

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, \pm 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, vernal 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, 37° 46' N, 119° 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 *Juncus exiguus* (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 valliculatis, cataphyllis arcte appressis, laevibus (non scabridulis), staminibus 3, capsula perigonium subaequante differt.

Description: 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 \pm 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).

Distribution: 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.

Selected herbarium specimens: 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: Chatham 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, Filmer 1611 (ORE); meadows below Barlow Pass, Mt. Hood, 1 Aug 1927, Leuch 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); Crook 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 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.

Distribution: 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.