inconsistent system of indirect references to authors of basionyms of new combinations, and indeed it is difficult to distinguish the combinations intended as new, new names and combination published by earlier authors. Heywood concluded that the Fournier's subspecific names should have been treated as a "summary indication of rank which they should be given but without a consistent (or even any) attempt to adopt the corresponding nomenclature". In spite of the very fact of rather confusing authorship and author references given by Fournier, the Code does not recognize the term "summary indication of rank"; the term 'sous-espéce' was used properly, and there is no possibility other than adoption of the Fournier's names at the rank of subspecies.

Plants (25–) 30–45 (–70) cm, forming dense to loose stands, rhizome creeping, 2–4 mm in diam., sparsely branched, with very short to 1.5 cm long nodes. Cataphylls usually 3–4, tight, 6–10 cm long, abaxially stramineous-brown or often reddish brown to castaneous distally, red-brown or dark castaneous proximally, glossy, blade minute or absent. Stem terete, 1–3 mm thick, pith of irregular cells with long processes, becoming arachnoid. Lower bract usually 9–16 cm long. Inflorescence mostly 1–3 cm, lax or rarely ± contracted, mostly (9–) 12–32-flowered. Bracteoles ovate, c. 1.5 mm long, scarious to castaneous. Outer tepals 4.0–5.4 mm, apiculate to acute, central band greenish, bordered deep castaneous, margins of variable width, scarious, inner slightly shorter, usually 3.5–4.5 mm long, lanceolate, mucronate to acute, castaneous-brown with broad green midrib and membranous margin. Stamens 1.8–2.6 mm; anthers 1.4–2.0 mm, 2.5–4.5 times as long as filaments 0.4–0.6 mm long; style c. 1.0–1.2 mm; stigmas to c. 2.0 mm. Capsule 3–4 mm long, narrowly trigonous-ovoid, subacute with mucro 0.2–0.3 mm long, ± equalling perianth, usually light to golden brown. Seeds ± ovoid, c. 0.7–0.8 mm long, faintly reticulate.

D i s t r i b u t i o n : S France and N Spain, the Pyrenees and Sierra de Gúdar.

Intermediates between subsp. *pyrenaeus* and subsp. *cantabricus* are known from the Spanish Pyrenees and Teruel.

c. ***Juncus balticus* subsp. *cantabricus*** (Diaz Gonzales, Fernandez-Carvajal et Fernandez Prieto) Snogerup, **comb. nova**

≡ *Juncus cantabricus* Diaz Gonzales, Fernandez-Carvajal et Fernandez Prieto, Trab. Dep. Bot. Univ. Oviedo 2: 13 (1977).
Type: Picos Albos (1800 m) Somiedo (Asturias), 5 Oct 1977, C. Fernandez-Carvajal et Fernández Prieto; holotype: FCO 6456.

Plants (15–) 20–40 cm, forming loose stands, rhizome creeping, 2.5–4.5 mm in diam., sparsely branched, with short or up to 1.5 cm long nodes. Cataphylls 4–5, stramineous to castaneous and glossy abaxially, upper with short awnlike blade. Stem terete, 1.0–2.5 mm thick, pith even in young stems arachnoid. Lower bract c. 4–10 cm long. Inflorescence usually contracted, mostly 6–10 (–19)-flowered, peduncles usually to 1 cm long. Bracteoles ovate, to 2 mm long, acute, castaneous at base. Tepals lanceolate, outer slightly longer, 3–4 mm long, lanceolate, acute to acuminate, inner subobtuse and mucronate to ± acute, 2.5–3.3 mm long, castaneous-brown with broad green central band and broad scarious to membranous margins. Anthers 0.7–1.3 mm, 1.9–2.6 times as long as filaments 0.4–0.6 mm long; style 0.5–0.7 mm; stigmas c. 1 mm long. Capsule c. 3 mm long.

D i s t r i b u t i o n : Spain, Cordilliera Cantabrica, Sierra de Gúdar.

d. ***Juncus balticus* subsp. *littoralis*** (Engelmann) Snogerup, **comb. nova**

≡ *Juncus balticus* Willd. var. *littoralis* Engelmann, Trans. Acad. Sci. St. Louis 2: 442 (1866).
≡ *Juncus litorum* Rydberg, *Brittonia* 1: 85 (1931).
≡ *Juncus arcticus* subsp. *littoralis* (Engelmann) Hultén, Kungl. Svenska Vet.-Akad. Handl. 8,5: 24 (1962).
≡ *Juncus arcticus* Willd. var. *littoralis* (Engelmann) Boivin, Phytologia 42: 405 (1979).
Type: Ipswich, Mass., 1842, Oakes s. n.; **lectotype**: MO, **designated here**.

Plants usually 35–80 cm, usually forming dense stands, or in loose rows; rhizome 2–7 mm in diam.; sometimes with nodes up to 2 cm long. Cataphylls 3–4, usually to 5–10 (–15) cm long, abaxially dull to slightly glossy, yellowish-stramineous distally, middle part usually castaneous to yellowish brown, proximally yellow-brown to castaneous, ± glossy, adaxial side yellowish-silvery, glossy, upper cataphyll with awnlike blade to c. 1.5 mm long. Stem ± paler green, terete, c. 0.8–1.5 (–2.0) mm in diam., pith initially of perfectly asterisciform cells. Lower bract c. 3–17 cm long. Inflorescence usually diffuse, rarely condensed, 1–3 (–6) cm, 5–20 (–25)-flowered, main branches often flexuose, usually 0.3–0.5 mm in diam. Bracteoles ovate, acute, to c. 1.5 mm, castaneous-brown at base, distally ± scarious to pale brownish. Tepals subequal, lanceolate, outer 3.3–4.4 mm long, with central band greenish to pale brown, bordered blackish to dark castaneous-brown, margins usually broad, membranous, inner tepals subacute, 3.1–3.9 mm long. Anthers 1.3–1.6 (–2.0) mm, 3–4 times as long as filaments 0.4–0.6 mm long; style 0.9–1.2 mm; stigmas c. 1.5 mm long. Capsule narrowly oblong-ovoid, subtrigonous, 3.1–4.0 mm, ± equalling perianth, castaneous-brown to dark castaneous-brown, shining, ± acute and mucronate, mucro 0.3–0.6 mm long. Seeds 0.7–0.8 × 0.40–0.45 mm, outer seed coat ± loose, faintly reticulate. 2n = 80, fide N. A. Harriman & D. Redmond, Rhodora 78: 731 (1976).

D i s t r i b u t i o n : E Canada and NE and NC USA, especially coastal areas and near the Great Lakes and other major watercourses.

e. ***Juncus balticus* subsp. *mexicanus*** (Willd. ex Roemer et Schultes) Snogerup, **comb. nova**

≡ *Juncus mexicanus* Willd. ex Roemer et Schultes, Linn. Syst. Veg., ed. 16, 7/1: 178 (1829).
≡ *Juncus balticus* Willd. var. *mexicanus* (Willd.) O. Kuntze, Rev. Gen. Pl. 3/2: 320 (1898).
≡ *Juncus arcticus* Willd. var. *mexicanus* (Willd.) Balslev, Brittonia 35: 308 (1983).
Type: Mexico, Humboldt & Bonpland s. n.; holotype: B-W 6843.

= *Juncus compressus* Humb., Bonpl. et Kunth, Nov. Gen. 1: 235 (1816), nom. illeg., non Jacquin (1762).
≡ *Juncus complanatus* Schult. et Schult. fil. in Roemer et Schultes, Linn. Syst. Veg. 7/1: 185 (1829).
Type: Mexico, Chapoltepec, San Augustin de las Cuevas and Real del Monte, Humboldt & Bonpland s. n.; holotype: P.

= *Juncus orizabae* Liebmann, Vidensk. Medd. Nat. Foren. Kjoebenhavn 1850: 39 (1850).
Type: Mexico, Mt. Orizaba, 3650 m, Sep 1841, Liebmann s. n.; holotype: C; isotype: W, fragment.

= *Juncus balticus* Willd. var. *durangensis* Buchenau in A. Engler, Pflanzenreich IV, 36(25): 146 (1906).
Type: Mexico, Durango, Apr-Nov 1896, Palmer 188; lectotype: W, fide H. Balslev, Fl. Neotrop. Monogr. 68: 96 (1996); isolectotype: G, K, US etc.

= *Juncus balticus* Willd. var. *columnaris* Buchenau in A. Engler, Pflanzenreich IV, 36(25): 145 (1906).
Type: Chile, Atacama, 2400 m, 19 Jan 1904, Reiche s. n.; holotype: W.

= *Juncus balticus* Willd. var. *crassiculmis* Buchenau in Grisebach, Pl. Lorentz. 219 (1874).
≡ *Juncus crassiculmis* (Buchenau) Herter, Rev. Sudamer. Bot. 6: 149 (1940).
Type: Argentina, Catamarca, Laguna Blanca, Lorentz 448; lectotype: GOET, fide H. Balslev, Fl. Neotrop. Monogr. 68: 96 (1996); isolectotype: W.

Plants (10–) 20–70 cm, forming loose to dense stands; rhizome creeping, ± long-noded, 3–6 mm thick, stems often in dense groups from abbreviated rhizome branches. Cataphylls usually 2–3, very loose, broad, to 8 (rarely to 10) cm long, pale stramineous in distal 2/3–3/4, dull, yellowish brown to mid-brown, rarely dull pale castaneous at base, pale stramineous adaxially, lower without or with short awnlike blade, uppermost usually with well developed blade. Stem with 1–2 mostly well developed basal leaves, terete but usually ± compressed and slightly twisted, 1–2 (–3) mm thick, smooth or irregularly slightly striate, green to greyish green; pith continuous, dense, of asterisciform cells. Well developed leaves 5–30 cm, terete, auricles short, rounded, somewhat cartilaginous. Lower bract often short, 1.5–5.0 cm (rarely to 15–30 cm), shorter than to three times as long as inflorescence, with a conspicuously pointed tip. Inflorescence pseudolateral, 1–3 (–5–10) cm long, diffuse or with several loose clusters on short, usually flexuose peduncles usually 0.2–0.4 mm thick, flowers most often 5–20. Bracteoles pale stramineous to scarious, sometimes pale castaneous-brown at base, ovate, acute, c. 1.5 mm long. Tepals 3.5–5.0 mm, subequal, lanceolate, outer acuminate, midrib greenish to stramineous, usually bordered pale brown to deep castaneous-brown, with broad, scarious margins, inner acute to acuminate, sometimes subobtuse and mucronate. Anthers 1.4–1.6 mm, much longer than filaments c. 0.4 mm long. Capsule 3.5–5.0 mm, ± equalling tepals, narrowly oblong-ovoid, subtrigonous, abruptly contracted to mucro 0.3–0.5 mm, castaneous-brown to brown. Seeds ellipsoid to narrowly ovoid, pale brown, 0.8–0.9 × 0.40–0.45 mm, oblong-ovoid, outer seed coat ± loose, finely reticulate.

D i s t r i b u t i o n : From Washington through Oregon and California, eastwards to New Mexico and W Texas, southeast to S Mexico and Guatemala, disjunct occurrence in high mountains of Peru, Bolivia and Chile, and probably near sea level in Patagonia (Balslev 1996).

The Andean form, at least partly corresponding to var. *columnaris* Buchenau, forms dense and high tussocks mostly consisting of former years' growth.

f. ***Juncus balticus*** **subsp.** ***ater*** (Rydberg) Snogerup, **comb. nova**

≡ *Juncus ater* Rydberg, Fl. Rocky Mts. 151, 1060 (1917).
≡ *Juncus arcticus* subsp. *ater* (Rydberg) Hultén, Kungl. Sv. Vetenskapsakad. Handl. IV, 8(5): 24 (1962).
≡ *Juncus balticus* var. *montanus* Engelmann, Trans. Acad. Sci. St. Louis 2: 442 (1866).
≡ *Juncus arcticus* var. *montanus* (Engelmann) Welsh Anders., Fl. Alaska 611 (1974).
Type: USA, Rocky Mountain Flora, lat. 39ş–41ş, 1862, E. Hall & J. P. Harbour 567; lectotype: MO, fide H. Balslev, Fl. Neotrop. Monogr. 68: 97 (1996); isolectotype: MO, PR.

Plants (25–) 40–120 (–150) cm, forming ± dense stands, with usually short-noded creeping rhizome. Cataphylls 3–4, usually lax, less often ± tight, abaxially stramineous-brown distally, usually dull (rarely slightly glossy) castaneous at base, upper c. 7–15 cm long, with short awnlike blade. Stem (0.7–) 1.5–4.0 mm thick, terete, pale to greyish green, not compressed nor twisted, pith continuous, of asterisciform cells, later ± arachnoid. Inflorescence mostly diffuse, (5–) 10–30 (–45)-flowered, main branches straight, c. 0.3–0.4 mm in diam. Bracteoles ovate, 1.5–2.0 (–2.5) mm long, acute, castaneous at least at base. Tepals ± equal, ± narrowly lanceolate, outer often slightly longer, 3.5–5.0 mm long, acuminate, castaneous with lighter midrib, often becoming stramineous, sometimes ± entirely deep castaneous, inner tepals subobtuse and mucronate or acute. Anthers 1.2–1.8 (–2.2) mm; 2–4 times as long as filaments 0.4–0.6 (–0.7) mm long; style (0.7–) 0.9–1.3 mm; stigmas c. 2–3 mm long. Capsule oblong-ovoid, trigonous, subabruptly narrowing in mucro usually 0.4–0.7 mm long, c. 3.5–4.5 mm long, subequalling perianth, dark castaneous-brown or brown. Seeds 0.7–0.8 × c. 0.4 mm, faintly reticulate.

Distribution: From Alaska through western N America to S Mexico and Guatemala.

An extremely variable, perhaps heterogeneous subspecies consisting of several local forms differing in stem diameter, length of lower bract, number of flowers in the inflorescence etc. It requires further investigation.

g. ***Juncus balticus*** **subsp.** ***andicola*** (Hooker) Snogerup, **comb. nova**

≡ *Juncus andicola* W. J. Hooker, Ic. Pl., ser. 2,8: pl. 714 (1848).
≡ *Juncus arcticus* var. *andicola* (W. J. Hooker) Balslev, Brittonia 35: 308 (1983).
Type: Ecuador, Andes of Quito, Jameson 51; holotype: K; isotype: BM, G.

Usually robust plants (20–) 50–110 (–170) cm, forming large and often dense stands; rhizome creeping, 2.5–10.0 mm in diam., with 1–4 cm long internodes. Cataphylls usually 3, large, (10–) 15–25 cm long, with awnlike blade, upper distally stramineous, stramineous-brown in the middle, darker towards the base, ± dull, adaxial side silvery stramineous, lower cataphyll often blackish brown, glossy. Stem (1–) 3–10 mm thick, terete, not compressed and twisted; pith of asterisciform cells, often interrupted. Lower bract usually 7–15 (–40) cm long. Inflorescence much branched, 2–15 cm, dense, with 20-several hundred flowers, sometimes wholly congested, usually partly congested, partly of ± dense heads on peduncles to 6 cm long and c. 0.5–0.7 mm in diam. Bracteoles ovate, 1.5–2.0 mm, acute, reddish brown. Tepals subequal, 4.5–6.0 mm, narrowly lanceolate, outer acute-acuminate, inner acutish, central band pale brown to dark castaneous-brown, the rest red-brown to dark castaneous-brown, margins narrow. Anthers 1.3–1.7 mm; filaments 0.6–0.8 mm; style 0.7–1.0 mm; stigmas c. 1.0–2.0 mm long. Capsule ellipsoid-ovoid, trigonous, c. 3.8–5.5 mm long, shorter than to equalling perianth, acuminate, gradually

narrowing in rostrum c. 0.5 mm long. Seeds ellipsoid, pale brown, c. 0.6–0.8 × 0.3–0.4 mm, faintly reticulate; appendages absent.

Distribution: C and S America, some localities in C to SE Mexico and Guatemala, main distribution along the Andes through Colombia, Ecuador, Peru, Bolivia and Argentina.

Juncus effusus L.

Juncus effusus is an extremely variable taxon, even in the narrow sense accepted here. We find it necessary to divide it into subspecies, also following the treatments of North American plants, cf. Hämet-Ahti (1980), Lint (1977) and Zika (2002). The African forms of *Juncus effusus* (the population south of Sahara, and on islands to the east and west) represent another entity, variable but still recognizable and deserving the subspecific status.

Juncus effusus* subsp. *laxus (Rob. et Tourn.) Snogerup, **comb. nova**

≡ *Juncus laxus* Robyns et Tournay, Bull. Jard. Bot. Brux. 25: 252 (1955).
Type: Congo, Kivu Province, Kundhuru-Ya-Tshuve, de Witte 1976; holotype: BR.

= *Juncus oehleri* Graebner, Bot. Jahrb. Syst. 48: 506 (1913).
Type: [Tanzania] Deutsch-Ostafrika, Ossirwa-Seen, [= Masai/Mbulu Distr., Lake Ossirwa], 20 Feb 1907, Oehler 499; holotype: B, n. v., probably destroyed.

= *Juncus canariensis* Willd. ex E. Mey., Syn. Luzul. 29 (1823).
≡ *Juncus effusus* var. *canariensis* (E. Mey.) Buchenau, Krit. Verz. Juncac. 11 (1880).
Type: [Canary Is.] in Canariis, Desfontaines; syntype: B-W 6873.

Mostly 80–120 cm. Cataphylls to 20 cm long, stramineous above, dark red-brown below, ± dull, blade filiform, to 1 cm long. Inflorescence mostly lax, to 8 × 8 cm, branches thin and lower often pendulous, flowers solitary or clustered, bract not constricted below inflorescence. Outer tepals 1.7–2.5 mm, inner 1.5–2.0 mm, linear-lanceolate, acuminate-subulate. Anthers 0.4–0.5 mm, shorter than filaments c. 0.5 mm long; style c. 0.1 mm; stigmas to 1 mm long. Capsule 1.6–2.0 (–2.5) mm, trigonous, oblong-ellipsoid to obovoid, obtuse. Seeds c. 0.4 mm long.

Atlantic Islands, Africa south of Sahara, including Madagascar and neighbouring islands. Also reported as locally occurring in Spain and Portugal (Fernandez-Carvajal 1982).

Selected herbarium specimens: MADEIRA: NW Casa de Arieiro, 1575 m, 25 Jun 1965, Wängsjö 1184 (LD). Santo do Serra, Dec 1968, Kraft (LD). KENYA: Mt. Kenya, Marimba Forest, Polhill & Verdcourt 313 (K). ZIMBABWE: Mare Dam in Nyanga Recreational Park, 2000 m, 3 Jan 1991, S. Laegaard 16113 (LD). SOUTH AFRICA, CAPE PROVINCES: between Smitswinkel Bay and Stangkop Point, 18 Dec 1934, Hafström (LD). MADAGASCAR: Andasibe, National Park 145 km E of Antanarivo, 16 Nov 1995, Desfayes (LD); Ambositra, c. 290 km S of Antanarivo, 11 Nov 1995, Desfayes (LD).

Pacific North American species of the sect. *Juncotypus*, group *J. effusus*, characterized by slender stems

Western North America is the center of variation in the group of species closely related to *J. effusus*. The detailed study of this complex by H. L. Lint (1977) led to the result that three taxa previously regarded as varieties by most botanists (Ceska 2001; Fernald & Wiegand 1910; Hitchcock & Cronquist 1973; Swab 1993) deserve recognition at a higher rank. They share the following characters: densely cespitose, stamens three, pith continuous, stems slender, most often 0.8–1.6 mm in diameter, smooth to faintly 20–25 striate, capsule shorter than to equalling perianth, triseptate, trigonous oblong-obovoid, and tepals with green mid-veins bordered by medium- to dark-brown bands. They appear closely related to the slender-stemmed *Juncus patens* E. Mey., which is sympatric but differs from all of them in its six stamens, blue-green stems, and in details of the sheaths. *Juncus effusus* L. subspecies are closely related, but are coarser, taller, and can be readily separated by their broad fertile culms (averaging 2.1–3.5 mm wide at the upper cataphyll apex), by their pale tepals, and by the characters of the upper cataphyll apex.

The distribution of slender-stemmed taxa is confined to Califonia, Oregon, Washington, and British Columbia, on the Pacific coast of western North America. They can be identified by means of the following key:

1a Upper cataphylls dark brown or castaneous, thickened, highly glossy, smooth, veins inconspicuous ..... ***J. laccatus***

1b Upper cataphylls green, pale brown with age, thin and membranous, dull or slightly shiny, never highly glossy, smooth or minutely papillose (30 ×), veins conspicuous **2**

2a Upper cataphyll apex symmetrical, slightly thickened, darkened, and inrolled, narrowly bordered with thin margin; cataphylls not papillose (30×); tepals with medium brown stripes bordering green midvein (sometimes fading to pale brown with age); upper stems (culms) smooth, green and shiny when fresh, drying to blue-green and strongly few-ridged ..... ***J. exiguus***

2b Upper cataphyll apex asymmetrical, thin and membranous, green or pale brown with age, flat not inrolled, with broad thin margins or wings; cataphylls papillose (30×); tepals with dark brown stripes bordering green midvein; upper stems smooth to slightly ridged when fresh, green and slightly shiny, drying to green and strongly few-ridged ..... ***J. hesperius***

Juncus exiguus (Fernald et Wiegand) H. L. Lint ex Snogerup et P. F. Zika, **comb. nova**

≡ *Juncus effusus* L. var. *exiguus* Fernald et Wiegand, Rhodora 12: 87 (1910).
Type: U.S.A., California, Yosemite Valley, Jul 1866, H. N. Bolander 4949; holotype: GH; isotype: UC.

Densely cespitose perennials, usually 40–90 cm, rhizome very short-noded. Stem leafless, terete, 0.8–1.4 (–1.6) mm in diam., smooth, green and shiny when fresh, blue-green and striate when dry, with c. 30–40 low flat ridges, subepidermal sclerenchyma strands present, 5–25; pith continuous, of asterisciform cells; cataphylls 3–4, upper mostly (3–) 5–11 (–14) cm, pale brownish castaneous at base, green above, drying to pale brown, sheaths dull, thin and membranous, tight, not papillose; sheath apex symmetrical, obtuse or rounded, slightly thickened, darkened, and inrolled, narrowly bordered with thin margin. Lower bract 4.3–21.0 cm, exceeding the inflorescence, its sheath moderately widened; lower middle bract 2–7 mm long, with a ± narrow membranous margin and reduced blade c. 0.3–4.0 mm long. Inflorescence usually diffuse, fastigiate, c. 1–7 cm long, 0.6–4.0 cm wide. Tepals subequal, lanceolate, acuminate to apiculate, soft, ± erect-spreading, with

a greenish midrib bordered by medium (to dark) brown bands and a narrow scarious margin, outer 1.8–3.0 mm, inner 1.5–2.3 mm. Stamens 3; anthers 0.7–0.8 mm, about equalling filaments; style 0.1–0.3 mm. Capsule unilocular, trigonous obovoid, 2.2–3 mm long, ± shorter than to equalling tepals, with no or short mucro, pale olive-brown, rarely dark brown. Seeds 0.4–0.6 mm, obliquely obovoid, reticulate, with pale apex; appendages absent.

Distribution: From the Cascade Mountains of central Oregon south through the Klamath Mountains into northern California and the W slopes of the Sierra Nevada. We have not seen material to verify reports from Pinal Peak, Gila County, Arizona (Kearney and Peebles 1942) or from Nevada (Kartesz 1999).

Habitat preferences are springs, swamps, marshes, creekbanks, gravelbars, pondshores, vernally moist slopes in open coniferous forest, and roadsides. It does not seem to occur in habitats flooded in summer. It has been collected from 1000 to 1900 m elevation, over granite, volcanics, pumice, and serpentine substrates.

Selected herbarium specimens: U. S. A., CALIFORNIA: Humboldt Co., swamp near McKay camp, 1675 m, 17 Jul 1930, Tracy 8982 (WTU); Mariposa Co., Yosemite Valley, Bolander [G. Engelmann, Herb. Junc. Bor.-Amer. Norm.] 9 (C, JEPS, RSA, PR, UC); Tuolumne Co., dry roadside, over granite, W slope of Sierra Nevada, elev. 1912 m, 37o 46' N, 119o 48' W, 3 Sep 2001, P. F. Zika 16483 (GH, PRA, WTU). OREGON: Coos Co., Rock Creek, Iron Mtn, 24 Aug 1948, Baker 5615 (OSC); Curry Co., Snow Camp Meadow, over peridotite, elev. 1070 m, 11 Jul 1981, Greenleaf 881 (OSC); Douglas Co., Cow Creek, 10 km SW of Riddle, ca. 1250 m, 8 Jul 1975, Crosby 221 (OSC); Jackson Co., wet ground near summit of Mt. Ashland, 2 Sep 1958, Bellinger s. n. (WILLU); Josephine Co., 40 km NW of Grants Pass, 1160 m, 7 Jul 1973, Denton 3084 (WTU); Klamath Co., Thousand Springs, Crater Lake National Park, 1830 m, 9 Sep 1994, P. F. Zika 12290, Newhouse & Brainerd (CLNP, WTU); Lane Co., rill, Vesuvius/Bohemia Mine, 1430 m, 8 Aug 1927, Henderson & Patterson s. n. (ORE).

Juncus exiguus is similar to and closely related to *J. patens* E. Mey. They both share the densely cespitose growth habit, with prominent veins on a green sheath with a symmetrical apex. However, *J. patens* differs in its more narrow, long tapering, and less clasping upper cataphyll apex, as well as having six stamens and fresh stems blue-green and strongly ridged. *Juncus exiguus* has fresh stems smooth and green. *J. exiguus*, with its symmetrical cataphyll apex that is slightly indurated, is more closely related to *J. laccatus*, but the latter always has thicker, much darker, glossier cataphylls and upper cataphyll apices, less prominent veins, and somewhat darker tepals.

Juncus laccatus P. F. Zika, **spec. nova**

Type: U.S.A., Washington, Clallam Co., low wet ground, south side of Route 101 near Dry Creek and Dry Creek Road, 6 air km SSE of Angeles Point, Olympic Peninsula, 140 m, 48°06' N, 123°31' W, 27 Sep 2001, P. F. Zika 16611; holotype: WTU; isotype: CAN, GH, MICH, MO, NY, OSC, PRA, UBC, UC, US.

= *Juncus effusus* var. *gracilis* Hook., Fl. Bor.-Amer. 2: 190 (1838).
Type: [U. S. A.] N. W. coast [Oregon or Washington, probably shores of Columbia River], 1825, D. Douglas s. n.; **lectotype**: K, **designated here**.

Diagnosis: A *Junco exiguo* (e sectione *Juncotypus*) cataphyllis superne castaneis nitidissimis crassis, venis inconspicuis apice coriaceis paulo incrassatis et anthracinis necnon tepalis atrobrunneis differt. A ceteris speciebus cognatis caulibus tenuibus, plerumque (0.5–) 0.8–1.8 (–2.5) mm in diametro, medulla continua asterisciformi repletis, indistincte valleculatis, cataphyllis arcte appressis, laevibus (non scabridulis), staminibus 3, capsula perigonium subaequante differt.

D e s c r i p t i o n : Densely caespitose perennials usually 25–108 cm; fresh upper stems shiny and smooth, green, wiry; dried stems c. (0.5–) 0.8–1.8 (–2.5) mm in diam., faintly striate with c. 30–40 ridges, subepidermal sclerenchyma strands 5–25, pith continuous, of asterisciform cells; cataphylls 3–4, upper usually (5–) 6–15 (–18) cm long, deep brown to castaneous throughout, coriaceous, glossy, smooth, not papillose, veins inconspicuously raised, dried sheaths often wrinkled longitudinally, sheaths tight but deeply split, margins not overlapping below apex; sheath apex symmetrical, rounded and firm (slightly thickened), black, glossy, sometimes slightly notched, never winged, apical veins convergent to parallel. Blade vestigial. Lower bract 3–12 (–17) cm long, much exceeding inflorescence; lower middle bract 1.8–7.0 mm long, with a narrow margin and mucro 0.1–3.3 mm long. Inflorescence mostly compact and not conspicuously fastigiate, usually dense, usually 1–4 × 1–2 cm, sometimes loose and larger. Tepals ±equal, lanceolate, acuminate, dark brown with narrow greenish central band, outer 2.2–2.8 mm, inner 1.8–2.6 mm, attenuate, margins very narrow. Stamens 3; anthers c. 0.6–0.8 mm long, about equalling filaments. Capsule unilocular, trigonous-obovoid, c. 2.5 mm long, conspicuously shorter than tepals, usually obtuse and shortly mucronate, brownish. Seeds obliquely ovoid, c. 0.4–0.6 mm long, apiculate, reticulate; appendages absent. 2n = 40, 42, fide H. L. Lint (1977); 2n = 80, Calder & Taylor 36078 (UBC) cited in Taylor & Mulligan (1968).

D i s t r i b u t i o n : From coastal British Columbia south through western Washington on the coast and in the southern Cascade Mountains of Washington, south into the northern Cascades of Oregon, and south along the coast to northern California and the northern Sierra Nevada. We have not seen specimens to verify a report from Alaska (Hitchcock et al. 1969).

Habitat preferences are wet clay to sandy soils, peatlands, sedge meadows, swales, springs, pond and lake shores, streambanks, roadside ditches, and disturbed wet places. Collections are from sea level to 1500 m elevation, over granite, volcanics including lahar, and conglomerates.

S e l e c t e d h e r b a r i u m s p e c i m e n s : CANADA, BRITISH COLUMBIA: Queen Charlotte Islands, Moresby Is., Alliford Bay, 5 Aug 1957, Calder, Savile & Taylor 23234 (MO, UBC); Queen Charlotte Islands, Graham Is., McIntyre Bay, 10 m, 5 Sep 1998, P. F. Zika 13554 (MICH, WTU); NE Vancouver Is., Claud Elliot Lake, 305 m, Roemer 208 (UBC); Vancouver, Pacific Spirit Regional Park, 27 Jul 1991, Schofield s. n. (UBC); South Burnaby, around pond, clay landfill, 27 Jul 1994, Lomer s. n. (UBC). U. S. A., WASHINGTON: Clallam Co., Lake Ozette, Ericson's Bay, 11 m, 3 Aug 1986, Buckingham 3926, et al. (ONP); Port Angeles harbor, 3 m, 27 Sep 2001, P. F. Zika 16615 (WTU); Cowlitz Co., Castle Creek drainage, devoid of most vegetation, Mt. St. Helens debris flow revegetation survey, 3 years after the eruption, 900 m, 26 Jul 1983, Joyal 644 (OSC); Grays Harbor Co., Carlisle Lakes area, ca. 25 m, 20 Jun 1981, Buckingham 2560 (ONP); W of Carlisle, road to Aloha, 9 Jul 1933, Helmrich 174 (WTU); Jefferson Co., S Fork Hoh River, 230 m, 24 Jun 1987, Rust 239 (ONP); Klickitat Co., by springs on mountains, 6 Jul 1892, Suksdorf 2157 (GH); near Gilmer, 18 Jul 1906, Suksdorf 5711 (WTU); Mason Co., Lilliwaup swamp, Melbourne Lake, 230 m, 22 Jun 1977, Buckingham 1076 (ONP); Skamania Co., Lower Muddy River mudflow, 3 yrs after eruption of Mt. St. Helens, 595 m, 25 Jun 1983, Joyal 623 (OSC). OREGON: Benton Co., Marys Peak, 17 Jun 1916, Gilbert 554 (OSC); Clackamas Co., Aug 1898, Elmer 1611 (ORE); meadows below Barlow Pass, Mt. Hood, 1 Aug 1927, Leach 1117 (ORE); Clatsop Co., lower end of Saddle Mt. Road, 11 Jul 1947, Peck 24287 (WILLU); Columbia Co., Rainier, 3 m, 26 Sep 1998, P. F. Zika 13625 (WTU); Coos Co., Golden and Silver Falls State Park, 14 Jul 1988, Thompson 88-1622 & Skeese (ORE); Douglas Co., headwaters of Doe Creek, 670 m, 28 Sep 1998, P. F. Zika 13627 (WTU); Hood River Co., Cooper Spur, 1220 m, Milburge 1511 (WTU); Lane Co., Big Fall Creek, 6 Jun 1938, Henderson 18719 (ORE); Marion Co., Breitenbush Hot Springs, 5 Jul 1930, Peck 16259 (WILLU); Tillamook Co., summit of Coast Mts, 455 m, 21 Jul 1927, Thompson 3025 (WTU); Devils Lake Fork, Wilson River, 504 m, 9 Jul 1990, Halse 4058 (OSC); Yamhill Co., Walker Flat, Coast Range, 552 m, 20 Jul 1985, Halse 3183 (OSC). CALIFORNIA: Tuolumne Co., Trout Creek, Stanislaus National Forest, 28 Jul 1971, Wiggins 21714 (OSC); 4 km E of Long Barn, 24 Jul 1979; McNeal 2275 (OSC); Trinity Co., between Dubakella and S Dubakella Mt., 1525 m, 4 Jul 1973, Smith & Sawyer 7093 (WTU).

The dark shiny thick cataphylls of *Juncus laccatus* are distinctive. Occasional specimens like Hitchcock 24052 (WTU) have paler cataphylls, greenish or olive-blackish, due to shade or juvenile growth, but the mature cataphylls are still are thickened, shiny, with inconspicuous veins, and have the black hardened symmetrical tips characteristic of the species. Plants of the Sierra Nevada show a taxonomically insignificant tendency to have cataphylls slightly less dark (rufous to medium dark-brown, rather than deep brown or castaneous or blackish-brown) and cataphylls slightly less shiny than plants from the coast and further north. The glossy cataphylls of *J. laccatus* look varnished, the source of the specific epithet. A similar sheen is found in the Eurasian and African *Juncus inflexus* L., a species differing in its purple-black cataphylls, chambered pith, and blue-green stems. Two east Asian taxa also have dark shiny cataphylls, *J. decipiens* (Buchenau) Nakai and *J. setchuensis* Buchenau, but the gloss and dark coloring is confined to the base of the cataphyll in the latter. *Juncus decipiens* also has pale upper cataphylls, as well as an essentially trilocular capsule; *J. laccatus* has triseptate, unilocular fruits.

Juncus hesperius (Piper) H. L. Lint, **comb. nova**

≡ *Juncus effusus* subsp. *hesperius* Piper, Contrib. US Nat. Herb. 11: 180 (1906).
≡ *Juncus effusus* var. *bruneus* Engelmann, Trans. Acad. Sci. St. Louis 2: 491 (1868).
Type: [California] Bolinas Bay near San Francisco, 12 Aug. 1866, A. Kellogg [G. Engelmann, Herb. Junc. Bor.-Amer. Norm.] 10; **lectotype**: MO, **designated here**; isolectotype: LD, POM.

Perennial, (30–) 40–60 (–100) cm, densely caespitose, rhizome very short-noded. Stem leafless, terete, usually 1–2 mm thick, light green, with c. 20–30 ridges conspicuous when dry; subepidermal sclerenchyma strands present, epidermis cells uniform; pith continuous, of asterisciform cells; cataphylls 3–4, upper (4–) 10–15 (–20) cm, with small awnlike blade, lax, pale brown to greenish above, reddish-brown and often shining and slightly scabrid at base. Inflorescence pseudolateral, 1–3 (–5) cm, dense to loose, flowers numerous, solitary or loosely clustered, Lower bract (5–) 7–15 (–35) cm, considerably exceeding inflorescence, sheath constricted below the inflorescence. Bracteoles ± ovate, c. 1.0–1.5 mm long, pale castaneous to scarious. Tepals 2–3 mm, outer usually slightly longer than inner, acuminate, inner acute, all dark brown or deep castaneous-brown with greenish center and narrow scarious margin. Stamens 3; anthers 0.5–0.7 mm; filaments 0.5–0.6 mm; style c. 0.1 mm; stigmas 0.5–1.0 mm. Capsule triseptate, 2.0–2.5 mm, shorter than to about equalling tepals, trigonous oblong-obovoid to trigonous-oblong, slightly exceeding perianth, c. 2.0–2.7 mm long, obtuse or slightly retuse, shortly mucronate, dark olive-brown or castaneous-brown at apex. Seeds pale brown, 0.4–0.5 × c. 0.2 mm, obliquely obovoidal, reticulate; appendages absent.

D i s t r i b u t i o n : Western coast of North American from Queen Charlotte Islands in British Columbia south to near Santa Barbara in California. We have not seen collections to substantiate reports from the Rincon Mts., Pima Co., Arizona (Kearney & Peebles 1942). All records border the Pacific Ocean, except two from northern Oregon 70 km inland, but both near sea level and the Columbia River.

Habitats include springs, wet meadows, peatlands, swales, pondshores, low open ground flooded in winter, creekbanks, the upper margin of estuarine marshes, ditches, and disturbed wet areas. It has been collected from sea level to 90 m, with one record from the Coast Range of northwestern Oregon at 730 m.

Selected herbarium specimens: CANADA, BRITISH COLUMBIA: Queen Charlotte Islands, Moresby Is., Upper Victoria Lake, rare, 6–8 Jul 1964, Calder & Taylor 35801 (MO, UBC); Kyuquot, Spring Is., 0 m, 9 Jul 1958, Taylor & Szczawinski 391 (UBC, V); Vancouver Is., Ucluelet, 0 m, 19 Aug 1963, Taylor 6728 (UBC); Vancouver Is., Loss Creek, between Port Renfrew and Victoria, 24 Jun 1961, Calder & MacKay 30975 (UBC, UC); Lulu Is., 14 Jun 1937, Eastham s. n. (UBC); Surrey Bend Bog, S side of Fraser River, 15 m, 1 Aug 1976, Pinder-Moss 1362 (UBC); U. S. A., WASHINGTON: Clallam Co., Roose's Prairie, 40 m, 2 Jul 1984, Dott & Gianniny 28 (ONP); W of Port Angeles, P. F. Zika 16610 (PRA, WTU); Grays Harbor Co., near Aloha, 9 Jul 1933, Thompson 9361 (WTU); Island Co., southern Whidbey Is. Freeland, 15 m, 6 Sep 2001, P. F. Zika 16500 (PRA, WTU); Jefferson Co., trail to Hoh, 90 m, 8 Jul 1927, Otis 1544 (WTU); King Co., Kirkland Lake, 20 Jun 1938, Eyerdam 1675 (WTU); E bank Duwamish River, Seattle; 26 Jul 2001; P. F. Zika 16426 & Jacobson (PRA, WTU); Pacific Co., Willapa River mouth, Raymond, P. F. Zika 13574 (WTU); Willapa Bay, 12 Jul 1952, Batlett & Grayson 680 (WTU); San Juan Co., San Juan Is., Mineral Point, 10 m, 8 Aug 1998, P. F. Zika 13524a (WTU); San Juan Is., False Bay, 20 m, 8 Sep 2001, P. F. Zika 16512 (PRA, WTU); Whatcom Co., Point Roberts, Benson Road, P. F. Zika 16572 (WTU). OREGON: Clackamas Co., Boring, 18 Jul 1919, Suksdorf s. n. (WS); Clatsop Co., John Day, 20 Aug 1902, Sheldon 10190 (ORE); base of Onion Peak, 730 m, 13 Aug 1971, Chambers 3338 & Rodin (OSC, WTU); Curry Co., Gold Beach, 24 Jul 1945, Peck 23966 (WILLU); bog, Port Orford, 30 Jun 1919, Peck 8612 (WILLU); Lane Co., Darlingtonia Botanical Wayside State Park, 9 Jun 1992, Thompson 92-24 & James (OSC); Woahink Lake, 12 Jul 1937, Sipe s. n. (ORE); Lincoln Co., Seal Rock, 5 Sep 1917, Peck 5149 (WILLU); 13 km N of Newport, 9 Jun 1943, Fleischman s. n. (OSC); Multnomah Co., Willamette Heights, Portland, 22 Jun 1902, Sheldon 10672 (ORE); Tillamook Co., Lake Lytle, 7 Jul 1924, Peck 13328 (WILLU). CALIFORNIA: Humboldt Co., Big Lagoon, Tracy 6763 & Parks (WTU); Marin Co., Hearts Desire, S shore of Tomales Bay, Ewan 8106 (POM); San Mateo Co., Route 1 near Pigeon Point, 15 m, 1 Sep 2001, P. F. Zika 16478 (WTU).

Juncus hesperius is unusual in its asymmetrical cataphyll apex and papillose cataphylls, characters shared with the two native subspecies of *J. effusus* on the west coast of North America, *J. effusus* subsp. *pacificus* (Fernald & Wiegand) H. L. Lint (in Zika 2002, in press), and *J. effusus* subsp. *austrocalifornicus* H. L. Lint (in Zika 2002, in press). Both are coarser plants with much thicker stems, that dry to show many fine ridges, where *J. hesperius* is a more delicate plants with narrower stems that dry to show fewer and broader ridges. *Juncus effusus* subsp. *pacificus* also differs in its much darker cataphylls, brownish-black from base to summit, and pale tepals. *Juncus effusus* subsp. *austrocalifornicus* has the thick stems characteristic of *J. effusus*, has pale tepals, and is largely a montane plant in southern desert areas, while *J. hesperius* is strictly coastal from further north, and has brownish-black bands on the tepals. The asymmetrical cataphyll apex of well-developed upper cataphylls is a quick means of separating *J. hesperius* from *J. exiguus* and *J. laccatus*, taxa that are similar in their slender stems and darkened tepals. Not all cataphylls of *Juncus hesperius* are clearly asymmetrical (e. g. Smith 833 [WTU]), especially cataphyll apices of the lower cataphylls or upper cataphyll apices if the plant was collected immature, or damaged by grazing or rough handling when uprooted. However, usually at least some asymmetrical cataphyll apices can be found on a mature plant. If not, examine the flat widely winged and pale membranous cataphyll apex, and papillose cataphyll, to separate *J. hesperius* from *J. exiguus*, with its epapillose cataphyll and narrow margins and slightly darkened thickened bent cataphyll tip. *Juncus laccatus* has thick dark epapillose cataphylls, and it matures roughly two weeks later where sympatric with *J. hesperius*. Balslev (1996) believed that *J. laccatus* (*J. effusus* var. *gracilis*) was most closely related to *Juncus aemulans* Liebm., but the latter has pale upper cataphylls and at least some plants show some membranous winged and asymmetrical cataphylls, suggesting a closer relationship with *J. hesperius*. *J. aemulans* needs more study. It has slender stems, and dark tepals like *J. hesperius*, but differs most obviously in its non-papillose cataphylls and high elevation habitat from the Mexican Plateau south to Guatemala.

A note on the name *Juncus luzuliformis*

There is a widely accepted Chinese species of *Juncus* sect. *Stygiopsis* Kuntze called *Juncus luzuliformis* Franch. 1887. In the literature, another name that might represent an earlier homonym of *J. luzuliformis* Franch. is seldom mentioned (e. g., Buchenau 1890: 177), *Juncus luzuliformis* P. Gennari, Sp. Var. Rimarch. Nuove Fl. Sarda 22 (1866) [as *J. luzulaeformis*]. Recently, the latter publication was studied to check the validity of the latter name. The examination of the protologue leads to the conclusion that the name was not accepted by P. Gennari, and therefore cannot be considered as validly published.

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Souhrn

Připravovaná monografie čeledi *Juncaceae* (v rámci projektu Species Plantarum: Flora of the World) přináší řadu nových poznatků, vedoucích jak k popisu nových taxonů, tak i nových pohledů na taxonomické skupiny doposud vždy vyhodnocované v užším geografickém měřítku. Předložená práce obsahuje popis nového druhu, *Juncus laccatus* P. F. Zika, pacifického severoamerického taxonu z blízkosti *Juncus effusus* s. l., charakterizovaného temnými katafyly (nápadnými pochvami při bázi lodyh) se ztlustlým horním okrajem. Nové kombinace zahrnují australoasijský druh *J. prismatocarpus* ze sekce *Iridifolii* (subsp. *lechenaultii*), jihoamerický druh z okruhu *J. scheuchzerioides* (*J. stipulatus* var. *chilensis*), africké populace druhu *Juncus effusus* (subsp. *canariensis*), řadu poddruhů *Juncus balticus*, a konečně dva druhy z okruhu *Juncus effusus* s tenkými lodyhami z pacifického pobřeží Severní Ameriky (*J. exiguus* a *J. hesperius*).

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