

## ELEOCHARIS

**Description:** Annual or perennial herbs, often rhizomatous. **Culms** usually tufted, erect or arcuate, terete to acutely angled. **Leaves** reduced to a tubular sheath often bearing a short erect apical mucro.

**Inflorescence** a terminal, ebracteate, single spikelet, sometimes proliferating. **Spikelet** terete or angular, rarely compressed, few--many-flowered; rachilla persistent. **Glumes** spirally arranged, sometimes subdistichous, caducous. **Flowers** bisexual. **Hypogynous bristles** 6-10, smooth or retrorsely or rarely antrorsely scabrous or toothed, sometimes reduced, rarely absent. **Stamens** 1-3. **Style** 2- or 3-fid, usually glabrous, articulated with the nut, the dilated base persistent on the nut. **Nut** trigonous or lenticular, obovoid, globose or pyriform, sometimes with a narrow neck just below the apex, crowned by the enlarged style base.

**Distribution and occurrence:** World: c. 150 species, cosmopolitan. Australia: c. 30 species (10 species endemic), all States.

Some species are used for matting. *E. dulcis* is cultivated for its edible tubers (Chinese Water Chestnut). The record of the trop. species *E. nuda* C. B. Clarke from this State (NT) is apparently erroneous. Note: nut length measurements do not include the persistent style base. Treatment based on Blake (1939).

Key to the genus <i>Eleocharis</i>		
1	Glumes leathery, finely many-nerved with distinct midrib, not at all or only obscurely keeled, spikelet not much broader than culm	2
	Glumes membranous with distinct midrib, often distinctly keeled, sides nerveless; spikelet much broader than culm unless the latter is flat	6
2	Culms longitudinally septate internally as well as transversely septate (septa not obvious externally)	3
	Culms transversely septate only, obvious externally at least when dried	4
3	Culms 4- or 5-angled	<i>Eleocharis philippinensis</i>
	Culms terete	<i>Eleocharis obicis</i>
4	Culms usually dark green, in a close linear series on a stout horizontal rhizome; in mature culms, some septa much stouter than the rest; glumes 7-11 mm long, usually with a dark red band inside the hyaline margins; nut 2-2.7 mm long; bristles 8-10	<i>Eleocharis sphacelata</i> <b>ACT, ST</b>
	Culms yellow-green, tufted (rhizome occasionally present but then slender and ascending with culms tufted along it); all septa similar in texture; glumes 5-6.5 mm long, without dark red band inside hyaline margins; nut 1.5-2 mm long; bristles 6-8	5
5	Inflorescence gradually tapering to apex; exposed portion of glumes mostly 2.5-4.5 mm long, usually longer than wide; glumes relatively long and narrow, 6-6.5 mm long, 2.5-3 mm wide, with hyaline margin 0.2-0.3 mm wide; nut c. 1.5-1.8 mm long, 1-1.5 mm diam., golden brown; bristles 6-8, united at the base, with teeth slender and irregularly retrorse; anthers 2.5-3 mm long, with apical appendage 0.1-0.2 mm long	<i>Eleocharis dulcis</i>
	Inflorescence very sharply tapered to apex (almost truncate); exposed portion of glumes 1.5-2.5 mm long, usually broader than long; glumes relatively broader, 5-5.5 mm long, c. 4 mm wide, with hyaline margins 0.1-0.2 mm wide; nut c. 2 mm long, 1.5-1.9 mm diam., pale yellow-brown; bristles 6 or 7, free, slender, regularly and strongly retrorsely toothed; anthers 2-2.5 mm long, with apical appendage 0.3-0.4 mm long	<i>Eleocharis equisetina</i> , <b>ACT</b>
6	Style 3-fid, or rarely 2-fid in <i>Eleocharis pallens</i> and then the uppermost leaf	7

	sheath is truncate and prominently mucronate at the summit	
	Style 2-fid; mouth of leaf sheath never mucronate	19
7	External surface of the nut longitudinally ridged, the intervening cells transversely linear or oblong; nut obscurely trigonous or terete; leaf sheaths membranous, with mouth oblique (often loose or difficult to observe), not dilated or thickened	8
	Surface of nut finely reticulate, wrinkled, pitted or smooth, the cells very small and often very faint, mostly shortly vertically oblong in very numerous series; nut trigonous or lenticular; uppermost leaf sheath thickened and differentiated at the oblique or transverse mouth	11
8	Stamens 1 or 2; bristles on nut 6 or 7, and nearly as long as nut	<i>Eleocharis parodii</i>
	Stamens 3; bristles on nut few, small or absent	9
9	Nut pyriform, with c. 8 prominent ridges on each face	<i>Eleocharis macbarronii</i>
	Nut narrow-obovoid to obovoid, with 3–5 prominent ridges on each face	10
10	Spikelet ovoid, 2–7 mm long, usually setting fruit; glumes 2.0–2.5 mm long; plants neither proliferating nor with tubers; glumes dark red-brown to blackish	<i>Eleocharis pusilla</i> <b>ACT, ST</b>
	Spikelet narrow-ovoid to linear, 10–20 mm long, rarely producing fruit; glumes 3–5 mm long; plants often proliferating, producing tubers; glumes red-brown	<i>Eleocharis atricha</i> <b>ACT, ST</b>
11	Culms clearly 4-angled, style base about as broad as nut	12
	Culms terete, angular-striate or flattened; style base a third to three-quarters as broad as nut	13
12	Culms to 0.5 mm diam.; spikelet 4–7 mm long; bristles 4; leaf sheath with oblique mouth, rarely minutely mucronate	<i>Eleocharis pachycarpa</i>
	Culms 1–1.5 mm diam.; spikelet 10–20 mm long; bristles 6–8; leaf sheath with usually transverse mouth, mucronate	<i>Eleocharis tetraquetra</i>
13	Nut more or less equally trigonous with ribbed dorsal angle	14
	Nut biconvex or plano-convex, with the dorsal angle not ribbed if present	15
14	Nut not constricted at apex; bristles usually longer than nut; culms not obviously septate; sheaths pale brown to pale reddish, uppermost with mouth more or less oblique, sometimes mucronate	<i>Eleocharis gracilis</i> <b>ACT, ST</b>
	Nut constricted to a very short neck below the apex; bristles three-quarters as long as to equalling nut; culms usually with partial transverse septa obvious when dried; leaf sheaths strongly reddish, uppermost with mouth transverse and mucronate	<i>Eleocharis dietrichiana</i>
15	Culms transversely septate (obvious externally at least when dried)	<i>Eleocharis blakeana</i>
	Culms not completely transversely septate	16
16	Rhizome creeping; nut not strongly ribbed on the angles; anthers with apical appendage c. 0.2 mm long; glumes tardily deciduous	17
	Rhizome very short; culms densely tufted; nut with prominently ribbed angles; anther appendage not exceeding 0.15 mm in length; glumes readily deciduous	18
17	Culms terete or nearly so, trigonous immediately below the spikelet (may be flattened when dried, and then mucro at mouth of leaf sheath may be in any	<i>Eleocharis acuta</i> <b>ACT, ST</b>

	position relative to 'margins' of 'flattened' culm); spikelet usually much broader than culm, 1.5–3 cm long, 3–7 mm diam	
	Culms strongly flattened when fresh even at apex; mucro at mouth of leaf sheaths always at middle of one flat face of culm; spikelet slightly broader than culm, 1–2(–4) cm long, c. 2.5 mm diam	<i>Eleocharis plana</i> <b>ST</b>
18	Glumes acute; spikelet more or less acute, c. 2 mm diam.; culms strongly longitudinally ridged (obvious at least when dried) with surface obviously reticulate and glistening between ridges	<i>Eleocharis pallens</i>
	Glumes rounded; spikelet more or less obtuse, 2.5–3 mm diam.; culms finely and faintly striate, dullish	<i>Eleocharis cylindrostachys</i>
19	Leaf sheath firm at apex; spikelet globose to ovoid; nut black	<i>Eleocharis geniculata</i>
	Leaf sheath thinly membranous, often torn at apex; spikelet ovoid or oblong-ovoid; nut pale green to dark greenish brown	<i>Eleocharis minuta</i>

### *Eleocharis acuta*

**Description:** Perennial with short rhizome. Culms tufted, terete but +/- trigonous at apex, 10–60 (rarely to 90) cm high, 1–3 mm diam. Spikelet narrow-ovoid to narrow-cylindrical, 10–30 mm long. Glumes long-acute to broad-acute, midrib distinct, 3.5–4.5 mm long, straw-coloured tinged red-brown to dark red-brown. Bristles 6–9, flattened below, strongly retrorsely toothed, rather unequal, reaching or somewhat overtopping the style base, occasionally reduced. Stamens 3; anthers 1.1–3.4 mm long. Style 3-fid. Nut plano-convex to biconvex, with angles obtuse, broad-obovoid, usually 1.5–1.7 mm long, 1.1–1.2 mm diam., shining, yellow to brown; external cells minute, shortly vertically oblong; style base usually 0.4–0.6 mm high, 0.5–0.6 mm wide, a third to half as broad as nut.

**Flowering:** spring-summer.

**Distribution and occurrence:** Widespread in NSW. In all States (not Northern Territory), New Zealand, New Guinea, Norfolk Island. Grows in moist situations. NSW subdivisions: NC, CC, SC, NT, CT, ST, NWS, CWS, SWS, NWP, SWP, NFWP, SFWP. Other Australian states: Qld Vic. Tas. W.A. S.A.

### *Eleocharis atricha*

**Description:** Slender tufted perennial, with slender rhizomes bearing ovoid tubers to c. 4 mm long and 2.5 mm diam. Culms angular-sulcate, 3–40 cm high, 0.5–1 mm diam. Spikelet narrow-ovoid to linear, often proliferating, 10–20 mm long. Glumes obtuse, narrowly keeled, 3–5 mm long, red-brown. Bristles absent. Stamens 3; anthers 1.5–2.6 mm. Style 3-fid. Nut obscurely trigonous, narrow-obovoid, narrowed in a short neck, prominently vertically ribbed, the external cells transversely linear to oblong in 4 or 5 vertical rows on each face, 1.3–1.5 mm long, c. 0.7 mm diam., straw-coloured; style base a third to half as long as and three-quarters to four-fifths as broad as nut.

**Flowering:** spring-summer.

**Distribution and occurrence:** Widespread on tablelands, extending inland to Yetman and Albury areas. Grows in moist situations. NSW subdivisions: CC, NT, CT, ST, SWS, NWP. Other Australian states: Qld Vic. S.A. N.T.

### *Eleocharis equisetina*

**Description:** Tufted perennial with slender rhizomes. Culms terete, often not much compressed when dry, transversely septate, to 1 m high, 1–3 mm diam. Spikelet cylindrical, 2–4 cm long. Glumes obtuse, midrib distinct, upper margins very narrowly hyaline with very narrow dark red-brown band within them, 5–5.5 mm long, straw-coloured. Bristles 6 or 7, free at the base, rather slender, minutely and regularly retrorsely toothed, from about as long to twice as long as nut. Stamens 3; anthers 2–2.5 mm long. Style 3-fid. Nut rather turgidly biconvex, with angles not ribbed, obovoid to globose, c. 2 mm long, 1.5–1.9 mm

diam., pale yellow-brown; external cells minute, isodiametric, arranged in numerous vertical series; style base about half as long as and half to two-thirds as broad as nut.

**Flowering:** spring–summer.

**Distribution and occurrence:** Coast, north from Nelligen. Also Queensland, Malesia, Asia, Madagascar. Grows in swampy areas. NSW subdivisions: NC, CC, SC. Other Australian states: Qld

### *Eleocharis gracilis*

**Description:** Slender perennial with short creeping rhizome. Culms tufted or solitary on rhizome, terete to flattened, grooved, to 20 cm or rarely to 50 cm high, to 1 mm diam. Spikelet ovoid to oblong, 5-9(-12) mm long, 2-3(-4) mm diam. Glumes obtuse to acute, obtusely keeled, sides membranous, 3.3-3.6 mm long, tinged red-brown. Bristles 5 or 6, flattened, pale brown, finely and retrorsely toothed, usually much exceeding the style base but sometimes only as long as nut. Stamens 3; anthers 1.0-2.2 mm long. Style 3-fid. Nut equally trigonous, with angles acute, obovoid, 1-1.5 mm long, 0.8-1 mm diam., somewhat shining, golden brown; external cells minute, shortly vertically oblong or subsodiametric; style base a third to half as long as and half to two-thirds as broad as nut.

**Flowering:** spring-summer.

**Distribution and occurrence:** Coast and tableland regions, extending inland to Mt Kaputar and Wagga Wagga area. Grows in seasonally wet situations. NSW subdivisions: NC, CC, SC, NT, CT, ST, CWS, SWS. Other Australian states: Qld Vic. Tas. S.A.

### *Eleocharis plana*, Flat Spike-sedge

**Description:** Perennial with creeping rhizome. Culms tufted, flat to slightly plano-convex, to 80 cm high, 2-4 mm diam. Spikelet narrow-cylindrical, 10-20(-40) mm long. Glumes acute, faintly keeled, margins broadly hyaline, 3.5-4 mm long, straw-coloured, red-tinged to +/- evenly dark red-brown. Bristles 6-8, slender, flattened and broad at the base, retrorsely scabrous, about as long as nut. Stamens 3; anthers 1.5-3.1 mm long. Style 3-fid. Nut biconvex, with the angles obtuse, obovoid, 1.2-1.8 mm long, c. 1 mm diam., shining, bright yellow to brown; external cells minute; style base about half as long and wide as nut.

**Flowering:** spring-summer.

**Distribution and occurrence:** Widespread inland, rarely extending east to tablelands and coast; also in Queensland and South Australia. Grows in moist situations. NSW subdivisions: CC, ST, NWS, CWS, SWS, NWP, SWP, NFWP, SFWP. Other Australian states: Qld S.A.

Very close to *E. acuta*, differing most obviously in the strongly flattened culms.

### *Eleocharis pusilla*

**Description:** Small tufted perennial with slender rhizome. Culms filiform, 2-15 (rarely to 25) cm high, c. 0.5 mm diam. Spikelet ovoid, 2-7 mm long. Glumes acute to obtuse, 1.7-2.7 mm long, usually dark red-brown to blackish. Bristles few, very slender, small or absent. Stamens 3; anthers 0.9-1.6 mm long. Style 3-fid. Nut obscurely trigonous, narrow-obovoid, acute or with very small neck with style base enveloping apex, each face with 3 or 4 vertical ribs, the cells between the ribs transversely elongate, 0.7-1.1 mm long, 0.4-0.6 mm diam., rather glistening, straw-coloured; style base very small, about a quarter as long as and a third to half as broad as nut.

**Flowering:** spring-summer.

**Distribution and occurrence:** Widespread in eastern half of State, extending west to Wanaaring and Balranald. Also in other States and New Zealand. Grows in moist situations. NSW subdivisions: NC, CC, SC, NT, CT, ST, NWS, CWS, SWS, NWP, SWP, NFWP, SFWP. Other Australian states: Qld Vic. Tas. W.A. S.A. N.T.

### *Eleocharis spachelata*

**Description:** Perennial aquatic with stout rhizome. Culms terete, transversely septate, to 5 m high (in deep water), 4-12 mm diam. Spikelet cylindrical, 3-5 cm long, 8-9 mm diam. Glumes +/- obtuse, finely striate with a fairly prominent midrib and narrow hyaline margins, 7-11 mm long, straw-coloured usually with dark reddish band near margins. Bristles 8-10, at least as long as the top of the style base, sparsely but regularly toothed, united at the base. Stamens 3; anthers 3-5 mm long. Style 3-fid. Nut turgidly

biconvex, with angles not ribbed, obovoid to globose, 2-2.7 mm long, 1.8-2.5 mm diam., straw-coloured to dark golden brown; external cells irregularly isodiametric, often elongated vertically in no regular series; style base from half as long as to equalling and about two-thirds as broad as nut.

**Flowering:** spring-summer.

**Distribution and occurrence:** Widespread on coast and tablelands, inland to Narrabri and Balranald. All other States; also New Guinea, New Zealand. Grows in more or less still fresh water to at least 5 m deep. NSW subdivisions: NC, CC, SC, NT, CT, ST, SWS, NWP, SWP, SFWP. Other Australian states: Qld Vic. Tas. W.A. S.A. N.T.