

bands: inflorescence from dense to somewhat loose (1–4 cm. in diameter).

Uppermost sheath close, coriaceous, lustrous, usually castaneous throughout var. *gracilis*.

Uppermost sheath looser, membranous, dull, greenish-drab above.

var. *brunneus*.

- C. Flowers medium or large, sepals 2.5–4.2 mm. long (rarely shorter): perianth-segments with no very conspicuous brown bands, frequently firmer in texture, often rigid, appressed or somewhat spreading: inflorescence commonly open, rarely somewhat dense, 1.5–14 cm. in diameter.

Summit of the uppermost sheath broad, usually emarginate, the edges much overlapping almost or quite to the tip; and with the cluster of veins very strongly converging at the summit: sheaths rarely paler above: inflorescence conspicuously fastigate. var. *pacificus*.

Summit of the uppermost sheath somewhat narrowed, merely rounded, the edges not overlapping within 1 cm. of the top; veins much less strongly converging: upper sheaths much paler above: inflorescence irregularly spreading, rarely slightly fastigate.

Sepals rarely exceeding either the petals or the capsule, 2.5–3.5 mm. long, firm, not conspicuously spreading nor strongly contrasting in color with the capsule: culms 2–4.5 mm. in diameter at the top of the sheaths, not sulcate var. *solutus*.

Sepals exceeding both the petals and the capsule, 3–4.2 mm. long, firm or rigid in texture and usually somewhat spreading, commonly contrasting in color with the darker capsule: culms 1–3.5 mm. in diameter at the top of the sheaths, finely striate or deeply sulcate.

var. *Pylaei*.

JUNCUS EFFUSUS L. Sp. Pl. 326 (1753). *J. communis* β *effusus* E. Meyer, Junci Gen. Monog. Sp. 22 (1819).

The typical form in Europe seems to be a plant of medium stature with non-sulcate culms and pale basal sheaths; the flowers small with soft perianth; the inflorescence also small. It has not yet been seen by us from America.

Var. *COMPACTUS* Lejeune et Courtois, Comp. Fl. Belg. ii. 23 (1831). *J. conglomeratus* L. Sp. Pl. 326 (1753) probably in part. *J. effusus* var. *conglomeratus* of many authors, in part, not Engelm.—Plants tall and rather stout, deep-green, 4.5–12 dm. high: culms usually firm, faintly many-striate, 1.5–4 mm. in diameter at the top of the sheaths: sheaths large and rather loose, dull, pale- or chocolate-brown below; the uppermost rather thin, pale-brown or stramineous toward the summit, 6–14 cm. long: involucral leaf 7–20 cm. long: inflorescence small compact and dense, 1–4.5 cm. in diameter: perianth-divisions rather noticeably spreading from the base, soft in texture, curved and wrinkled when dry; the midrib broad and pale, with no conspicuous dark lateral bands; the margins broadly scarious; sepals 1.8–2.5 mm.

long, about equaling the petals: capsule olive-brown, rounded or slightly retuse and sometimes umbonate at apex, about equaling the perianth.—Typical specimens examined: NEWFOUNDLAND: Bay of Islands, September 2, 1897, *Waghorne*, no. 41, August 10, 1899, *Waghorne*, no. 64; Bay St. George, August 5–7, 1901, *Howe & Lang*, no. 1031; near Topsail, Conception Bay, August 12–19, 1901, *Howe & Lang*, no. 1264; bank of Rennie's River, St. Johns, July 31, 1894, *Robinson & Schrenk*, no. 132. PRINCE EDWARD ISLAND: Tracadie Beach, July 29, 1901, *Churchill*. NOVA SCOTIA: Big Intervale, Cape Breton Island, July 18, 1898, *J. Macoun*, no. 20,730; North Sydney, July 21–25, 1901, *Howe & Lang*, no. 654; Sydney, August 17, 1902, *Fernald*; Kentville, August 22, 1902, *Fernald*. NEW BRUNSWICK: Scovil's Brook, Westfield, August 8, 1909, *Fernald & Wiegand*. MAINE: Pembroke, August 15, 1909, *Fernald & Wiegand*; Squirrel Island, August 2, 1892, *Fernald*; Long Island, Portland Harbor, August 14, 1904, *Chamberlain & Fellows*, no. 716. MASSACHUSETTS: Brush Hill Turnpike, Milton, July 7, 1853, *Wm. Boott*; Otis, September 22, 1904, *R. Hoffmann*. BRITISH COLUMBIA: vicinity of Ucleulet, Vancouver Island, Aug. 9, 1909, *J. Macoun*, no. 78,085, said to have been introduced with Cranberry plants and moss from Nova Scotia. (Also in Europe.)

The variable size and diffuseness of the inflorescence in the different varieties of *J. effusus* may lead to some confusion in the interpretation of this variety. Although occasional specimens with condensed inflorescences of var. *solutus*, var. *Pylaei*, var. *brunneus*, var. *gracilis*, and perhaps of other varieties occur, the condensed character in this case accompanies definite structural characteristics, and seems to be fairly constant. The var. *compactus*, therefore, seems to be, in America, a real variety and not made up of forms with condensed inflorescences of different varieties. This variety differs from var. *solutus* in the compact inflorescence of smaller flowers with softer more spreading and more scarious perianth; from var. *decipiens* in the stouter culms with paler basal sheaths; and from var. *Pylaei* in the stouter culms with pale basal sheaths and condensed inflorescences of smaller flowers with shorter and much less rigid perianth. From var. *conglomeratus* it may be distinguished by the absence of coarse striations or ridges on the culm below the inflorescence; and from var. *brunneus*, with which it might be confused in the Northwest, by its coarser habit, paler flowers, broader less attenuate perianth-segments, and especially by its broad-ovate less attenuate prophylla, which in var. *brunneus* are narrow-ovate and long-attenuate.

Var. COMGLOMERATUS Engelm. in Gray, Manual, ed. 5, 537 (1867).

anth 2.4–2.9 mm. long, soft, wrinkled when dry; midrib greenish, very slender, bordered by very broad dark-brown bands and a nearly obsolete scarious margin: sepals less slender-pointed than in the last variety: capsule about equaling the perianth, olive-brown, often castaneous at the obtuse or slightly retuse short-apiculate summit.—Typical specimens examined:—BRITISH COLUMBIA: Sooke, Vancouver Island, August 2, 1893, *J. Macoun*, no. 511; Renfrew, Vancouver Island, June–July, 1901, *Rosendahl & Brand*, no. 39; Alberni, Vancouver Island, in salt marshes, August 2, 1887, *J. Macoun*, no. 27,850; vicinity of Nanaimo, July 4, 1908, *J. Macoun*, no. 78,080, July 10, no. 78,081; vicinity of Ucleulet, July 16, 1909, *J. Macoun*, no. 78,082. WASHINGTON: without locality, 1852, *J. G. Cooper*, no. 7; Montesano, Chehalis County, June 27, 1898, *A. A. & E. G. Heller*, no. 3970; Southbend, August 17, 1899, *W. J. Spillman*. OREGON: John Day, Clatsop County, August 20, 1902, *E. P. Sheldon*, no. 11,206. CALIFORNIA: marshes, San Francisco, *Bolander*, no. 151; shore of Bolinas Bay near San Francisco, August 12, 1866, *Kellogg* in Engelm. Herb. Junc. Bor. Am. Norm, no. 10; large bogs in wet sandy soil, Lobos Creek near San Francisco, August 4, 1866, *Kellogg* in same, no. 11; near Ocean View, San Francisco, June 8, 1906, *A. A. Heller*, no. 8386; Pacific Grove, Monterey County, July 1, 1905, *C. P. Smith*, nos. 1093 and 1001.

In "*Das Pflanzenreich*" Buchenau takes up the name var. *aemulans* for this variety, based on the *J. aemulans* of Liebmann (in Vidensk. Meddel. nat. For. Kjöbenh. 38, 1850). Liebmann's description was based, however, on material from southern Mexico, and since we have seen no material of the present variety from that region, so far disconnected from its usual range, it seems unwise, without further knowledge of Liebmann's plant, to treat it as identical with var. *brunneus* Engelm. This variety and var. *gracilis* both have the same dark-colored perianth of similar rather soft texture, but may easily be distinguished by the basal sheaths. From var. *compactus*, which has been found on Vancouver Island, var. *brunneus* is quickly distinguished by its slender habit, darker flowers, and more slender and attenuate perianth-segments and prophylla.

- Var. **pacificus** n. var., caulibus crassis 6–13 dm. altis 2–3.5 mm. diametro rigidis obscure multi-striatis; cataphyllis basilaris castaneis opacis chartaceis, supremis 6–15 cm. longis, marginibus fere ad apicem subtruncatum vel emarginatum arcissime imbricato-convolutis, venis ad apicem valde convergentibus; inflorescentia plerumque laxè fastigiata 2.5–15 cm. longa; bractea infima 6–20 cm. longa; sepalis 2.7–3.5 mm. longis submollibus quam petalis vix longioribus, dorso fulvo-viridibus gracilibus, marginibus fulvis scariosis; petalis similibus; capsulis perianthium vix aequantibus.

Plant rather large and stout, 6–13 dm. high or possibly more: culms rigid, faintly many-striate, 2–3.5 mm. in diameter at the top of the sheaths: sheaths chocolate-brown or castaneous at base or throughout and dull, chartaceous; the uppermost pale or dark toward the summit, 6–15 cm. long, the edges much overlapping nearly or quite to the sub-truncate or emarginate tip, the veins strongly converging at the summit: involucre 6–20 cm. long: inflorescence usually loosely fastigate, rarely more spreading, 2.5–15 cm. long: sepals 2.5–3.5 mm. long, rather soft, scarcely longer than the petals; midrib pale greenish-brown, not very broad nor bordered by dark bands, but with pale-brownish scarious margins: petals similar: capsule about equaling the sepals, olive-brown, obtuse or slightly retuse, slightly apiculate. — Typical specimens examined: BRITISH COLUMBIA: Barclay Sound, Vancouver Island, August 2, 1887, *J. Macoun*, no. 27,848; vicinity of Victoria, Vancouver Island, July 21, 1893, *J. Macoun*, no. 512; Burrard Inlet, July 27, 1889, *J. Macoun*, no. 27,849; vicinity of Nanaimo, July 6, 1908, *J. Macoun*, no. 78,078. WASHINGTON: Seattle, June 23, 1889, *C. V. Piper*, no. 1029; Union Lake, King County, August 5, 1890, *W. N. Saksdorf*, no. 1010; Waitsburg, July 31, 1897, *R. M. Horner*. OREGON: Calapooya Valley, Douglas County, alt. 3500 ft. July 17, 1899, *M. A. Barber*, no. 109; Wilamette Heights, Portland, July 7 and August 24, 1902, *E. P. Sheldon*, no. 10,832 (type in Gray Herb.). CALIFORNIA: Mariposa Big Trees, July, 1866, *Bolander*; near Ukiah, Mendocino County, July 9, 1902, *A. A. Heller*, no. 5838; San Ysabel, San Diego County, June 20, 1903, *Leroy Abrams*, no. 3783; Fredalba, San Bernardino Mts., July 22, 1902, *Leroy Abrams*, no. 2797.

Rather easily recognized by the peculiar summit of the upper sheath and the fastigate inflorescence. In some respects it seems intermediate between the var. *brunneus* and the eastern var. *solutus*. From the former it differs especially in the two characters mentioned above and also in the much paler flowers; from var. *solutus* it may be recognized by the same two characters and the less rigid perianth. The only other form with similar fastigate inflorescence is the very slender small-flowered var. *exiguus*.

Var. *solutus* n. var., caulibus crassis pallide viridibus 6–17 dm. altis, 2–4.5 mm. diametro plerumque mollibus obscure multi-striatis; cataphyllis basilariis laxis basi fulvis, supremis membranaceis ad apicem fulvis vel stramineis interdum utrinque fuscis 9–28 cm. longis; inflorescentia laxis saepe diffusissimis 4–14 cm. diametro; bractea infima 1–4 dm. longa; sepalis 2.7–3.3 mm. longis subrigidis subappressis quam petalas vix longioribus subconcoloribus, dorso viridescentibus vel fulvis; maginibus angustis scariosis; petalis similibus; capsulis fulvis vel fulvo-viridibus paulo retusis perianthium aequantibus vel paulo superantibus.