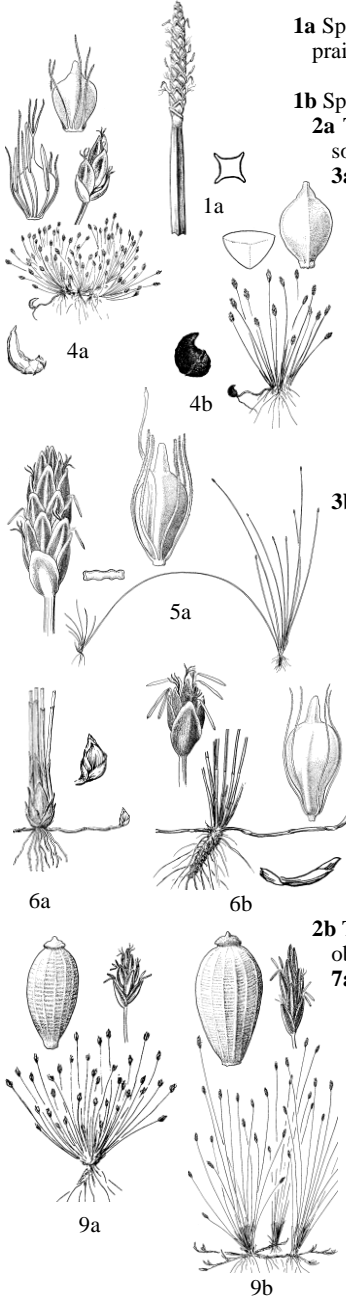


Replaced image of achene in *E. palustris*.

Eleocharis R. Br. Spike-rush

Spikelet solitary and terminal, without subtending bracts; scales spirally arranged (ours) or sometimes distichous, largely scarious or hyaline, the lowest one(s) in most spp. empty; fls ♀, borne singly in axils of scales; perianth of 0–6(9) bristles, these < to somewhat > the achenes, sometimes reduced or obsolete; stamens 3 (sometimes fewer); style bifid or trifid, thickened toward base, the thickened part persistent on the achene as a tubercle which is typically sharply differentiated from the body of the achene, but which in a few spp. is confluent with it and poorly differentiated from it; achene lenticular to planoconvex or ± trigonous; ann or per herbs with rectangular to terete or flattened sts, the lvs all basal or nearly so and reduced to mere sheaths or scarcely sheathing scales. (Gr *helos*, a marsh, and *charis*, grace).

Ripe achenes are essential for identification. The *E. palustris* complex (nos 18–23) involves widespread and intergrading taxa, and its interpretation in our area requires additional research. *Eleocharis flavescens* (Poir.) Urb. app our area from the se.



1a Spikelet ca as thick as st in fr; the st rectangular, 4-angled; disturbed ground in wet prairie; e N Am intro; Lane Co, OR to CA; square-st s.

1 E. quadrangulata (Michx.) Roem. & Schult.

1b Spikelet thicker than st in fr; st round or flat, never rectangular, 4-angled

2a Tubercle confluent with achene body, not forming a distinct apical cap, though sometimes a slightly different color

3a Achenes and scales small, achenes 0.9–1.3 mm (including tubercle), scales gen 1.5–2(–2.5) mm; pls very small, matforming, mostly 0.2–0.6(–1) dm; spikelets 2.5–4(–6) mm, with 2–9(–20) fls

4a Perianth bristles gen present, commonly ≥ achene; achenes smooth (at 10×); rhizomes forming narrow, curved, J- or U-shaped white terminal tubers; ours coastal salt marshes; VI to CA, Newf to Cuba and Mex, also at scattered stations inl in e N Am; small s.

2 E. parvula (Roem. & Schult.) Link ex Bluff, Nees & Schauer

4b Perianth bristles much-reduced or obsolete; achenes cellular-roughened (at 10×); rhizomes forming ovate to rhombic, black terminal tubers (white if immature); sandy shores, deltas, seeps; scattered in our area, s BC, e WA, and s ID, otherwsie se OR to CA, e to Gr Pl, c N Am, se US, and Mex; CO or dwarf s. (*E. parvula* var. *anachaeta*)

3 E. coloradoensis (Britton) Gilly

3b Achenes and scales larger, achenes 0.9–2.8 mm, scales gen 2.5–5.5 mm; larger pls, seldom < (0.5–)1 dm

5a Cespitose, some sts arching and rooting at tip (unique among our spp.); rachilla internodes of ± uniform thickness and length at middle and base of spikelet (requiring dissection); sts 2–10 dm; spikelets 5–17 mm; shores, wet meadows, seeps, hot springs, fens, often alkaline; e Cas, s BC to CA and Mex, e to Atl and W Indies; walking or beaked s.

4 E. rostellata (Torr.) Torr.

5b Rhizomatous, sts erect; rachilla internodes thinner and longer at mid-spikelet, thicker and shorter at base; sts gen 1–4 dm; spikelets 3–10 mm

6a Pl base bulbous or swollen; rhizomes forming ovoid tubers with papery scales; perianth bristles different lengths, ≤ achene; basal scale gen with fl; shores, peatlands, wet meadows, often alkaline; circumboreal, s to CA, NM, NJ; few-fl s. (*E. pauciflora*)

5 E. quinqueflora (Hartmann) O. Schwarz

6b Pl base a hard, narrow caudex, not bulbous; rhizomes without tubers; perianth bristles equal lengths, ≥ achene; basal scale gen without fl; shores, peatlands, wet meadows, seeps; c BC to CA, in the Cas and e to MT and CO; Suksdorf's s. (*E. quinqueflora* var. s.)

6 E. suksdorfiana Beauverd

2b Tubercle forming a distinct apical cap well differentiated from achene body by an obvious constriction

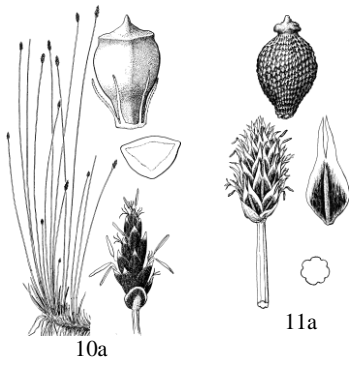
7a Stigmas gen 3; achenes ± trigonous

8a Achenes longitudinally ridged, with fine cross-bars, white to pale or dark gray, narrowly obovoid; basal scales of spikelet fertile

9a Pls gen ann, gen cespitose; sts 1–7 cm; scales 1–1.5 mm; achenes 0.55–0.75 mm, with 20–30 horizontal cross-bars; anthers 0.3–0.5 mm; shores, sloughs, wet meadows, vernal pools; WA to CA, mostly e Cas, e to MT and NM; delicate or pretty s.

7 E. bella (Piper) Svenson

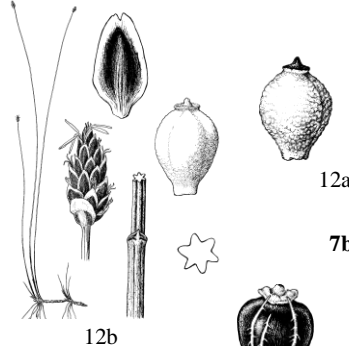
9b Pls gen per, rhizomatous (but still densely tufted); sts to 6 dm; scales 1.5–2.5(–3.5) mm; achenes 0.7–1.1 mm, with 30–60 horizontal cross-bars; anthers 0.7–1.5 mm; submerged or emersed, shores, marshes, vernal pools, ditches; circumboreal and common, s to CA, C and S Am, e to Atl (*E. a.* vars.



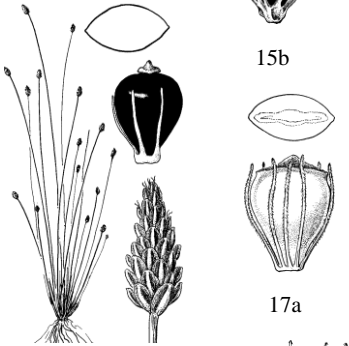
10a



11a



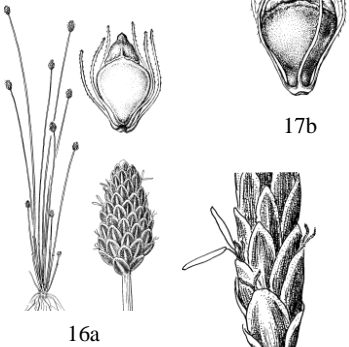
12a



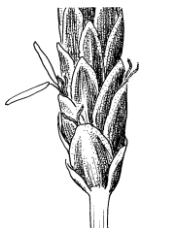
15a



17a



16a



18a

gracilescens, occidentalis)

8 **E. acicularis** (L.) Roem. & Schult.

8b Achenes never longitudinally ridged, roughened to irreg horizontally ridged, white, or yellow to brown (rarely green); obovoid; basal scales of spikelet sterile

10a Tubercle ± as wide as truncate upper achene; pls cespitose, densely tufted; vernal pools and streams, drying meadows, springs, marshes; ne OR, s to CA, e to ID and CO; Bolander's s.

9 **E. bolanderi** A. Gray

10b Tubercle gen 1/2 as wide as rounded upper achene; pls cespitose or rhizomatous

11a Middle scales red-brown with hyaline apices notched to bifid, 0.6–1.5 mm long, the hyaline portion gen longer than wide; st ridges 2–12, inconspicuous; achenes persisting or falling as scales shed at maturity; pools, shores, often alkaline; disjunct in BC, Sask to NM and TX; prairie s.; ours var. **acutisquamata** (Buckley) S.G. Sm.

10 **E. compressa** Sull.

11b Middle scales red-brown with hyaline apices entire to notched or bifid, < 0.7 mm long, the hyaline portion gen wider than long or as wide as long; st ridges 6–8, conspicuous; achenes persisting as scales shed at maturity

12a Sts gen 3–10(–15) cm, 0.2–0.3 mm wide; scales 1–1.4 mm; achenes 0.7–0.8 mm; upper sheath lacking distinct apical tooth; pond shores, mossy springs; AK to s BC, scattered e to Sask and e N Am; quill s.

11 **E. nitida** Fernald

12b Sts gen 10–50 cm, 0.4–0.8 mm wide; scales 1.9–3.4 mm; achenes 0.8–1.4 mm; upper sheath with apical tooth to 0.5 mm on some sts; limy shores, marl, pools, peatlands, wet meadows; e Cas, BC to ID, MT, and WY, e to Atl; elliptic s. (*E. tenuis* var. *borealis*)

12 **E. elliptica** Kunth

7b Stigmas 2 (or mostly so in *E. engelmannii*, *E. obtusa*); achenes lenticular

13a Pls ann, cespitose

14a Achenes dark purple to black, 0.45–1.1 mm, not including tubercle

15a Tubercle much wider than tall, depressed with central projection, pale or as dark as achene, not very spongy at 10×, constricted at base or sessile, 0.05–0.1 mm tall × 0.1–0.2 mm wide; bristles bright white; scales 1–1.6 mm, membranous; damp sandy shores; in our area known only from Shuswap Lake, BC; pantropical, s and e US, C and S Am, Asia, Africa; purple s.

13 **E. atropurpurea** (Retz.) J. Presl & C. Presl

15b Tubercle a nearly equilateral triangle of white or gray spongy tissue at 10×, contrasting strongly with achene, gen sessile and not constricted at base, 0.15–0.4 mm tall × 0.2–0.45 mm wide; bristles rufous or brownish-whitish; scales 1.5–2 mm, membranous, the proximal sometimes stiff and cartilaginous; muddy or sandy shores; in our area known only from Lake Osoyoos, BC and Lake Chelan, WA; s and e US, pantropical, C and S Am, Asia, Africa; capitate s. (*E. dispar*)

14 **E. geniculata** (L.) Roem. & Schult.

14b Achenes white or yellow to brown, 1.1–1.7 mm, not including tubercle

16a Tubercle base a little < 2/3 width of widest portion of ripe achene; achene summit often somewhat rounded; scales purplish-brown; shores, vernal pools, marshes, ditches; c BC s on both sides Cas to CA, e to Alta and AZ, also e N Am; ovoid s. (*E. obtusa* var. *ov.*)

15 **E. ovata** (Roth) Roem. & Schult.

16b Tubercle base > 2/3 width of widest portion of ripe achene; achene summit often somewhat flattened at junction with tubercle; scales brown to red-brown, rarely purplish

17a Tubercle low and wide, < 1/4 total length of achene, < 1/3 as tall as wide; perianth bristles gen absent or vestigial, rarely slightly > tubercle; lake and riverbanks, swales, sloughs; s BC s on both sides Cas to CA, e to Alta, AZ, e N Am; Englemann's s. (*E. obtusa* var. *e.*, *E. e. detonsa*)

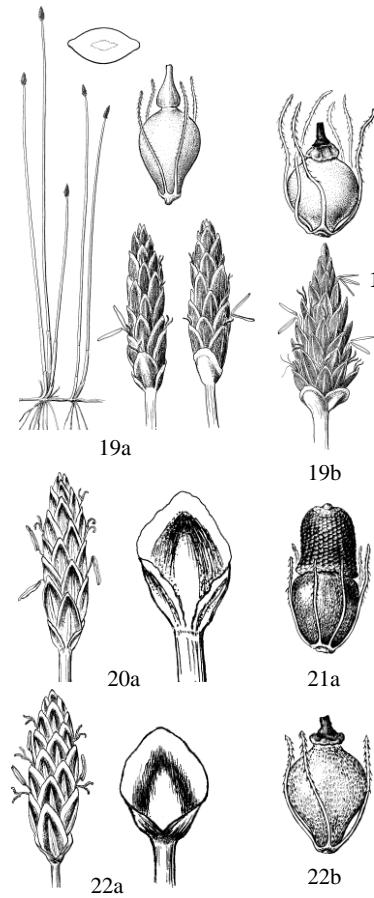
16 **E. engelmannii** Steud.

17b Tubercle gen tall and wide, > 1/4 total length of achene, > 1/3 as tall as wide; perianth bristles gen > tubercle, rarely absent; common, widespread, throughout our area, also e N Am; blunt s.

17 **E. obtusa** (Willd.) Schult.

13b Pls per with elongate rhizomes

18a Basal scale clasping or encircling 1/2–2/3(–3/4) of st; basal 2–3 scales sterile, without fl or fr



19a Perianth bristles 0–4(5), gen < tubercle; achene apex sometimes narrowed to a neck; tubercle stipitate or sessile; ripe achenes yellow to dark brown; filaments deciduous; sts firm to soft; spikelets cylindrical to ellipsoid-conical; shores, marshes, often emergent; circumpolar, s to Mex, common throughout our area; common or creeping s. (*E. p.* subsp. *vulgaris*)

18 E. palustris (L.) Roem. & Schult.

19b Perianth bristles (4)5–6(–8), > tubercle; achene apex never narrowed to a neck, tubercle sessile; ripe achenes yellow; filaments persisting in dispersal; sts soft and easily compressed; low to mid elev, tidal flats, lakes, peatlands, ditches; AK to nw WA, e to ne N Am; Eurasia; soft-st s; ours subsp. **mamillata**

19 E. mamillata H. Lindb.

18b Basal scale clasping or encircling 3/4 or more of st; basal 2–3 scales sterile or fertile, with fl

20a Basal scale clasping or encircling < 100% of st, on at least some sts; subproximal scale sterile on some spikelets; shores, marshes, often alkaline, vernal pools, dunes; common, AK to CA, Mex; e N Am, S Am; pale or confusing s.

20 E. macrostachya Britton

20b Basal scale clasping or encircling 100% of st; subproximal scale always fertile

21a Tubercles > 2/3 as wide and as tall as achene body, gen with vertical rows of pits when ripe; rachilla with 1–2 scales per mm; sts often < 20 cm, bases red; shores, tidal flats, moist meadows; n BC and AK coast, reported on n VI; Kamchatka s.

21 E. kamtschatica (C.A. Mey.) Kom.

21b Tubercles < 2/3 as wide and tall as achene body, gen without vertical rows of pits; rachilla with (2)3–5 scales per mm; sts often > 20 cm and bases red or brown

22a At mid-spikelet 4–5 scales attached per mm of rachilla, scales 2–3.5 mm wide; tidal flats, shores, limy fens; AK s, mostly e Cas, to OR and AZ, e to Atl; bald or redfoot s.

22 E. erythropoda Steud.

22b At mid-spikelet 2–4 scales attached per mm of rachilla, scales 1.8–2.5 mm wide; shores, dunes, alkaline marshes, peatlands; circumboreal, s to BC, Alta, reportedly Grant Co, WA, and scattered s to NV, NM, NC; slender s.

23 E. uniglumis (Link) Schult.