CHAPTER V

SYSTEMATIC ENUMERATION

CYPERACEAE


The family can be distinguished from the closely related groups by the following major characters.

Highly reduced florets spirally or distichously arranged on the axis of the spikelet; usually each flower seemingly or actually subtended by only a single bract without an evident bract between the flower and axis; seed coat generally free from the pericarp; leaf sheath usually closed; stem usually solid, often triangular; flowers often with a perianth of evident bristles; carpels three or less, often two; embryo embedded in the endosperm; pollen tri-nucleate (Cronquist, 1968).
Key to the genera

1. Florets unisexual:
   2. Nut enclosed in a utricle:
      3. Spikelets 1-flowered; rhachilla deciduous above
         the 2nd glume; 2nd glume spathiform ... Ascopholis
      3. Spikelets many-flowered; rhachilla persistent;
         glumes not spathiform ... Carex
   2. Nut not enclosed in a utricle:
      4. Nut enveloped by two glumes and falling together
         with them ... Diplacrum
      4. Nut not enveloped by two glumes ... Scleria

1. Florets bisexual:
   5. Glumes on spikelets distichous:
      6. Plants floating ... Anosporum
   6. Plants terrestrial:
      7. Plants bulbous-thickened basally, style base
         persistent; spikelets 1-3 ... Abildgaardia
      7. Plants not bulbous-thickened basally, style
         base deciduous; spikelets numerous:
      8. Style 2-fid; nut bilaterally flattened:
         9. Rhachilla articulated, hence spikelets
            falling entirely ... Kyllinga
         9. Rhachilla not articulated, persistent, hence
            glumes falling apart from rhachilla:
10. Nut compressed radially to the rhachilla ... \textit{Pycreus}

10. Nut compressed at right angles to the rhachilla ... \textit{Juncellus}

8. Style 3-fid, nut triangular or dorsiventrally flattened:

11. Rhachilla not articulated, persistent:

12. Rhachilla not winged; stamen 1 ... \textit{Sorostachys}

12. Rhachilla winged; stamens 1 to 3 ... \textit{Cyperus}

11. Rhachilla articulated, deciduous, leaving a knob above the two lowest glumes:

13. Keel of nut bearing glumes winged ... \textit{Indocourtoisia}

13. Keel of nut bearing glumes not winged ... \textit{Mariscus}

5. Glumes on spikelet spiral:

14. Hypogynous scales present ... \textit{Lipocarpha}

14. Hypogynous scales absent:

15. Style base dilated and constricted or articulated above the nut:

16. Hypogynous bristles present, nut beaked:

17. Leaves absent, style persistent ... \textit{Eleocharis}
17. Leaves present, style not persistent

... Khynchospora

15. Hypogynous bristles absent, but not beaked:

18. Style base persistent; if falling not leaving a tumour on the nut ... Fimbristylis

18. Style deciduous leaving a tumour on the nut ... Bulbostylis

15. Style base not dilated, continuous with the nut:

19. Nut tightly enclosed in a corky thickened rhachilla ... Remirea

19. Nut not enclosed in a corky thickened rhachilla:

(except S. maritimus)

20. Leaves reduced to sheaths ... Schoenoplectus

20. Leaves well developed:

21. Leaves with a collar around the stem ... Fuirena

21. Leaves without a collar around the stem:

22. Hypogynous bristles present, stamens 3 ... Scirpus

22. Hypogynous bristles absent; stamen 1 ... Rikliella

....
Abildgaardia Vahl

Single stemmed tufted, usually bulbous-based perennials; leaves narrowly linear to filiform; inflorescence of few (1-3) spikelets or several in a terminal cluster; spikelets slightly compressed; glumes distichous, lower most fertile, upper ones subtending only male flowers; perianth lacking; stamens 2 or 3; style 3-branched, style base deciduous from the nut; nut stipitate, trigonous to subglobose, apiculate, verrucose.

A genus of about 15 species of New and Old world tropics.

1. Spikelets 3 - 7mm wide; achenes 2 - 2.5 mm long; inflorescence with 1-4 large spikelets;
   2. Tall plants with rigid culms 30-80 cm tall; inflorescence with 2-4 spikelets .. .. .. A. triflora
   2. Low, slender plant with slender culms, 6-40 cm tall; inflorescence mostly with single terminal spikelet .. .. .. A. ovata

1. Spikelets 1.5 - 3 mm wide; achenes 0.7 - 1 mm long; inflorescence with many small spikelets in corymbs;
   3. Glumes glabrous; within a spikelet lower glumes distichous, upper glumes spirally imbricated .. A. eragrostis
   3. Glumes pubescent; substantially all the glumes within an spikelet distichous .. A. cinnamomeotum

Perennial, rhizomatous, caespitose herb, to 40 cm tall, culms very slender, 3-sided, striate, leaved at base. Leaves many ranked; blades filiform, ca.1/2 the length of the culm, to 20 cm long, folded, glaucous green, distantly hispid on distal margins, subdensely ciliate at base with long white hairs; ligule a fringe of dense white hairs; sheaths folded with keel, the ventral side hyaline, pale brownish, the orifice obliquely truncate, ciliate. Corymbs compound, to 7 cm long, subdensely to loosely bearing 80 spikelets; involucral bracts 3, elongated, the lowest leaf like; rays 7, filiform, unequal, to 5 cm long, patent; secondary corrymbs bearing 9 spikelets. Spikelets solitary, lance-ovate, to 3 mm long, bearing 10 glumes. Glumes pubescent, 2 ranked, the basal 2 broadly ovate, much smaller than the others, empty; flower bearing glumes ovate, to 4 mm long, folded with acute keel, lightly brown, stained with deep red-brown on both sides of the keel. Stamens 3, style filiform, to 3 mm long, pyramidal at base; stigmas 3. Achenes narrowly obovate, very obtusely trigonous, maturing cream-white, transversely ridged.
Occasional in wet low lands and along grassy slopes. Fl. & Fr.: August–December.

**Distribution:** Ceylon, India, Burma, Thailand, Sumatra, Philippines, New Guinea, N. Australia.

**Specimens examined:** CHITTOOR: Tandipandal, M. Chandrabose 45098 (MH); VISHAKHAPATNAM: Arakuvalley, N.P. Balakrishnan 10774 (MH); CUDDAPAH: Mogilipenta, J.S. Gamble 21334 (CAL & DD).


Perennial, tufted, rhizomatous herb, rhizome clothed with dark brown old sheaths and their fibrous remnants. Culms stifly erect, to 40 cm tall, triquetrous, weakly compressed, light green, leaved at very base. Leaves many; blades flattish with incurved margins, sheaths to 3 cm long, yellow brown. Corymbs open, simple, subdense, to 8 cm long, final corymb bearing 12 spikelets; rays 6, unequal, to 6 cm long; involucral bracts 5, setaceous, to 2 cm long. Spikelets solitary, oblong, to 12 mm long, yellow brown and tinged with purple, distichously bearing 20 flowers. Glumes broadly ovate, mucronate at apex, to 4 mm long, folded with keel, chartaceous, slightly shiny, yellow brown and tinged
with dark brown, pale hyaline on margins; keel ending on a
Achenes broadly obovate, rounded at apex, cuneate at base,
trigonal, with convexed sides, maturing in straw colour.

Occasional on stable sandy grounds, grassy hill sides,
crivices of rocks. Fl. & Fr.: September - October.

**Distribution:** India, Ceylon, Indo-China, and Southern
China.

**Specimens examined:** CHITTOOK: Gosala, G.V. Subba Rao
45890 (MH).

**Abildgaardia ovata** (Burm. f.) Kral in Sida 4:71. 1971.

**Carex ovata** Burm. f., Fl. Ind. 194. 1768. **Cyperus**
monostachyos Linn., Mant. 2:180. 1771. **Abildgaardia**
monostachyos (Linn.) Vahl, Enum. 2:296. 1805.

**Fimbristylis monostachyos** (Linn.) Hassk., Fl. Jav.
Rar. 61. 1848, ("monostachya"); FSI 5:649; Fischner
1660 (1152). **F. ovata** (Burm.f.) Kern in Blumea 15:126.

Perennial, erect, caespitose and leafy herb, to 40 cm
tall; culms filiform, trigonous. Leaves crowded on the swollen
base of the stem, filiform, to 20 cm long, scabrid; ligule 0;
sheaths stramineous. Spikelets solitary on the stem.
Involucral bracts 2, not overtopping, to 1 cm long. Spikelets
compressed, ovate, acute, shining, 2 lower glumes empty and longer than the others, cuspidate, to 1 cm long, Rachilla winged. Glumes loosely imbricate, distichous, ovate, acute cuspidate, coriaceous; to 4.5 mm long, mucronate; keel strong. Stamens 3; anthers to 2 mm long, yellow. Style 3-fid, trigonous, pubescent all over and on the conical base, base pyramidal. Stigmas papillate. Achenes obovoid, trigonous, stipitate, stramenious. (Fig. 11)

Occasional on wet grass land, stream banks, in bunds of rice fields and in marshy areas. Fl. & Fr.: December – March.

Distribution: Widely distributed in the tropics and subtropics of the world.

Specimens examined: KURNOOL: Peddathumbalam, KH 10956; ANANTAPUR: Gangalakunta, KH 7432; VISAKHAPATNAM: Industrial area, KH & BR 5593; NIZAMABAD: Ghanapur, BR & KH 7102; RANGAREDDY: Mohammadabad RF, MSM & KH 10505; ADILABAD: Jaipur RF, LVP & KH 9428; ANANTAPUR: Gundumala RF, TP & NY 717; GUNTUR: Kothapalem, VRK 5772; CHITTOOR: Nagapatla RF, K. Subramanyam 6859 (MH); EAST GODAVARI: Addathigala, G.V. Subba Rao 68557 (MH & CAL); KRISHNA: Mylavaram, C.A. Barber 8172 (MH); NELLORE: Venkatagiri Hills, E. Suryanarayana 3498 (VV); SRIKAKULAM: Salur, N.P. Balakrishnan 949 (CAL).
Fig. 11. *Abildgardia ovata* (Burm.f.) Kral

A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume,
E. Opened glume, F. Pistil with stamens, G. Achene
(A. BR 9260, Others KH & BR 5593).

Perennial, densely tufted herb often forming a large clump; rhizome knotty, woody, oblique, clothed with brown remnants of leaf sheaths; roots stout. Culms to 80 cm tall, bulbous thickened at base, stiff, suberete, smooth, glaucous. Leaves many; some recurved; blades incurved, coriaceous, thickish, glaucous green, scabrous on margins; sheaths 7 cm long, cylindrical, dorsally pale, ventrally hyaline, lightly brown, transversely truncate at orifice. Corymbs simple, bearing 3 large spikelets. Involucral bracts 2, much shorter than the corymb; rays 2, to 4 cm long, each bearing 1 spikelet. Spikelets lanceolate, weakly laterally flattened, 2.5 cm long, acute at both ends, gradually tapering to apex, straw brown. Glumes distichously disposed, suberect, broadly ovate, abruptly narrowed above to cuspidate apex, to 5 mm long, chartaceous, straw-coloured, stained with chestnut brown on both sides of keel, 5-nerved on each side below the middle, keel wide, ending in a straight cusp. Stamens 3; anthers 4.5 mm long; filaments 3 mm; style 8 mm long, fimbriate
above the middle, pyramidal at base; stigmas 3, 6 mm long. Achenes obovate, tirgonos with convexed sides, 3 mm long, gradually attenuate below the middle to long strip like base, maturing brownish grey, shiny. (Fig. 12).

Rare in saline swamp areas. Fl. & Fr.: July - December.

**Distribution:** Tropical Africa, Madagascar, Southern India and Ceylon.

**Specimens examined:** KURNOOL: Peddathumbalam, KH 10974; ANANTAPUR: Aakuthotapally, KH 7455; NELLORE: Dugarajapatnam, J.S. Gamble 12783 (DD) & (MH).

**Note:** A distinct species readily recognizable by its remarkably large spikelets as much as 3 cm long and bearing irregularly distichous greyish-brown glumes.

*A. ovata* is the type species of the genus *Abildgaardia* Vahl, which has been regarded

1) as an independent genus because mainly of the distichous arrangement of the glumes,

2) as a section of *Fimbristylis* because of the deciduous style base

3) by Lye (1973) as conspecific with *Bulbostylis* because of the resemblance in embryo type recorded by van der Veken.

Based on the studies established by Lye (1973) and Kral (1971) *Abildgaardia* is regarded here as a distinct genus.
Fig. 12. Abildgaardia triflora (Linn.) Abeywick.
A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume,
(KH 10974).
Anosporum Nees


Perennial, rhizomatous, stoloniferous herb; stolons to 15 cm long, brownish, rooting at nodes. Culms to 40 cm tall, triquetrous at least distally. Leaves 2 to several, half as long as the culm, blades narrowly linear, to 50 cm long, 1-costate, stiffish, sheaths to 70 cm long, the dorsal hyaline part eventually brownish, the lower ones cinnamon-coloured. Inflorescence an ovoidal, conical, lobed head, bearing 4 glomerules of 8 spikelets. Involucral bracts foliaceous, 5 patent, the longest to 30 cm long, the base dilated, purplish, striate, hyaline margined. Spikelets ovoid, to 8 mm long, densely to 20-flowered, brown to fuscous with yellowish margins. Glumes ovate, to 4 mm long, mucronate at apex, subcoriaceous, the sides yellow brown and stained with chestnut brown, obscurely 5-nerved near the keel, very narrowly whitish, membranous on margins, the keel 3-nerved, projecting into slightly recurved mucro. Stamens 3. Style slender, to 4 mm long, shallowly 3-lobed at apex; stigmas 3, longer than the style. Achenes ovoidal, trigonous and dorsally flattened, brown, minutely puncticulate, the wings developing into yellowish corky ridges.
Occasional in wet or flooded rice fields, in tanks etc.
Fl. & Fr.: July - December.

**Distribution:** From India through Indo-China Northeastern to Southern China and Eastwards to Malesia and Northeastern Australia.

**Specimens examined:** KRISHNA: Manjinarupudi: P. Venkanna 5377 (MH); VIZAYANAGARAM: Makkova, M. Venkaiah 6932 (AU).

**Note:** There is difference of opinion as to whether the taxon has a perigynium or not. Nees (1835) and Boeckler (1869, 1870) described the nutlet as being surrounded by a perigynium. Nees (1835) treated this species under a separate genus *Anosporum* and included it in the tribe *Hypolytreæ*. Boeckeler (1870) placed it next to *Cyperus* saying that the coryx wings at the base of the nutlet are the fusion product of three scales, which are connate with and absorbed into it, while the pistil is young. According to Clarke (1884) *C. cephalotes* is the only member of *Cyperus* subgen. *Anosporum* (Nees) Clarke. Kukenthal (1935-36) treated *Cyperus cephalotes* as belonging to the section *Anosporum* of *Cyperus*. According to Lye (1981) *Anosporum* is sufficiently different from *Cyperus* to warrant generic separation.
Ascotholis Fischner


Fischer 1679 (1164).

Perennial, erect, glabrous herb to 15 cm tall; culms bulbously thickened at base, covered with papery, brown leaf sheaths. Spikes sessile, oblong, aggregated in a globose terminal bracteate head; involucral bracts 4. Spikelets spirally imbricate, 1-flowered. Rhachilla disarticulating above the 2 empty glumes, leaving a knob. Glumes 2, opposite, brown-dotted, lower empty, upper spathiform containing a single hermaphrodite flower enclosed in a longer pale-brown utricular scale which is split down one side about half-way. Stamens 3. Achene enclosed in the scale, oblong, dark-brown, sessile, with a beak continuous with style, obscurely trigonous, 2.25 x 0.75 mm long.

Ran in dry grass lands. Fl. & Fr.: August - December.

Distribution: Tropics.


Note: This species is added to the sedge flora of Andhra Pradesh by Raghava Rao et al. (1990) from Mahaboob Nagar district.
**Bulbostylis Kunth nom. cons.**


A genus of about 120 species primarily on dry sandy situations on the warm-temperate or tropical regions of the world.

1. Inflorescence capitate, achenes smooth:
   2. Stems thick, rigid, curved shallowly grooved, up to 10 cm long . . . . . *B. subspinescens*
   2. Stems slender, striate, up to 30 cm long . . . . . *B. baroata*

1. Inflorescence of loose or crowded anthelas, achenes transversely wrinkled:
   3. Glumes glabrous, muticuous . . . *B. densa*
   3. Glumes pubescent, mucronate .... *B. puberula*
Bulbostylis barbata (Rottb.) Kunth ex Clarke in Hook. f.,
Progr. 27. 1772. Isolepis barbata (Rottb.) R. Br.
Bombay 2:87. 1903; Fischer 1662 (1153).

Key to the sub species

1. Bracts as long as or shorter than the heads, glumes
   2-2.2 mm with a short, straight mucro at apex. ... sub sp. barbata
1. Bracts much longer than the heads, glumes 3 mm with a
   recurved mucro at apex ... ... ... ... sub sp. pulchella

sub sp. barbata

Annual, densely tufted erect herb, to 30 cm tall,
culms slender, striate, leaved at base. Leaf blades filiform,
4 to 8 cm long, sheaths membranous, brownish. Inflorescence a
terminal head of 2-20 sessile spikelets, 5-15 mm across,
brownish. Involucral bracts 3, spreading, to 2 cm long,
setaceous. Spikelets sessile, lanceolate, 3-8 mm long, angular,
subdensely 7 to 15-flowered, pale brownish. Glumes ovate,
to 2 mm long with recurved short awn, membranous, yellowish-
green and becoming rusty brown, prominently keeled, ciliolate.
Stamen 1. Style base depressed-globular; style filiform;
stigmas 3. Achenes obovate-orbicular, trigonous, pale rounded
at apex.
This is a very common species found everywhere. Usually seen in open dry especially sandy areas, rocky surfaces, waste lands, road sides, and as a weed in cultivated lands. 
Fl. & Fr.: August - December.

Distribution: Widely distributed on the warmer parts of the old world, also on southern U.S.A., throughout Malesia, India.

Specimens examined: ANANTAPUR: Samatagram, KH 7460; GUNTUR: Vijayapuri south, VRK 5320; CUDDAPAH: Guvvalacheruvu, RVR 7846; ADILABAD: Ankusapuram, GO 4330; NIZAMABAD: Bongaun, BR 9281; CHITTOR: Nagapatla RF, K. Subramanyam 6856 (MH); KRISHNA: Machilipatnam, J.S. Gamble 12067 (CAL); SRIKAKULAM: Salur, N.P. Balakrishnan 950 (CAL); VISAKAPATNAM: Araku, N.P. Balakrishnan 650 (CAL); KARIMNAGAR: Kodimial, G.V. Subba Rao 20049 (MH); NELLORE: Dugarajapatnam, J.S. Gamble 12385 (DD).


Plants more rigid than sub sp. barbata. Head 10-15 mm across, more densely bearing numerous spikelets. Glumes 3 mm long, wholly subdensely pilose with often tubercle-based brownish hairs, the midrib thick, not clearly nerved, projecting beyond the glume apex forming a recurved awn-like cusp.
Not a common species. Usually seen in coastal areas and sandy places. Fl. & Fr.: August - November.

Distribution: India and Ceylon. In India this taxon is restricted to the southern parts of Deccan Peninsula.

Specimens examined: KURNOOL: Tungabhadra river, KH 10940; KURNOOL: Peddathumbalam, KH 10971; ANANTAPUR: Aakuthotapally, KH 7463; CUDDAPA: Palakonda Hills, CSR 9331; GUNTUR: Macherla, VRK 3524.

Bulbostylis densa (Wall.) Hand.-Mazz. in Karsten & Schenk.

Veg. 20. 7:16. 1930. Scirpus densa Wall. in Roxb.

Fl. Ind. 1:231. 1820. Bulbostylis capillaris (Linn.) Kunth ex Clarke var. trifida (Nees) Clarke in Hook.


Annual, tufted, glabrous, slender herb to 20 cm tall; culms capillary, leaved at base. Leaf blades filiform, to 10 cm long, light green; sheaths pale, membranous, loosely pilose with white hairs at orifice. Anthelas simple to sub compound, occasionally contracted nearly head like, bearing 2 to 8 spikelets, to 4 cm long; rays 1-5, capillary, 1 to 5 cm long. Involucral bracts setaceous, to 1.5 cm long. Spikelets solitary, oblong-ovate, to 6 mm long, somewhat angular,
ca.10-flowered, chestnut brown. Glumes glabrous, broadly ovate, 3 mm long, muticous, strongly keeled on back, light chestnut brown. Stamens 2. Style filiform. Achenes obovate-orbicular, trigonous, pale and eventually becoming greyish, transversely wrinkled, distinctly buttoned.

Common in open wet grassy places. This taxon can easily be recognised by its less tufted habit, capillary leaves and stems and the inflorescence with 3 spikelets. Fl. & Fr.: September - December.

**Distribution:** Widely distributed in the old world from tropical Africa through Indian subcontinent to China and Japan also to Malesia and Australia.

**Specimens examined:** ANANTAPUR: Chintakunta, TP 457.


Annual, tufted, slender erect herb, to 30 cm tall. Leaves basal, much shorter than the culms; blades filiform, puberulent; sheaths pubescent, straw brownish. Anthelas simple, to 1.5 cm long and as broad, open but crowded to almost headlike
with up to 5 short rays and, to 15 spikelets. Involucral bracts 2-4, filiform, dilated at membranous base, the lowest to 4 cm long. Spikelets solitary, ovate-oblong, to 7 mm long, angular, to 14-flowered. Glumes broadly ovate, to 2.5 cm long, apex with recurved mucro, strongly keeled on back, pale-greenish to light brown, densely pubescent. Stamen 1. Style base conical-globular; stigmas 3. Achenes broadly obovate, trigonous, to 1 mm long.

Usually thrives in sandy areas near river banks and sea-shore (Gamble). Fl. & Fr.: October-December.

Distribution: Widely spread in tropical Africa; Madagascar, India and Malesia.

Specimens examined: A specimen of this taxon is housed in Madras Herbarium without collector's name and Field number.


Annual, tufted herb to 10 cm tall. Culms thick, hairy, rigid, curved, shallowly grooved. Leaves basal, channelled, hispid-puberulous. Spikelets in dense, terminal, globose heads. Involucral bracts 3, as long as the head. Spikelets to 1.8 cm long, stellately spreading. Glumes rigid, scarcely keeled, densely pubescent. Style 3-fid. Achenes broadly obovoid, obtusely trigonous, pale brown.
Occasional in sandy areas. Fl. & Fr.: August - December.

Distribution: India, Indo-China, Malesia.

Specimens examined: VISAKHAPATNAM: Beach, KH 10988; CUDDAPAHT Guvvalachervu, K. Subramanyam 6402 (CAL); VISAKHAPATNAM: Araku, N.P. Balakrishnan 10860 (CAL); KURNOOL: Srisailam, J.L. Ellis 22035 (CAL); EAST GODAVARI: Uppada beach, T.A. Rao 7327 (CAL); NELLORE: Dugarajapatnam, J.S. Gamble 12386 (DD).

Carex Linn.

Perennial herbs often with ligneous rhizomes. Leaves 3-ranked, radical and cauline, the base forming a closed sheath; radical sheaths often coloured with brown, red-brown, purple-brown, often disintegrated into fibres and covering the neck of the rhizome. Inflorescence racemose, spicate, paniculate with 2 to many spikes or of a single terminal spike. Glumes spirally arranged, close together; the staminate ones bearing an axillary staminate flower; the pistillate one bearing an utricle at the axil. Spikelets reduced to a single flower. Utricles completely closed on the side, open only at apex with an orifice through which style exposes its stigmas. Each utricle subtended by a pistillate glume. Stamens 2-3. Fruit an achene, 3-sided with 3 stigmas or lenticular with 2 stigmas.
This is a very large cosmopolitan genus with about 1000 to 2000 or even 2500 species (Standley, 1935). Most of the species prefer moist or wet localities, some are found in rain forests, others in open habitats like mountain marshes, grasslands etc. The species of this genus fall into 3 ecological grounds, wet land, forest and ruderal. Certain species reproduce mostly vegetatively. Species of this genus provide fodder for domestic and wild animals, especially in colder regions.

1. Inflorescence panicled in the axils of all or at least the lower involucral bracts:
   2. Spikelets almost all 2.5 to 10 cm long:
      3. Utricles strongly inflated, broadly obovoid; to subglobose, red on maturity .. C. baccans
      3. Utricles not inflated, ellipsoid-oblong, pale to castaneous .... C. myosurus

2. Spikelets almost all 0.4 to 1.5 cm long:
   4. Utricles glabrous, glumes straw or dirty white coloured . . . . . . . C. stramentita
   4. Utricles short hairy, glumes reddish brown . . . . C. cruciata

1. Inflorescence spicate with a solitary spike in the axils of each involucral bract or spikelets solitary, terminal:
5. Utricles not tomentose .... C. speciosa

5. Utricles grey tomentose ..... C. hebecarpa ssp. ligulata

*Carex baccata* Nees & Wight, Contr. Bot. Ind. 122. 1834; FBI 6:722; Fischer 1687 (1169).

Perennial, loosely tufted, rhizomatous herb; culms to 110 cm tall, acutely 3-angled, clothed at base with purple or greyish brown sheaths, slightly disintegrating into fibres. Leaves cauline, dense on the lower portion, leaf blades widely linear, upper ones overtopping the culms, to 9 mm wide, deeply green, coriaceous, stiff, 3-costate, flattish, scabrid on upper surface; sheaths to 15 cm long, tightly surrounding the culm internode, upper ones greenish, lower ones reddish brown, eventually splitting into oblique fibres on ventral side. Inflorescence a compound panicle, interrupted and contiguous above; partial panicles 5, elliptical, to 20 cm long, single at each node, further branched into ca. 15 spikes; upper peduncles enclosed in the involucral bract sheath, the lower ones exserted. Lower involucral bracts leaf-like, overtopping the inflorescence, the sheathing base to 5 cm long. Spikes suberect, cylindrical to 5 cm long, androgynous; pistillate part subdensely many-flowered; male portion linear, dark red when young. Pistillate glumes ovate, to 3.5 mm long, herbaceous, stramineous, Perigynia inflated, broadly obovoid obscurely trigonous, to 4 mm, subcoriaceous, to 8-nerved, dark red at maturity, abruptly
contracted at both ends; beak hispidulous margined. Stamens 3. Style short, not thickened at base; stigmas 3. Achenes loosely enveloped, short beaked at subdensely contracted apex, elliptic, to 3 mm long, acutely 3-angled, dark brown.

This is a rare species usually seen in wet grassy slopes in forests. Fl. & Fr.: July - August.

Distribution: From India and Ceylon through Indo-Chinese subcontinent north-east wards to southern China and Formosa and eastwards to Malesia.

Specimens examined: VISAKHAPATNAM: Anantagiri-Galikonda, TP & EC 739; Minumuluru, G.V. Subba Rao 28276 (CAL).


Perennial herb with a short, stout, woody rhizome which is clothed with fibrous remains of leaf-sheaths. Culms trigonous, smooth, glabrous. Leaves sub-basal, often 1-2 cauline, as long as or longer than stem, to 0.8 cm broad. Sheaths trigonous. Panicle slender, compound, to 25 cm long with 8-10, solitary, 7 cm long secondary panicles. Involucral bracts foliaceous, becoming smaller upwards. Spikelets cylindrical, linear-oblong, to 1.5 cm long. Bracteoles glumaceous, aristate.
♀ florets: to 5. Glumes ovate-oblong, aristate, reddish brown. Utricle inflated, ellipsoid, faintly trigonous many-ribbed, with a hairy margin, thinly pilose, narrowed into a 2-fid beak. ♂ florets: glumes longer than the glumes. Shortly aristate.

Shady localities of ravines and forest edges. Fl. & Fr.: August - December.

Distribution: India, Burma, Ceylon.

Specimens examined: VISAKHAPATNAM: Sunkarimetta, G.V. Subba Rao 19603 (MH & CAL).


Perennial very loosely tufted, rhizomatous herb to 75 cm tall; rhizome short, prostrate, knotty, covered tightly with reddish-brown scales; roots reddish-brown, culms erect from ascending base, lower half to 1/3 clothed with bladeless sheaths and leaved only above the middle, to 8-noded below the inflorescence, the internodes triquetrous, becoming yellowish; basal sheaths bladeless, the sheathing portion to 5 cm long, herbaceous, reddish-brown below. Leaves subdensely
alternate, equalling to or surpassing the inflorescence; leaf blades linear-lanceolate, to 35 cm long, to 12 mm wide, deeply green above, whitish green beneath, roughened above, the sheathing portion to 5 cm long, sharply trigonous, greenish, ligule brown, membranous, to 1.5 cm long. Involucral bracts foliaceous, all surpassing the inflorescence, the lower 2-4 long sheathing, the upper 2-3 short sheathing. Spikes 6, terminal spike stamineate, linear, to 2.5 cm long, lightly brown, almost equalling the uppermost pistillate spike; lateral spikes pistillate, cylindrical, to 4 cm long, subdensely many-flowered, glaucous green; penduncles to 3 cm long. Pistillate glumes ovate, to 3 mm long excluding awn, membranous, pale, ending in a mucro at glume apex or projecting beyond glume apex into a straightish awn. Utricle erect, patent, ovate, elliptic, obtusely trigonous, to 4 mm long, thickly herbaceous, cinnamon-greenish at maturity, wholly densely pubescent with spreading white rough hairs. Style base bulbose; stigmas 3. Achenes tightly enclosed, elliptic, triquetrous, 3 mm long.

Occasional in wet forests as undergrowth. Fl. & Fr.: September - January.

Distribution: India, Indo-China, Ceylon.

Specimens examined: VISAČAPATNAM: Galikonda, G.V. Subba Rao 19604 (MH).
Carex myosurus Nees in Wight Contrib. Bot. India 122. 1834; FBI 6: 723; Fischer 1687 (1159).

Perennial herb, to 90 cm tall with a short, stout, woody rhizome which is clothed with persistent, fibrous remains of leafsheaths. Culms erect, obtusely trigonous, minutely hairy on faces just a little below the sheath. Leaves subbasal, as long as or longer than the stem, to 1 cm broad. Panicle simple, to 50 cm long, with secondary panicles reduced to solitary spikes. Involutural bracts foliaceous. Spikelets oblong-cylindric, terete, 7 × 0.8 cm, male at apex, many-flowered. Male glume oblong, to 5 mm long, membranous, obtuse; keel 3-nerved.

Stamens 3. Female glume broadly ovate, to 4 mm long; keel 3-nerved. Style 3-fid, 2 mm long. Utricle equal to glume, ellipsoid-oblong ribbed, scabrid, beak short, 2-fid, pale to castaneous, stipitate. Achene ellipsoid, trigonous, to 2 mm long, castaneous.

This species is usually found along wet forest slopes, shady places of ravines and in mountain sides. Fl. & Fr.: September - December.

Distribution: India, Burma, Indo-China.

Specimens examined: VISAKHAPATNAM: Ebul RF, north of Gudem, V. Narayanaswamy 536 (CAL).
Carex speciosa Kunth, Enum. Pl. 2:504. 1837; FBI 6:729; Fischer 1686 (1168).

Annual, tufted, rhizomatous, erect herb, to 30 cm tall. Culms slender, winged. Leaves basal, exceeding stem, to 3 mm wide, multistriate. Involutural bracts over-topping. Spike 1, oblong, terete. Spikelets male at apex, female at base. Male glume ovate, to 1.5 mm long. Female glume to 2.5 mm long, muticous. Stigmas 3. Utricle ovoid-ellipsoid, base trigonous, to 4 mm long, pale, ribbed margins winged, exceeding glume, beak conical, truncate, 2-fid with ciliate margins. Style persistent, very stout, thickened at the base. Achene ellipsoid, trigonous with prominent angles, stipitate, pale brown with darker markings to 1 mm long.

Occasional along moist shady slopes of forests.

Fl. & Fr.: September - December.

Distribution: India, Burma, Malaysia, Ceylon.

Specimens examined: EAST GODAVARI: Maredumilli, KH & BR 10904; VISAKHAPATNAM: Chintapalli, G.V. Subba Rao 28205 (MH & CAL); EAST GODAVARI: Rampa hill, M.S. Ramaswami 1543 (CAL); VIZAYANAGARAM: Kankanapalli, M. Venkaiah 2594 (AU).

Carex stramentita Boott ex Boeck. in Linnaea 40:351. 1876.

FBI 6:717.
Perennial, rhizomatous herb; rhizome woody, clothed with persistent, fibrous remains of leaf sheaths. Culms to 100 cm tall, trigonous; nodes hairy. Leaves sub-basal, nearly as long as the culms, plicate. Panicle dense, compound, to 25 cm long with 3 secondary panicles. Involucral bracts foliaceous. Spikelets cylindric, straw-coloured, 1.3 cm long. $\phi$ florets: Glumes ovate-oblong, aristate, straw-coloured, 3 mm long. Utricle ellipsoid-rhomboid, trigonous, greenish, glabrous, with subentire, glabrous beak, many-nerved. $\delta$ florets: glumes ovate, aristate.

This is a rare species and is usually found in wet open places in forests. Fl. & Fr.: December - January.

Distribution: India, lower Burma, S. China, Thailand.

Specimens examined: VISAKHAPATNAM: Ebul RF, north of Gudem, V. Narayanaswamy 539 (CAL); EAST GODAVARI: Dummakonda, V. Narayanaswamy 222 (CAL).

Cyperus Linn.

Annual or perennial sedges, often rhizomatous or stoloniferous, culms not nodose above the leafy base, solid. Leaves 3-ranked with gramineous blade. Inflorescence a terminal anthela, sometimes becoming capitate by contraction; involucral bracts leaflike, not sheathing; spikelets sessile, prophyllate at base, bearing few to many glumes distichously imbricated on a continuous
persistent rhachilla. Glumes distichous, often imbricating, all abscissed at base falling apart from the rhachilla, the base of the glumes often decurrent along the rhachilla, internode forming the wings of rhachilla, stamens 1-3, connectives often crested, style 2 or 3-fid, continuous with ovary. Achenes trigonous or bi-convex, stipitate, apiculate.

A genus of about 500 species widely distributed in tropics and sub tropics. Most species of this group grow in moist or wet localities at low and medium altitudes.

1. Spikelets spicately disposed on conspicuously elongated rhachis thus forming spikes:
2. Rhachilla of spikelets winged with base of glumes, which decurrent along the rhachilla internode:
3. Spikes cylindrical, rhachis 3-7 cm long; spikelets numerous:
4. Anthers with a crest:
   5. Culms smooth on angles; involucral bracts 10; spikes cylindric ........ C. elatus
   5. Culms scabrid on angles; involucral bracts 5; spikes linear ........ C. platyphyllus
4. Anthers without a crest:
   6. Rhizome short; spikes umbelled or corymbose; spikelets distinctly compressed; involucral bracts 3-6 .... C. exaltatus
6. Rhizome woody, creeping; spikes digitalis; spikelets terete; involucral bracts 3-12 ... *C. digitatus*

3. Spikes broadly elliptic, rhachis 1-4 cm long; spikelets occasionally up to 30:

7. Plants with creeping rhizomes or stolons (except in *C. bulbosus* which bears tunicate bulb at base of the culm).

8. Culms thick, more than 5 cm wide and 60 cm tall, clothed at base with bladeless sheaths:

9. Culms obtusely trigonous to subterete; involucral bracts much shorter than the corymb:

10. Culms not septate ... ... ... *C. corymbosus*

10. Culms transversely septate ... *C. articulatus*

9. Culms acutely trigonous; involucral bracts much surpassing the corymb ... ... ... *C. panyorei*

8. Culms slender, 1-2 mm wide and less than 60 cm tall leaves with elongated blade:

11. Culms arising from bulb-like tuber; stolons filiform soon disappearing ... *C. bulbosus*

11. Stolons conspicuous and persistent, culm base forming corm-like enlargement:

12. Glumes 2-2.5 mm long; leaves as long as the culm:

13. Leaves flaccid, flat; umbels compound and expanded ... ... ... *C. esculentus*
13. Leaves rigid, filiform; umbels simple and compact ............................................... C. stoloniferous

12. Glumes 3-4 mm long; leaves much shorter than the culm:
14. Culms 10 to 30 cm tall; longest involucral bract to 15 cm long ........................................ C. rotundus
14. Culms 30-60 cm tall, longest involucral bract to 10 cm long:
15. Spikelets spreading to erect, linear, achenes obovoid .................................................. C. bifax
15. Spikelets obliquely patent, flattened achenes oblong .................................................. C. mitis

7. Plants without creeping rhizome or stolons:
16. Spikelets linear to lanceolate, 1.5-2 mm wide, weakly flattened with two acute edges; glumes close together .................................................. C. tenuiculmis
16. Spikelets filiform, subterete, less than 1 mm wide; glumes spaced:
17. Spikelets spreading; glumes rounded, obtuse at apex bearing narrow hyaline margins towards apex .................................................. C. distans
17. Spikelets erect patent; glumes shallowly emarginate at apex, bearing very broad hyaline margin towards apex .................................................. C. nutans

2. Rhachilla of spikelets without conspicuous wings, base of glumes not decurrent along the rhachilla internode:
18. Plants perennial with stolons:
   19. Rhachis of spikes glabrous; glumes obtuse at white hyaline apex .... C. procerus
   19. Rhachis of spikes densely hispid; glumes acute at apex with broad hyaline apex C. pilosus

18. Plants annuals with fibrous roots only:
   20. Spikelets 1-2.5 cm long, 2-3 mm wide; glumes 2-3.5 mm long, acute at apex .... C. compressus
   20. Spikelets 1 cm long, 1-1.5 mm wide; glumes 1-1.5 mm long, obtuse at apex:
      21. Rhachilla of the spike glabrous; keel 3-5-nerved, smooth, not winged ... C. iria
      21. Rhachilla of the spike scabrid on the angles; keel 7-nerved, winged with serrate margins at apex .... C. alulatus

1. Spikelets digitately disposed or capitately congested at apices of inflorescence rays, thus forming heads without elongated rhachis:

22. Inflorescence with open elongated rays:
   23. Large sized perennials with conspicuous rhizomes; at least some leaves and involucral bracts more than 10 mm wide; culms 30-90 cm tall:
      24. Achenes with acute angles; spikelets in clusters of 2-3, weakly compressed ... C. diffusus
      24. Angles of achenes spongy thickened; spikelets in clusters of 5-8, strongly compressed ... C. platystylis
23. Small to medium sized annuals, leaves and bracts almost 5 mm wide; culms up to 30 cm tall:

25. Leaves flattish; glumes muticous; achenes obovate:

26. Spikelets digitate in clusters of 3-15; glumes acute at apex:

27. Glumes subaxially imbricate and slightly spaced; thus achenes exposed between glumes; plants tufted with fibrous roots

only ... ... ... C. tenuispica

27. Glumes densely imbricate and close together so that the achenes not shown between the glumes; rhizomes frequently elongated ... ... ... C. haspan

26. Spikelets many, congested on globose heads ... ... ... C. difformis

25. Leaves canaliculate; glumes awned or mucronate at apex; achenes oblony:

28. Glumes darker in colour, long with short erect mucro at apex ... ... C. amabilis

28. Glumes awned at apex:

29. Spikelets chestnut black; glumes with straight awn ... ... C. castaneus

29. Spikelets ferruginous; glumes with recurved awn:

30. Involucral bracts 5; style shorter than the achenes ... ... C. cuspidatus
30. Involucral bracts 3; style longer than the achenes. 
C. rubicundus

22. Inflorescence congested in a single head:
31. Annual, tufted herb. 
C. meeboldii

31. Perennial rhizomatous herbs:
32. Rhizome short, rootlets wiry. 
C. niveus
32. Rhizome with long creeping stolons, rootlets thick. 
C. arenarius


Annual, tufted herb, to 40 cm tall, culms triquetrous. Leaves as long as the culms, linear, serrulate margin near apex. Inflorescence terminal, lax, compound umbel. Involucral bracts 8, unequal, the longest one up to 30 cm long. Spikes to 3 cm long; rachis flexuous, scabrid on the angles; rays 3, unequal, to 15 cm long. Spikelets greenish yellow, patent, Glumes ovate, imbricate, keel 7-nerved, winged with a serrulate margin in the upper part. Stamens 2. Style 2-partite near to the base. Achenes obovoid, triquetrous, reddish-brown, apiculate.

Occasional in dry rice fields, ditches and agricultural fields. Fl. & Fr.: August - November.
**Distribution:** India, Indo-China, Japan.

**Specimens examined:** ADILABAD: Nirmal, V.S. Raju 2104 (KU); WARANGAL: Vidyaranyapuri, V.S. Raju 1990 (KU).

*Cyperus amabilis* Vahl, Enum. Pl. 2:318. 1806; FBI 6:598.

Annual, slender, tufted herb, to 30 cm tall, culms triquetrous. Leaves 2, sub-basal, half as long as the culms. Umbel compound; rays 9, to 10 cm long; involucral bracts 2, leaflike, longest up to 15 cm long; spikelets linear, golden brown. Glumes boat-shaped, truncate, mucronate, back 5-nerved, sides nerveless. Stamen 1, style as long as the achenes; stigmas 3. Achenes obovoid, fine brown, faintly rugose.

Occasional weed in cultivated fields, grass lands and marshy localities. **Fl. & Fr.: August - December.**

**Distribution:** Tropics

Raghava Rao (1989) reported it from Manabooonajar district.


Perennial, tufted, rhizomatous, stoloniferous herb, whole plant glaucous green, rhizome creeping, clothed with chestnut brown sheaths, roots thick; culms to 10 cm long, erect, terete,
Fig. 13. *Cyperus arenarius* Retz.

A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume,
E. Opened glume, F. Pistil with stamens, G. Achene (KH 10984)
Stout, clothed below with long withered sheaths. Leaves to 6 cm long, terete, coriaceous, sulcate, scaberulous, acute. Heads solitary on the summit of the stems, globose; involucral bracts 2, over-topping. Spikelets radiating, 10-15 in a cluster, oblong, brown-coloured, 8-10-flowered; rhachilla stout, not winged. Glumes ovate-oblong, boat-shaped, obtuse, streaked with brown, 4 x 3 mm long, thick, several-nerved. Stamens 3; filaments 2 mm long, persistent; anthers narrowly linear, muticous. Stigmas 3. Achenes triquetrous, smooth, brown, apiculate. (Fig. 13).

Commonly growing on sandy beaches, growing among other littoral species like Spinifex littoreus, Ipomoea pes-caprae etc. It can survive long periods of drought. Fl. & Fr.: July - December.

Distribution: Southern and Central Asia, India, Pakistan, Iran and Ceylon.

Specimens examined: VISAKHAPATNAM: Visakhapatnam beach, KH 10984; GUNTUR: Nizampatnam, VRK 5925; NELLORE: Tummalapenta, J.S. Gamble 12395 (MH); GUNTUR: Bapatla, K. Greenivasan 17504 (MH); KRISHNA: Machilipatnam, T.A. Rao 7409.

Note: This species can be easily identified by its single dense spikelets and long rhizomes. Usually this species forms large communities along sandy sea-shores.
Cyperus articulatus Linn. Sp. Pl. 44. 1753; FBI 6:611;
Fischer 1641 (1140).

Perennial, erect, glabrous, stout, robust herb, to 150 cm tall; stoloniferous root stock; culms to 1.2 cm wide, terete, transversely stipitate. Leaves reduced to 7-20 cm long, brown to grey purple-coloured sheaths and covers the base of the stem. Inflorescence compound umbel; involucral bracts 5, much shorter than the corymb, to 1 cm long; primary rays 5-8, to 9.5 cm. Spikes shortly racemose, to 4 cm long, 2-15-spikeletted, spikelets oblong, narrow, linear, compressed, acute, ca. 35-flowered; rhachilla 2-winged. Glumes ovate, 3 x 2 mm, mucronate, keel greenish. Stamens 3, stigmas 3. Achenes oblong, trigonous, maturing brown. (Figs. 14, 15a).

A water loving sedge, usually found in standing waters of ponds, canals, along river banks, and sandy sea coast in large colonies. Fl. & Fr.: March - September.

Distribution: Tropical Africa, India, Indo-China, Mediterranean region, South Eastern USA to Central and South America, more frequent in the Neotropics.

Specimens examined: KURNOOL: Peddathumbalam, KH 10955; ANANTAPUR: Gangalakunta, KH 7477; NIZAMABAD: Mosra Road TP & BR 6092; WEST GODAVARI: Chettaraparu, K. Subramanyam 5118 (MH & CAL); HYDERABAD: Along the Moosi River bank, K. M. Sebastian 5929 (MH & CAL); PRAKASAM: Somavarapupadu, R. K. Mohan 0672 (CAL);
Fig. 15 A. *Cyperus articulatus* Linn. on road side
between Mosra and Malkapur in Nizamabad district
B. *Schoenoplectus articulatus* (Linn.)Palla
in Adilabad district
**Cyperus bifex** Clarke in *Kew Bull.* 3:13. 1903. **Cyperus retzii**

Nees in Wight, *Contr. Bot. India* 82. 1834. **C. tuberosus**

sensu Clarke in *Hook. f., Fl. Brit. India* 6:616. 1893
ex parte.

Perennial, rhizomatous, stoloniferous herb; stolons
covered with brown scales; tubers ellipsoidal, to 3 cm long.
Culms to 70 cm tall, trigonous. Leaves few, blades shorter
than the culm, to 6 mm wide, flattish, herbaceous; sheaths
subloosely surrounding the culm, pale and tinged with light
reddish-purplish brown. Anthela subcompound, to 14 cm long.
Involucral bracts 4, foliaceous, patent, two longer surpassing
the anthela, the longest to 10 cm long, slender, erect patent.
Spikes broadly ovoidal, bearing 15 spikelets on short rhachis.
Spikelets spreading to erect, linear, to 20 mm long, gradually
narrowed distally to acuminate apex, moderately flattened,
pale stramineous and tinged with light reddish brown, 20-flowered,
\( \hat{h} \) Rachilla straight, internodes broadly winged, wings hyaline,
persistent. Glumes patent, subloose, ovate, markedly acute at
straight apex, to 4 mm long, pale stramineous and stained with
rusty brown on median part, rather broadly scarious on pale
margins, with slender 3 parallel nerves on both sides of costa
ending just below the glume apex, costa green. Stamens 3.
Stigmas 3. Achenes obovoid, trigonous, greyish brown, puncti-
culate.
Occasional in open wet ground, the margins of ditches, tanks, irrigation canals and rice fields etc. Fl. & Fr.: July - December.

**Distribution:** Southern India, Ceylon, Thailand, Malaysia and Australia.

**Specimens examined:** RANGAREDDY: Anantasagar beat, KH & MSM 10928; WARANGAL: Parvathajiri, A. Ragan 2003 (KU).


Perennial, stoloniferous herb, to 30 cm tall; tuber ovoid-globose, clothed with coriaceous black-brown striate coat splitting into several segments; stolons filiform, to 10 cm long, terminated by tuber. Culms triquetrous arising from bulblike tuber. Leaves to 20 to a culm, slightly overtopping the culm; blades to 20 cm long, incurved plicate, scabrid on upper margins; sheaths to 6 cm long, broader than the blade, membranous, cinnamon-coloured, the inner ones pale white. Inflorescence simple, to 3 cm long, spicately bearing 2 subdigitate clusters of spikelets on very short axis. Involucral bracts 3, patent, the lowest surpassing the inflorescence, the longest to 10 cm long. Spikelets subdigitate-spicate on very short rhachis, patent, linear, to 2 cm long, to 20-flowered, sanguineous brown; rachilla flexuous, the internodes winged. Glumes sub-erect, ovate-oblong,
to 4 mm long, 9-nerved with nerves equally spaced, the sides characeous, shining reddish, the green keel ending into a straight mucro. Stamens 3. Style to 4 mm long, 3-cleft. Achenes ellipsoid, trigonous, maturing black, apiculate at obtuse apex.

Occasional in sandy beaches, river sides, and marshy areas. Fl. & Fr.: September - December.

**Distribution:** Tropical Africa, Southern Asia, Malysia, Northern Australia.

**Specimens examined:** KURNOOL: Nemakal, KH 10975; WARANGAL: Hanumakonda, V.S. Raju 1984 (KU).

**Note:** Fischer (loc. cit) reported it from Deccan and Carnatic; Beypore in South Malabar. Obviously its distribution in Deccan was not specifically mentioned. This species is added to the sedge flora of Andhra Pradesh State by Raju and Ragan (1989) from Warangal district as new record.

*C. bulbosus* can easily be distinguished by the black-coated bulbils which give rise to new plants. In the absence of the bulbils *C. bulbosus* may easily be confused with *C. rotundus*. But the former can be distinguished by spaced lower bracts, and more distinctly nerved glumes.

**Cyperus castaneus** Willd. Sp. Pl. 1:278. 1797; FBI 6:598; Fischer 1639 (1139).
Annual, tufted, glabrous herb to 20 cm tall, culms slender, triquetrous, 10-leaved at base. Leaves 9 cm long; blades setaceous, weakly scabrid, reddish brown. Anthela simple, to 8 cm long, frequently congested in a single head. Involucral bracts 4, surpassing the inflorescence; rays 5, to 5 cm long, stiff, slender. Spikelets stellately clustered in groups of 5 to 10, slenderly linear, to 10 mm long, flattened, 20-40-flowered, chestnut black; rachilla straightish, wingless. Glumes erect-patent, oblong, to 2 mm long, thinly chartaceous with very narrow membranous margins, sanguineous, keel acute, greenish, strongly 3-nerved, excurrent into straight mucro. Stamen 1. Stigmas 3. Achenes oblong with parallel sides to oblong-obovoid, brown, puncticulate. (Fig. 16).

Common in open wet lands, grassy places, rice fields, and in swamps etc. Fl. & Fr.: August - December.

Distribution: From India through Indo-China, Malaysia to Northern Australia.

Specimens examined: KURNOOL: Peddathumbalam, KH 10992; RANGA REDDY: Mohammadabad RF, MSM 10525; ADILABAD: Rebbana, GO & PVP 4844; CUDDAPAH: Guvvalacheruvu, RVreddy 7968; CHITTOOR: Near Komativicneruvu, G.V. Subba Rao 46331 (MH & CAL); KURNOOL: Srisailam, J.L. Ellis 22115 (MH); KRISHNA: SNG Palem, P. Venkanna 5799 (AU); EAST GODAVARI: Y. Ramavaram, S. Sudhakar 693 (AU); VIZAYANAGARAM: Duggeru, M. Venkaiah 633 (AU).
Fig. 16. *Cyperus castaneus* Willd.


(RVReddy 7968).
Cyperus compressus Linn., Sp. Pl. ed. 1, 46. 1753; FBI 6:605;
Fischer 1640 (1140). C. pectiniformis Roem. & Schult.,
Mant. 2:128. 1824.

Annual, tufted herb. Culms patent, to 30 cm tall,
3-sided. Leaves 4 to a culm, basal; blades linear, shorter
than the culms, light green; sheaths membranous, pale brownish,
striate. Inflorescence anthelate, to 10 cm long; involucral
bracts 7, foliaceous, unequal, the longest one to 20 cm long;
rays 8, patent, to 10 cm long. Spikes bearing to 10 spikelets
on abbreviated axis. Spikelets lance-oolong, 1-2.5 x 0.2-0.3
long, Ca.20-flowered, compressed, greenish and stramineous at
maturity; rhachilla flexuose. Glumes broadly ovate, 3.5 mm
long, chartaceous, pale green and eventually stramineous,
strongly folded with acute keel, 3-nerved on both sides, the
keel broadly green, the apex acute with straigntish mucro.
Stamens 3. Style 3 fid at apex. Acnenes 1.3 mm long, broadly
ovate, 3-sided, dark brown, shiny. (Fig. 17).

Common weed of cultivated fields, waste lands, in open
grass lands, along the sides of water courses, along paths on
moist sandy soils. Fl. & Fr.: September - February.

Distribution: Tropical, subtropical and temperate
regions of the world.

Specimens examined: ANANTAPUR: Reddypalli farm, KH 5587;
KURNOOL: Kuppagal RF, KH 10967; RANJAREDDY: Mohammadabad
RF, MSM 10382; ADILABAD: Bellampalli, PVP & KH 9448; GUNTUR:
Fig. 17. *Cyperus compressus* Linn. A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume, E. Spared glume, F. Pistil with stamens, G. Achene. (VR 5722).

Perennial tall, glabrous, glaucous-green, rush-like herb; rhizome creeping, clothed with dark brown scales; culms to 90 cm long. 6 mm wide, terete below, trigonous above. Leaves reduced to sheaths. Umbel compound, to 14 cm long; involucral bracts 3, longest to 13 cm long, green; lowest involucral bract much shorter than the corymb; primary rays 6-9, very unequal, the longest reaching 10 cm long; secondary rays terminated by spikes or corymbs of 4-5 very slender spikelets. Spikes ca. 10, 6-9-spikeletted. Spikelets spicate, very variable in length, 2.5 cm long, rusty brown, rhachilla winged, 15-20-flowered. Glumes closely appressed to the rhachilla, oblong, 3-nerved on the back,
3 mm long, muticous; sides pale, margins hyaline. Stamens 3; filaments to 3 mm long; anthers to 2 mm long. Stigmas 3. Achenes oboviod, tapering towards the base, trigonous.

Common in marshy areas near river banks, canals, along the sides of the ponds, in ditches etc. Fl. & Fr.: August - December. Distribution: Tropical West Africa, Madagascar, Nepal, India, West Indies and Tropical South America.

Specimens examined: KURNOOL: Tungabhadra river, KH 10950; RANGAREDDY: Mohammadabad RF, KH & HSH 10922; ANANTAPUR: Kalasamudram RF NY 1135; NIZAMABAD: Chandur, BR & GO 9209; EAST GODAVARI: Koringa canal, G.V. Subba Rao 6d692 (MH).

Note: This species is used for making mats.


Annual, erect, tufted herb, 9 cm tall. Leaves setaceous, as long or half as long as culms, filiform, sheaths purple. Umbel simple, consisting of a central sessile head and few or many filiform spreading unequal rays, each terminated by a head of stellately spreading spikelets; involucral bracts 5, longest to 5 cm long, filiform. Spikes ovoid, digitately and stellately spikeletted. Spikelets 5-15 in a cluster, compressed, 12-24-flowered, 1 cm long, reddish-brown, rhachilla persistent.
Glumes 1 mm long, oblong, obtuse, arista recurved; keel 3-nerved, produced into a long recurved mucro; sides brown, margin hyaline. Stamens 3, anthers oblong. Stigmas 3; style shorter than achenes; Achenes obovoid, triquetrous, winged, dark-brown.

Common in moist or damp sandy soil of cultivated and fallow fields. Fl. & Fr.: July - December.

Distribution: Pantropic with its range extending north to southern continental China and Formosa.


Cyperus difformis Linn. Cent. Pl. II.6.1756; FBI 6:59d;
Fischer 1640 (1139).

Annual, glabrous, tufted herb with many reddish fibrous roots; culms to 40 cm tall, weak, triquetrous towards the top. Leaves few, shorter than the stem, acuminate, flaccid, to 13 cm long; sheaths stramineous or brown. Spikes in a simple or compound or contracted into a head; involucral bracts 3, overtopping, longest to 20 cm long, leaflike; rays of the umbel 3-6, to 3 cm long. Spikes globose, capitate, to 1.5 cm across. Spikelets many in dense heads, dusky or brown, oblong, 10-20-flowered, compressed, rhachilla not winged. Glumes closely
imbricate, obovate, obtuse, concave, 3-nerved and rounded on the back, patulous, margin hyaline; keel greenish. Stamens 2, anthers muticous, yellow. Stigmas 3. Achenes ellipsoid, trigonous, yellow or brown.

Very common species found as a weed in rice fields, and cultivated lands, often associated with C. haspan, C. iria and Pycreus sanguinolentus. Fl. & Fr. throughout the year.

**Distribution:** Tropical and warm temperate regions of the Old World; widely distributed in Eurasia, from southern Europe through India and China to Japan and Malesia also in Pacific islands and Australia; introduced to central America and S. Africa.

**Specimens examined:** ANANTAPUR: Ganjalakunta, KH 7476; KURNOOL: Peddathumbalam, KH 10990; RANGAREDDY: Mohammadabad RF, KH & MSM 5584; GUNTUR: N.S.right canal, VRK 3548; KURNOOL: Ghani RF, RVR 1565; NIZAMABAD: Minjaram, TP & JR 6307; ADILABAD: Alampalli, TP & PVP 4175; ANANTAPUR: Bukkapatnam, J.S. Gamble 20926 (MH & DD); CHITTOOR: Horsely Konda, J.S. Gamble 15157 (DD); CUDDAPAH: Guvvalacheruvu, K. Subramanyam 7790 (CAL); HYDERABAD: Katasintha, K.M. Sebasti 6015 (MH & CAL); KARIMNAGAR: Godavari river, G.V. Subba Rao 22474 (MH & CAL); MEDAK: Narsapur, K.M. Sebasti 7986 (MH & CAL); SRIKAKULAM: Ranjamatiyedda, G.V. Subba Rao 62346 (MH & CAL); EAST GODAVARI: Polavaram agency, D.C.S. Raju 117 (CAL); KRISHNA: Nunna, P. Venkanna 5924 (AU).

Perennial tufted herb with short corm-like rhizome clothed with dark brown scales and their fibrous remnants. Culms to 84 cm tall, rigid and coarse, trigonous. Leaves flattish, 3-costate, scabrous on margins, sheaths pale green eventually turning rusty brown. Anthelia decompound, diffuse; primary rays many, spreading, 15 cm long. Secondary rays to 5 cm long. Involucral bracts 12, leafy, longer than the corymb, the longest up to 30 cm long. Spikelets sessile, compressed, digitate in groups of 3-5 at apices of secondary and tertiary rays, linear obovate, 8 mm long, 12-flowered, green tinged with straw-coloured, internodes winged. Glumes orbicular-ovate, 2 mm long, contracted above to an acute mucronate apex, thinly herbaceous, nerved, greenish and stained with straw colour, keel excurrent in a recurved mucro. Stamens 3, stigmas 3. Achenes elliptic, 3-sided, slightly surpassing the glume, 2 mm long, brownish.

Common in wet low lands, along canals and as a weed in paddy fields. Fl. & Fr.: December - August.

**Distribution:** India, Indo-China, Southern China and Malesia.

**Specimens examined:** VIZAYANAGARAM: Punyagiri hill - S. Kota, KH & BR 9714; EAST GODAVARI: Sesharayi, S. Sudhakar
Cyperus digitatus Roxb. Fl. Ind. 1:209, 1d20; Fischer 1642

C. digitatus Roxb. var. hookeri (Boeck.)
Cyperus spongiosa-vaginatus Boeck. in Cyp. Nov 1:5.1888.

Perennial, erect, stout, robust herb with woody creeping, rhizome, culms triquetrous, to 100 cm tall. Leaves as long as the stem, coriaceous, multistriate, flat, with scaberulous margins; sheaths purplish. Umbel very large, broad, to 15 cm long; involucral bracts 3-12, to 40 cm long, leaflike; primary rays 3-6, rigid, trigonous, to 9 cm long, terminated by stellately spreading sessile or cylindric spikes of unequal length, loosely set all round with innumerable horizontally spreading spikelets; secondary rays 1-3. Spikes digitate, terete, 7-15 in a cluster, to 2.5 cm long, sessile, 10-20-flowered. Spikelets terete, 3 cm x 0.5 cm, spicate, at right angles to rhachis, acute, yellowish-brown, rhachilla winged. Glumes ovate, 2 mm long, plicate, fuscous, mucronate, margin hyaline; keel strongly 3-nerved. Stamens 3. Stigmas 3. Achene ellipsoid, trigonous, yellowish.

Occasional near water logged places, at the sides of ponds, channels, ditches, and in marshy areas. Fl. & Fr.: July - December.
Distributions: Pantropic with its range extending north into southern China and Formosa, abundant in South Africa, and Southern Asia, relatively scarce in tropical Africa, and Australia.

Specimens examined: KURNOOL: Tungajnadra river, KH 10941; NIZAMABAD: Kotgir, NR & KH 9644; ANANTAPUR: Penakachnerla NY 592; VIZAYANAGARAM: Duggeru, M. Venkaih 6894 (AU).

Cyperus distans Linn. f., Suppl. 103, 17d; FBI 6:607; Fischer 1640 (1140).

Key to the varieties

1. Spikelets distant, spreading at maturity .. var. distans
1. Spikelets crowded, erect at maturity .. .. var. pseudonutans

var. distans

Perennial, erect, robust, leafy herb; culms not tufted, to 100 cm tall, trigonous. Leaves flat, as long as stem, scaberulous; sheaths purplish. Inflorescence brown, decompound, to 25 cm long. Involucral bracts 5-7, leaflike, very much elongated, primary rays 7-9, secondary rays 1-5. Spikes ovate, with 15-20 patent spikelets, at right angles to rhachis. Spikelets distant, spreading, narrowly linear, 2 cm long, purplish, 13-15-flowered; rhachilla persistent. Glumes elliptic, to 2 mm long, purplish, rounded, obtuse at apex bearing narrow
Fig. 18. *Cyperus distans* Linn. var. *distans*

A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume, E. Opened glume, F. Pistil with stamens, G. Achene
hyaline margin at apex. Stamens 3, filaments 2 mm long, apiculate. Stigmas 3. Acneses ellispid, triquetrous, grey, apiculate. (Fig. 18).

Occasional on the margins of ponds, ditches, rivers, rice fields and in wet places. Fl. & Fr.: September - December.

**Distribution**: Wide spread over the warmer regions of the world.

**Specimens examined**: VISAKHAPATNAM: Visakhapatnam beach, KH 10986; Tyada forest, KH & BR 9719; ANANTAPUR: Bikkapatnam RF, NY 642; KURNOOL: Javakulavagu river side, J.L. Ellis 25437 (MH); KRISHNA: Agiripalle, P. Venkanna 5230 (MH); EAST GODAVARI: Talupulanna, J. Venkateswarulu MH s.No.95703; KURNOOL: Mahanandi, J.L. Ellis 25437 (CAL).


**Cyperus nutans** auct. non Vahl: FBI 6;507.

Perennial, rhizomatous herb, culms to 90 cm tall. Spikes rather densely spikeletted. Spikelets crowded, erect or suberect at maturity.

Occasional in wet places and along water streams. Fl. & Fr.: September - December.

**Distribution**: Tropical Africa, India to Taiwan.

**Specimens examined**: VIZAYANAGARAM: On the way to Punyagiri hill - S.Kota, KH & BR 5597; KURNOOL: Nallamalais,
Cyperus elatus Linn., Cent. Pl. 2:301. 1756 & Sp. Pl. ed. 2. 67. 1762; PBI 6:618; Fischer (1141) 1642.

Perennial, stout, robust herb, to 120 cm tall; culms above bluntly trigonous, the angles smooth. Leaves nearly as long as culm. Inflorescence compound umbel. Involucral bracts 10, to 80 cm long; primary rays to 10, to 20 cm long; secondary rays to 5 cm long; spikes narrowly cylindric, clustered at the ends of the rays and few sessile at the base of the partial umbels, to 5 cm long; spikelets densely spirally inserted on the angular rhachis, erect, linear, wings of rachilla lanceolate, yellow, caducous. Glumes closely imbricate, ovate when expanded, keeled, yellowish brown. Anthers crested. Stigmas 3. Achenes trigonous, ellipsoid, pale-brown.

Occasional on river banks and swamps. Fl. & Fr.: August - December.

Distribution: Deccan peninsula and Malaya.

Specimens examined: CUDDAPAH: Porumamilla, J.S. Gamble 10386 (DD).

Cyperus esculentus Linn. Sp. Pl. 45. 1753; PBI 6:616;
Fischer 1641 (1141).
Perennial, stoloniferous, tuberous herb to 30 cm tall; stolons slender, subterranean, covered with hard, strongly veined scales and ending in ovoid, edible tubers. Culm base pale brown, trigonous, finely striated. Leaf blades flat, shorter than the culms, linear and gradually tapering in the upper part to a fine acuminate apex. Inflorescence primarily umbellate, of sessile and peduncled spikes, expanded; the rays to 7 cm in long. Spikelets linear, to 12 mm long, rachis slender with narrow hyaline wings. Achenes obvoid-ellipsoid in outline with 3 sharp angles.

Occasional in marshy areas, along banks of streams and rivers. Fl. & Fr.: August - January.

**Distribution:** India, Indo-China, Burma.

**Specimens examined:**


Perennial, stout, glabrous, tufted erect herb with a short rhizome; culms to 110 cm tall, rigid, trigonous. Leaves folded, to 75 cm long, thick, to 8 mm wide, nerves prominent above,
multistriate; sheaths brown to purple, spongy. Umbel compound, to 20 cm long; involucral bracts 3-5, overtopping, longest to 55 cm long, leaf-like; primary rays 7-10, unequal, to 20 cm long, spreading; secondary rays 3-5, to 5 cm long, bearing spikes. Spikes umbelled or corymbose, terete, loose, to 4 cm x 1 cm long, 30-40-spikeletted, rhachis visible, flexuous. Spikelets spicate, at right angles to rhachis, oblong, ascending, chestnut brown, much compressed, 1 cm long, acute, 10-20-flowered; rhachilla winged. Glumes ovate, to 2 mm long, mucronate, black-green; keel pale green, 3-5-nerved. Stamens 3; anthers yellow; muticous. Stigmas 3, exserted; style 3-fid. Achenes ellipsoid, tapering to both ends, trigonous, brown.

Common in wet fields, swamps, marshy areas, along streams and canals. Fl. & Fr.: August - December.

Distribution: Pantropic with its range extending northwards to eastern China and Japan, common in India.

Specimens examined: KURNOOL: Peddathumlam, KH 10939; RANGAREDDY: Mohammadabad RF, KH & MSM 10914; ADILABAD: Sone, TP & PVP 4051; KARIMNAGAR: Rechapalli, G.V. Subba Rao 22271 (MH); NELLORE: Gudur, K.C. Jacob 18518 (MH); VISAKHAPATNAM: Chintapalli, G.V. Subba Rao 28212 (CAL); SRIKAKULAM: Salur, N.P. Balakrishnan 929; KRISHNA: Nunna, P. Venkanna 5925 (AU); EAST GODAVARI: Maduguxota, S. Sudhakar 9910 (AU); VIZAYANAGARAM: Dajgeru, M. Venkalaiah 5852 (AU).
Cyperus halpan Linn. Sp. Pl. ed. 1, 45, 1753; FBI 6:600; Fischer 1640 (1139).

Key to the subspecies

1. Rhizome long, creeping, stem spaced, glumes 1.5 - 1.8 mm, stamens 3 ... ... sub sp. juncoides
2. Rhizome short, stem tufted, glumes 1 mm long, stamens 1 ... ... sub sp. halpan

subsp. halpan

Perennial, tufted, rhizomatous herb, culms to 50 cm tall, acutely triquetrous, leaved at base. Leaves 2 to a culm, blades linear, to 15 cm long, herbaceous, light green; sheaths to 4 cm long, lower ones membranous, red purple. Umbel compound, dense to subloose, to 10 cm long. Involucral bracts 2, the lowest one surpassing the anthela, the longest one to 8 cm long; primary rays to 10, unequal, patent, up to 7 cm long; secondary spikelets, rays to 2 cm long bearing 3-5 stellately spreading spikelets linear-oblong, to 10 mm long, suddensly to 2δ-flowered, chestnut brown, the wingless rhachilla hidden by densely disposed glumes. Glumes ovate-oblong, brown, to 1 mm long rounded on the back, sides hyaline, densely imbricate and close together so that achenes not shown between the glumes. Stamen 1, stigmas 3. Achenes broadly obovate, trigonous, cream-yellow. (Fig. 19).
Fig. 19. *Cyperus halpan* Linn. sub sp. *halpan*

A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume,
E. Opened glume, F. Pistil with stamens G. Achene

(KH & BR 10706 A).
Common weed in rice fields, abundant in wet and marshy areas. Fl. & Fr.: August - December.

Distribution: Tropical and subtropical regions of all world, with its range extending northwards in to Japan and in East Asia.

Specimens examined: EAST GODAVARI: Maredumilli, KH & BR 10906 A; KURNOOL: Owk RF, RVR 3035; CHITTOOR: Seethalam river bed M.C. Barber 45093 (MH); VISAKHAPATNAM: Minumuluru, G.V. Sudha Rao 29747 (MH & CAL); MEDAK: Madikonakurtà, K.M. Sebastian 6723 (MH); KURNOOL: Srisailam, J.L. Ellis 15894 (CAL); KRISHNA: Nunna, P. Venkanna 5923 (AU).

subsp. juncoides (Lam.) Kükenth. in Feddes Rep. 23:134. 1926.

C. juncoides Lam. III. 1:147. 1791. Cyperus naipan
Cyperus naipan var. flaccidissimus Kükenth. in Engl.

Perennial herb with long creeping rhizome, along which the culms are disposed in a row in a spaced manner.

This is not a common species. Occasionally seen in marshy areas, in wet, grass lands. Fl. & Fr.: September - November.

Distribution: Pantropical.

Cyperus iria Linn., Sp. Pl. 45. 1753; FBI 5:506; Fischer 1640


Annual, glabrous, erect, tufted, marshy herb; culms to 50 cm long, triquetrous, striate, rigid. Leaves flat or channelled, to 30 cm long, 6 mm wide, scaberulous, multistriate, acuminate, flaccid; sheaths purplish. Umbel decompound, 5-15 cm long; involucral bracts 5, longest reaching 15 cm long; primary rays 5-7, to 11 cm long; secondary rays 3-5, to 3 cm long, bearing irregularly fascicled umbellules formed of narrow interrupted spikes of 15-20, small few-flowered spikelets. Rhachilla of the spike glabrous. Spikelets spicate, oblong, 8 x 1 mm, to 15-flowered. Glumes broadly obovate, thick, rigid, fulvous, muticous, margin hyaline, obtuse; keel 3-5-nerved, smooth, not winged. Stamens 2-3; anthers yellow, muticous. Stigmas 3. Achenes obovoid, triquetrous, black or brown.

Common weed in wet and flooded paddy fields. Fl. & Fr.: July - December.

Distribution: Widely distributed in Asia from Iran and Afghanistan through Indian subcontinent north-eastwards to China and Japan and eastwards to Malesia and Australia.
Specimens examined: KURNOOL: Tungabhadra river, KH 10954; Peddathumbalam, KH 10991; ANANTAPUR: Aakuthotapalli, KH 7455; Kalasamudram RF, NY 1163; RANGAREDDY: Mohammedabad RF, KH & MSH 5572, 5579; EAST GODAVARI: Dhavaleswaram barrage, KH & BR 9724; ADILABAD: Nirmal, GO & DAM 5032; CUDDAPAH: Palakonda hill, CSR 7699; NIZAMABAD: Minjaram, TP & BR 613; CHITTOOR: Kambakam hill, M.C. Barber 45149 (MH); MEDAK: Harsapur, K.M. Sebastine 6538 (MH & CAL); SRIKAKULAM: Near Rangamatiagedda G.V. Subba Rao 62338 (MH & CAL); MARAGAL: Parnal lake, K.M. Sebastine 13138 (MH & CAL); VISAKHAPATNAM: Araku, N.P. Balakrishnan 10096 (CAL); NELLORE: Venkatagiri hill, P. Suryanarayana 4137 (VV); PRAKASHAM: Malakondapenta RF, R.K. Mohan 0506 (CAL); KRISHNA: Guraja, P. Venkanna 5545 (AU); VIZAYANAGARAM: Duggeru, M. Venkaiyana 7174 (AU).


Annual tufted herb; to 12 cm tall. Spikelets up to 5 mm long, crowded into a terminal head, subtended by two leafy involucral bracts of unequal length. Style long. Achenes turbinate, apiculate.

Occasional in moist gravel soil, along the banks of rivers and ravines. Fl. & Fr.: August - December.

Distribution: A native of Africa

In Andhra Pradesh it was reported from Hyderabad district as a new record by Rajagopal (1973).

Perennial, stoloniferous herb, stolons terminated by a globose tuber. Culms to 60 cm tall, solitary, triquetrous above, forming globose corm-like enlargement at base. Leaves few, shorter than the culms; blades flattish-plicate; sheaths to 15 cm long, stained with light reddish brown, the basal sheaths dusky, disintegrating into dark brown fibres. Anthela terminal with the lowest involucral bract upright, simple, to 7 cm long, rather lax. Involucral bracts leafy, 4, elongated, the lowest much surpassing the anthela, to 10 cm long; primary rays ca. 6, erect-patent, filiform, unequal, the longer ones to 5 cm long. Spikes broadly obovate, bearing 6 spikelets. Spikelets obliquely patent, to 20 mm long, flattened, ca. 30-flowered, yellow brown; rhachilla winged. Glumes erect patent, oblong, 3 mm long, membranous, light yellow brown and stained with brown on lower half, bearing 2 nerves on both sides. Stamens 3. Stigmas 3. Achenes oblong, trigonous.

In plains and as a weed in rice fields. Not as common as *C. rotundus* but this is also found growing along with *C. rotundus*. Fl. & Fr.: October - December.
Distribution: Madagascar, India to Indo-China, Malesia, Australia.


Cyperus niveus Retz. Obs. 5. 12. 1789; FRI 6:601; Fischer 1640 (1139).

Perennial, glaucous, rhizomatous herb, 20-70 cm tall; rootlets wiry; culms nodose at the base. Leaves much shorter than the stem, to 25 cm long, narrowly linear, setaceous-acuminate. Spikelets 6-16 in one head, 2 cm long, obovate-elliptic, compressed, pale or sometimes almost white, 20-30-flowered, rhachilla not winged. Involucral bracts 2, longest reaching 5 cm long; finely acuminate, leaflike. Glumes ovate-lanceolate, compressed, 4 x 2 mm long; keel produced into very short mucro; sides whitish-brown, multistriate, margins narrow and hyaline. Stamens 3; filaments 1 mm long; anthers linear, 2 mm long, muticous, exerted from the glume. Stigmas 3, style 2 mm long. Achenes obovoid, triglottous, dark brown. (Fig. 20).

This is a rare species usually seen in sandy localities of river beds, in gravelly soils and in dry grass lands.

Fl. & Fr.: May - November.

Distribution: More or less throughout India, Afghanistan, China.
Fig. 20. *Cyperus niveus* Retz.

Specimens examined: NIZAMABAD: Manchippa RF, BR & KH 9035; KURNOOL: Ghani RF, RVR 1506; EAST GODAVARI: Devipatnam, G.V. Subba Rao 24443 (MH & CAL); KARIMNAGAR: Kodimial, G.V. Subba Rao 20049 (MH); PRAKASAM: Ongole, C.A. Barber 7952 (MH); NELLORE: Tammanapatnam, J.S. Gamble 12318 (DD); GUNTUR: Najarjunakonda valley, K. Thothathri 9713 (CAL); VISAKHAPATNAM: Lakshmipuram, C.A. Barber 1756 (MH).


Key to sub species

1. Spikes loose, sub erect, open; achenes ellipsoid,
   1.5 mm long .. .. .... .. .... subsp. nutans
1. Spike dense, erect, close; achenes obovoid,
   1.2 mm long .. .. .... .. .... subsp. eleusinoides

subsp. nutans

Perennial, herb with short corm like rhizome. Culms solitary, to 40 cm tall, trigonous. Leaves few, shorter than the culm, to 20 cm long, succoriaceous, flattish, 3-costate, whitish beneath, scabrous in upper margins; sheaths subloosely surrounding the culm base, the lower ones tinged with reddish brown, the upper most pale green, to 10 cm long. Anthela ample,
compound, to 10 cm long. Involucral bracts 5, foliaceous, lower 2 much surpassing the anthela, to 25 cm long; primary rays 6, unequal, to 10 cm long. Spikes loose, suberect, open, to 4 cm long, spreading. Spikelets erect, patent, linear, 4 mm long, light brown. Glumes suberect, oolong, 2.5 mm long, folded with acute keel, slenderly 3-nerved on both sides of strong green midnerve, shallowly emarginate at apex bearing very broad hyaline margin at apex. Stamens 3. Stigmas 3. Achenes ellipsoid, 1.5 mm long, maturing brown. In wet low lands, in shallow ponds, and also as a weed in low land cultivations. Fl. & Fr.: June - October.

**Distribution:** India, Southern China, Malesia.

**Specimens examined:** KURNOOL: Peddathumoolam, KH 10972; ANANTAPUR: Reddipalli farm, NY 289; EAST GODAVARI: Nulakamaddi, G.V. Subba Rao 24533 (CAL).


Culms to 90 cm tall. Leaves as long as the culms, thick. Inflorescence decompound, 15 cm long. Involucral bracts 7, longest to 30 cm long; primary rays 7. Spikes erect, oolong close, densely spikeletted, bearing spikelets nearly to the base.
Glumes more patent, cuspidate, tinged with glaucous green. Achenes obovoid, trigonous 1.2 mm long, more suddenly narrowed to apiculate tip.

In swamps or wet areas, along banks of streams and rivers. Fl. & Fr.: September - December.

**Distribution:** Tropical Africa, India to Malesia and Northern Australia.

**Specimens examined:** KURNOOL: Tunganadra river, KH 10946; RANGAREDDY: Mohammadabad RF, KH & MSM 10921; ANANTAPUR: Penannahobilam, TP & NY 358; NALGONDA: Najarjunsagar, K.M. Sebastine 9757 (MH & CAL); MEDAK: Way to Pajarikutta, K.M. Sebastine 6623 (MH & CAL); CHITTOOR: Horseleykonda, J.S. Gamole 15062 (CAL); EAST GODAVARI: Bhupatipalem, V. Narayanaswamy 239 (CAL).


Perennial, erect, glaucous green, rhizomatous, robust, marshy herb; culms to 130 cm tall, 7 mm wide, rigid, trigonous, ribbed, sulcate. Leaves flat, to 25 cm long, to 1 cm wide, acuminate, nerves prominent; sheath long, purplish, lax. Umbel compound, to 10 cm long; involucral bracts 3, unequal, overtopping,
longest 15 cm long, erect-patent, with strong midrib and scaberulous margins which are usually recurved in dried specimens; primary rays 5-7, to 7.5 cm long; secondary rays 5, to 2 cm long. Spikes corymbose, 3-10 spikeletted. Spikelets spicate, narrow-oblong, to 3 cm long, purplish brown, acute, compressed; rhachilla with large, dark-brown, deciduous wings. Glumes closely imbricate, ovate, to 2 mm long, plicate, thin, sides 4-5-nerved, keel 3-nerved, pale. Stamens 3; filaments to 4 mm long; anthers to 2 mm long, yellow-brown. Stigmas 3, longer than the style. Achenes ellipsoid, trigonous, tapering towards the base, yellowish-brown.

Occasional along the water streams in marshy and swampy areas. Fl. & Fr.: September - December.

Distribution: Ceylon, India, Burma, Nepal.

Specimens examined:

ANANTAPUR: Samatagram KH 7459; Guntakal, KH 10996; RANGAREDDY: Mohammadabad RF, KH & MSH 5577; EAST GODAVARI: Rampa hill, KH & BR 9730; GUNTUR: Macherla RF, VRK 3283; ADILABAD: Penganga river, GO & PVP 4292;

KRISHNA: S.N. Gollapalem, P. Venkanna 5549 (Hi); KURNOOL: Nallamalais, J.L. Ellis 32453 (MH & CAL); CUDDAPA: Rajampet, J.S. Gamble 10800 (DD & CAL); KARIMNAGAR: Godavari, G.V. Subba Rao 22475 (CAL); EAST GODAVARI: Polavaram agency, D.C.S. Raju 190 (CAL).
**Cyperus pilosus** Vahl, Enum. Pl. 2:354. 1806; FBI 6:609; 
*Fisch. 1641 (1140). C. marginellus* Nees in Wight,
Contr. Bot. India 83. 1834. *C. ooliquus* Nees in 

Perennial, slender, erect, rhizomatous herb; culms to
90 cm tall, rigid, triquetrous. Leaves as long as stem, to 35 cm
long, 8 mm wide, flat or canaliculate, nerves prominent; sheaths
pale to purplish. Umbel compound, to 17 cm long; involucral
bracts 3-7, overtopping the inflorescence, longest to 20 cm long,
primary rays 5-7, to 15 cm long, trigonous; secondary rays 5,
1-5 cm long. Spikes 15-20-spikeletted, at right angles to the
rhachis, rhachis densely hispid. Spikelet spicate, oblong,
narrow, 7 mm long, compressed, pale to grey-purple, 5-10-flowered;
rhachilla hispid. Glumes broadly ovate, 2 mm long membranous,
sides 5-nerved, acute at apex with broad hyaline apex, basal
ellipsoid, triquetrous, dark grey. (Fig. 21).

A common weed, usually seen in rice fields, river banks,
and open wet places. Fl. & Fr.: May – December.

**Distribution:** Widely distributed in tropical and sub-
tropical regions of the Old World, from tropical West Africa
through central and South Asia, eastwards to Malesia and
Northern Australia.
Fig. 21. *Cyperus pilosus* Vahl

A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume,
E. Opened glume, F. Pistil with stamens, G. Achene

(kw 6 pp 10002)
Specimens examined: EAST GODAVARI: Rampa hill, KH & BR 9736; Maredumilli RF, KH & BR 10907; ANANTAPUR: Pennanobilam, TP & NY 358; SRIKAKULAM: Near Gummada, G.V. Subba Rao 52438 (MH & CAL); VISAKHAPATNAM: Araku, G.V. Subba Rao 21575 (MH & CAL); KRISHNA: Hanuman junction, P. Venkanna 5260 (MH); VIZAYANAGARAM: Simalaguda, M. Venkaiah 5221 (AU).


Perennial, densely tufted, rhizomatous herb; rhizome coarse, obliquely ascending, to 8 cm long; roots dusky brown, culms robust, to 200 cm tall, 12 mm thick, sharply triquetrous with shallowly concave sides, scabrous on angles below the anthela. Leaves 7 to a culm, up to 2/3 as long as the culm; blades broadly linear, to 3 cm wide, to 100 cm long, scabrous lower mid-rib and margins toward apex, coriaceous, deep green; sheaths to 50 cm long, sub-cylindrical, straw-coloured. Anthela compound, to 30 cm long. Involucral bracts 5, patent, broadly linear, two lower ones much surpassing the anthela, the lowest to 100 cm long and 3 cm wide; rays 10, the longer ones rather equal, robust, to 20 cm long. Spikes linear, cylindrical, to 6 cm long, yellow-brownish, the rhacnis hidden by the densely crowded spikelets. Spikelets erect-patent, linear, to 8 mm long.
subterete, to 14-flowered; rhachilla flattened, straightish, the internodes winged. Glumes tightly imbricated, erect, elliptic, 2 mm long, incurved margined, 5-nerved close to the broad green midrib, the sides stramineous and tinged with gold brownish. Stamens 3; the connective reddish-brown, wholly setulose-pubescent; anthers crested, style deeply 3-cleft. Achenes elliptic, trigonous, apiculate at apex, maturing greyish-brown.

Occasional in marshy areas. Fl. & Fr.: August - December.

Distribution: Confined to southern India and Ceylon.

Specimens examined: WEST GODAVARI: Kolleru lake, KH & HR 10909.

Note: This rather rare species is easily discernible by its sessile or nearly sessile spikes forming digitate secondary corymbs and very broad leafy bracts and leaf blades.

*Cyperus platystylis* R. Br., Prodr. 214. 1810; F&I 6:599;

Perennial, rhizomatous, aquatic herb, to 90 cm tall, culms solitary, triquetrous, stiff, scabrid on angles. Leaves few equalling the culm; blades linear, to 12 mm wide, coriaceous,
1 costate, flatis-plicate, septate, nodulose, scabrous on margins; sheaths light brown. Anthela compound, depressed hemispherical, to 10 cm long, loose. Involucral bracts 10, slightly spaced, spreading, the longest to 70 cm long, to 12 mm wide, primary rays 15, spreading, to 10 cm long, slender and rigid; secondary rays slightly spaced, hence anthelules truly corymbose, to 4 cm long. Spikelets digitate in groups of 3 at apices of raylets, each lance-oblong, flattened, to 2 cm long, densely to 50-flowered, straw-coloured and stained with brown. Glumes ovate, to 3 mm long, herbaceous, light straw-coloured, the greenish keel broad, mucronate at apex. Stamens 3. Style flattened, papillose; stigmas 3. Acenes oblong-elliptic, trigonous with concave sides, glaucous brownish, the angles markedly spongy thickened, pale brownish.

Usually seen in marshy areas, swamps, and in the margins of ponds in large communities. Pl. & Fr.: September - December.

Distribution: From India and Ceylon and through Malesia, northern and eastern Australia.

Specimens examined: WARANGAL: Pakhal lake, V.S. Raju & A. Ragan 1190 (KU); KRISHNA: Linnala, P. Venkanna 5410 (AU).

Cyperus procerus Rottb. Descr. Icon. Rar. Nov. Pl. 29. t. 5. f. 3. 1773; FaI 5:610; Fischer 1541 (1140).
Perennial, rhizomatous, stoloniferous hero; stolons slender, long, distantly covered with scales, culms to 100 cm tall, triquetrous. Leaves several, shorter than the culm; blades to 10 mm wide, sub coriaceous, scabrid margined distally; sheaths long, pale greenish, the basal sheaths stained with dusty brown. Anthela simple, subloose, to 15 cm long. Involucral bracts 4, erect patent, the lowest one surpassing the anthela, the longest to 50 cm long; primary rays 7, very unequal, erect – patent, to 15 cm long; secondary rays to 2 cm long. Spikes broadly ovoid, to 4 cm long, loose, bearing 3 spikelets, rhachilla glabrous; spikelets ovoid, often weakly curved, to 3 cm long, patent, subdensely to 40-flowered, pale and tinged with red brown. Glumes ovate, obtuse at white hyaline apex, to 3 mm long, pale brownish and stained with red brown, broadly white hyaline on upper margins. Stamens 3. Style as long as the achene, stigmas 3. Achenes elliptical, trigonous, brownish.

Usually seen in marshy areas, rice fields, grows with C. pilosus. Fl. & Fr.: August – January.

Distribution: India, Ceylon, Indo-China, Malesia and Australia.

Note: This species is so close to *C. pilosus* that it is very difficult to distinguish them in the field. But *C. procerus* can be distinguished by the larger and more distant spikelets, large anthers and achenes, and by its glabrous rhachis.


Perennial, glabrous, erect stoloniferous herb; stolons bearing ovoid, tunicate, black, fragrant tubers; culms to 30 cm tall, triquetrous at the top, tuberous at the base. Leaves several, narrowly linear, flat, to 10-30 cm long, nerves prominent; sheaths brown. Umbel compound, to 4-9 cm long. Involucral bracts 3-5, unequal, longest to 15 cm long; primary rays 4-6, to 6 cm long; secondary rays 3, bearing, short spikes of 4-10 slender, spreading, red-brown spikelets. Spikelets variable in length, linear, red-brown, compressed, spicate, to 3 cm long, pale or purplish, 15-30-flowered; rhachilla winged, pale. Glumes closely imbricating, ovate, membranous, sides 5-nerved, margin hyaline, to 3 mm long, back reddish-brown; keel 3-nerved, green. Stamens 3; filaments to 4 mm; anthers 2 mm long, red-crested. Stigmas 3, much exserted. Achenes oblong, trigonous, greyish-black.

Very common weed in rice fields, cultivated lands, in unusual sites etc. *Fl.* & *Fr.*: October - December.
Distribution: A cosmopolitan weed in tropical, subtropical and temperate regions of the world.

Specimens examined: VISAKHAPATNAM: Visakhapatnam beach, Mohammodabad, KH 10983; ANANTAPUR: Gangalakunta, KH 7490; RANGAREDDI: G & MSM 5571; ADILABAD: Bellampalli, PVP & KH 9467; CUDDAPAH: Palakonda hills, CSR 8271; KURNOOL: Sudireddipalli, AA 2017, Nandyal, J.S. Gamble 10386 (CAL); NIZAMABAD: Mallipet, BR & CPR 9293; GUNTUR: Atchampeta, VRK 5855; HYDERABAD: Moosi River Bank, K.M. Sebastine 5926 (MH); KARIMNAGAR: Bhupatipur, G.V. Subba Rao 20192 (CAL); VISAKHAPATNAM: Anantagiri, G.V. Subba Rao 19447; KRISHNA: Sita-ramapuram, J.S. Gamble 12659 (CAL); SRIKAKULAM: Salur, N.P. Balakrishnan 1002 (CAL); EAST GODAVARI: Polavaram, D.C.S. Raju 376 (CAL).

Note: This species is a traditional medicinal plant not only among Asians but also in Germany, where it is called "die Apotnegrasser"; this is used in Indian, Chinese, and Japanese indigenous medicine. In herbal medicines the tubers are used roasted or raw.


Annual, reddish-brown-coloured, glabrous tufted nero, to 18 cm tall; culms trigonous. Leaves usually shorter than the stem or half (or less) as long as the stem, linear, acuminate;
Fig. 22. *Cyperus rubicundus* Vahl

sheaths reddish, inflated. Head solitary, to 2 cm long.

Involucral bracts 3, to 3 cm long, linear, leaf like; spikelets 3-12, sessile, much compressed, reddish-brown, ovoid, digitate, stellate, 2 cm x 4 mm, 15-40-flowered. Glume boat-shaped, to 3 mm long; keel produced in to conspicuous recurved mucro; sides with 4-5 conspicuous ribs on each, margins hyaline. Stamens 3, anthers oblong, muticous. Stigmas 3, style 2 mm long, longer than achenes, Achenes obovoid, triquetrous, sides concave, apiculate, white, puncticulate, brown-stipitate. (Fig. 22)

A rare species usually found in rocky areas, in dry forests, at higher altitudes. Fl. & Fr.: November - January.


Specimens examined: KURNOOL: Kuppajal, ♂H 10994; CUDDAPAH: Guvvalacheruvu RFR, RVR & RV Reddy 7905; GUNTUR: Jayanthipuram, VRK 6959.

Cyperus stoloniferus Retz. Obs. Bot. 4:10. 1765; FBI 6:615; Fischer 1641 (1141).

Perennial, rhizomatous, stoloniferous herb; rhizome woody, creeping, forming ellipsoid or ovoid enlargement at base of short, clothed with dusky brown parallel fibres. Culms to 30 cm tall, obtusely trigonous, glaucous green, leaved at base. Leaves rigid, filiform, shorter than the culm; blades linear, to 4 mm wide, folded, recurved; sheaths pale, split into parallel
brown fibres. Umbels simple and compact to 5 cm long; involucral bracts 3, foliaceous, lowest to 30 cm long, second briefly surpassing the anthela; primary rays 4, unequal, rigid, to 5 cm long. Spikes ovate, to 2 cm long with 3-6 spikelets on short axis. Spikelets linear oblong, 10 mm long, to 18-flowered, slightly thickened with rather blunt edges, glaucous yellow and stained with sangineous brown; rachilla widely winged. Glumes densely disposed, broadly ovate, to 3 mm long, contracted, obtuse apex, 6-nerved, glaucous yellow, the greenish keel obtuse. Stamens 3. Stigmas 3. Achenes ovate, oval, 3-sided, 1.5 mm long, maturing dark-brown.

Frequent in sandy river banks. Fl. & Fr.: May - December.

Distribution: Madagascar, Mauritius, India, Indo-China, Malesia and Australia.

Specimens examined: KURNOOL: Tungareshadra river, KH 10944; 10949; ANANTAPUR: Guntakal, KH 10998; VISHAKHAPATNAI: Beach, KH 10985; KURNOOL: Nandyal, J.G. Gamole 10386 (DD).

Fig. 23. *Cyperus tenuiculmis* Boeck.

A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume,
E. Opened glume, F. Pistil with stamens, G. Achene
(KH & MSM 5582).
Involucral bracts 3, leafy, the lowest surpassing the anthela, the second one equalling the anthela; rays erect-patent, slender, unequal. Spikes ovoidal, upto 4 cm long, bearing ca. 12 spikelets. Spikelets linear, nearly quadrangular, straw-coloured, 1.5-2 mm wide, weakly flattened with acute edges rhachilla dark brown, internodes winged, the wings hyaline, caducous, pale. Glumes close together suberect, ovate-elliptic, boat-shaped, 3.5 mm long, chartaceous, straw-coloured. Stamens 3; anthers 1.5 mm long. Stigmas 3. Acnenes elliptic, triquetrous with concave sides, 2 mm long, maturing black. (Fig. 23).

A very rare taxon seen only in swampy areas. Fl. & Fr.: September - December.

Distribution: Throughout the tropics of the world, Tropical Africa, South and East Asia, to Micronesia and Australia.

Specimens examined: RANGAREDDY: Mohammadaavad RF, Km 5532; WARANGAL: Thadvai, V.S. Raju & A. Rajan 2043(KU).


Annual, slender, erect, tufted herb; culms to 20 cm tall, triquetrous, finely ribbed. Leaves flat, linear, acute to 15 cm long. Umbel compound, to 7 cm long; involucral bracts 3, longest to 13 cm long, overtopping; primary rays 7-10,
to 6 cm long; secondary rays 5-7, to 1 cm long, bearing heads of 5-10 stellately spreading minute spikelets. Spikelets narrowly linear, to 5 mm long, pale brown, ca. 20-flowered; rhachilla flexous. Glumes ovate, membranous, ootuse, muticous purplish, margin hyaline, sub laxly imbricate and slightly spaced thus achenes exposed between glumes, keel 3-nerved. Stamen 1; anther muticous. Stigmas 3. Achenes gloosely obovoid, trigonous, rounded, at first pale-yellow becoming white when ripe.


Distribution: Widely distributed in the warmer regions of the world.

Note: This species is often confused with C. halpan but can be separated by the small, obtuse glumes which are spaced, exposing a considerable part of subtending achene between them, the rhachilla smooth and small achenes. In C. halpan, the achenes are completely hidden by the closely disposed glumes and have anthers with bristly connective and slightly larger achenes.

**Diplacrum R.Br.**


Annual, small, slender, caespitose herb, to 25 cm tall; culms loosely tufted from purplish-reddish fibrous roots, sharply 3-angled, several-noded. Leaves basal and on the culm, to 5 cm long, to 4 mm wide; sheaths to 9 mm long, acutely 3-angled with out wings, slightly dilated upwards. Inflorescence of about 20 small globose clusters, one or two at leaf axils of much of the culms, scarcely exserted from the sheath of subtending leaf like bract. Spikelets with 4 glumes; lower glumes setaceous, pale. Staminate partial spikelet one to a bisexual spikelet, borne at the lowest axil of glume, to 2 mm
long, staminate glumes broadly lanceolate, 1-nerved. Two empty glumes immediately below the fruiting structure, ovate-lanceolate, to 3 mm long, to 7-nerved, strongly folded, greenish, 3-lobed at apex. Stigmas 3. Achenes tightly enveloped in 2 subtending glumes and falling off with them, globular with about 3 prominent longitudinal ribs, white, irregularly ribbed, slightly hispidulous at apex; disc adnate to the base of achene, obtusely triangular in outline.

This is a rare species collected from hilly areas, moist grassy localities in the forests. Fl. & Fr.: August - January.

**Distribution:** Tropical Asia from India through Indochina and Southern China north eastwards to northern Australia.

**Specimens examined:** KHAMMAM: Vazeedu, V.S. Raju 927 (MH)

**Eleocharis** R. Br.

Annuals or stoloniferous perennials. Culms terete or trigonous, solid. All leaves reduced to bladeless sheaths and radical scales. Inflorescence a single terminal spikelet. Spikelets solitary, terminal, ovoidal, ellipsoidal, sessile, subtended by scale like bract; rhachis continuous. Glumes spirally imbricated, ovate to elliptic, keeled or obtuse on back, bearing hermaphrodite flower at axil. Flowers with 4 to 9 hypogynous bristles, 1 to 3 stamens and a pistil. Pistils
clearly bordered between the style base and the ovary, style base persistently crowns the achene; style bases spongy, conical. Stigmas 2 or 3-fid. Achenes ovoid, trigonous to biconvex.

This genus consists about 250 species distributed in all the world. Many species show extremely wide range of distribution.

1. Spikelets cylindrical, as wide as the thick culms that range from 3-6 mm in width:
   2. Culms solid, not septate:
      3. Culms triquetrous
   3. Culms terete
      2. Culms hollow, transversely septate
1. Spikelets ovoidal to ellipsoidal, much wider than slender culms that range from 0.3 - 2.5 mm in width:
   4. Floral glumes spirally imbricate:
      5. Culms 25-60 cm tall; hypogynous bristles present:
         6. Stigmas 3; achenes olive-coloured to yellow green at maturity, trigonous
      6. Stigmas 2; achenes black when mature, biconvex:
         7. Hypogynous bristles 4-6, equalling or shorter than achene; stamens 2
      7. Hypogynous bristles 5-7, longer than the achene; stamens 3

5. Culms 5-25 cm tall; hypogynous bristles absent. *E. setifolia*

4. Floral glumes 2-ranked *E. retroflexa*


Perennial, tufted, aquatic, partly submerged, rhizomatous and stoloniferous herb, to 70 cm tall. Culms sharply triquetrous, lightly green, solid, not septate. Basal sheaths 4, the lower ones scale like, brownish, the uppermost ones to 10 cm long, pale green, obliquely truncate at orifice. Spikelets cylindrical, to 4 cm long, 4 mm wide, subacute at apex, obtusely angular, loosely many-flowered, pale green. Glumes ovate, to 5 mm long, rounded at apex, the broadly green dorsal part nervaceous and obscurely several-nerved. Hypogynous bristles 5, surpassing the style base, rigid, retroresly spinulose-scaorous. Stamens 3. Style 7 mm long, 3-cleft; style base subulate deltoid. Achenes broadly obovate, 2 mm long, compressed-triangular, the apex contracted to an annular neck, the sides yellowish brown, cancellated with 15 rows of transversely oblong epidermal cells.

Rare in marshy areas near river sides, shallow stagnant waters in ponds. Flw & Fr.: June - December.
Fig. 24. *Eleocharis atropurpurea* (Retz.) C. Presl

A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume
E. Opened glume, F. Pistil with stamens, G. Achene

(KH & BR 9727).
**Distribution:** Widely distributed but apparently uncommon species in the tropics both of the Old and New world.

**Specimens examined:** CHITTOOR: Thandipandal, M. Cnandrabose 45094 (MH); WARANGAL: Pakhal, V.S. Raju & A. Ragan 110 (KU).


Annual, erect, tufted, non rhizomatous herb, to 10 cm tall; culms terete, capillary, smooth, sulcate; leaves reduced to bladeless sheaths; sheaths membranous, purple-coloured. Inflorescence with a single spikelet; spikelets globose or ovoid, 3-5 x 2 mm, angular, densely many-flowered. Glumes spiral, ovate, obtuse, 1.3 mm long, distinctly keeled, 1-nerved, sides nerveless, purplish; hypogynous bristles 4-6, glistening white, shorter than as long as the achenes, minutely retrorse and scarios. Stamens 2; anthers oblong. Stigmas 2; style-base discoid, as wide as achene. Achenes obovoid, biconvex, to 1 mm long, glossy. (Fig. 24).

Common in wet fields, marshy areas etc. Fl. & Fr.: November - December.

**Distribution:** Scattered throughout the tropics of the Old and New World.

**Specimens examined:** EAST GODAVARI: Dhavaleswaram barrage,
Note: This species can be distinguished from the more common *E. geniculata* by its smaller size, smaller achenes, delicate bristles which are glistening white and by the prominently beaked achenes.

**Eleocharis congesta** D. Don. *Prod. Fl. Nepal* 41. 1825; *FBI* 6:630; *Fischer* 1648 (1145).

**Key to the subspecies**

1. Stems thick, rigid, spikelet 8-10 x 2.5 - 3 mm long
   
   subsp. *congesta*

1. Stems slender, capillary, spikelet
   
   2 x 1.8 mm

   subsp. *japonica*

subsp. *congesta*

Annual, densely tufted herb. Culms thick, rigid, to 25 cm tall, terete, deeply green, clothed at base with 3 sheaths. Basal sheaths membranous, reddish below, pale above, the upper-most one to 6 cm long, the orifice brown-tinged on margin. Spikelets ovate-ooolong, to 10 mm long, terete, brownish, densely
many-flowered. Glumes tightly imbricated, ovate, to 2.5 mm long, sanguineous brown, white hуline on margins. Hypogynous scales 6, whitish, surpassing the achene, subloosely retroensely spinulose from the base. Stamens 2. Stigmas 3; style base conical, the dilated base much wider than the mucronate apex of the achene. Achenes obovate, trigonous, 1.2 mm long, obtuse, edged, contracted to apex, the surfaces lightly greenish yellow, shiny, smooth.

Usually found in high elevations in hill sides.

Fl. & Fr.: April - October.

Distribution: India, Indo-China, Malasia, Japan.

Specimens examined: VISAKHAPATNAM: Galikonda, G.V. Subba Rao 19615 (MH).


Culms slenderly filiform. Spikelets 2 mm long. 1.8 mm wide. Glumes 1.5 mm long. Stamen 1. Stigmas 2. Achenes small, black, 1 mm long.

Collected from wet rice fields. Fl. & Fr.: October - January.
**distribution**: Japan, China, India, Malesia.

**Specimens examined**: RANGAREDDY: Monamadaabad RF, KH & MSM 10920.

Eleocharis dulcis (Burm.f.) Trin. ex Hensch. in Vita Rumph. 185. 1833. *Andropogon dulce* Burm. f., Fl. Ind. 219. 1768.

Eleocharis plantaginea (Retz.) Roem. & Schult. Syst. Veg. 2:150. 1817; FBI 6:525; Fischer 1547 (1145).


Perennial, tufted, partly submerged, stoloniferous herb; stolons terminated by a small tuber. Culms to 90 cm tall, 7 mm thick, hollow, transversely septate, the inter septa to 12 mm long, empty, deeply green, somewhat shiny. Basal sheaths to 20 cm long, coloured with red brown, truncate at orifice. Spikelet cylindrical, to 5 cm long, 4 mm wide, subacute at apex, terete, whitish to pale stramineous. Glumes elliptic, to 7 mm long, obtuse at apex, chartaceous, whitish, the broad greenish dorsal part finely striate. Hypogynous bristles 8, unequal, twice as long as the achene, filiform, flattened toward free base, surpassing the achene, retrorsely spinulose, scabrous from above the base. Stamens 3. Style to 8 mm long, slender, 2-cleft; style base elongated, conical, the base depressed, crescentiform. Achenes obovate, to 3 mm long, biconvexed with obtuse edges, yellow, shiny.
Occasional in marshy areas, grows on stagnant or slowly moving water. Fl. & Fr.: September - December.

**Distribution:** Widely distributed in the Old world tropics from tropical west Africa and Madagascar through India east-wards to Malesia and northern Australia, also north east-wards to western Japan.

**Specimens examined:** EAST GODAVARI: Thimmapuram, C.A. Barber 8283 (MH); VISAKHAPATNAM: Araku valley, N.P. Balakrishnan 10791 (MH & CAL); WARANGAL: Paholi, K.M. Sebastine 13111 (MH & CAL); KRISHNA: Atapaka, P. Venkanna 5345 (AU).

Note: Sebastine & Henry (1967) have reported it first time from the State as addition to sedge flora of Andhra Pradesh State.

Tubers of *E. dulcis* provide the familiar water-chestnut of oriental cuisine. The juice of the tubers is strongly antibiotic (Hegnauer, 1953). This species is a perennial sedge of marshy ditches, swampy laxes and valued for its edible tubers. The tubers are used as food, source of starch and medicine (Hodge, 1956). This is cultivated in Indonesia, United States and Sumatra. The stems are used for making mats. This is commonly known as "Chinese water Chestnut".

Annual, erect, caespitose herb, to 30 cm tall; culms slender, angular, sulcate, slightly glaucous green. Sheaths herbaceous, pale green, often tinged with red brown on lower part, the mouth oblique, acute. Spikelets ovoid - globose to ovoid-ellipsoidal, 5 x 3 mm, rounded at base, very obtuse at apex, reddish-ferrugineous, densely many-flowered. Glumes patent, broadly elliptic to ovate, 1.3 mm long, obtuse at apex, membranous; rhachilla terete, pitted. Hypogynous bristle 7, ferrugineous, slightly longer than the achene body, sparingly retrorsely spinulose, to 2 mm long. Stamens 3; anthers linear, obtuse. Style short; base conical, articulate; stigmas 2. Achenes globose to obovoid, brown, shining, apiculate with broad style base. (Fig. 25).

A very common species usually on wet fields, marshy areas, including rice fields. Fl & Fr.: June - October.

Distribution: Most widely distributed throughout the warmer parts of the Old and the New World.

Specimens examined: KURNool: Kuppayal RF, KH 10955; Thungabhadra river, KH 10945; ANANTAPUR: Gangalakunta, KH 7483;
Fig. 25. *Eleocharis geniculata* (Linn.) Roem. & Schult.
A. Habit, B. Spikelet, C. Rhachilla, D & E. Glumes, F. Pistil with stamens and hypogynous bristles,
G. Achene with hypogynous bristles (KH & BR 9712).

*Scirpus retroflexus* Poir. in Lam., Encycl. Meth. Bot. 6:753. 1804 sub sp. *chaetaria* (Roem. & Schult.)


*Eleocharis chaetaria* Roem. & Schult. Syst. Vey. 2:154. 1817; Fischer 1648 (1145); FBI 3:529. *Scirpus chaetaria*


Annual, densely tufted, erect nerv., to 15 cm long, culms filiform, recurved, angular, lightly green, clothed at base with 2 sheaths. Sheaths pale, the orifice hyaline, obliquely truncate, lanceolate. Spikelets broadly ovate at maturity, to 5 mm long, bearing 8 distichously disposed flowers, sanguineous-tinged. Glumes loosely 2-ranked, patent, ovate, 3 mm long, boat-shaped, subacute at apex, sanguineous tinged except at apex and on broadly hyaline margin. Hypogynous bristles 6, briefly surpassing the style-base, weakly scabrid towards apex. Stamens 2. Style 3-cleft; style base depressed, conical,
sanguineous spotted. Achenes broadly obovate, contracted to apex, rounded-truncate at apex, trigonous with ribbed edges, the sides lightly yellow, trabeculate with 9 rows of isodiametrical thick-walled cells, rather deeply pitted.

Common species found in marshy areas, near river sides margins of rice fields, wet sandy edges of ponds. Fl. & Fr.: October - December.

**Distribution:** Old World tropics.

**Specimens examined:** KHAMMAM: Vazeedu, V.S. Raju 1010 (KU).


Annual, tufted, slender, glabrous herb, to 25 cm tall. Culms filiform, quadrangular, sulcate. Sheaths 2, tubular, whitish to light brown, apex acute. Spikelets ovate, 3 mm long. Glumes ovate, apex obtuse; lowest glume sterile, light to mid brown with dull green or light brown midrib. Stamen 1; connective tip apiculate; filaments translucent. Style 3-branched, style base apiculate with distinctly upturned rim. Achenes obovate, obscurely trigonous, light brown.
Though rare this species is found along the margins of the lakes, marshy places, in shallow puddles etc. Fl.& Fr.: August - December.

**Distribution:** Brazil, Virginia islands, Cuba, Africa, Malagasy, Philippines and Australia.

**Specimens examined:** WARANGAL: Pakhal lake, A. Ragan 2061 (MH & KU).


Perennial, rhizomatous herb; rhizome elongated, obliquely creeping. Culms erect, tufted, terete throughout, smooth, not transversely septate, to 50 cm tall; sheaths membranous, dirty black, shining, tightly clasping, obliquely truncate, to 15 cm long. Spikelets cylindric, terete, later becoming angular due to squarrose glumes, broader than culms, obtuse, many-flowered, pale brown, to 20 mm long. Glumes firm, loosely imbricate, obliquely erect, later becoming spreading and convolute when dry, narrowly ovate, subacute, many-nerved, without prominent midnerve, broadly hyalined on upper half, 3.5 mm long. Hypogynous bristles 7, unequal, 2 times longer than the achenes, retrorsely scabrous throughout, yellowish. Stamens 2-3. Stigmas 3, 2 times longer than the style, coiled, sparsely hairy. Achenes turgid, symmetric, biconvex, distinctly cancellate, broadly orbicular or
suborbicular with short neck, prominently rimmed above the neck, shining, yellowish-brown, 1.7 mm long.

Commonly found from mean sea level to 500-600 m.

Fl. & Fr.: September - December.

Distribution: Coastal Andhra Pradesh.


Fimbristylis Vahl

Annuals or rhizomatous perennials, culms central, not nodose, leaved at base, trigonous or laterally compressed. Leaf blades flat and becoming ensiform; sheaths closed, cylindrical or laterally compressed with an acute keel; ligules reduced, existing as fringe of pubescence. Inflorescence corymbose, head like or reduced to a single terminal spikelet; bract leafy, setaceous, not sheathing. Spikelets ovoidal or ellipsoidal, terete. Glumes many, spirally imbricated, usually glabrous; basal ones empty, uppermost tabescent; stamens 1-3; anthers with crested connectives. Styles trigonous, articulate with ovary, base dilated hence falling free from the achene. Stigmas 2 or 3. Achenes trigonous or lenticular, often verruculose, bearing a style like or an inconspicuous gynophore.

A genus of about 200 species, mainly pantropic but also
well represented in warm temperate regions. Most species prefer wet
localities; wet rice fields, margins of lakes, river banks, swamps.
Relatively few occur in forests or are characteristic of muddy sea
shores. *F. dichotoma* and *F. miliacea* are sometimes troublesome weeds.

1. Achenes sub-orbicular, obovate; stigmas 3 or 2:

2. Stigmas 3; achenes trigonous:

3. Leaves surrounding culm bases bladed:

4. Leaves with a ligule of a series of pubescence:

5. Perennial rhizomatous herb; involucral
   bracts 2 .......................... *F. complanata*

5. Annual tufted herb without rhizome; involucral
   bracts 3-4 ........................  *F. arnottiana*

6. Rhizome thick, oblique, to 7 cm long, leaves
   rosette like, recurved ............ *F. falcata*

6. Rhizome inconspicuous; leaves erect.. *F. tenera*

3. All or upper few leaves surrounding culm bases blade
   less:

7. Leaf blades dorsiventral; culms
   pentagonal ........................ *F. quinquangularis*

7. Leaf blades laterally flattened, culms compressed,
   tetragonal ........................ *F. miliacea*

2. Stigmas 2; achenes biconvex:(Occasionally 3 in *F. cymosa*)

8. Inflorescence corymbose with more than 2 rays and
   5 spikelets
9. Styles hardly flattened, glaorous .... F. cymosa
9. Styles dorsiventrally flattened, fimbriate or long ciliate atleast on upper part:
10. Leaves with a ligule, usually a fringe of dense pubesence:
11. Glumes pubescent on upper half:
    12. Lowest involucral bract shorter than inflorescence; leaves less than 10 cm long ..... F. ferruginea
12. Lowest involucral bract exceeding the inflorescence; leaves 15-40 cm long:
    13. Perennials with decumbent rhizome; involucral bracts 3-5; stamens 3.
        .... F. sieberiana
    13. Annuals without rhizome; involucral bracts 1-3; stamens 2 ..... F. pubisquama
11. Glumes glabrous:
    14. Spikelets 1-1.3 mm wide, obovate. F. bisuvelata
    14. Spikelets 2-4 mm wide, ovate:
    15. Leaves half as long as the culms; involucral bracts 2; spikelets whitish green ..... F. acoviridis
    15. Leaves as long as the culms; involucral bracts upto 6; spikelets brown. F. dichotoma
10. Leaves without a ligule:
16. Achenes strongly trabeculate       F. albicans
16. Achenes faintly cancellated or nearly smooth       F. aestivallis

8. Inflorescence head like or consisting of 1-4 solitary spikes only:

17. Inflorescence head like with many spikelets; style glabrous       F. argentea
17. Inflorescence with 1-4 solitary spikes; styles fimbriate (except in F. acuminata):

18. Inflorescence with 1-3 spikelets; leaf blades well elongated       F. schoenoides
13. Inflorescence with a single spikelet; leaves bladeless:

19. Spikelets erect:

20. Spikelets obtuse at apex; leaf blades occasionally remaining as a setaceous appendages of sheath       F. polytrichoides
20. Spikelets acute at apex; leaf blades always none       F. acuminata

19. Spikelets obliquely patent       F. nutans

1. Achenes oblong - cylindrical; stigmas 2:

21. Inflorescence corymbose with few to several small spikelets; spikelets 6 mm long       F. dipsacea
21. Inflorescence of a single terminal spikelet;
    spikelets 12 mm long       F. tetragona
Fimbristylis acuminata Vahl, Enum. Pl. 2:285. 1806; Fischer 1858 (1150).  

Annual, densely tufted, rhizomatous herb; culms slender, to 35 cm tall, obtusely trigonous, glaucous green, clothed at base with 3 bladeless sheaths only. Basal sheaths 1 cm long, cylindrical, membranous, pale green, the upper most sheath to 4 cm long. Inflorescence a single terminal spikelet with a scale like bract. Spikelet ovate, terete, acute, to 12 mm long, greenish white, tightly ca. 15-flowered. Flower bearing glumes ovate-oval, 3 mm long, shallowly boat-shaped without ridged keel, contracted at both ends, thinly chartaceous, pale greenish, sub 5-nerved on back, the median 3 greenish, projecting beyond glume apex forming a green mucro. Stamens 2. Style glabrous, flattened, stigmas 2. Achenes obovate-orbicular, biconvexed, maturing whitish or cream-coloured, transversely coarsely wrinkled with 8 ridges.

Usually seen in marshy places at low altitudes. It is common weed in paddy fields (Naidu & Prakasa Rao, 1969).

Fl. & Fr.: October - November.

**Distribution:** Tropical Asia, from India to Malesia also in southern China.

Annual, densely tufted, small erect hero, to 10 cm tall; culms trigonous, lightly green, few-leaves at base. Leaf blades much shorter than the culm, flattish with incurved margins, lightly green, subdensely to sparsely pilose on both surfaces with spreading hairs; sheaths to 15 mm long, pale greenish to yellow-brownish, subdensely pubescent with spreading hairs, the ventral side hyaline, lightly brown; orifice obliquely truncate. Corymbs compound, to 4 cm long; rays 7, filiform, patent. Involucral bracts 3, filiform. Spikelets solitary, lance-ovate, subterete, to 6 mm long, densely to 40-flowered. Glumes imbricated, ovate, boat-shaped with keel, mucronate, membranous, yellow-brownish, lower ones often hairy on the keel, the keel green, finely 3-nerved, excurrent to recurved cusp. Stamen 1. Style fimbriate above, ciliolate at dilated base, stigmas 2. Achenes obovate, thickly biconvexed, rounded at apex, short-stipitate cuneate base, yellowish at maturity and smooth.

Occasional in wet or moist sandy low lands and as a weed in rice fields. Fl. & Fr.: January - April.

**Distribution:** From India through Indo-China eastwards to Malesia and northern Australia and north-eastwards to China.

**Specimens examined:** VISAKHAPATNAM: Simhachalam hill; KH & BR 5592; Sunkarimetta, G.V. Sudda Rao 19649 (mh).
Fimbristylis albicans Nees in Wight Contrib. Bot. India 100.

1834; FBI 6:641; Fischer 1659 (1151).

Perennial herb, to 30 cm tall. Culms few, slender, leafy at base, compressed. Leaves half as long, flat, narrowly ligulate, tip suddenly narrowed, acute. Spikelets 15 in the head; involucral bracts 2, to 2.5 cm long, suddenly acute. Spikelets ellipsoid, rusty grey, clustered, all sessile. Glumes lanceolate, subacute, boat-shaped, not keeled, to 3 mm long, pale-brown. Stamens 2. Style 2-fid, longer than the acnene, slender, with long linear branches. Achenes obovate, stipitate, stramineous, shining, transversely trabeculate.

Occasional in marshy areas (Fischer). Fl. & Fr.: August - January.

Distribution: Deccan peninsula.


Annual, erect, tufted herb, to 20 cm tall; culms slender, compressed, obtusangular. Leaves half as long as the culms, glabrous, scabrid on the margins in the upper part, greyish green; ligule a fringe of short white hairs. Inflorescence simple, loose,
with several spikelets, 2 cm long; involucral bracts 2, suberect, the lowest somewhat shorter than the inflorescence, spikelets solitary, ovoid, terete, acute, densely many-flowered, whitish-green, often brownish variegated; rachilla narrowly winged. Glumes spiral, subchartaceous glabrous, broadly ovate, obtuse, muticous, keel 3-nerved, greenish, sides nerveless and brownish except for the whitish basal part. Stamen 1. Style ciliated in the upper part, stigmas 2, shorter than the style. Achenes biconvex, obovate, shortly stipitate, obsoletely reticulate by the transversely elliptic not impressed epidermal cells in 15 vertical rows on either face, stramineous.

Rarely seen in dry grass lands and grassy slopes.

Fl. & Fr.: October - December.

**Distribution:** South East Asia, from India to Malesia, Malay peninsula, west and east Java, Philippines.

**Specimens examined:** RANGAREDDY: Mohammadpad RF, MSM & KH 10529.


Annual, caespitose, glaucous nerv, to 10 cm tall; culms
filiform, trigonous, striate. Leaves filiform, to 5 cm long; ligule 0; sheaths stramineous. Inflorescence capitate, 5-12 in a cluster. Involucral bracts 4, overtopping, longest to 3 cm long. Spikelets sessile, cylindric-oblong, terete, obtuse, many-flowered, 3 mm long. Glumes closely imbricate ovate, obtuse, stramineous. Stamen 1. Style 2-fid, glabrous base bulbous. Stigmas 2. Achenes obovoid, compressed, biconvex, fulvous.

Occasional on wet sandy grounds of open grasslands and in rice fields. Fl. & Fr.: September - December.

Distribution: South and Southeastern Asia, India, Ceylon, Thailand, Indo-China and Malesia.

Specimens examined: ANANTAPUR: Chintalapalli Road, KH 7458; RANGAREDDY: Mohammadabad RF, KH & MSM 5574; EAST GODAVARI: Dhavaleswaram barrage, KH & BR 9725; NIZAMABAD: Mamidipalli, BR & SPB 9600; CHITTOOR: Kambakam hill, M.C. Barber 45129 (MH); KRISHNA: Aluru, C.A. Barber 7937 (MH); NELLORE: Venkatagiri hill, B. Suryanarayana 3307 (VV); CUNDAPAH: Guvvalacheruvu, K. Subramanyam 6387 (MH & CAL).

Fimbristylis arnottiana Boeck. in Linnaea 37:23. 1871; FSI 1659 6:643; Fischer (1152).

Annual, tufted herb to 30 cm tall; culms 4-5-angular under umbel. Umbel decompound, glabrous with 30 spikelets.
Involucral bracts 4; spikelets obtuse, 10-fid; styles conspicuously protruded, cuboid-ellipsoid, one-coloured. Glumes ovate-obtuse, apressed incurved, brown, scarcely striate. Stamens 3; anthers linear-oblong. Style 3-fid; as long as the achenes, slender, deciduous with the narrow style base. Achenes small, obovoid, yellow-brown, transversely lineate, obscuringly tuberculated.

Rarely seen in wet grassy slopes, open grasslands etc.

Fl. & Fr.: October - November.

**Distribution:** Deccan peninsula.

Raghava Rao (1939) reported from Mahaboobnagar district.

**Fimbristylis bisumbellata** (Forsskal) Subani, Dodecanthea 30.


Annual, erect, tufted herb; culms to 30 cm tall, trigonous. Leaves flat, to 12 cm long, pubescent; ligule hairy; sheaths membranous. Umbels compound, terminal, 5 x 5 cm.

Involucral bracts 3, longest to 5 cm long; primary rays 3-5, to 3 cm long; secondary rays 3-5. Spikelet solitary, oblong, 7 x 1.8 mm, many-flowered. Glumes broadly ovate, 2 mm long, membranous, greenish-red; keel 3-nerved. Stamens 1; filaments 2 mm long. Style 2-fid. Achenes obovoid, biconvex, creamy-yellow. (Fig. 26).
Fig. 26. *Fimbristylis bisumbellata* (Forssk.) Bubani

This is common species usually found in rice fields, wet places, marshy areas. Pl. & Fr.: September - December.

**Distribution:** Widely distributed from the Mediterranean region through tropical Asia eastwards to northern Australia.

**Specimens examined:** KURNOOL: Tungabhadra river, KH 10951; RANGAREDDY: Mohammadabad RF, KH & MSM 5575, 5530; Lambaditanda rice fields, KH & MSM 5586; EASH GODAVARI: Rampahill, KH & BR 9733; VISAKHAPATNAM: Tyada Forest, KH & BR 9721; GUNTUR: Krishna river, VRK 6743; ADILABAD: Potchera, GO & DAM 5055; WEST GODAVARI: Kolleru lake, K. Subramanyam 5098 (MH); MEDAK: Narsapur, K.M. Sebastine 7970 (MH & CAL); NALGONDA: Krishna river bank, K.M. Sebastine 9807 (MH & CAL); HYDERABAD: Puranapul, K.M. Sebastine 5996 (CAL); KRISHNA: Manjinaudi, P. Venkanna 5145 (AU).

**Note:** This species stand as an intermediate between *F. aestivalis* and *F. dichotoma*. The smaller plants resemble *F. aestivalis* from which this species is distinguished by the glabrous glumes, which are not cuspidate and cancellated achenes. The larger plants resembles *F. dichotoma* from which *F. bisumbellata* can be distinguished by its more densely tufted, annual habit and the smaller yellowish brown and shiny spikelets. This species varies in its inflorescence and habit. The plants collected from sandy soils near river banks are densely tufted, caespitose, spreading and reaches
height of 10 cm. The leaves are glabrous, inflorescence congested with numerous spikelets which are 1 cm long. In some collections the stems reach 15-20 cm height. The inflorescence open with very small 3 mm long spikelets. The leaves are densely pubescent also.


Perennial, tufted, rhizomatous herb, to 40 cm tall; culms densely caespitose, apex compressed, base trigonous. Leaves crowded at the base, 20 cm long, coriaceous, glaucous, scabid, ligule shortly hairy; sheaths compressed, keeled. Umbels decompound, effuse, 5 cm long; involucral bracts 2, not overtopping, to 6 cm long, largest leaf like; primary rays 3-5, to 3 cm long; secondary rays 3-4. Spikelet solitary, ovoid-oblong, to 8 mm long, acute, ca 12-flowered, brown with distichously arranged glumes. Glumes ovate, to 3 mm long, grey-purplish, mucronulate; keel 3-nerved, stamens 3. Style 3-fid, triquetrous, fuscosus, base triangular. Achenes obovoid, trigonous, stipitate and stramineous. (Fig. 27).

This species is usually found in wet or moist places,
Fig. 27. Fimbristylis complanata (Retz.) Link

on grassy slopes, river banks, open grass lands at low altitudes, in cultivated lands and in forest margins.

Fl. & Fr.: August - April.

**Distribution:** A pantropical species. This is common in South and Southeast Asia. In India it is common almost throughout.

**Specimens examined:** KURNOOL: Peddathumlam, K 10959; Nandyal, J.S. Gamole 20350 (DD); ANANTAPUR: Samatayram, K 10999; CUDDAPAH: Balapalle, J.L. Ellis 14J01 (MH & CAL); HYDERABAD: Katasinta, K.M. Sebastine 6017 (MH & CAL); NALGONDA: Nagarjunasagar, K.M. Sebastine 9755 (MH & CAL); VISAKHAPATHAM: Gajapathinagaram, V. Narayanaswamy 4585 (MH); KARIMNAGAR; Kodimial, G.V. Subba Rao 20110 (MH); KRISHNA: Annavaram, C.A. Barber 3190 (MH); PRAKASHAM: Bainnachela, R.K. Mohan 0854 (CAL).


Perennial, erect, tufted, rhizomatous herb, to 40 cm tall; culms densely leafy below, obtusely trigonous. Leaves densely crowded on the root stock, spreading and recurved, narrowly linear, to 15 cm long, rigidly coriaceous, margins recurved
Fig. 28. *Fimbristylis cymosa* R.Br. A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume, E. Opened glume, F. Pistil with stamens, G. Achene (KH 10936)
and scaberulous, sheaths short, coriaceous. Umbels compound, to 6 cm long; involucral bracts 3, filiform, to 2.5 cm long, leaf-like, with broadly dilated base; primary rays 3-5, to 4 cm long; secondary rays 3, spikelet globose, to 3 mm long, pale brown, achilla winged. Glumes laxly imbricate, broadly ovate, to 2 mm long, hyaline; keel 3-5-nerved. Stamens 2. Style 2-fid, glabrous, trigonous, base dilated, stigmas papilllose; longer than the style. Achenes obovoid, biconvex, turbinate, compressed. (Fig. 28).

Widely distributed species. Usually seen in sandy areas near sea shores, river beds and marshy low lands.

Fl. & Fr.: March - October.

Distribution: Tropical and subtropical regions of all world.

Specimens examined: KURNOOL: Peddathumbalam, KH 10973; Beldora, KH 10935; RANGAREDDY: Rangammajudem beat, KH & MSM 5585; GUNTUR: N.S. Right canal, VRK 3545; NIZAMABAD: Nizamsagar, BR & CPR 9242; ANANTAPUR: GutturuKona, NY 936; VIZAYANAGARAM: S.Kota, G.V. Subba Rao 21826 (MH); NELLORE: Dugarajpatnam, J.S. Gamble 12782 (DD & CAL); EAST GODAVARI: Kakinada, T.A. Rao 7286 (CAL); Krishna: Guraja, P. Venkanna 5533 (AU).

Key to the subspecies

1. Leaves and bracts densely pubescent ... subsp. podocarpa
1. Leaves and bracts glaurous ... ... subsp. dichotoma

subsp. dichotoma

Annual, tufted herb in a small clump. Culms to 40 cm tall, trigonous, leaved at base. Leaves to 10, as long as the culms; blades erect, patent, linear, to 30 cm tall, herbaceous, glaucous green beneath, whitisn green on upper surface, several veined; ligule of a fringe of dense white hairs; sheaths cylin­dric with rounded back, the dorsal side pale greenish, the hyaline ventral side lightly brown. Umbels compressed, bearing ca 6 spikelets, lax to subdense, to 7 cm long. Involucral bracts to 6, the lowest one foliaceous, remaining setaceous; rays to 5, unequal, to 3 cm long, compressed, patent, terminated by 3 spikelets. Spikelets solitary, ovoid, to 7 mm long, terete, chestnut brown, densely many-flowered. Glumes broadly ovate, deeply boat-shaped, 2.7 mm long, thinly chartaceous, deeply brown with brown striae, nerved on both sides of the keel, pale hyaline on margin, the costa greenish, ending in a mucro at glume apex. Stamens 2. Style 1.5 mm long, flattened, copiously fimbriate above the middle, dilated at base. Achenes obovate, biconvex, 1.8 mm long, excluding gynophore, rounded-truncate at mucronate apex,
each side cancellated with 7-13 rows of transversely oblong cells.

Common along the sides of water courses, open grassy places, sandy localities and as a weed in cultivated lands.

Fl. & Fr.: March - December.

Distribution: All warmer parts of the whole world.

One of the most widely distributed species.

Specimens examined: KURNOOL: Peddathumlam, KH 10964; Mahanandi, J.L. Ellis 25486 (CAL);

VISAKHAPATNAM: Tyada Forest, KH & BR 9720;

EAST GODAVARI: Angerla village, G.V. Subba Rao 59551 (MH);

KRISHNA: Peyyuru, P. Venkanna 5850 (MH); WEST GODAVARI: Palagudem, V. Narayanaswamy 4491 (MH); MEDAK: Narsapur, K.M. Sebastine 6634 (MH & CAL); NELLORE: Kavali, K.C. Jacob 13375 (MH); VIZAYANAGARAM: Elwinpet, M. Venkaiah 2796 (AU).

subsp. podocarpa (Nees & Meyen) T. Koyama in Micronesica

Leaves and involucral bracts densely pubescent. Stamen 1, style tongue like, strongly flattened, 1.2 mm long, the base gradually tapering from base to apex, hence the style base becoming obscure, fimbriate on upper margins. Stigmas 2, 0.5 mm long, recurved. Achenes orbicular - obovate, thickly biconvexed, 1.5 mm long excluding gynophore, 1 mm wide, mucronate at apex, contracted at base, tuberculate on shoulder, cream-coloured, each side cancelled by 25 series of transversely oblong hexagonal cells, gynophore obdeltoid.

Wet places, moist fields and in grass lands. Fl. & Fr.: March - November.

Distribution: India, Southern China, Indo-China, Malesia.

Specimens examined: RANGAREDDY; Mohammabad RF, MSM 10455; KURNOOL; Chelama, J.L. Ellis 22079 (MH); KRISHNA; D.M. Bhavi, P. Venkanna 5033 (MH & AU).

Note: Fimbristylis dichotoma is a wide spread species and is extremely variable in its vegetative and floral parts and is based on Scirpus dichotomus Linn.

Many cyperologists consider F. annua as a part of F. dichotoma complex, however F. annua is invariably an annual and are either hairy or narrow leaved, have softer foliage and with tubercles on the achenes, whereas F. dichotoma is a perennial, smooth plant usually with broader, stiffer foliate and with no tubercles on the

Kern (1974) divided F. dichotoma into 2 sub-species viz. subsp. dichotoma and subsp. depauperata. The latter subspecies resembles ssp. podocarpa (Nees & Meyen) T. Koyama (F. tomentosa Vahl) in its habit, shape of style, pubescence etc. But these two species viz. subsp. depauperata and subsp. podocarpa can be well distinguished by the conspicuous gynophore not distinctly longitudinally ribbed with epidermal cells in numerous rows in the latter and in conspicuous gynophore, distinctly longitudinally ribbed with epidermal cells in 8 rows in the former.

Koyama (1985) described 3 subsp viz. subsp. dichotoma, subsp. podocarpa and subsp. glauca. In these three sub-species subsp. podocarpa is a synonym of F. tomentosa. subsp. glauca is eligulate whereas the other two are ligulate.

Based on the above, we have divided our materials into two subspecies. subsp. dichotoma subsp. podocarpa, and subsp. glauca is not collected from our area of present study.
Fimbristyliis dipsacea (Rottb.) Clarke in Hook. f., Fl. Brit.


Annual, densely tufted herb, to 15 cm tall, culms slender, trigonous, clothed at base with about 3 sheaths. Leaves reduced to short-bladed sheaths, 4 to a culm; blades 5 cm long, flattish with incurved margins, herbaceous, lightly green; sheaths to 3 cm long, cylindrical, pale green on dorsal side, the hyaline ventral side lightly brown, obliquely truncate at pale hyaline orifice, the lowest 2 sheaths scale like, brown. Corymb simple, of a cluster of 3 spikelets, to 4 cm long, bearing ca 20 spikelets. Involucral bracts 7, filiform, 3 longer than the inflorescence; rays 12, subequal, to 3 cm long, each bearing one spikelet. Spikelets globose, to 6 mm long, squarrose, wholly greenish, densely many-flowered. Glumes tightly spirally imoricated, with a long awn as long as the body of glume, the body oblong, contracted at shallowly 2-toothed apex, scarious, lightly brownish, obscurely 3-nerved, lightly green keel often spotted with dark red flecks, projecting beyond the glume apex forming weakly recurved smooth greenish awn. Stamen 1. Style slender, slightly dilated at base; stigmas 2. Acnenes linear-oblong, thickly biconvexed, cream-coloured, with clavate out growths, stipitate.

Common in sandy soils, in the sea shore, river beds and in sandy fields forming cushions. Fl. & Fr.: April - August.
**Distribution:** Tropical Africa, Asia, India, Indo-China, Malesia.

**Specimens examined:** MEDAK: Narsapur K. M. Sebastine 7974 (MH & CAL).


Perennial, erect, rhizomatous herb; rhizome oblique, to 7 cm long, thickly clothed with brown leaf sheaths, culms solitary or sparsely tufted, rigid, 4-angular, to 40 cm tall deeply strigose. Leaves crowded round the base of the stems, shorter than stems, spreading and recurved with triangular acute tip, to 20 cm long; sheaths short, ligule 0. Umbel compound, at times capitate, to 5 cm long, bearing distant or clustered small chestnut-brown spikelets. Involutcal bracts 4, shorter than umbel, to 3.5 cm long; primary rays 3, slender, to 2 cm long; secondary rays 2. Spikelets ellipsoid, solitary, 5 mm long, purplish, Rachilla winged. Glumes ovate, shortly mucronate, 3 mm long, margins hyaline, Stamens 3; anthers 2 mm long, acuminate. Style 3-fid, base conical, pubescent above; stigmas 3, ciliate. Achenes obovoid, trigonous, stramineous. (Fig. 29).
Fig. 29. *Fimbristylis falcata* (Vahl) Kunth
A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume,
(GO & PVP 4795).
This species is usually seen in open grass lands along the lateritic slopes. The plants which grow on rocky surfaces the inflorescence is rather compact, whereas in open grassy places, it is open and lax. Fl. & Fr.: June - November.

**Distribution:** Pakistan, India, Nepal, Indo-China, Malesia.

**Specimens examined:** SRIKAKULAM: Korada RF, G.V. Suopa Rao 62390 (MH & CAL); VISAKHAPATNAM: Karaka, C.A. Barber 1638 (MH); NELLORE: Venkatagiri hills, B. Suryanarayana 3303 (VY).


Perennial, tufted, erect, rhizomatous herb, to 140 cm tall; culms sub trigonous, rigid, to 7 mm wide. Leaves less than 10 cm long scabrid, apex acuminate; ligule a dense fringe of short hairs; sheaths fuscous, margin hyaline. Umbel subcompound of few spikelets, to 5 cm long. Involucral bracts 2, lowest involucral bract shorter than inflorescence. Spikelets solitary, ovoid or oblong, pale reddish brown, pubescent, to 2 cm long, lowest spikelet bractiform; racnilla angular and winged. Glumes shortly recurved, broadly ovate, shortly mucronate, characeous, to 40 mm long, apex puberulous, back with green keel. Stamens 3; filaments 2 mm; anthers 2 mm. Style 2-fid, ciliate, base dilated; stigmas papillose. Acenes obovoid, biconvex, stipitate, stramineous. (Fig. 30).
Fig. 30. *Fimbristyliis ferruginea* (Linn.) Vahl
A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume,
E. Opened glume, F. Pistil with stamens, G. Achene

(KH & BR 10910).
A common species usually found in wet places, open swamps, marshy areas, and in brackish waters. **Fl. & Fr.**: August - December.

**Distribution**: Pantropical.

**Specimens examined**: ANANTAPUR: Samatagram, KH 745d; KURNOOL: Peddathumbalam, KH 10962; Beldona, KH 10937; WEST GOTAварИ: Kolleru lake, KH & BR 10910; VISAKHAPATNAM: Industrial area, KH & BR 5591; VIZA/ANAGARAM: S. Kota KH & BR 5595; CHITTOOR: Varadayapalem, M.C. Barber 45154 (MH); KRISHNA: Bhavanipuram, P. Venkanna 6039 (MH); NELLORE: Gudult, K.C. Jacob 18529 (MH); MEDAK: Ruchentempet, K.M. Sebastian 7975, (MH & CAL); NALGONDA: Krishna river, K.M. Sebastian 9866 (CAL); CUDDAPAH: Guvvalacheruvu, K. Subramanyam 7793 (CAL); HYDERABAD: Katasinha, K.M. Sebastian 6014 (CAL).

**Fimbristylis miliacea** (Linn.) Vahl, Enum Pl. 287, 1806; FBI 6:544; Fischer 1560 (1152). *Scirpus miliaceus*

Annual, tufted, erect herb, to 40 cm tall; culms compressed, 4-angled below, triquetrous above. Leaves shorter than the stem, laterally flattened, to 30 cm long, apex acuminate, scabrid on upper margins; ligule zero; sheaths stramineous. Umbel decompound, rays unequal, spreading, filiform, to 3 cm long, bearing many scattered very small pedicellate spikelets. Involucral bracts
filiform, 3-5, to 2 cm long; primary and secondary rays 3.
Spikelets solitary, globose, to 2 mm long, brown; Rachilla winged. Glumes closely imbricate, ovate, obtuse, cymbiform, to 2 mm long. Stamen 1; anther to 3 mm long. Style 3-fid, trigonous, base pyramidal; stigmas ciliate and papillate. Achenes obovoid, trigonous, yellow.

Common species usually found in marshy areas, along the sides of water courses and also a characteristic weed of the rice fields. Fl. & Fr.: July - December.

Distribution: Tropical and subtropical regions of all world. In eastern Asia the range extends into temperate regions as far as to central Japan and China.

Specimens examined: ANANTAPUR: Gangalakunta, KH 7478; KURNOOL: Peddathumbalam, KH 10993, Tungabhadra river KH 10952; VISAKHAPATNAM: Visakhapatnam beach, KH 10999; Araku Valley, N.P. Balakrishnan 524 (CAL); RANGAREDDY: Mammadabad RF, KH & MSM 5583; ADILABAD: Birsaipet RF, GO & PVP 4608; NIZAMABAD: Ibrahimpet, TP & BR 6118; CUDDAPAH: Guvvalacheruvu RF, RR 7991; ANANTAPUR: Pennahobilam, TP & NY 374; GUNTUR: Jayanthipuram, VRK 6940; CHITTOOR: Varadayapalem to Kamakam, M.C. Barber 45161 (MH); EAST GODAVARI: Maredumilli, G.V. Subba Rao 27298 (MH & CAL); KARIMNAGAR: Akasapur, G.V. Subba Rao 25543 (MH & CAL); MEDAK: Narsapur, K.M. Sebastian 6720 (MH & CAL); NELLORE: Venkatagiri hills, B. Suryanarayana 3635 (VV); SRIKAKULAM: Near Rangam, G.V. Subba Rao 62335 (CAL).

Perennial, densely tufted, rhizomatous herb, to 70 cm tall. Culms subterete, obtusely trigonous above, striate, clothed at base with 3 bladeless sheath obly. Basal sheaths cylindrical, membranous, dorsally lightly green, ventrally thinly membranous, pale brownish, the orifice obliquely truncate with broad brown hyaline margin, the uppermost sheath to 12 cm long, second to 4 cm long, the radical ones scale like, rusty brown. Inflorescence a single terminal spikelet; involucral bract 1, scale like, broadly pale green on back. Spikelets obliquely patent, ovoidal, to 16 mm long, terete, brown, densely many-flowered. Glumes tightly spirally imoricated, broadly ovate, flattish, to 5 mm long, mucronate at apex, membranous, brown with dark brown striae on both sides or broad yellow-brownish keel, broadly pale hyaline on margins, keel ending in a straight mucro. Stamens 3. Style to 4 mm long, strongly flattened, sparsely ciliate above, slightly dilated at brown deltoid base; stigmas 2. Achenes broadly obovate, unequally biconvexed, maturing cream-coloured, roughly transversely wrinkled with 6 ridges.

Occasional in wet places. Fl. & Fr.: September - December.
Distribution: India, Malesia, northern Australia, also extending northwards to southern continental China, Formosa and the Ryukyus.

Specimens examined: CHITTOOR: Tandipandal, M.C. Barber 45102 (MH).


Perennial, densely tufted herb, culms to 25 cm tall, trigonous, shallowly striate, glaucous-green, clothed at base with few sheaths. Sheaths to 3 cm long, herbaceous, yellowish-brown. Leaf blades to 10 cm long, canaliculate, remaining as setaceous appendages of sheath. Inflorescence a single, terminal spikelet. Involucral bracts 2, the longest up to 3 cm long, overtopping the spikelet. Spikelet ellipsoidal, to 5 mm long, terete, obtuse, brownish grey, densely many-flowered. Glumes tightly imbricated, erect, patent, elliptic, to 4 mm long, boat-shaped, brownish on upper part, apically pubescent with short hairs, ciliate on margins, hyaline on margins. Stamens 3. Style subloosely fimbriate above the middle with short cilia, slightly dilated at base; stigmas 2. Acenes obovoid, biconvex to 2 mm long, grey purple at maturity, minutely cancellated with transversely oblong cells.
Open wet grounds, sandy shores, rock crevices near the sea. Fl. & Fr.: September - March.

**Distribution:** Tropical Africa, Asia and Australia.

**Specimens examined:** KURNOOL: Peddathumalam, KH 10963; VIZAYANAGARAM: Punyagiri hill, KH & BR 9715; VISAKHAPATNAM: Harbour bridge area, T.A. Rao 7192 (CAL); WEST GODAVARI: Xakinada T.A. Rao 7725 (CAL); NELLORE: Pulicat lake, A.R.K. Sastry 7761 (CAL); Varanji, J.S. Gamble 12681 (MH, DD, & CAL); EAST GODAVARI: Uppada, T.A. Rao 7340 (CAL).

**Fimbristylis pubisquama** Kern in Blumea 3:131. 1955, **F. compressa** Boeck. in Linnaea 38:337. 1874; FBI 5:639; Fischer (116).

Annual densely tufted herb, to 40 cm tall; culms obtusely trigonous, glaucous green, leaved at base. Leaves 4 to a culm; blades compressed trigonous, glabrous, glaucous green; ligules ciliate; sheaths to 9 cm long, subloosely surrounding the culm, dorsally whitish green, the membranous, ventral side whitish cinnamon-coloured, ciliate with soft hairs on margins. Corymbs compound, to 7 cm long, suodensely bearing ca 30 spikelets; rays to 5, patent, compressed. Involute bracts 1-3, the lowest leaflike, nearly 2 times as long as the corymb, the base dilated with broad brown ciliate hyaline margins, the second bract nearly equaling the corymb, the third setaceous. Spikelets ovoidal, to 6 mm long, terete, deeply rusty brown.
wholly pubescent, densely many-flowered. Glumes tightly imbricated, ovate, to 2.5 mm long, membranous, deeply rusty brown, wholly pubescent with short hairs, ciliate on margins. Stamens 2. Stigmas 2. Achenes obovate, biconvexed, 1 mm long, the surfaces yellow brown, shiny, finely cancellated.

In margins of saline marshes, open grass lands near the sea shore. Fl. & Fr.: October - December.

**Distribution:** Southern India and Cambodia

Raghava Rao (1989) reported from Mahaboodnagar district.


Annual, densely tufted, rhizomatous herb, to 70 cm tall. Culms arising from axils of bladed leaves which first form a leaf shoot; pentagonal, clothed at base with 4 sheaths. Culm sheaths bladeless, subterete, pale green, the ventral side hyaline and lightly yellow brown, the orifice obliquely truncate, hyaline on margin, the uppermost sheath to 13 cm long, second to 10cm. Leaf blades dorsiventrally flat, shorter than the culm, to 30 cm long, herbaceous, whitish green and 5-nerved on upper surface, smooth except on upper margins where spinulose scabrid;
sheaths to 7 cm long, pale green, yellow-brownish, ventral side split as culm grows. Corymbs compound to 9 cm long; rays 7, patent, to 5 cm long, scabrous; secondary corymbs bearing to 30 spikelets. Involucral bracts 5, setaceous, much shorter than the rays. Spikelets solitary, ovoidal, to 5 cm long, rusty brown, ca.40-flowered. Glumes ovate, deeply boat-shaped membranous, yellow brown, widely pale brownish on hyaline margins, tinged with dark brown on both sides of keel, the midnerve greenish, ridged above. Stamen 1. Style somewhat dilated at base.

Usually seen in wet places, grass lands, along canal banks and often in rice fields. Fl. & Fr.: August - November.

Distribution: Widely distributed in the old world tropics from Tropical Africa through India and Malesia to Northern Australia.

Specimens examined: /ISAKHAPATNAM: Forest near Anjeri, G.V. Subba Rao 6686 A (MH); EAST GODAVARI: Rampa hill, V. Narayanaswamy 245 (CAL).

Annual, caespitose, glaucous hero, to 70 cm tall; culms filiform, obtusely angled, striate. Leaves few, blades filiform, shorter than the culm, to 16 cm long, ligule shortly hairy; sheaths pinkish-brown. Involucral bracts 3, stiff, filiform, not overtopping, to 1.5 cm long. Spikelets 3, ovoid-subglobose, 1 x 0.4 cm long, rachilla strongly winged. Glumes deciduous, loosely imbricate, orbicular, obtuse, shortly apiculate, very concave, to 3 mm long, sides many-nerved, pale brown; keel 3-nerved. Stamens 3; anthers acute. Style 2-fid, upper half villous, base enlarged, subglobose. Stigmas 2. Achenes compressed, obovoid, biconvex, to 2 mm long, stipitate, striate. (Fig. 31).

This species is usually seen in sandy areas along river banks, sea shores and also along the margins of rice fields. Fl. & Fr.: September - December.

Distribution: From India and Ceylon to Malesia and northern Australia also extending northwards to southern China.

Specimens examined: ANANTAPUR: Samatagram, KH 7462; EAST GODAVARI: Rampahill, KH & HR 9729; RANGAREDDY: Mohammedabad RF, MSM 10483; ADILABAD: Sarvaiyet, GO 4505; CUDAPAH: Guvvalacheruvu, K. subramanyam 6389 (MH & CAL); VISAKHAPATNAM: Araku valley, N.P. Balakrishnan 10765 (MH & CAL); MEDAK: Narsapur, K.M. Sebastine 6759 (MH); NELLORE: Kavali, K.C. Jacob 18376 (MH).
Fig. 31. *Fimbrystylis schoenoides* (Retz.) Vahl

A. Habit, B. Spikelet, C. Rhachilla, D. Closed glumes,
E. Opened glume, F. Pistil, G. Stamens, H. Achene
(KH & BR 9729).


Perennial, tufted, rhizomatous herb, rhizome small, woody. Culms to 45 cm tall, basally scabrid. Leaves flat, to 40 cm long, margins inrolled, scabrid; ligule short, hairy; sheaths purple brown, hairy. Inflorescence simple, to 3 cm long. Involucral bracts 3-5, lowest overtopping, to 5 cm long; rays 2, to 2 cm long. Spikelets solitary, terete, to 1 cm long, obtuse. Glumes broadly ovate, to 2.5 mm long, fuscous, apically tomentose; keel 3-nerved. Stamens 3. Style 2-fid, shortly ciliate. Achenes obovoid, biconvex, stramineous, smooth, stipitate.

Occasional in open marshy places and in cultivated fields. Pl. & Fr: July - December.

Distribution: Africa, Syria through Arabia, Persia to India, Tropical Australia, Malesia.

Specimens examined: HYDERABAD: Katasinta, K.M. Sebastine 6014 (MH); KARIMNAGAR: Akaspur, G.V. Suuba Rao 22532 (MH); MEDAK: Rusthempet, K.M. Sebastine 7996 (MH); NALGONDA: Krishna river bank, K.M. Sebastine 9866 (MH); KURNOOL: Nandyal, J.S. Gamble 10393 (DD).

Annual, slender, caespitose herb, to 30 cm tall; culms filiform, obtusely trigonous, striate. Leaves erect, many at the base of the culm, shorter than the culm, filiform, glaucous-green, 15 cm long. Umbel subcompound, rays 4 with 2 spikelets on each. Involucral bracts very short, setiform. Spikelets to 1 cm long, oblong, acute, compressed, dark brown; rhachilla with deep pits. Glumes triangularly ovate, apiculate, coriaceous; keel conspicuous. Stamens 3; anthers with acute tip. Style with bulbous base, stigmas 3. Achenes stipitate, globose to ovoid, obtusely trigonous, yellow or brown. (Fig. 32).

This species is usually seen in moist low lands, sandy soils, grass fields, Fl. & Fr.: August - November.

**Distribution**: Lower Bengal, Lower Burma.

**Specimens examined**: KURNOOL: Kuppayal RF, KH 10995; ANANTAPUR: Kalasamudram RF, TP & EC 2855; ADILABAD: Ankusapuram, GO 4337; NELLORE: Venkatagiri hill, B. Suryanarayana 3494 (VV); CUDDAPAH: Guvvalacheruvu, K. Subramanyam 5338 (MH & CAL).


Perennial, caespitose herb, to 35 cm tall; culms slender, ribbed, quadrangular. Leaves reduced to membranous sheaths, grey.
Fig. 32. *Fimbrystylis tenera* Schult.
A. Habit, B. Spikelet, C. Rachilla, D. Closed glume,
Fig. 33. *Fimbristylis tetragona* R. Br.
A. Habit, B. Spikelet, C. Rhachilla, D & E. Glumes,
F. Pistil with stamens, G. Achene (*KU & MSM 10931*).
Spikelet solitary, hemispherical, or sublyoboese, lowest glume hardly brachiform, coriaceous, deciduous; rhachilla thickly studded with deep tetragonal pits with raised edges. Glumes closely imbricate, broadly obovate, rounded at the apex, concave, to 3 mm long; keel 3-nerved. Stamens 2; anthers muticous. Style villous, as long as the nut, base conical, compressed, stigmas 2. Achenes obovate, cylindrical, biconvex tapering towards the base, stipitate, fulvous grey, to 2 mm long. (Fig. 33).

Not very common. It is seen growing in wet or moist open places, borders of rice fields, banks of ponds, edges of marshes and also in forest areas during monsoon. Fl. & Fr.: July - December.

Distribution: Tropical Southern Asia from India and Ceylon through Indo-China north eastwards to Southern China and eastwards to Malesia and northern Australia.

Specimens examined: KURNOOL; Peddatnumbalam, Kli 10958; ANANTAPUR: Chintalapalli Road, Kli 7473; Samatagram, Kli 7461; RANGAREDDY: Snaikpalli, Kli & MSM 10931; ADILABAD: Jannaram, TP & PVP 4206; KARIMNAGAR: Raunapalli, G.V. Subba Rao 22231 (MH & CAL); KHAMMAM: Vazeedu, V.S. Raju 1000 (MH).

Fuirena Rottb.

Perennial or annual herbs sometimes with decumbent rhizome. Culms 3-5-angular, nodose and leafy throughout.
Radical leaves cataphylloid; bladed leaves cauline, the sheath closed. Inflorescence paniculiform with few to many glomerulous clusters of sessile spikelets at few to several nodes. Involu-er bracts leafy. Spikelets ovoidal or ellipsoid, terete, pubescent, many-flowered. Glumes spirally imbricate, basal 1 or 2 empty, remainder bearing a hermaphrodite flower (synanthium) at axil, awned. Flowers bearing 3 hypogynous squamellae and bristles. Stamens 2-3. Style continuous with the ovary. Ovary developing into triquetrous beaked achene.

A genus of about 30 species distributed along temperate and tropical regions of the world. They are usually found in open wet localities at low and medium altitudes, and have no reported economic significance. _F. glomerata_ and _F. umelata_ have been reported as important weeds (Holm et al., 1979).

1. Perennials with decumbent rhizome; stem trigonous; leaves glabrous; hypogynous scales and bristles absent _F. wallichiana_

1. Annuals with fibrous roots; stem sulcate; leaves pilose; hypogynous scales and bristles present:

2. Scales quadrate or suborbicular:

3. Inflorescence subcapitate; awn slender, pilose;
bristles 4-6; claw of the petals (scales) as long
as the blade ... ... ... ... _F. ciliaris_

3. Inflorescence capitate; awn strong, thorn like,
scabrid; bristles 3; claw of the petals shorter
than the blade ... ... ... ... _F. capitata_

2. Scales lunate, trilobate ... ... _F. trilobites_

Annual, tufted, pubescent herb with reddish brown fibrous roots. Culms subdensely tufted, to 20 cm tall, obtusely subpentagonal, ribbed. 4 nodes including inflorescence, the internodes pilose, to 5 cm long. Leaves basal and cauline; blades linear-lanceolate, to 8 cm long, several-costate, flaccid, herbaceous, subdensely pilose on both sides with white, spreading, tubercle-based hairs; sheaths to 5 cm long, laxly clothing the culm internode, pilose. Basal leaves reduced to sheaths, those rusty brown. Inflorescence capitate bearing 5 glomerules of spikelets. Spikelets sessile, squarrose, ellipsoidal, polygonal, bearing up to 20 glumes. Glumes imbricate, oovovate, 2 mm long, glaucous green and pubescent on intercostal areas, the broad, stramineous margins pilose, the glume strongly boat-shaped, both sides bearing 3 strong glabrous yellowish costa, two of which are concurrent to the midvein and excurrent beyond the glume apex to a recurved, thorn shaped-scabrid awn. Hypogynous bristles 3, retrorsely scabrid, claw of the scales shorter than the blade. Stamens 3. Style 3-cleft. Achenes reniform-oval, triquetrous with concave sides, stipitate at base, maturing light brown.
Usually seen in wet or moist sandy fields, along marshy places in sticky-muddy soils of rice fields. Fl. & Fr.: December - March.

**Distribution:** Confined to Ceylon and Southern India.

**Specimens examined:** RANGAREDDY: Shaikpalli, KH & MSM 10934; CUDDAPAH: Balapalle, J.L. Ellis 15733 (MH & CAL); CHITTOOR: Balapalle, C.E.C. Fischer 4278 (CAL).


Annual, slender erect, leafy herb, to 30 cms tall; culms sub-cylindric below and trigonous above, 2 mm wide, sparsely hairy above, glabrous below. Leaves linear-lanceolate, acuminate, to 9 x 0.4 cm; sheaths long, closed, striate, slightly pubescent. Inflorescence umbellate, 3-10 in a cluster in terminal and axillary spikelets in subcapitate heads, 1.8 x 1.8 cm. Involutrical bracts 0, but the leaf under each cluster of spikelets. Spikelets oblong, obtuse, brown, squarrose, lowest glumes longest, empty ciliate, 0.8 x 0.3 cm, many-flowered. Glumes 2.5 mm long, squarosely imbricate at length, deciduous, membranous, obovate-oblong, obtuse, keel ending in a long awn, shoulders and tip ciliolate, sides pubescent or nirsute. Hypogynous scales 4–6,
Fig. 34. *Fuirena ciliaris* (Linn.) Roxb.

with a slender stalk about equalling the blade, blade quadrate, strongly 3-nerved, with 3 acute lobes at apex. Stamens 3. Ovary compressed; stigmas 3, nearly as long as the style. Achenes triquetrous, stipitate, cuspidate, pale, obvoid. (Fig. 34).

Common species usually seen in wet open grounds, river banks, margins of ponds and rice fields. Fl. & Fr.: September - March.

Distribution: Widely distributed in tropical and subtropical regions of the old world; Tropical Africa, Indian subcontinent, South eastern Asia, southern China, Japan, Malesia and Australia.

Specimens examined: ANANTAPUR; Chintalapally Road, KH 7472, Garugudukona, TP 954; RANGAREDDY; Mohammadawad, KH & MSM 10924; GUNTUR; Vinukonda, VRK 6867; ADILABAD; Jannaram, TP & PVP 4201; NIZAMABAD; Sirnapalli river, 3R & GO 3075; KARIMNAGAR: Kodimial, G.V. Subba Rao 21836 (MH & CAL); CUDDAPAH: Near Rayachoty, K. Suoramanyam 7313 (MH & CAL); WARANJAL; Pakhal lake, K.M. Sebastine 11701 (MH & CAL); EAST GODAVARI: Polavaram agency Karagapudu, D.C.S. Raju 271 (CAL).


Annual, erect, caespitose herb, to 40 cm tall; culms slender, striate; glaucous, leafy, sparsely hairy. Leaves to
11 cm long, linear-lanceolate, acuminate, 7-nerved, profusely hairy; sheaths 3 cm long, close, pubescent. Inflorescence cluster of 3-9 axillary and terminal spikelets in subcapitate heads; bracts absent but inflorescence invariably arising from leaf axil. Spikelets to 7 mm long, ovoid or oblong, obtuse, pale brown, squarrose, lowest glume empty, possess longest awn, densely ciliate. Glumes 3.5 mm long, deciduous, membranous, obovate, obtuse, greyish black, keel pale green, 3-nerved, ending in a long awn, back ciliolate. Hypogynous perianth trilobed, 6 in two sets; the outer whorl of three consists of linear bristles, shorter than nut; inner whorl consists of 3 petaloid laminae. Each of the petaloid laminae is as long as the nut and consists of a distinct stalk and a semicircular lunate head with their two lower angles extending downwards, cuspidate. Stamens 3. Ovary triquetrous; stigmas 3, minutely ciliate. Achenes stipitate, triquetrous, acute, base trigonous flat, minutely tuberculate showing very faint horizontal striations. (Fig. 35).

Found growing in rice fields and water logged grass lands. Fl. & Fr.: November – March.

**Distribution**: Endemic in W. Peninsula (India).

**Specimens observed**: CUDDAPAH: DevaraKona - Guvvalacheruvu RF, R.V. Reddy 8116.
Fig. 35. Fuirena trilobites Clarke
A. Habit, B. Spikelet, C. Rhachilla, D & E. Glumes,
F. Pistil with stamens, G. Achene with hypoquamous scales
and bristles, H. Achene (RVReddy 8116).
**Fuirena wallichiana** Kunth, Enum. Pl. 2:132. 1837; FBI 6:655; Fischer 1659 (1153).

Perennial, robust, rhizomatous herb, to 60 cm tall; culms many, 3 mm wide, rigid, trigonous, hallow, slightly pubescent towards apex. Leaves linear-lanceolate, acute with strong midnerve, 10 cm long, glaucous; sheaths 3 cm long, trigonous, striate, with a short ligule. Spikelets in corymbose terminal clusters, oblong, terete, many-flowered, 1.1 x 0.4 cm. Glumes broadly oblong, rounded at the apex below the mucro, green with red streaks by transmitted light, pubescent and ciliate, 3 mm long, mid region thick, 3-nerved; hypogynous scales 0. Stamens 3, anthers linear-oblong. Ovary fusiform, style 3-fid, hairy at base, stigmas hairy. Achene turbinate, with conical pubescent apex, trigonous, pale yellow, 1 mm long. (Fig. 36).

Found along the banks of streams and tanks, common in most pasture lands. Fl. & Fr. : Most of the year.

**Distribution:** Endemic to India

Fig. 36. Fulrena wallichiana Kunth
**Indocourtoisia** Bennet & Raizada


Annual, erect, tufted, non rhizomatous herb to 30 cm tall, culms trigonous, glabrous. Leaves few, basal, as long as the stem, gradually acuminate; sheaths 2.5 cm, yellow, membranous. Inflorescence compound, branches ending in spikes. Involucral bracts 6, lower ones much exceeding the inflorescence, spreading. Spike globose, 6 mm long; spikelets many, 4 mm long, clustered, compressed, 1-flowered, broadly elliptic, golden-brown-coloured, shining; achilla slender, narrowly winged; glumes distichous, 4, lower 2 smaller, empty, upper two glumes enclose the achenes, ovate-acute, with a strong broadly winged keel, excurrent into a short mucro. Stamens 3, anthers oblong, stigmas 3. Achenes trigonous, linear oblong, 2.8 mm long, apiculate, golden brown, strongly puncticulate, about 3/4 of the length of the glume. (Fig. 37).

This is not a common species. Occasionally seen in rice fields as a weed and also found in waste lands. Fl.&.Fr.: November - January.
Fig. 37. *Indocourtoisia cyperoides* (Roxb.) Bennet & Raizada
A. Habit, B. Spikelet, C. Rhachilla, D. Opened glume,
E. Closed glume, F. Stamens, G. Achene with stigmas
(NY 1186).
**Distribution:** Tropical Africa, Indo-Malesia.

**Specimens examined:** ANANTAPUR: Kalasamudram RF Tank, Ny 1186; KURNOOL: Nallamalas, J.L. Ellis 32512 (MH); VISAKHAPATNAM: Anantagiri, G.V. Subba Rao 19568 (MH).

**Juncellus** (Griseo.) Clarke

Stems erect, leafy only near the base. Leaves rarely reduced to sheaths; sheaths not inflated. Inflorescence umbellate or capitate. Spikelets compressed; rhachilla persistent. Glumes distichous, concave, the 2 lowest empty, the uppermost 1-3 sterile or empty, the intermediate bisexual. Stamens 3 or 2. Style 2-fid. Achenes plano-convex, more or less compressed at right angles to the rhachilla.

1. Inflorescence umbellate, stems robust, up to 120 cm tall ........ *J. alopecuroides*

1. Inflorescence capitate, stems densely tufted up to 25 cm tall:

2. Rhizome absent, involucral bracts ca. 5 .. *J. pygmaeus*

2. Rhizome creeping, involucral bracts

2 only .. ........ *J. laevigatus*

Perennial, erect, stout, rhizomatous herb to 120 cm tall. Culms rounded below, trigonous above. Leaves many, flat, as long as the stem, coriaceous, acute; sheaths dark. Inflorescence compound umbel with 4-9 primary rays, to 15 cm long; secondary rays 3-7, to 2 cm long, bearing clusters of oblong spikes, densely covered with small spikelets. Spikelets spicate, to 1 cm long, 15-30-flowered, persistent, elliptic-lanceolate. Involucral bracts 5, far overlapping, to 40 cm long, leaf like. Glumes ovate, to 2 mm x 2 mm, thin, concave, apiculate, margins inrolled. Stamens 3. Style 1 mm long; stigmas 2. Acenes broadly elliptic, light brown, stipitate, apiculate.

Usually found in marshy low lands, along the banks of canals, ponds, lake margins and in swamps. Fl. & Fr.: September - February.

Distribution: North and Tropical Africa, Madagascar, Indo-China and Malesia.


Fig. 38. *Juncellus laevigatus* (Linn.) Clarke

A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume, E. Opened glume,
F. Pistil with stamens, G. Achene (KH 10948).
Perennial, tufted, rhizomatous herb, rhizome creeping horizontally with solitary distant stems, their bases enclosed by imbricate, shining, chestnut red scales. Culms to 30 cm tall, round, fleshy. Leaf blades undeveloped. Spikelets 30 in one apparently lateral head, straw-coloured. Involutural bracts 2, the lower as though a continuation of stem, to 7 cm long, the other much shorter. Spikelets ovate, compressed but thick, straw-coloured dotted with brown spots. Glumes ovate, acute, closely imbricate, dotted with brown spots, the sides with hyaline margins. Stamens 3; anthers yellow with reddish brown acute tip. Style as long as the achene; stigmas 2. Achenes obovoid, brown, stipitate. (Fig. 38).

Occasional in moist localities, salt marshes, sandy beds of rivers and muddy soil. Fl. & Fr.: September - March.

Distribution: India, Mediterranean region, Africa, West Asia, Australia, South America.

Specimens examined: KURNool: Tunjaohadra River, KH 10948; Peddathumbalam, KH 10950; CUDDAPAH: way to Guvvalacheruvu; K. Subramanyam 7789 (MH); HYDERABAD: Puranapul, K.M. Sebastian 9761 (MH & CAL); ANANTAPUR: Gooty, J.S. Gamble 11091 (DD).

Annual, dwarf, tufted herb; culms to 3 cm tall, triquetrous. Leaves several, to 3 cm long, flacid, scaberulous, green, acuminate; sheaths reddish. Spikelets very many, sessile, densely packed in a terminal head; involucral bracts 5, unequal, to 4 cm long, base dilated, acuminate, leaflike. Spikelets broadly ovate, to 3 mm, pale-brown, 5-10-flowered, compressed. Glumes oblong-lanceolate. Stamen 1. Stigmas 2. Achenes ellipsoid, trigonous, orange-brown.

Frequent along the sandy or silty beds of rivers, in rice fields as tufted cushions. Fl. & Fr.: September - March.

Distribution: Widely distributed in Euresia from Mediterranean region and East Africa through Asia Minor and India to south eastern Asia, Malesia and Australia.

Specimens examined: RANGAREDDY: Mohamsnadaad RF, KH & MSM 5575; EAST GODAVARI: Dhavaleswaram Varanje, KH & BR 9725; ADILABAD: Potchera, GO & DAM 5032; NIZAMABAD: Lakshimpur, TP & BR 6280; CHITTOOR: Neraoylu, G.V. Subba Rao 46026 (MH); KRISHNA: Alluru, C.A. Barber 7939 (MH); MEDAK: Narsapur, K.M. Sebastine 7958 (MH & CAL); NALGONDA: Krishna river bank, K.M. Sebastine 9311 (MH & CAL); WARANGAL: Kanapur, K.M. Sebastine 11531 (MH & CAL).
Kyllinga Rottb.

Perennials; stem 3-angled; the rhizome short or horizontally creeping. Leaves basal. Inflorescence head like with 1 to few sessile spikes; spikes cylindrical, globose, bearing many spikelets crowded in a short rhachis; glumes 4-5, distichous (two ranked); rhachilla disarticulating and falling off whole above the 2 lowest, very small empty glumes; 3rd glume bisexual, 4th male or empty, rarely bisexual, 5th rudimentary or altogether absent. Stamens 2-3. Style not joined at base, 2-fid at apex forming 2 stigmas. Achenes bilaterally flattened with one angle facing the rhachilla.

A genus of 40-45, mainly tropical species, this is partly pollinated by wind and partly by insects (Tucker, 1984).

1. Rhizome short or absent, stems tufted:
   2. Stem bulbous based, leaf sheaths disintegrate leaving a tuft of fibres, central spike globose... *K. bulbosa*
   2. Stem hardly thickened at base, leaf sheaths remain intact, spikes cylindrical ... ... *K. odorata*

1. Rhizome long, stems solitary in linear rows along the length of the rhizome;

3. Glumes not winged:
   4. Stems 30-50 cm tall, close ... ... *K. melanosperma*
   4. Stems 5-25 cm tall, spaced ... ... *K. brevifolia*

3. Glumes winged ... ... ... ... *K. nemoralis*


Perennial, stoloniferous, rhizomatous herb; rhizome horizontal, creeping, clothed with brownish scales. Culms many, spaced, arranged in a single row along the rhizome, to 25 cm tall, slender, triquetrous, few-leaved at base. Leaf blades shorter than the culm, narrowly linear, flattish, plicate, herbaceous, scabrid on margin and on the abaxial midvein; sheaths brownish. Inflorescence a terminal, single globose head. Involucral bracts 3, foliaceous, very unequal in length, lowest to 8 cm long; head globose, pale green, densely bearing numerous spikelets. Spikelets lance-oblong, laterally compressed. Glumes ovate-elliptical, folded with an acute keel, pale green, keel projecting beyond the glume apex into a slightly recurved cusp, sparsely spinulose towards apex, stamen/often upto 3. Style 2-cleft. Achenes obovate, laterally lenticular, brownish.

A common ubiquitous taxon found growing almost everywhere from the sandy coast to grass lands on lower hills. Fl. Fr.: July - December.

Distribution: Pantropical in Asia extending northwards into the warmer regions of continental China and the temperate region of Japan.
**Specimens examined:** KURNOOL: Kuppagal RF, KH 10970; VISAKHAPATNAM: Simanachalam hill, KH & BR 5588; NIZAMABAD: Kama Reddy, BR & CPR 9230; EAST GODAVARI: Rampanill, V. Narayana swamy 424 (CAL); PRAKASHAM: Pedamanantasya RF, R.K. Mohan 0595 (CAL); VISAKHAPATNAM: Krishnapuram, C.A. Barber 1942 (MH).


Perennial, rhizomatous herb. Culms to 15 cm tall, densely tufted with short erect rhizome, obtusely trigonous, the base forming an ovoidal, corn-like enlargement clothed with brown fibres. Leaves few; blades flattish- to plicate, sheaths stout, pale and basal ones tinged with light brown, sheaths disintegrate leaving a tuft of fibres. Inflorescence a head with 3 sessile spikes, pale greenish, central spike ovoid globose, to 8 mm long, obtuse, the lateral ones globose. Involutral bracts 3, eventually reflexed, the longest to 10 cm long. Spikelets ovoid, pale greenish, 1-flowered. Glumes 4, ovate-oblanceolate, hyaline, acuminate. Stamens 2. Stigmas 2. Achenes ovoid, laterally flattered, brownish.
Common species usually found in grass lands, lawns, and almost everywhere in the coastal plains. Fl. & Fr.: August - December.

**Distribution:** From Tropical Africa through India and Indo-China north eastwards to Southern China and eastwards to Malesia and Norther Australia.

**Specimens examined:** KURNOOL: Kuppagal RF, KH 10955; VISAKHAPATNAM: Tyada Forest, KH & BR 9722; NIZAMABAD: Dicipalli, BR & KH 6440; CUDAPAH: Guvvalacheruvu, RV Reddy 7970; Balapalle, J.L. Ellis 15785 (CAL); ADILABAD: Sirpur, GO & PVP 4959; GUNTUR: Nagarjunakonda, VRK 5714; CHITTOOR: Mamandur valley, K. Subramanyam 6895 (MH & CAL); KRISHNA: Nuzvedu, P. Venkanna 5217 (MH); KARIMNAGAR: Aklaspur, G.V. Subba Rao 25659 (CAL); MEDAK: Narsapur, K.M. Sebastian 5639 (MH & CAL); WARANGAL: Pakhal lake, K.M. Sebastian 13121 (MH & CAL); NELLORE: Venkatagiri hill, B. Suryanarayana 3836 (VV).


Perennial, rhizomatous herb; rhizome decumbent, to 8 cm long, knotty, clothed with lance-ovate, dark brown scales, very aromatic. Culms to 50 cm tall, disposed in a row along
the rhizome, close together, triquetrous with almost winglike angles. Leaves all reduced to bladeless sheaths; sheaths 4, membranous, to 20 cm long, greenish, tinged with purplish brown, the orifice with hyaline margin. Inflorescence a single globose head, to 12 mm long, greenish, densely many spiculose. Involucral bracts 3, to 15 cm long, spikelets elliptic-oblong. Glumes 4, the lower two ovate-elliptic, 3 mm long, remaining glumes 4 mm long, lanceolate. Stamens 3. Stigmas 2. Achenes elliptic-oblong, apiculate, laterally flattened.

Though not common, this is occasionally found on forest margins, in swampy areas. Fl. & Fr.: January - July.

**Distribution:** Tropical and subtropical, Southern Asia, Fiji and Malesia.

**Specimens examined:** EAST GODAVARI: Nulakamaddi, G.V. Subba Rao 24535 (MH); VISAKHAPATNAM: Araku valley, N.P. Bala-krishnan 10878 (MH & CAL).

**Note:** This species can be easily recognised by the strong odour of the rhizome.

*Kyllinga nemoralis* (Forster & Forster. f.) Dandy ex Hutchins. & Dalziel, Fl. W. Trop. Africa 2; 486, 487. 1936.


Perennial, laxly tufted, rhizomatous herb; rhizome long-creeping, culms to 20 cm tall, along the rhizome, triquetrous, not thickened at base. Leaves many, longer than the stem; sheaths brown. Inflorescence a single head, densely bearing many spikelets, whitish. Involutral bracts 4, spreading, the lowest to 15 cm long. Spikelets ovate, elliptic, 2-flowered. Glumes 5, winged, the lowest 2 smaller, the remaining glumes to 3 mm long, boat-shaped, whitish and becoming straw-coloured, variegated with rusty brown, the keel ending in a short recurved cusp. Stamens 3, Stigmas 2. Achenes oblong-ovovate, biconvexed, maturing brownish.

Common species found in road sides, waste places, open grass lands, near canals, as herbaceous undergrowth on moist soil. Fl. & Fr.: July - November.

Distribution: Pantropic but relatively scarce in tropical America.

Specimens examined: VISAKHAPATNAM: Tyada Forest, KH & BR 9717; CUDDAPAH: Guvvalacheruvu, R.V. Reddy 3439; CHITTOOR: Near Papanasanam Falls, K. Subramanyam 6956 (MH); EAST GODAVARI: Forest near Angeri, G.V. Subba Rao 68554 (MH); KRISHNA: Ajiripalle, P. Venkanna 5233 (MH); KURNOOL: Nallamalais, J.L. Ellis 22131 (MH).


Perennial, tufted, rhizomatous herb; rhizome clothed with brown fibres. Culms to 30 cm tall, slender, triquetrous, hardly thickened at base. Leaves few, shorter than the culm; blades flattish plicate; sheaths pale brownish, remain intact. Inflorescence a head with 3 spikes, whitish green; central spike cylindrical; lateral spikes elliptical, much shorter than the central spike, each densely bearing many spikelets. Involucral bracts 4, reflexed, the lowest to 10 cm long. Spikelets patent, elliptic. Glumes broadly ovate, apiculate at apex, membranous folded with green keel, the lower two to 20 mm long, the upper 2 to 3 mm long. Stamens 2. Stigmas 2. Achenes elliptic-obovate laterally flattened, maturing dark brown.
Usually grow in moist places and open grass lands along mountain slopes. Pl. & Fr.: May - October.

**Distribution:** Tropical Africa, tropica, and subtropical Asia.

**Specimens examined:** VISAKHAPATNAM: Anantagiri, 19439 (MH); EAST GODAVARI: Maredumilli, G.V. Subba Rao 68545 (MH).

**Lipocarpha R. Br. nom. cons.**

Annual, glabrous herbs, culms leaved only at base. Inflorescence a terminal or a pseudoterminal head with 1-8 spikes, subtended by 1-few leaf like involucral bracts. Spikes ovoidal, terete, bearing many bracteoles. Spikelets solitary at axil of scale like bracteoles of the spike and completely hidden by them, 1-flowered. Glumes of small hyaline inner scales, the lower one of prophyllar nature, the upper one bearing a hermaphrodite flower (Synanthium). Stamens 1 or 2. Stigmas 2 or 3. Ovary maturing into an oblong, terete achene.

A genus of about 8 species in tropical and warm temperate regions and have no reported economic significance.

Chermezon (1937) divided the genus in to two sections, sect. **Acutae.** Spikelet squarrose, and the glumes mucronate and sect. **Obtusae** (correct name sect. Lipocarpha). Spikelets not squarrose and glumes not mucronate.
1. Glumes white, 2.5 mm long, Achenes not beaked  

L. chinensis

1. Glumes dark purple brown on upper part, 1.5 - 2 mm long, Achenes beaked  

L. sphacelata

Lipocarpha chinensis (Osbeck) Kern in Blumea, Suppl. 4:167.


Annual, caespitose herb with reddish brown fibrous roots, culms to 50 cm tall, obtusely trigonous, whitish green. Leaves 4 to a culm; blades linear, rather soft and slightly spongy, whitish green; sheaths to 15 cm long, subloosely surrounding the culm, pale, the lower ones stained with reddish purplish colour. Inflorescence a head with 7 spikes. Involucral bracts 3, unequal, dilated at base, much surpassing the head, the longest up to 20 cm long. Spikes oblong-ellipsoidal, terete, to 8 mm long, rounded at apex, whitish, densely bearing numerous bracteoles. Glumes 2, white, 2 mm long, lanceolate, membranous, the adaxial slenderly 3-nerved. Hypogynous scales to 5 mm long, exceeding achene. Stamen 1. Stigmas 3. Achenes oblong, 1.5 mm long, trigonous, straight to weakly curved, straw-brown.

A common species usually seen in marshy areas, swamps and rice fields. Fl. & Fr.: May - October.
Distribution: Widely distributed in the Old world tropics, from tropical Africa and South Africa through India and South Eastern Asia eastwards to Australia.

Specimens examined: CHITTOOK: Akkagari gudi, G.V. Subba Rao 45931 (MH); VISAKHAPATNAM: Araku valley, N.P. Balakrishnan 522 (CAL); EAST GODAVARI: Valamuru, S. Sudhakar 365 (AU).


Annual, erect, caespitose herb, to 20 cm tall; culms triquetrous. Leaves basal, canaliculate, shorter than stem, to 14 cm long; ligule 0. Involucral bracts 3, foliar, overtopping, to 7 cm long. Inflorescence terminal, capitate. Spikelets 3-5 in a cluster, globose or ovoid, many-flowered. Glumes spiral, to 2 mm long, dark purple striped on upper part, 5-nerved, obtusely apiculate. Hypogynous scales 2, oblong, slightly exceeding the nut. Stamens 2; anthers oblong-linear, shortly apiculate. Stigmas 3. Achenes ellipsoid, beaked, fuscous, stoutly stipitate and trigonous. (Fig. 39).

Occasional in damp grassy places and open wet fields and margins of swamps. Fl.& Fr.: August - January.
Fig. 39. Lipocarpha sphacelata (Vahl) Kunth
A. Habit, B. Spikelet, C. Rhachilla, D & E. Glumes,
F. Achene, G. Stamens (KH & MSM 10930).
Distribution: Tropical Africa, India, Ceylon, Nepal, Thailand and Tropical America.

Specimens examined: RANGAREDDY: Shaikpalli, Mohammadabad RF, KH & MSM 10930; ADILABAD: Vempalli, GO 4450; CUDDAPAH: Balapalle, J.L. Ellis 15785 (MH); CHITTOOR: Talakona RF, G.V. Subba Rao 46950 (MH); KARIMNAGAR: Akasapur, G.V. Subba Rao 25658 (MH).

Mariscus Vahl nom. cons.

Perennial herbs. Inflorescence of a single head or in simple or compound umbels. Spikelets usually in compact compressed or terete heads. Glumes distichous, often only 1 to several; of these flower bearing rhachilla deciduous above the prophyll and falling before glumes. Stamens 3. Style 3-fid. Achenes trigonous, linear oblong, one of the sides facing the rhachilla.

1. Spikelets flattened, 3 to many-flowered, glumes folded on a conspicuous keel:
   2. Glumes awned ... ... M. squarrosus
   2. Glumes not awned:
      3. Plants 40-60 cm tall:
         4. Spikelets lanceolate, spicate, straw-coloured ... ... ... M. javanicus
4. Spikelets linear, congested in a globose head, red-brown \( \ldots \) \( \ldots \) \( M. compactus \)

3. Plants 15-30 cm tall \( \ldots \) \( \ldots \) \( M. dubius \)

1. Spikelets terete, 1 or 2-flowered, glumes not or scarcely keeled:

5. Base of the stem hardly enlarged:

6. Spikelets 1 or 2-fruited, greenish straw-coloured \( \ldots \) \( \ldots \) \( \ldots \) \( M. cyperinus \)

6. Spikelets 1-fruited, whitish-green \( \ldots \) \( M. paniceus \)

5. Base of the stem bulbous \( \ldots \) \( \ldots \) \( \ldots \) \( M. clarki \)


Mariscus bulbosus Clarke in Hook. f. Fl. Brit. India \( \text{non Stud.} \);
6:620. 1893 \( / \) Fischer 1544 (1142). Mariscus pictus

Nees in Wight, Contr. Bot. India 90. 1834.

Perennial, rhizomatous, stoloniferous herb; stolons to 6 cm long, the internodes to 5 mm long, clothed with pale brownish membranous scales, culms solitary, to 22 cm tall, triquetrous, the base thickened, to form a lanceolate enlargement, to 4 cm long, clothed with dusky brown, membranous sheaths. Leaves 6 to a culm, shorter than the culm; blades 18 cm long, herbaceous, 1-costate, plicate with incurved margins, glaucous green; sheaths 4 cm long, membranous. Dusky brown inflorescence simple, congested in a digitate cluster, 2 cm long. Involutral
Fig. 40. *Mariscus clarkei* (Cooke) Koyama

A. Habit, B. Spikelet, C. Closed glume, D. Opened glume, E. Rhachilla with a reduced glume, F. Pistil with stamens, G. Achene (*MSM & NV 10380*).
bracts 6, spreading, surpassing the inflorescence, the longest
10 cm long; spikes cylindrical, subsessile, 2 cm long, obtuse.
Lower glume ovate, 3 mm long, acute, conspicuously 11-nerved,
the midvein green, the sides light straw-coloured, membranous;
upper glume lanceolate, acute, 2 mm long. Stamens 2. Style 3
cleft to halfway down. Achenes oblong elliptic, trigonous,
1.5 mm long, maturing dark brown. (Fig. 40).

Rarely grown on wet shallow soil over rock outcrops.
Fl. & Fr.: September - December.

**Distribution:** Confined to South India and Ceylon.

**Specimens examined:** RANGAREDDY: Kusumasamudram beat,
MSM & KH 10380; ANANTAPUR: Kalasamudram RF, TP & EC 2816;
CUDDAPAH: Guvvalacheruvu, RVR & R.V.Reddy 7847; KURNOOL: North
Dhone RF, RVR 3198.

**Note:** This species is characterised by bulbous stem-bases
which emit a few, slender stolons. Another bulbous
Mariscus is *M. dubius*. Both these can be distinguished
by the inflorescence. In *M. clariei* the inflorescence
resembles *M. cyperinus* where as in *M. dubius* the
inflorescence is a dense, hemispherical head.

**Mariscus compactus** (Retz.) Bold. Zakfl. Java 77. 1916; Fischer
*C. spinulosus* Roxb. Fl. Ind. 1:203. 1832. *Mariscus*

Perennial, rhizomatous herb, rhizome corm like; culms solitary, erect, to 50 cm tall, obtusely trigonous, septate nodulose. Leaves 3, longer than the culm; blades elongated, linear, thickish, canalicate, glaucous green, markedly septate nodose; sheaths elongated, cylindrical, septate nodose, purple brown. Anthela compound, ample, 7 cm long and as wide. Involucral bracts 8, patent, the lower ones much surpassing the anthela, the longest 60 cm long; primary rays 5, patent, the longer ones up to 7 cm long; secondary corymbbs with 5 raylets; spikes nearly globose, bearing many stellately arranged spikelets; rhachis very short. Spikelets linear, red brown, jointed at base, congested in a globose head, 12 mm long, pale green and tinged with sanguineous brown; rhachilla flexuose with pale white hyaline wings, glumes erect, convolute, linear-lanceolate, 3 mm long, membranous, pale brown, slightly shiny, 5-nerved on greenish back. Stamens 3. Stigmas 3. Achenes linear-oolong, trigonous, to 2 mm long, yellow brown. (Fig. 41).

This is a rare taxon, this species can be seen occasionally along ravines, flowing water streams. Fl. & Fr.: March - September.

Distribution: India, Southern continental China, Taiwan and Malesia.
Fig. 41. *Mariscus compactus* (Retz.) Bold.
A. Habit, B. Spike, C. Spikelet, D, E, F & G. Glumes, 
H. Pistil with stamens, I. Achene (KH & BR 973).
Specimens examined: EAST GODAVARI: Maredumilly, KH & BR 9739; CUDDAPAH: Balapalle, J.L. Ellis 15767 (MH & CAL); KURNOOL: Krishnanandi, J.L. Ellis 25529 (MH & CAL); VIZAYANAGARAM: Bhogapuram, M. Venkaiah 3971 (AU).


Key to the subspecies

1. Rhizome short, not stoloniferous; leaves 2.5 mm wide; umbel truly terminal .. .. .. subsp. cyperinus

1. Rhizome emitting slender stolons, leaves as a rule 1 mm wide, umbel quasilateral .. .. subsp. laxatus

subsp. cyperinus

Perennial, rhizomatous herb; rhizome woody, clothed with brown fibres, culms few, erect, to 40 cm tall, triquetrous, leaved at thickened base. Leaves 7, nearly equalling the culm; blades narrowly linear, long-attenuate, 2.5 mm wide, herbaceous, plicate; sheaths pale green and stained with purplish pink, the basal sheaths dark red brown. Umoe simple, terminal open with short rays, rays 9, to 2 cm long each terminated by a spike;
spikes cylindrical, narrowed to base, 2 cm long, greenish, densely bearing up to 60 spikelets. Involucral bracts 8, patent, the lower few surpassing the anthela, the longest up to 16 cm long. Spikelets patent, greenish straw-coloured. Linear-lanceolate, 5 mm long, bearing 4 glumes and 2 achenes; rhachilla with lanceolate wings. Glumes erect, elliptic, 3 mm long, inrolled, membranous, glaucous green and tinged with straw-brown, 3-nerved on both sides, the green keel appressed. Stamens 3. Stigmas 3. Achenes oblong, trigonous, 2.5 mm long, brownish.

Occasionally growing in a marshy areas, banks of streams, and in open grassy places in hilly areas. Fl. & Fr.: July - October.

**Distribution:** From India to Malesia and Northern Australia, also in Eastern Asia extending northwards to Southern China and the Ryukyus.

**Specimens examined:** EAST GODAVARI: Maredumilli RF, KH & BR 9740; RANGAREDDY: Mohammadabad RF, MSM & KH 10430; ADILABAD: Jaipur RF, PVP & KH 9437; NIZAMABAD: Gandhrari RF, BR & CPR, 7241; KRISHNA: D.M. Bhavi, P. Venkanna 5650 (AU); KURNOOL: Chelama, J.L. Ellis 16733 (MH); VISAKHAPATNAM: Forest near Anantagiri, N.P. Balakrishnan 11002 (MH & CAL).

Perennial rhizomatous herb with long, creeping, slender stolons. Leaves 1 mm wide. Inflorescence few-spiked contracted umbel; lowest involucral bract tending to be erect and continued down to the culm thereby inflorescence becoming pseudolateral. Spikes to 10 mm long. (Fig. 42).

Rare in open grassy places in hilly areas. Fl.& Fr.: September - December.

**Distribution:** India to Malesia, not as common as the typical phase.

**Specimens examined:** NALGONDA: Nagarjunakonda; B.V. Raghava swamy 80 (NU).

*Maricus dubius* (Rottb.) Kukenth. ex Fischer in Gamble Fl.

Fig. 42. *Mariscus cyperinus* (Retz.) Vahl subsp. *laxatus* (Clarke) Koyama

Perennial, tufted herb with short rhizome; culms thickish, stiffly erect, to 20 cm tall, triquetrous, with a narrowly ovoidal bulbose enlargement with thickened basal sheaths, 30 mm long, clothed with brown outer sheaths and their dusky brown fibrous remnants. Leaves 7 to a culm; blades linear, surpassing the culm, soft, herbaceous, scabrid on upper margins; sheaths to 5 cm long, scarious, whitish. Inflorescence a dense, hemispherical, ovoid, deltoid, head, to 12 mm long and as wide. Involucral bracts 4, spreading, the longest 13 cm long; spikes broadly ovoidal, densely bearing 20 spikelets, light greenish; rhachis subulate, 2 mm long. Spikelets patent, ovate, 5 mm long, bearing 5 glumes, 6-flowered, rhachilla straightish; wings lanceolate, white-hyaline. Glumes patulous, broadly ovate, acute, to 3 mm long, herbaceous, whitish-greenish, broadly white hyaline margined. Stamens 3. Stigmas 3. Achenes elliptical, 1.5 mm long, trigonous, apiculate, light brown. (Fig. 43).

Open rocky ground, usually seen along sandy beaches. Fl. & Fr.: August - December.

Distribution: Tropical Africa through India and Indo-China eastwards to Malesia.

Specimens examined: VISAKHAPATNAM: Simhachalam hill, K& 5590; CUDDAPA: Ummithela Kodur, J.L. Ellis 14334 (MH); EAST GODAVARI: Rampachodavaram, V. Narayanaswamy 231 (CAL);
Fig. 43. *Mariscus dubius* (Rotth.) Kuekenth.
Perennial, tufted, stoloniferous herb with short rhizome:

- Culms stout, to 70 cm tall, obtusely trigonous, minutely papillose, glaucous green. Leaves rather many, surpassing the culms;
- Blades linear, to 12 mm wide, coriaceous, rigid, slightly spongy, septate nodolose, plicate below middle, glaucous green and often white powdery, prominently scabrous on margins; sheaths castaneous to dark brown, often slightly shiny, cylindrical, septate nodolose. Anthela ample, compound, to 15 cm long.
- Involucral bracts leafy, the lower ones much surpassing the corymb, the longest to 70 cm long; primary rays 10, to 12 cm long, patent, papillose; spikes cylindrical to ovoid, to 3 cm long, bearing many spikelets; rhachis 2 cm long. Spikelets spicate, divergent to slightly reflexed, lanceolate, acute, to 9 mm long, turgid, to 10-flowered, straw or white coloured;
rhachilla rather broader winged; jointed above the prophyll; wings ovate, pale. Glumes broadly ovate, to 4 mm long, subcoriaceous, 9-nerved, pale and turning brownish with rust-coloured, the margins whitish hyaline; keel greenish, forming an obtuse back. Stamens 3. Stigmas 3. Achenes ovate to obovate, trigonous, shining black, brown at maturity.

Usually seen in sandy areas along the coastal belt, characteristic of open moist to swampy usually salt or brackish localities near sea shores (Fischer). Fl. & Fr.: Throughout the year.

**Distribution:** Tropical Africa, Madagascar, through Indian subcontinent, Southern China and Southern Ryukys, as well as to Malesia, northern Australia and the Pacific Islands.


*Cyperus paniceus* (Rottb.) Boeck. in Linnaea 36:381. 1870.

Perennial, rhizomatous, stoloniferous herb; rhizome decumbent, knotty, 2 cm long, clothed with dark red brown fibres, emitting stolons; stolons covered with reddish-brown scales, soon disintegrating into brown fibres, culms to 40 cm tall, trigonous. Leaves 4 to a culm; blades nearly equalling the culm, flattish-plicate; sheaths to 5 cm long, reddish-brown. Anthela simple.
Umbel of spikes or digitate-contracted, to 3 cm long, light glaucous-greenish. Involucral bracts 7, patent, surpassing the anthela, the longest to 25 cm long. Spikes cylindrical, to 1.5 cm long, densely bearing up to 30 spikelets. Spikelets horizontally divergent, lanceolate, whitish green, slightly recurved, 3 mm long, bearing 4 glumes, and 1-flowered. Lower 2 glumes ovate, pale whitish, the third glume lanceolate, 3 mm long, 3-nerved. Stamens 2. Stigmas 3. Acnenes elliptic-ovlong, trigonous, yellow brown.

Though rare it is sometimes seen growing along forest margins, in damp places preferably undersnades. Fl. & Fr.: July - December.

**Distribution:** Lower Bengal, Thailand, Indo-China.

**Specimens examined:** EAST GODAVARI: Rampahill, KH & BR 9734; CHITTOOR: Nagapatla RF, K. Supramanyam 6854 (MH & CAL); KARIMNAGAR: Kodimal, G.V. Subba Rao 20130 (MH).

**Note:** Clarke (1893) and Kern (1974) described two varieties under this species var. paniceus and var. roxburghianus. Koyama (1985) united these two varieties and treated *Mariscus paniceus* as a single species. For the treatment we have also followed Koyama (l.c.).

Annual, densely tufted herb with reddish purplish fibrous roots, culms to 15 cm tall, triquetrous with wing like angles. Leaves 3 to a culm, nearly equalling the culm; blades thinly herbaceous; sheaths to 2 cm long, membranous, pale-greenish and stained with reddish-purple. Anthela simple, capitate with numerous spikelets crowded into globose heads. Involucral bracts 3, patent, the lowest two much longer than the anthela, the lowest to 7 cm long. Spikes subglobose, light yellow-green. Spikelets densely spicately disposed on a short rhachis, oblong. Glumes subloosely disposed, patent, recurved, the body oblong-ovate, folded, to 2 mm long, pale-greenish, the apex subdensely narrowed to a strong, recurved, smooth awn, stamen 1. Style as long as the achene, filiform; stigmas 3. Achenes broadly oblong, trigonous, greyish-green.

Common species usually seen in wet sandy soils, open grass lands. Fl. & Fr.: July - November.

Distribution: Widely distributed in tropical and subtropical regions of the world, extending also into temperate
regions in the Americas, where the range covers from Southern Canada to Argentina and Chili.

Specimens examined: ADILABAD: Bellampalli, PVP & KH 9446; CHITTOOR: Near Komativaricheruvu, G.V. Subba Rao 45360 (MH); KARIMNAGAR: Aklaspur, G.V. Subba Rao 24640 (MH); VISAKHAPATNAM: Near Anantagiri, N.P. Balakrishnan 11011 (MH).

Pycreus Beauv.

Annual, erect, tufted herbs, stems triquetrous, leafy at base. Leaves well developed, flat or canaliculate. Inflorescence 1 to many, corymbose or subumbellate spikes; umbel simple. Involucral bracts leaf like, often overtopping; Glumes distichous, 4 to very many, 2 lowest empty, the next bisexual, the uppermost 1 to 3 sterile. Rnachilla persistent. Stamens 2. Stigmas 2. Achenes dark-brown to black, apiculate, with one edge against the winged rhachilla.

1. Achenes transversely wrinkled:

2. Rhizomatous herb; inflorescence umboel, sometimes reduced to one head .... .. P. diaphanus

2. Non rhizomatous herbs; inflorescence spicate .. P. atramiteus
1. Achenes smooth to puncticulate:
   3. Culms few to several nodose below the middle, the
      lower part decumbent or obliquely ascending, branching
      and rooting at lower nodes, culms clothed to consid-
      erably above the base .......... P. sanguinolentus
   3. Culms not nodose above the base, erect from very
      base; culms with leaves only at the base:
      4. Glumes distinctly cuspidate, apex retuse P. pumilus
      4. Glumes not cuspidate nor retuse
      5. Stems tufted:
         6. Achenes symmetric:
            7. Annuals; rhachilla straight, not at all
               winged; involucral bracts 2-4. P. flavidus
            7. Perennials; rhachilla winged; more or
               less zigzag; involucral bracts 3-5.
               .. P. polystachyos
         6. Achenes asymmetric, concave. P. sulcinux
         5. Stems robust, solitary .......... P. puncticulatus

Pycreus diaphanus (Schrad. ex Roem. & Schult.) Hooper &
diaphanus Schrad. ex Roem. & Schult., Mant. 2:477.
Pycreus latespicatus (Boeck.) Clarke in Hook. f., Fl.
latespicatus (Boeck.) Kern in Steenis, Fl. Males. 1,
Annual, rhizomatous herb, to 30 cm tall, culms slender, stiff, obscurely angled, striate. Leaves shorter than the stem, rigid. Umbel simple, sometimes reduced to one head. Involucral bracts 3, unequal, the longest sometimes reaching 10 cm long. Spikelets straw-coloured, shaded with chestnut brown, oblong-lanceolate, compressed, to 60-flowered. Glumes to 3 mm long, boat-shaped, when opened out broadly ovate, leaving a scar on the rachilla after falling. Stigmas 2, filiform, longer than the style. Achenes obovoid, black, shortly apiculate, slightly compressed.

Occasional in wet places marshy grounds along water streams, banks. Fl. & Fr.: August - January.

Distribution: India, China, Malaysia.


Key to the varieties

1. Culms 8-60 cm tall; leaves setaceous; spikelets spreading
   var. flavidus

1. Culms 15-40 cm tall; leaves stiff; spikelets narrower
   var. nilagiricus

var. flavidus

Annual, densely tufted herb, to 40 cm tall, obtusely trigonous. Leaves few, setaceous, shorter than the culm; blades slenderly linear, plicate; sheaths elongated tinged with reddish-brown. Anthela simple with 4 unequal rays, at times congested in a head like cluster of spikelets; rays slender, the longer ones up to 5 cm long. Spikes bearing ca. 20 spikelets in short rhachis, ovoid, becoming subglobose cluster of spikelets in the upper part. Involucral bracts 3, erect-patent, the lowest one much surpassing the anthela, the longest up to 18 cm long. Spikelets spreading, linear, parallel-sided, strongly flattened, 20 mm long, densely 40-flowered, red brown; rhachilla straight, wingless, tetragonal. Glumes ovate-oblong, folded, 2 mm long, charactaceous, pale brown, shiny, pale on hyaline margins. the greenish keel 3-nerved, prominent. Stamens 2. Stigmas 2. Achenes narrowly obovate, apiculate, lenticular and laterally flattened, 1 mm long, maturing dark brown. (Fig. 44).

This species is found in wet places in forests, near water falls and marshy localities. Fl.& Fr.: July - November.
Fig. 44. *Pycreus flavidus* (Retz.) Koyama var. *flavidus*
A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume,
E. Opened glume, F. Stamens, G. Pistil, H. Achene
(KH & BR 5598)
Distribution: Widely distributed from the Mediterranean region and tropical Africa eastwards to central and southern Asia, and north eastwards to Japan.

Specimens examined: KURNOOL: Kuppagal, KH 10999;
ANANTAPUR: Guntakal, KH 10997; RANGAREDDY: Mohammadabad RF,
KH & MSM 10923; 5573; VIZAYANAGARAM: S. Kota-Punyajiri hill,
KH & BR 5598; NIZAMABAD: Sirnapalli RF, BR & SP3 9577; ADILABAD;
Potchera, GO & DAM 5054; GUNTUR: N.S. Right canal, VRK 3548;
EAST GODAVARI: Donkarayi, S. Sudhakar 4855 (AU); CUDD APAH:
Balapalle, J.L. Ellis 14299 (MH & CAL); KARIMNAGAR: Kodimial,
G.V. Subba Rao 21847 (MH & CAL); MEDAK: Rusthempet, K.M. Sebastine
7997 (MH & CAL); VISAKHAPATNAM: Araku valley, D. Daniel Sundar Raj
21408 (MH).

var. nilagiricus (Hochst. ex Steud.) Karthik. in Kartik. et al.

2:2. 1855. Pycreus capillaris var. nilagiricus (Hochst. ex Steud.) Clarke in J. Linn. Soc. 21:49. 1884; Fischer
1627 (1132). P. globosus var. nilagiricus (Hochst. ex Steud.) Clarke in J. Linn. Soc. 36:204. 1903. Cyperus
flavidus var. nilagiricus (Hochst. ex Steud) Korla. in

Perennial herb, to 40 cm tall. Leaves stiff. Inflorescence once anthelate. Spikes globose to oval. Spikelets linear, about
12 mm long. Achenes 1 x 6 mm, irridescent.

Common throughout in marshy and irrigated places.

Fl. & Fr.: October - January.

Distribution: India, Africa, South East Asia, Australia.


Pycrus polystachyos (Rottb.) Beauv., Fl. de Oware & Benin

2:48, t. 86, f. 2. 1807; FBI 6:592. Cyperus polystachyos
Pycerus odoratus Urban, Symb. Antill 2:164. 1900;
Fischer 1627 (1132).

Key to the varieties

1. Inflorescence capitate, rays short .... var. polystachyos
1. Inflorescence anthelate, rays well developed .. .. .. .. var. laxiflorus

var. polystachyos

Perennial erect, tufted rhizomatous herb, to 50 cm tall; rhizome covered with purple scales; culms trigonous, smooth. Leaves shorter than the culms, flat, linear, gradually acuminate, scabrid on margins in the upper part; sheaths purple brown, 5 cm long. Inflorescence simple, reduced to a single head, 3 cm long.
and wide, rays sometimes present with spikelets spicately arranged. Involucral bracts 8, lower 5 much exceeding the inflorescence, others short; spikelets strongly compressed, yellow to straw-coloured, 20 mm long, linear-lanceolate, rhachilla flexuous, narrowly winged. Glumes distichous, 2 mm long, ovate, acute, sharply keeled, keel 3-nerved, green, sides nerveless, pale. Stamens 2 (in some flowers only 1). Stigmas 2. Achenes oblong, bicovnex, 1.2 mm long, dark brown, sharply apiculate.

This species is found in marshy areas, rice fields, along water streams, river banks etc. Fl. & Fr.: September - December.

**Distribution:** Tropical and subtropical regions. The region is extending in to warm temperate regions in eastern Asia as far as to central Japan and in to the Mediterranean region.

**Specimens examined:** VIZAYANAGARAM: Punyagiri hill - S. Kota, KH & BR 5600; NIZAMABAD: Nizamsagar project, BR & CPR 9245; GUNTUR: Macherla, VRK 5880; SRIKAKULAM: Near Rangamatiagedda, G.V. Subba Rao 62340 (MH & CAL); HYDERABAD: Katasintha, K.M. Sebastian 6012 (MH & CAL); VISAKHAPATNAM: Near Araku, N.P. Bala krishnan 10853 (MH & CAL); KURNOOL: Srisailam, J.L. Ellis 16835 (MH); EAST GODAVARI: Maredumilli, G.V. Subba Rao 27296 (CAL); CHITTOOR: Kailaskona, G.V. Subba Rao 32031 (CAL); KRISHNA: Lingala, P. Venkanna 5413 (AU).
This species is very variable, with respect to the inflorescence, they vary from open umbellate to capitate ones. Kern (1974) mentioned two varieties based on this character, but Koyama (1985) included all in a broad species, without mentioning subspecific taxa.


Inflorescence compound with well developed rays, 7 cm long and wide, branches spicate. Glumes ferrugineous. (Fig. 45).

This is a rare species found in a semi-evergreen forests. Fl. & Fr: November - December.

**Distribution:** Widely distributed in the tropical and subtropical regions of the world.

**Specimens examined:** EAST GODAVARI: Maredumilli RF, KH & BR 9738; NELLORE: Venkatagiri hill, B. Suryanarayana 3990 (VV).

*Cyperus pumilus* (Linn.) Nees in Linnaea, 9:283. 1835; Fischer 1627 (1132). *Cyperus pumilus* Linn., Cent. Pl. 2:6. 1756.

Fig. 45. *Pycreus polystachyos* (Rottb.) Beauv. var. *laxiflorus* (Benth.) Clarke

A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume,
E. Opened glume, F. Pistil with stamens, G. Achene 
(KH & BR 9738).
Annual, densely tufted, herb, to 15 cm tall, culms slender, triquetrous. Leaves few, surpassing the culm, blades narrowly linear, set, flat, light green, sheaths pale. Anthela simple; involucral bracts 4, patent, lower 3 much surpassing the anthela, the longest 15 cm long; primary rays 4, patent, up to 3 cm long, slender; spikes subglobose, densely bearing many spikelets, the short rhachis up to 3 mm long. Spikelets spreading, oblong, 7 mm long, flattened, ca. 30-flowered, light greenish, rhachilla straight, wingless. Glumes patent, close together so that the rhachilla is invisible, ovate, 1.7 mm long, hyaline, pale, the keel green, 3-nerved, projecting beyond the glume apex forming mucro, apex retuse. Stamens 2. Stigmas 2. Achenes elliptic, laterally flattened, lenticular, maturing brownish, contracted to truncate apex.

Occurs along the banks or in the drying beds of canals of soft sticky soil, marshy fields, sandy river sides. Fl. & Fr.: August - November.

Distribution: From India through Indo-China, and Southern China eastwards to Malesia and Australia.

Specimens examined: VISAKHAPATNAM: Visakhapatnam beach, KH 10987; ANANTAPUR: Chintalapalli Road, KH 7475; EAST GODAVARI: Dhavaleswaram barrage, KH & BR 9723; WEST GODAVARI: Kollerukkle, KH & BR 10913; RANGAREDDY: Ranjamagudem beat, MSM & KH 10475; CUDDAPAH: Palakonda hill, CS 7695; GUNTUR: Najarjunakonda, VRK 6715; SRIKAKULAM: Salur, N.P. Balakrishnan, 947 (CAL); KARIMNAGAR:
Aklaspar, G.V. Subba Rao 25541 (MH & CAL); CHITTOOR: Near Komativaricheruvu, G.V. Subba Rao 46833 (MH & CAL).


Kunth, Enum. Pl. 2:115. 1837.

Annual herb with brownish fibrous roots; culms robust, solitary, to 50 cm tall, triquetrous, often some what enlarged at base. Leaves 3-5 to a culm, slightly overtopping the culm; leaf blades to 40 cm long, to 3 mm wide, subcoriaceous, glaucous green; sheaths to 20 cm long, broader than blade, pale brown. Anthela compound, lax, large, to 24 cm long and as broad.

Involucral bracts 5, spreading, longer than the anthela, the lowest to 30 cm long; rays 10, unequal, patent, slender, the longer ones to 14 cm long. Spikes lax, to 6 cm long, distantly bearing 20 spikelets; rhachis sharply angled. Spikelets spreading, linear oblong, to 20 mm long, compressed, to 30-flowered, pale sanguineous. Glumes imbricate, ovate-orbicul with 3 mm long, folded slenderly, 3-nerved green keel, sides purplish stramineous, the margins broadly, whitish-hyaline, the apex rounded and shallowly erose. Stamens 2. Style 2-cleft. Achenes obovate, orbicular, laterally strongly flattened, rounded-emarginate at apex, stipitate at deltoid-contracted base, maturing orange-brown, densely puncticulate.
This species is usually found in the rice fields, swamps, and marshy areas, tank margins (Fischer). Fl. & Fr.: August - December.

**Distribution:** Very common in Southern China, Malay Peninsula and Cochin China.


Perennial, rhizomatous herb, to 40 cm tall; culms tufted, trigonous, clothed above the base, the lower part decumbent, 3 nodose, rooting and branching at nodes, the upper part erect. Leaves borne on the lower part of the culms, shorter than the culms; blades linear, plicate; sheaths loosely surrounding the culm, longer than the inter-node, pale green. Anthelia simple with 3 short rays, 3 cm long; spikes ovoidal, densely bearing ca. 15 spikelets on short rhachis; involucral bracts 5, spreading, the lower 3 much surpassing the corymb, the longest to 12 cm long, spikelets narrowly ovate, 10 mm long, flattened, 16-flowered, sanguineous brown; rhachilla tetragonous, straight, not winged. Glumes ovate, 2.5 mm long, folded, membranous, the sides nerveless, pale brown, furrowed, the keel 3-nerved, broadly straw-green. Stamens 3. Style up to 3 times as long as the achene; stigmas 2. Achenes broadly obovate, laterally lenticular, 1.2 mm long, maturing black. (Fig. 46).
Fig. 46. *Pycreus sanguinolentus* (Vahl) Nees
A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume,
E. Opened glume, F. Pistil with stamens, G. Achene
(KH & MSM 10926).
Usually found in marshy localities, rice fields, swamps and along water courses. Fl. & Fr.: July - December.

**Distribution:** South India, Malay Peninsula, Afghanistan, Japan, Indo-China.

**Specimens examined:** RANGAREDDY: Mohammadabad RF, KH & MSM 10925, 10926; EAST GODAVARI: Maredumilli RF, KH & BR 10903; VISAKHAPATNAM: Tyada Forest, KH & BR 9718; Araku valley, N.P. Balakrishnan (MH & CAL).


Annual, slender, tufted herb, to 30 cm tall; culms obtusely trigonous. Leaves 3 to a culm; blades nearly equalling the culm, slenderly linear, canaliculate, subrigid, gradually tapering to a long acuminate apex; sheaths to 4 cm long, stained reddish-purplish. Inflorescence congested in a single, spike-like cluster of ca 15 spikelets, to 40 cm long. Involution bracts 2, leaflike, both erect-patent, surpassing the inflorescence, the lower up to 10 cm long. Spikelets erect-patent, lance-oblance, to 30 mm long, acute, flattened, straw yellowish, rhachilla straight, wingless. Glumes patent, ovate, longer than
broad, 2 mm long, acute, mucronate, the nerveless sides straw-coloured to golden yellow, membranous, widely subtranslucent, whitish hyaline on margins, the keel greenish, 3-nerved.
Stamens 2. Stigmas 2, as long as the style. Achenes orbicular obovate, 1 mm long, laterally flattened, biconvex, maturing purplish-brown, finely transversely undulate with 15 discontinuous weak slender wrinkles.

This species is usually found in marshy localities, rice fields and grass fields. Fl. & Fr.: August - December.

**Distribution:** India, Ceylon, Indo-China and Malay Peninsula.

**Specimens examined:** VISAKHAPATNAM: Araku valley, N.P. Balakrishnan 10763 (CAL).


Perennial, slender, tufted herb. Spikelets longer, up to 40-fid. Glumes more remote. Achenes unsymmetric, its faces much compressed usually concave, narrow edge of achenes much flattened against the rhacheola.

This species is not common. Though rare this species is seen in marshy localities. Fl. & Fr.: October - January.

**Distribution:** India, Africa, Tropical Malaya.

Remirea Aublet

Benth., Fl. Austr. 7:347. 1878. Mariscus pedunculatus
Neerl. 7:793. 1958 & in Steenis, Fl. Males. 1, 7:644
1974.

Perennial, rhizomatous herb to 10 cm tall; rhizome
horizontally long creeping, branched, rooting at nodes, clotted
with membranous acute, brownish sheaths, the internodes to 5 cm
long; culms tufted from the branched head of the rhizome, rigid,
trigone. Leaves crowded, rigid, canaliculate, scabrid on the
margins in the upper part, very gradually narrowed into the
triquetrous pungent tip. Inflorescence head like, consisting of
digitately arranged sessile short spikes. Involutecral bracts
3-5, patent, the longest up to 8 cm long, much overtopping the
inflorescence. Spikes ovoid, to 12 mm long. Spikelets sessile,
densely crowded, ovoid, acute, slightly compressed, 1-flowered,
falling off as a whole; rhachilla disarticulating above the
basal 2 glumes; uppermost internode strongly flattened finally
thickened, corky, to 3 mm long. Glumes broadly ovate, many-nerved,
Fig. 47 Remirea maritima Aublet

A. Habit, B. Spikelet, C. Achene enclosed by upper glumes, D & E. Glumes, F. Pistil, G. Achene (KH 10953)
3 lower ones empty, to 3 mm long, the uppermost vestigial. Stamens 3; anthers yellow. Stigmas 3. Achenes trigonous, oblong, slightly compressed, shining, tightly enclosed in the upper node of the rhachilla. (Fig. 47).

Along wet, sandy edges of rivers and ponds. Fl.&. Fr.: August - December.

Distribution: Southern Asia, Malesia and northern Australia, also in tropical America from eastern Venezuela through the Guianas South to Brazilian Parana.

Specimens examined: KURNOOL: Thungabhadra River, Kd 10953.

Note: This is a rare taxon. This species was not reported earlier from Andhra Pradesh by any earlier taxonomists. It was reported from South Kanara and Malabar districts by C.E.C. Fischer. It is addition to the sedge flora of the state by author from Kurnool district.

Rhynchospora Vahl nom. cons.

Rhizomatous perennials. Stems tufted, triquetrous. Leaves basal and cauline, distant, panicles terminal and axillary, corymbiform and distantly superposed. Involucral bracts foliar. Spikelets clustered, terete, 2-7-flowered. Glumes lower 2-5 empty, short, upper or mid one bisexual, uppermost male, 2-ranked keel prominent. Hypogynous bristles 6,
antrorsely scabrid. Stamens 1-3, style 2-fid; style base conical, compressed, as broad as or longer than the achene. Achenes obovoid, 2-sided, plicate, irregularly wrinkled, stipitate.

A genus of about 225-250 species world wide distribution, with a great concentration of species in tropical and subtropical regions of the South America and is absent in arctic regions. Most of the species prefer wet localities especially in moist grass lands river banks, rice fields, swamps and have no economic significance. *R. wightiana* has its habit in grass lands, in plains and forests in the periodically dry regions. Several species are detrimental weeds, in rice fields.

Most of the species of *Rhynchospora* are slender leafy annuals with setaceous leaves and a more or less corymbose or subumbelliform inflorescence of brown spikelets. The perennial species are more varied with corymbose inflorescence or with one or more dense spherical heads of white or brown spikelets. The spikelets are composed of numerous glumes of which lowest 3 are empty, the succeeding 1-4 female and the uppermost male or empty. Perianth bristles are usually conspicuous or absent. The style is bifid either at the tip only or with the branches longer than the style; the style base is swollen and persistent on the biconvex obovoid or narrowly oblong, smooth or transversely wrinkled nutlet (Napper, 1964).
1. Stem leafy throughout; inflorescence paniculate consisting of a solitary or more corymbiform anthelas:
   2. Style deeply bifid .. .. .. .. \textit{R. gracilima}
   2. Style sub entire or shallowly bifid .. \textit{R. corymbosa}

1. Stem leafy only at the base; inflorescence capitate consisting of a solitary terminal subglobose head:
   3. Bristles all scabrid in the upper part only, the three inner ones plumose at the base .. .. \textit{R. longisetis}
   3. Bristles all scabrid throughout, none plumose .. .. .. .. \textit{R. wightiana}


Perennial, rhizomatous herb, to 120 cm tall; culms solitary, arising from short but rather thick rhizome, to 9 mm thick, several nodose, leaves up to the top, scaberulous on upper angles. Leaves many, aggregated at base of culm and several upper on the culm; blades broadly linear, to 60 cm long, to 20 mm wide, gradually long acuminate at apex, cauline sheaths shorter than the internode, bearing hyaline, contraligule at orifice; basal sheaths straw-brown. Inflorescence ample, to 35 cm long, bearing 4 anthelas rather distantly borne on upper part of the culm; anthelas corymbiform,
to 14 cm long, diffuse, many branched and bearing numerous spikelets. Involucral bracts leafy, to 25 cm long; primary rays to 12 cm long; secondary rays to 3 cm long. Spikelets lanceolate, acute, to 9 mm long, rusty or chestnut brown, 3-flowered, the lowest bearing fruit; glumes 7, obtusely 2-ranked, the lower ones ovate, the upper ones oblong-ovate, to 6 cm long, light brown. Hypogynous bristles of fruit bearing flower 6, unequal, to 5 mm long, brown, upwardly scabrid; those of staminate flowers 3. Style base elongated. Conical, to 5 mm long, the base as wide as the achene body, furrowed in median portion; style elongated, shallowly bifid at apex. Achenes obdeltoid-obovate, compressed, to 4 mm long, yellow brown, finely transversely wrinkled in median portion, coarsely undulate-rugose towards margins, truncate at apex.

Occasional in moist hilly areas, along streams in open swamps and margins of rice fields (Fischer). Pl. & Fr.: August - January.

**Distribution:** Pantropic


Annual, densely tufted herb, with yellow brown fibrous roots to 50 cm tall; culms trigonous, leaves at and above the base. Leaves 4 to a culm, setaceous; sheaths to 3 cm long, light green. Inflorescence to 20 cm long, bearing 3 very
lax anthelas distantly; terminal anthela larger than the lateral ones, to 3 cm long, bearing 4 capillary rays, to 4 cm long, rays terminated by 2 spikelets; lateral anthelas simple. Involucral bracts setaceous, to 3 cm long, the sheathing base to 15 mm long. Spikelets solitary, peduncled, lanceolate, acuminate, acute, to 7 mm long, 4-flowered, 2-fruited, brown; glumes 7, spirally disposed, ovate, lightly ferugeneous, lineolate with pruplish brown. Stamens 2. Style base depressed conical, the broad bilobed base as wide as the achene; style 2-cleft. Hypogynous bristles none. Achene obovate-orbicular, rounded to short stipitate at base, truncate at apex, light grey, undulate rugose with 8 ridges.

Occasional in the openings of secondary forests and wet grass lands. Fl. & Fr.: August - December.

**Distribution:** From India and Ceylon through Thailand and South Eastern China eastwards to Malesia and Australia.

**Specimens examined:** VISAKHAPATNAM: Araku valley, N.P. Balakrishnan 10773 (MH & CAL).


Annual, slender, tufted herb, to 30 cm tall; culms trigonous, smooth. Leaves flat or canaliculate, to 20 cm long, scaberulous at the tip. Inflorescence a terminal subglobose head. Involucral bracts 6, spreading, dilated and densely
ciliate at the base, lowest up to 3 cm long; spikelets many, linear-lanceolate, acuminate, to 12 mm long, fulvous-ferrugineous, 2-flowered, lower female, upper male, glumes 6, subdistichous, acute, keeled, achenes bearing glume to 10 mm long. Hypogynous bristles 6, all antrorsely scabrid on upper part only, 3 of these slightly to densely plumose at the base, exceeding the achene beak, the longest to 9 mm long, one much shorter. Stamens 2, anthers linear. Style to 5 mm long, shallowly bifid. Achenes sessile, oblong, compressed, bristly on the shoulders, to 3 mm long, brown; beak oblong-conical, to 2 mm long with a median groove on each side.

Though rare this species is seen in moist grounds in forests, in hilly areas, in wet grass lands. Fl. & Fr.: September - December.

**Distribution:** North Australia

**Specimens examined:** HYDERABAD: M.R. Saxena 255 (DD).

*Rhynchospora wightiana* (Nees) Steud. *Cyper*. 148. 1855; *F3I*

6:669; Fischer 1672 (11:0). *Haplostylis wightiana*


2:143. 1855.

*Perennial, erect, caespitose herb, to 35 cm tall; culms slender, trigonous, glabrous. Leaves many, at the base of the*
stem only, to 14 cm long, linear, acuminate, grass like.
Spikelets numerous in reddish-brown heads. Involucral bracts 6, unequal, the longest to 7 cm long, linear-lanceolate, acuminate, dilated and ciliate at the base. Spikelets to 1.5 cm long, lanceolate, acute, reddish-brown, smooth and shining. Glumes 6-7, elliptic-lanceolate, acute, to 6 mm long, the 3 or 4 lowest empty, the next bisexual and larger than the lowest ones, the next male or rudimentary. Hypogynous bristles 6, unequal, slender, all scabrous with numerous minute teeth, non plumose, brown. Stamens 2. Style base dilated, brown, stigmas 2.
Achene compressed, oblong, dark brown.

This species is occasionally found in rice fields, grass lands and in moist grounds in forests. Fl. & Fr.: September - January.

**Distribution**: S. India, Ceylon, Malesia.

**Specimens examined**: RAJAREDDY: Monamadabad RF, MSM & KH 10480; ADILABAD: Chennur, GO 4500; GUNTUR: Jayanthipuram, VRK 6941; NIZAMABAD: Annaram RF, BR & CPR 7177; KHAMMA M: Vazeedu, V. S. Raju 1005 (MH).

**Rikliella J. Raynal**

**Rikliella squarrosa** (Linn.) Raynal in Adansonia (Ser.2)

181. 1771; FBI 6:663; Fischer 1656 (1156).
Isolepis squarrosa (Linn.) Roem. & Schult. in Syst. Veg. 2:111. 1817.

Annual, slender, glabrous, tufted herb, to 25 cm long; culms filiform, terete, strigose, whitish green. Leaves shorter than the stem, filiform, acuminate, 2 or 3 to a stem; sheaths pinkish-grey, short, tightly surrounding stem base. Inflorescence pseudolateral head with 1-3 spikes, deeply red brown. Involucral bracts 2, lower bract leaflike, erect, much surpassing the inflorescence, to 2.5 cm long, upper bract setaceous, slightly longer than the spikes. Spikes sessile, ovate-elliptic, squarrose, 6 mm long, deeply red brown with pale green awns, densely many-flowered. Glumes spirally imbricated, tight, patent, squarrose, to 6 mm long, obovate, cuneate, truncate, awned at apex, herbaceous; keel pale green, projecting beyond the glume apex into a recurved awn, hypogynous bristles 0. Stamen 1. Stigmas 3, patent. Achenes obovoid, trigonous, yellow, obtuse at apex.

Occasional in wet sandy soil at the margin of ponds, ditches and paddy fields. Fl. & Fr.: August - December.

Distribution: Southern Asia, from India and Ceylon through Malaya and Thailand to Indo-China.

Specimens examined: ANANTAPUR: Aakuthotapally, KH 7467; VISAKHAPATNAM: Tyada forest, KH & BR 9716; RANGAREDDY: Dharmapuram, KH & MSM 10932; ADILABAD: Vempalli, GO 4440; CUDDAPAH:
Guvvalacheruvu, R.V. Reddy 7972; KRISHNA: Manginapudi, P. Venkanna 5137 (MH); KARIMNAGAR: Aklaspur, G.V. Subba Rao 22493 (MH & CAL); MEDAK: way to Pegarikutta, Narsapur, K.M. Sebastine 6616 (MH & CAL); NELLORE: Kollurupad, C.E.C. Fischer 4227 (CAL); SRIKAKULAM: Salur, N.P. Balakrishnan 952 (CAL); CHITTOOR: top of Gyanaiah gundlu, G.V. Subba Rao 46820 (MH); EAST GODAVARI: Valamuru; S. Sudhakar 333 (AU); VIZAYANAGARAM: Elwinpet, M. Venkaiah 2790 (AU).

*Schoenoplectus* (Reich.) Palla

Rhizomatous perennials, sometimes stoloniferous, culms 3-sided or terete, naked, occasionally 1 or 2-nodose above the base, solid. Leaves reduced to bladeless sheaths surrounding culm-bases. Inflorescence congested in heads, bearing few to many spikelets, quasilateral. Involucral bracts several, often one and culm like with dilated base. Spikelets ovoidal, bearing many glumes on continuous rhachilla, glumes spirally imbricated. Hypogynous bristles up to 5, needle like, spinulose-scabrous. Stamens 1-3, Pistils with style continued down to ovary without joint, 2 or 3-fid. Achenes trigonous, often transversely wrinkled, maturing brown or black.

A genus of about 130 species distributed all over the world. Only a few species are economically important. The stems of *S. grossus* and *S. mucronatus* are used for making mats.
and bags. The roots of *S. grossus* are slightly sweet, cooling, laxative. *S. articulatus* is used as a purgative.

1. Spikelets clustered on lateral or terminal heads:

2. Hypogynous bristles present, retrorsely scabrid:

3. Culms slender, terete; style 2-fid; achenes with transverse wavy lines .. .. .. *S. juncoides*

3. Culms robust, sharply triquetrous; style 3-fid; achenes vertically lineolate with dark coloured patches .. .. .. .. *S. mucronatus*

2. Hypogynous bristles absent:

4. Culms flowering in the lower half, septate when dry; glumes not mucronate:

5. Culms robust; sheaths lax; achenes with transverse wavy lines .. .. .. .. *S. articulatus*

5. Culms slender; sheaths close; achenes with transverse undulate ridges .. .. .. .. *S. senegalensis*

4. Culms flowering in the upper half, not septate (except *S. roylei*); glumes mucronate:

6. Glumes multistriate, lax, inflated in fruit; stem septate when dry .. .. *S. roylei*

6. Glumes not striate, imbricating; not inflated in fruit; stem not septate when dry:

7. Culms trigonous; glumes ovate; achenes broadly elliptic .. .. *S. supinus*

7. Culms terete; glumes elliptical; achenes broadly obovate .. .. *S. lateriflorus*
1. Spikelets many, stalked, umbellate
   (single head in *S. maritimus*):

8. Inflorescence at a lateral umbel; hypogynous bristles absent .. .. .. .. *S. corymbosus*

8. Inflorescence a terminal umbel; hypogynous bristles present:

9. Hypogynous bristles retrosely scabrid:

10. Rhizomatous creeping herb with tubers, glumes bifid at apex, keel produced in to awn;
    style 2-fid .. .. .. *S. maritimus*

10. Stoloniferous herb; glumes apex entire, not awned,
    style 3-fid .. .. .. *S. grossus*

9. Hypogynous bristles plumosely fringed with antrorse hairs .. .. .. .. .. *S. littoralis*


Perennial, short living, robust herb, to 40 cm tall; culms terete; 0.8 cm wide below, transversely septate at intervals of 1 cm, hollow, smooth, glabrous, deeply green and
slightly shiny when alive, clothed at base with 3 bladeless stramineous-brown lax sheaths; upper 2 basal sheaths cylindrical, to 12 cm long, herbaceous, pale green and later becoming yellow brownish, finely many-nerved, lower 1 sheath reduced and scale like. Inflorescence a pseudolateral head, globose or spherical, 4 cm in diameter, located at the midway portion of the (culm) stem or much lower down near the apex of uppermost sheath (depending upon the depth of the water at the locality as the inflorescence appear immediately above the water surface) densely bearing several to over 40 spikelets, lightly green. Involucral bract 1, stem like, to 40 cm long, terete, septate. Spikelets cylindrical or oblong, to 14 x 4 mm, pink-fulvous, acuminate. Glumes tightly spirally imbricated, suberect, ovate, to 5 mm long, acute at mucronate apex, membranous, many-nerved, pale greenish and frequently tinged with red-brown on back. Hypogynous bristles none. Stamens 3. Stigmas 3. Achenes obovoid, triquetrous, with transverse wavy lines and apiculate. (Figs. 48 & 15 b).

Common species usually found in marshy places, shallow waters and also along the margins of ponds. Fl. & Fr.: August - December.

Distribution: India, Indo-China, Malesia, and Tropical Australia.

Specimens examined: ANANTAPUR: Ganganukunta, KH 7481; RANGAREDDY: Kothapalli beat, KH & MSM 10915;
Fig. 48. Schoenoplectus articulatus (Linn.) Palla
A. Habit, B. Spikelet, C. Closed glume, D. Opened glume,
E. Pistil with stamens, F. Achene (KH & MSM 10916).
Mohammadabad RF, KH & MSM 10916; WEST GODAVARI: Kolleru lake, KH & BR 10911; CUDDAPAH: Guvvalacheruvu R.V. Reddy 8137; NIZAMABAD: Indalwai, TP & BR 6405; CHITTOOR: Satyaveedu, M.C. Barber 45224 (MH); KARIMNAGAR: Réchapalli, G.V. Subba Rao 22265 (MH & CAL); KRISHNA: Kolletixota, P. Venkanna 5816 (MH); NELLORE: Gudur, K.C. Jacob 18515 (MH); EAST GODAVARI: Tirumalayapalem, S. Sudhakar 1754 (AU); VIZAYANAGARAM: Vijayanajaram, M. Venkaiah 3927 (AU).

Schoenoplectus corymbosus (Roth ex Roem. & Schult) J. Raynal in J.B. Lebrum et al., Cat. Niger Pl. 343. 1976.


Perennial, rhizomatous, robust herb, to 90 cm tall; culms terete, finely striate; sheaths few, near the base. Leaves absent. Inflorescence lateral umbel from near the top of the stem, which is bract-like above it into an acute stiff point. Spikelets ovate-oblong, reddish-brown, in pedunculate clusters. Involucral bract to 3 cm long, erect, rigid. Glumes oblong, acute with a narrow minutely excurrent midrib, pale brown with darker streaks, strongly keeled;
hypogynous bristles absent. Stamens 3; anthers linear, obtuse, yellow. Style reddish, stigmas 3, as long as the style. Achenes obovoid, trigons with a pyramidal apex, to 2 mm long, yellowish brown, shining, punctate.

Occasional in standing waters of marshy areas. Fl.& Fr.: September - December.

Distribution: India, Africa, Madagascar.

Specimens examined: MEDAK: Rusthempet, K.M. Sebastine 6799 (MH).


Perennial, stoloniferous herb; stolons producing tubers. Culms to 200 cm tall, sharply 3-angled, spongy, faces concave, septate-nodose, with a corm like hard enlargement at base. Leaves, equaling the culm, 1-ribbed, flatish-pletate, septate-nodose, sheaths spongy, prominently septate-nodose, tightly surrounding the culm base. Inflorescence a large terminal corymb with primary, secondary and tertiary rays; rather dense, to 12 cm long. Involute bracts 4, foliaceous, exceeding the inflorescence, the longest to 40 cm long. Spikelets solitary, ellipsoid, to 10 mm long, densely many-flowered, light brownish-rust-coloured. Glumes elliptical, brownish-rust-coloured, boat-

A rare species found in marshy fields. Fl. & Fr.: August - December.

Distribution: India, Indo-China, Malesia and the Boin Islands.


Annual, erect, caespitose herb without conspicuous rhizome, to 30 cm tall; culms slender, terete, obtusely several-angled, light green, clothed at base with few sheaths only. Sheaths 3, the lower ones scale like, brownish, the upper one to 5 cm long, pale green, obliquely truncate. Inflorescence a pseudolateral
head with 3-5 spikelets. Involucral bracts to 13 cm long, rather suddenly subacute at apex, dilated at base. Spikelets oblong to ovoid-oblong, terete, 3 x 3 mm, straw-coloured, acute, densely many-flowered. Glumes oval to ovate-oval, 1 x 2.5 mm, thickly membranous, pale and brown tinged, concave, mucronate, keel green. Hypogynous bristles 6, retroresely scabrid except for base, to 2 mm long. Stamens 3. Stigmas 3. Achenes broadly obovoid, unequally biconvex, 2 mm long, compressed, faintly transversely undulate, apiculate. (Fig. 49).

Common in the margins of rice fields, river banks, swampy and marshy localities. Fl. & Fr.: September - December.

**Distribution:** From Japan south to Malesia, South east to India also to Hawai and Fiji.

**Specimens examined:** ANANTAPUR: Chintalapalli Road, KH 7469; RANGAREDDY: Mohommadabad RF, KH & MSM 10917; VISAKHAPATNAM: Forest near Anantagiri, N.P. Balakrishnan 11006 (MH & CAL); KARIMNAGAR: Kodimial, G.V. Subba Rao 21959 (CAL), 20137 (MH); KHAMMAM: Vazeedu, V.S. Raju 1005 (MH).

**Note:** Clarke misapplied the name *Scirpus erectus* Poir. to a quite different species occuring in Madagascar, S.E. Asia and Tropical Australia and he was followed by several authors. The correct name of this species is *S. juncoides* Roxb. and the name *S. erectus* Poir.
Fig. 49. *Schoenoplectus juncoides* (Roxb.) Palla
A. Habit, B. Spikelet, C. Rhachilla, D & E. Glumes,
F. Pistil with stamens and hypogynous bristles, G. Achene
(KH & MSM 10917).
does not belong to its synonym. *S. erectus* is related to *S. supinus* Linn. than to *S. juncoides* Roxb. It differs from *S. supinus* by the larger spikelets, large, more distinctly mucronate glumes, the bristly appendage of the connective, the bifid style, and the larger, convex, faintly wavy ridged elliptic or suborbicular achenes.


Annual, tufted herb, to 30 cm tall; culms terete; sheaths often enclosing a long-stigmased ovary or enlarged achenes at base. One leaf blade often developed. Involucral bract to 10 cm long, slender, canaliculate, obtuse. Spikelets 4-5, sessile, ovate-oblong, pale-brown, acute with glumes in 5 ranks. Glumes elliptic papery, strongly keeled above, apiculate, tinged
dark-red brown. Hypogynous bristles lacking. Achenes broadly obovate, unequally triquetrous, to 2 mm long, sharply transversely ridged, black.

Common on plains, in rice fields, and other wet areas.
Fl. & Fr.: September - January.

Distribution: Paleotropics.

Reported from Warangal (Satyanarayana Reddy 1985) and Medak districts (Narasimha Rao, 1985).


Perennial, rhizomatous, stoloniferous herb, the stolon terminated by a tuber. Culms to 70 cm tall, terete, but obtusely triangular below inflorescence, clothed at base with blade-less sheaths, basal sheaths membranous, cylindrical, to 15 cm long, greyish-brown, mouth oblique with hyaline margin. Inflorescence a pseudolateral simple, umbel-like corymb with 4 unequal ascending rays, to 3 cm long, terminated by a cluster of spikelets. Involucral bract 1, foliaceous, as long as corymb. Spikelets oblong-obovate, to 8 mm long, many-flowered, rust-coloured. Glumes oblong-ovate, to 4 mm
Fig. 50. *Schoenoplectus littoralis* (Schrad.) Palla
long, boat-shaped, thin membranous, rust-coloured and sanguineous tinged near the margin. Hypogynous bristles 4, plumosely fimbriate with many ciliae on the upper part. Anthers 3. Stigmas 2. Achenes broadly obovate, biconvex, 2 mm long, faces a little shining, chestnut brown at maturity. (Fig. 50).

This is not a common species, very rarely seen in shallow brackish waters near the coast, swampy areas etc.
Fl.& Fr.: September - March.

**Distribution:** India, Malesia and Micronesia.

**Specimens examined:** KURNOOL: Tungabhadra River, KH 10943; ADILABAD: Sone, TP & PVP 404d; ANANTAPUR: Gangalakunta, KH 7479; Peravali, TP & NY 506; NIZAMABAD: Sreeramsagar, BR & GO 9226; CUDDAPAH: Balasamudram, J.S. Gamble 20371 (DD); Near the river Bhuganka, K. Subramanyam 6449 (CAL).

**Schoenoplectus maritimus** (Linn.) Lyne in Blyttia 29:145. 1971.

**Scirpus maritimus** Linn., Sp. Pl. 75. 1753; F&I 6:653;
Fischer 1656 (1156). **Bolboschoenus maritimus** (Linn.)

Perennial, erect, rhizomatous creeping herb with tubers, to 75 cm tall; culms triquetrous. Leaves flat, linear, to 30 cm long, acuminate, ligulate, sheaths long. Inflorescence terminal
Fig. 51. *Schoenoplectus maritimus* (Linn.) Lye

A. Habit, B. Spikelet, C. Rhachilla, D. Close\(^4\) glume, E. Opened glume, F. Pistil with stamens, G. Achene

\(^{(KH \& MSM \leq 57\%)}\)
umbel, rayed, unequal. Involucral bracts 3-5, leaflike. Spikelets ovoid to cylindrical, acute. Glumes thin, oblong, hispidulous, keeled, bristled at base, bifid at apex, awned, 8 mm long. Stamens 3; filament 0.5 mm long; anther 4 mm long. Stigmas 3, to 7 mm long; style 4 mm long. Hypogynous bristles 1.5 mm long. Achenes obovate, trigonous, smooth, to 4 mm long. (Fig. 51).


Distribution: India, Indo-China, Malesia.

Specimens examined: KURNOOL: Thungabhadra - Kurnool town, KH 10947; ANANTAPUR: Chintalapally Road, KH 7474; RANGAREDDY: Gadireyal beat, KH & MSM 5575; Shinlapally, KH & MSM 10935; ADILABAD: Penganga River, GO & PVP 4290; NIZAMABAD: Narsulladad, TP & BR 6181; KARIMNAGAR: Aklapur, G.V. Subba Rao 22531 (MH & CAL); KRISHNA: Mylavaram, C.A. Barber 8164 (MH); MEDAK: Rusthempet K.M. Sebastine 8009 (MH & CAL); CUDDAPAH: Rayachoty, K. Subramanyam 7812 (MH); WEST GODAVARI: Kollerulake, K. Subramanyam 5084 (CAL); GUNTUR: Nagarjunakonda valley, K. Thotnari 9817 (CAL).


Perennial, rhizomatous herb to 120 cm tall; culms
robust, sharply 3-angled, sides deeply green, striate when dry, surrounded at base with 2 to 3 sheaths tightly, the lowest sheath scale like, brown to chestnut-brown, the upper 3-angled, to 15 cm long, pale tawny, stramineous-brownish, often septate-nodose below, mouth obliquely truncate, brown scarious. Inflorescence of hemispherical pseudolateral head with 10 spikelets. Involucral bract 1, culm like, sharply 3-angled, to 5 cm long. Spikelets sessile, stramineous-brown, ovate, to 13 mm long, densely many-flowered, terete. Scales oval, boat-shaped, to 4 mm long, minutely ciliate along the upper margin. Hypogynous bristles 5, hard, almost as long as the achene, brownish, retrorsely scabrous with short spinules except at base. Stamens 3, connective subulate, cuspidate. Stigmas 3, minutely papulose, rust-coloured. Achenes broadly obovate, obcompressed-triangular, 2 mm long, glossy, transversely wrinkled with dark colourd patches.

A rare species usually collected from forest areas, shallow waters, marshy places. **F. & Fr.**: September - December.

**Distribution**: Eurasia, lowlands in temperate regions and montane regions in tropics.

**Specimens examined**: VISAKHAPATNAM: Araku, D. Daniel Sundar Raj s.n. (MH); HYDERABAD: Hussain sagar Dam, K.M. Sebastine 8036 (MH & CAL).
Schoenoplectus roylei (Nees) ov czinn. & Czukav., Fl.


Annual, erect, slender, tufted herb, to 30 cm tall; culms terete, slender, slightly compressed, conspicuously transversely septate. Leaves absent. Spikelets in a single lateral cluster near the top of the stem, pale-brown, shining; Glumes membranous, multistriate, concave, acutely mucronate, loosely imbricate in fruit, keeled. Stamens 3. Stigmas 3. Achenes triquetrous, obovoid, faintly transversely wavy, black.

Occasional in drying paddy fields, on muddy or wet soil and in marshes near canals and streams. Fl. & Fr.: August - November.

**distribution:** India, Turkestan, Cabul.

**Specimens examined:** HYDERABAD: Osmania University Campus, T. Raja Gopal 932 (HH).

Fig. 52. *Schoenoplectus senegalensis* (Hochst. ex Steud.) Palla
A. Habit, B. Spikelet, C. Rhachilla, D. Closed glume,
E. Opened glume, F. Pistil with stamens, G. Achene (KH 7470)
Perennial, erect, caespitose, herb to 30 cm tall; culms slender, subterete, transversely septate. Sheaths close, obliquely truncate. Inflorescence pseudolateral, capitate. Involu­cral bracts greater than 20 cm long, stem like. Spikelets ca. 20 in a cluster, ovoid-subglobose, 8 mm long, fulvous. Glumes broadly ovate, to 5 mm long, concave, sides many-nerved, mucro short, keeled. Hypogynous bristles 0. Stamens 3. Style gla­brous; stigmas 3. Achenes obovoid, triquetrous, to 2 mm long, undulate, sharply angled, apiculate. (Fig. 52).

Occasional in marshy places. Fl. & Fr.: August – December.

Distribution: India, Indo-China, Malesia.

Specimens examined: ANANTAPUR: Chintalapally Road, KH 7470; RANGA REDDY: Mohammedabad RF, KH & MSM 1031d; NIZAMABAD: Navabpet, BR & SPB 9595; WEST GODAVARI: Gobanapalem, K. Suoramanyam 5163 (MH & CAL); CUDDAPAH: Near Komativaricheruvu, G.V. Subba Rao 46826 (CAL).

Annual, tufted herb to 30 cm tall; culms trigonous, greenish, clothed at base with 2 sheaths only. Sheaths 5 cm long, membranous, pale green, the orifice obliquely truncate with a 2 mm long mucro, frequently the upper most sheath born 3 cm above the base of the culm. Inflorescence pseudolateral, head like. Involucral bract 1, to 10 cm long, ventrally sulcate. Spikelets to ca·15 to an inflorescence, wholly congested, ovate-oblong, to 6 mm long, pale green and becoming lightly straw-coloured, subdensely many-flowered. Glumes ovate, to 3 mm long, boat-shaped with a prominent green faintly many-nerved keel, both sides membranous, pale with sanguineous spots. Stamens 3. Style 3-cleft at apex. Achenes broadly elliptic 1.8 mm long, truly triangular, suddenly contracted at both ends, mucronate at apex, the sides transversely wrinkled, maturing black. (Fig. 53).

Common species usually found in wet grassy places, margins of ponds, rice fields. Fl. & Fr.: August - December.

Distribution: India through Indo-China eastwards to Malesia and tropical Australia also in Southern continental China and Formosa.
Fig. 53. *Schoenoplectus supinus* (Linn.) Palla

A. Habit, B. Spikelet, C. Rhachilla. D. Closed glume,
E. Opened glume, F. Pistil with stamens G. Achene

(KH & MSM 10919)
**Specimens examined:** ANANTAPUR: Chintalapally Road, KH 7471; RANGAREDDY: Mohammadabad RF, KH & MSM 10919; ADILABAD: Kadam dam, TP & PVP 4143; NIZAMABAD: Sinapalli RF, BR & SPB 9576; CHITTOOR: Near Komativaricheruvu, G.V. Subba Rao 46329 (MH & CAL); CUDDAPAH: Balapalle, J.L. Ellis 15757 (MH & CAL); WEST GODAVARI: Gobanapalem, K. Subramanyam 5161 (MH & CAL); MEDAK: Rusthempet, K.M. Sebastine 6735 (MH & CAL); NELLORE: Gudur, K.C. Jacob 18514 (MH); WARANGAL: Pakhal, A.N. Henry 15962 (MH).

*Scirpus Linn.*


Perennial, erect, creeping rhizomatous herb with woody tubers; culms to 90 cm tall, stout, trigonous. Leaves often as long as the stem, coriaceous, numerous. Inflorescence umbellate, terminal. Involucral bracts leaf like, finely pointed; spikelets ovate-oblong, 3-8 or solitary on each ray, reddish brown. Glumes strongly keeled, membranous, bifid at the apex, keel excurrent in between the lobes of apex into a long mucro. Hypogynous bristles 6, unequal, scabrid. Stamens 3. Stigmas 3. Achenes obovoid, plano-convex, smooth, polished, brown.
Common in marshes, in beds of drying ponds and canals.

Fl. & Fr.: March - October.

**Distribution:** Old World countries.


**Note:** This sedge is amphibious as it occurs either in water or on marshy soil.

*Scirpus* Berg.

Perennials, often with stout rhizome, culms erect, triquetrous, many-noded, leaved for the most part. Leaves 3-ranked, the basal ones reduced into bladeless cataphylls, often coloured with brownish or purplish sheaths often winged. Inflorescence usually paniculate, terminal and often also at a few lateral ones at apical nodes of culm. As a rule monoecious. Ultimate portions of inflorescences a pistillate spikelet and a staminate spikelet. Pistillate spikelets consisting of a single terminal pistillate flowers at the apex of determinate spikelet axis and few empty glumes distichously arranged on the axis. Staminate spikelets with several glumes distichously arranged on an indeterminate rachilla, most glumes bearing staminate flowers at apex the uppermost glume immediately below fruiting structure bearing a sessile staminate spikelet as a side branch. Pistillate flowers a terminal single naked pistil subtended by hypogynium; the pistil developing into globose bony achene.
This is predominantly tropical genus of about 200 to 225 species. Many of the species in this genus are endemic. This type of endemism contrasts with the distribution of *Cyperus* which are pantropic. These leafy herbs are frequently found in sterile soils. Though they occur in open places in the forest they tend to be more common and gregarious in secondary growths and grass lands along road-sides, on forest edges, marshes, streams and are most abundant in areas of high rainfall.

No species of *Scleria* are used as food. The tough, scabrous foliage make it unsuitable for cattle forage. Some of them are significant weeds. Some species are aromatic.

The morphology of the achene and the hypogynium has provided the chief criteria for the circumscription of species. In some species both smooth and verrucose achenes can be seen within a single collection and sometimes within the same inflorescence (Core, 1936). The hypogynium is apparently derived from receptacular tissue (Blaser, 1940, 1941).

1. Culms from woody rhizome, solitary or close together but not densely tufted; plants perennial;
2. Achenes globose, as long as wide; hypogynium well developed;
3. Lobes of hypogynium lanceolate, acute, half as long as the achene ....................... **S. levis**

3. Lobes of hypogynium broadly oval, obtuse-tipped hardly reaching 1/3 the length of achene ....................... **S. terrestris**

2. Achenes elongated, conspicuously ovate, 1.5 times longer than the width; hypogynium much reduced, only strip like:

4. Robust plant, culms 90-150 cms tall; inflorescence dense corymbose-paniculate, dense .................. **S. corymbosa**

4. Slender plant, culms to 80 cm tall; inflorescence very loose with spadiform branches .................. **S. lithosperma**

1. Culms tufted with fibrous roots only, without conspicuous rhizome; plants annual:

5. Hypogynium deeply 3-lobed:

6. Lobes of hypogynium subcoriaceous, ovate-oblong:

7. Achenes cancellated and often pubescent .................. **S. parvula**

7. Achenes irregularly lacunose, glabrous .................. **S. multilacunosa**

6. Lobes of hypogynium thin, narrowly lanceolate .................. **S. biflora**

5. Hypogynium shallowly or hardly lobed .................. **S. rugosa**

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**Scleria biflora** Roxb., Fl. Ind. 3:573. 1832; FSI 5:687.

**Scleria tessellata** var. **biflora** (Roxb.) Blatt. &
Annual, loosely tufted herb, to 50 cm tall; culms distinctly few nodose, triquetrous, glabrous. Leaves dense towards the base of culms, the upper ones much spaced; leaf blades linear, to 20 cm long, soft, 3-costate, sparsely pilose, abruptly narrowed to a short obtuse apex, scaberulous on upper margins; sheaths 3-sided, to 4 cm long, loosely surrounding the culm, scabrous on wing edges. Inflorescence with 4 panicles; terminal panicles larger than the lateral ones, to 4 cm long; lateral panicles much spaced, solitary, erect; peduncles slightly exerted from bract sheath, compressed-triangular, smooth. Involucral bracts leaf like, elongated, much longer than their subtending panicle but not overtopping the total inflorescence, long sheathing at base. Pistillate spikelets and staminate spikelets intermingled. Pistillate spikelets broadly obovoid, to 4 mm long; glumes ovate, to 3 mm long, pale green, membranous. Staminate spikelets peduncled, lanceolate, to 3 mm long; stamens 2 or 3 to a glume. Achenes globose, short beaked at apex, ceramic white, finely trabeculate with regular vertical rows of square-pits, ferrugineous-pubescent on ridges between pit rows, disk deeply 3-lobed; lobes thin, narrowly lanceolate, brownish-yellow.

This is usually found in wet grass lands and sedge swamps.
wet forest scrub and as a weed in rice fields. Pl. & Fr.: September - December.

**Distribution:** From India and Ceylon through Indo-China and Southern China to the Ryukyu islands and eastwards to the Philippines and western Malesia.

Reported from Warangal district by Satyanarayana Reddy (1985).


Perennial, rhizomatous robust herb, to 150 cm tall; rhizome woody, horizontal, covered with reddish-brown scales. Culms solitary, acutely triquetrous, many-noded. Leaves evenly distributed on the total length of culms; leaf blades broadly linear, to 60 x 20 mm, sub-coriaceous, light green, 3-costate, glabrous, abruptly narrowed to an obtuse apex, the margins smoothish for most length, scabrid towards leaf apices, sheaths elongated, to 20 cm long, somewhat loose, 3-sided, not winged, the lower ones coloured with brown, the basal sheaths bladeless, reddish-brown; contraligule depressed-deltoid, to 6 mm long. Inflorescence to 80 cm long, cylindrical leafy; lateral
panicles at 3 to 5 nodes, decompound, corymbiform, dense, peduncles long exserted, unequal in length, acutely triquetrous. Bisexual and staminate spikelets intermingled. Bisexual spikelets sessile, ovoid, 4-5 mm long, bearing a sessile staminate spikelet at axil of the uppermost glume; glumes broadly ovate, straw brown to dark fuscous, to 4 mm long, acute at mucronate apex. Staminate spikelets sessile when grouped, to 5 mm long, lance-ovate; stamens 3. Achenes ovoid, exceeding the subtending glumes.

Sporadically occurring in forest margins. Fl. & Fr.: September - December.

**Distribution:** India, Ceylon, Indo-China, Southern China and Western Malesia.

**Specimens examined:** CHITTOOR: Near Kailaskona, G.V. Subba Rao 46053 (MH); EAST GODAVARI: Rampa hill, V. Narayana swamy 629 (CAL).


Perennial, rhizomatous herb; rhizome woody, horizontally creeping, covered with purple brown scales, culms solitary and
approximate, to 30 cm tall, 3-sided with slightly concave sides, scabrid on angles. Leaves about evenly scattered on the culm. Leaf blades to 30 cm long, herbaceous, 3-costate, scabrous on margins and along costas, sheaths to 3 cm long, 3-sided, with scabrous wings, the lower sheaths tinged with reddish brown; contra ligule depressed rounded, to 2 mm long, pubescent and hirsute on upper part. Inflorescence scanty and narrow, consisting of 2 loose panicles usually spaced, the lateral ones solitary at node, the terminal one to 12 cm long; axes scabrous, acutely angular, peduncles exserted from bract sheath. Involucral bracts foliaceous, slightly surpassing the inflorescence. Pistillate spikelets and staminate spikelets in intermingled groups; pistillate spikelets sessile, borne toward the base of branchlets, obovoid; two large glumes subtending fruiting structure ovate, sanguineous brown; staminate spikelets peduncled, lance-oblong. Stamens 3. Achenes globose, 2.5 mm long, smoothish, apiculate at apex; disc lobes acute, lanceolate, half as long as the achene.

This species is found in wet sands, along ravine slopes of the forest grasslands. Fl. & Fr.: March - October.

Distribution: Wide spread from India and Ceylon, north eastwards to southern Japan and eastwards to Malesia and northern Australia.
Specimens examined: EAST GODAVARI: Maredumilli, KH & BR 10901; KURNOOL: Way to Diguvametta, J.L. Ellis 22185 (MH).

Note: This species is often confused with *S. lithosperma* due to its small and slender nature. *S. levis* can be easily distinguished by the presence of a well developed disk, whereas the disk is reduced to a narrow, brown ring in *S. lithosperma*.


**Key to the subspecies**

1. Achenes smooth .. .. .. .. subsp. *lithosperma*

1. Achenes transversely rugose .. .. subsp. *linearis*

subsp. *lithosperma*

Perennial, erect, tufted herb, to 80 cm tall; culms loosely tufted from short knotty rhizome, rigid, slender, 3-sided. Leaves dense or clustered at the middle of the stem; leaf blades narrowly linear, to 25 cm long, rigid, canaliculate,
Fig. 54. *Scleria lithosperma* (Linn.) Sw. sub sp. *lithosperma*

A. Habit, B. ♀ spikelet, C to J. Glumes (closed and opened),
L. Pistil, M. Achene, K. ♂ Stamens (RVR & FVP 2163)
revolute on scabrous margins, deeply green and glaucescent when dried; sheaths 3-sided, to 7 cm long, brownish-reddish, not winged, puoescent, the basal ones bladeless, reddish-purplish; contraligule convex, hairy. Panicles narrow, very loose spicate, terminal ones to 15 cm long, axillary ones to 5 cm long, dark brown. Involucral bracts leaf like, much longer than the inflorescence. Spikelets bisexual, solitary and clustered, (in clustered condition female, 1 or 2 male flowers together, others empty), ovate-turbinate. Glumes lanceolate, to 4 mm long, purplish, mucronate, keel long. Stamen 1. Stigmas 3. Achenes obovoid, to 3 mm long. (Fig. 54).

Common species usually found along hill slopes associated with other grasses, rocky surfaces and as the undergrowth of dry forests. Fl. & Fr.: throughout the year.

**Distribution:** Pantropic

**Specimens examined:** VISAKHAPATNAM: Simhachalam hill, KH & BR 5589 A; KURNOOL: Peccheruvu, RVR & PVP 2163; ADILABAD: Ankusapuram; GO 4346; CHITTOOR: Kailasakona, G.V. Subba Rao 46995 (CAL); CUDDAPAH: Balepalle, J.L. Ellis 14934 (MH).


Achenes transversely rugulose with wavy ridges that are slightly viscid on top.

Not as common as subsp. lithosperma. Occasionally seen in dry forest areas. Fl. & Fr.: September - January.

Distribution: From India and Ceylon, through Indochina, eastwards to Malesia and Northern Australia.

Specimens examined: VISAKHAPATNAM: Simhachalam hill, KH & BR 5589 B.


Annual, caespitose herb with purplish fibrous roots, culms to 90 cm tall, sharply triquetrous, 3 or 4 nodose, 1 or 2 leaved on the midway portion, clothed at base with 1 or 2 bladeless sheaths. Basal sheaths to 4 cm long, sharply triquetrous, without wings, pale-green and stained with purple, obliquely truncate at orifice. Leaves shorter than the culm; blade 15-30 cm x 3-8 mm, tricostate, fresh green, scabrous on margins and abaxial costa, gradually tapering to acute apex;
sheaths to 6 cm long, greenish, sharply triquetrous, the angles scabrous; contraligule rounded-truncate, ciliate with short rusty brown hairs. Inflorescence with 2-4 partial panicles, the lowest one distant from the remainder and on a long exserted peduncle, the remainder contiguous at the culm apex; partial panicles subspiciform, to 2 cm long, branches bearing 3 to 5 pistillate spikelets and 1-3 staminate spikelets. Lowest leafy bract sheathing for 2 to 3 cm, the blade to 12 cm long, not surpassing the culm; blade of the second bract to 5 cm long, longer than its subtending partial panicle, ciliate at base, the third and fourth bracts much shorter. Staminate spikelets to 3.5 mm long, lanceolate, short peduncled. Pistillate spikelets to 4 mm long, obdeltoid; glumes 3, ovate, to 4 mm long, acuminate at apex, pale green and stained with straw-brown, boat-shaped with green prominent keel ending in a straight cusp at apex. Style filiform, stigmas 3. Achenes globose, to 3 mm long, rounded at mucronate apex, the whitish ceramic surface irregularly lacunose with many shallow depressions of varying shape and size. Disk deeply 3-lobed; lobes obovate-oblong, subcoriaceous, yellowish, rather suddenly contracted at cuspidate apex.

Occasional in wet grassy localities around bushes and herbs in the openings of the forests. Fl. & Fr.: September - December.
**Distribution:** India, Ceylon.

**Specimens examined:** WARANGAL: Pakhal, A. Ragan 1195 (MH & KU).


Annual, erect, caespitose herb, to 25 cm tall; culms slender, triquetrous, scabrid on angles, with dark or reddish brown fibrous roots. Basal sheaths bladeless, acutely triquetrous, reddish brown. Leaves with elongated blade spaced on the lower midway portion of the culm; blades linear, to 15 cm long, herbaceous, lightly green, scabrid on abaxial midvein and margins; sheaths to 8 cm long, loosely clothing the stem-internode, triquetrous; contraligule truncate or rounded, ciliate on margin. Inflorescence terminal and lateral, of 1-3 cm long sparingly branched panicle. Involucral bracts erect, leaf like, nearly equalling to slightly surpassing the inflorescence. Staminate spikelets lanceolate; pistillate spikelets obdeltoid. Glumes ovate, acuminate, membranous, dark-brown, with prominent green costa, to 3 mm long. Stamens 3. Stigmas 3, hairy. Achenes globose to ellipsoidal, to 3 mm x 2 mm wide.
Fig. 55. *Scleria parvula* Stend.
A. Habit, B to I. Glumes (Closed and opened), J. ♂ Stamens, K. ♀ Pistil, L. Achene (BR & CPR 7197).
cancellated with regularly arranged transversely rectangular lacunae, shining white, often pubescent, rounded at mucronate apex; hypogynium 3-lobed, pale green; lobes ovate. (Fig. 55).

This is rarely seen in wet grass lands, margins of forests. Fl. & Fr.: May - October.

Distribution: Nepal, India, Ceylon, Thailand, Indochina, Southern China to Central Japan, Malesia.

Specimens examined: NIZAMIabad: Gandivedu fields, BR & CPR 7197; KHAMMAM: Vazeedu, V.S. Raju 1003 (MH).


_Scleria flaccida_ Clark in Hook. f., l.c. 858 non Steud. 1855. _S. lateriflora_ Boeck. in Linnaea 33:455. 1874.

Annual, densely tufted herb, to 3.5 cm tall; culms acutely 3-angled. Leaf blades narrowly linear, to 10 cm long, soft, 3-costate, abruptly narrowed to obtusish apex; sheaths to 3 cm long, triquetrous, the basal ones tinged with brown. Inflorescence consisting of 3 small contracted panicles, each to 2 cm long, with few clusters of spikelets; lateral panicles, solitary on exserted peduncle; peduncles stout, compressed-triangular. Involucral bracts leaflike, elongated, the longer ones surpassing
the total inflorescence. Pistillate spikelets and staminate spikelets intermingled. Pistillate spikelets broadly obovate to 4 mm long; glumes obovate, boat-shaped, to 3 mm long, membranous. Staminate spikelets on short peduncle, to 2 mm long, lanceolate. Stamens 1 to a glume. Achenes shorter than the subtending glumes, globular, terete, white. Disk cup like shallowly 3-lobed, lobes semiorbiculur.

This species is not very common. Occasionally seen in wet grass places, margins of marshy areas. Fl. & Fr.: September - December.

**Distribution:** Widely occurring in Asia and Oceania from India and Ceylon through Indo-China and southern China north eastwards to Japan and eastwards to Malesia, Micronesia, Australia, and New Caledonia.

Reported from Warangal district by Satyanarayana Reddy (1985).

**Scleria terrestris** (Linn.) Fassett. in Rhodora 26:159. 1924,


**S. elata** Thw., Enum. Pl. zeyl. 353. 1864. **S. melanostoma** Nees ex Boeck. in Linnaea 33:514. 1874. **S. chinensis** Kunth. var. biauriculata Clarke in Hook. f., Fl. Brit. India 6:690. 1893. **S. cochinchinensis** (Lour.) Druce,
Fischer 1678 (1153). S. hookeriana sensu Kükenth.,
Lour., Fl. Cochin ch. 578. 1790.

Perennial herb with short, creeping woody rhizome, to
150 cm tall; culms elongated, triquetrous, densely leaved for
the most length; leaf blades linear, to 40 cm long, to 20 mm
wide, subcoriaceous, 3-costate, gradually tapering to very long
acute apex, recurved on scabrous margins; sheaths to 13 cm long,
triquetrous, coloured with reddish brown, scabrid on angles;
contraligule to 4 mm long, lunate or depressed-rounded, brown.
Inflorescence consisting of 4 compound panicles, generally
spaced, to 40 cm long, 10 cm wide; partial panicles solitary,
ovate pyramidal or broadly ovoid, dense, the branches ascending,
scabrid, the peduncle long-exserted up to 20 cm long, compressed
triangular, scabrous. Involutucral bracts leaf like, slightly
overlapping the inflorescence. Pistillate spikelets and
staminate spikelets in groups of 2 or 3; pistillate spikelets
sessile, broadly ovoid, to 6 mm long, the two largest glumes
broadly ovate, to 4 mm long, deeply red-brown; staminate spi-
kelets lanceolate, to 4 mm long, deeply red-brown; stamens 3.
Achenes longer than the two subtending glumes, broadly obovoid-
globose, to 3 mm long, shining white or finally dark purplish;
hypogynium appressed to achene, 3-lobed or nearly obtusely
triangular, the lobes ovate, finely toothed at apex, hardly
reaching 1/3 the length of achene. (Fig. 56).
Fig. 56. *Scleria terrestris* (Linn.) Fassett
A. Habit, B. $^{\delta}$ Spikelet, C. Closed glume, D. Opened glume, 
E. Stamens, F. $^{\varphi}$ Spikelet, G. Opened glume, H. Closed glume, I. Pistil, J. Achene (K1 10968).
A rare species usually found in wet places in forest areas and scrub jungles as a undergrowth. Fl. & Fr.: February - December.

**Distribution:** Widely distributed in tropical and subtropical Asia from India and Ceylon north eastwards to south western Japan and eastwards to Malesia and northern Australia.

**Specimens examined:** KURNOOL: Kuppagal RF, KH 10953; CHITTOOR: Japalathirtham, K. Suuramanyam 7369 (MH); EAST GODAVARI: Nulakamaddi, G.V. Subba Rao 24531 (MH & CAL); VISAKHAPATNAM: Anantagiri, G.V. Subba Rao 21755 (CAL).

**Sorostachys Steud.**

**Sorostachys leucoccephalus** (Retz.) Lye in Nord. J. Bot. 1:190.


Perennial, tufted, rhizomatous herb; rhizome very short, woody. Culms to 30cm tall, very slender, nodose at the base, each carrying one head. Leaves shorter than the stem. Heads dense, globose, white, containing 40 spikelets. Involucral bracts 3, the longest reaching to 6 cm long, long acuminate.
Spikelets compressed, elliptic, to 18-flowered. Glumes oblong-lanceolate, pale-brown, with hyaline margins. Stamen 1; anthers oblong, muticous. Stigmas 3, as long as the style. Achenes oblong-ellipsoid, trigonous, shortly apiculate, black.

Occasional in marshy and swampy areas. Fl. & Fr.: July - October.

Distribution: Tropics

Specimens examined: KARIMNAGAR: Kodimial, G.V. Subba Rao 20071 (MH); CUDDAPAH: Guvvalacheneruvu, K. Subramanyam 6382 (MH & CAL).