

# The Cyperaceae Tribe Cyperae of Ceylon

TETSUO KOYAMA

*The New York Botanical Garden, Bronx, New York*

## Abstract

This taxonomic treatment, revising all the Ceylonese taxa of the Cyperaceae tribe Cyperae, enumerates 59 species of four genera, *Cyperus*, *Pycreus*, *Mariscus* and *Kyllinga*. The following new names are proposed: *Cyperus compressus* ssp. *micranthus*, *C. diffusus* ssp. *macrostachyus*, *C. nutans* ssp. *eleusinoides*, *Pycreus flavidus*, *P. pumilus* ssp. *membranaceus*, *Mariscus cyperinus* ssp. *laxatus*, *M. pedunculatus*, *M. sumatrensis*, and *Kyllinga odorata* ssp. *cylindrica*.

In the course of my preparation of a taxonomic account of the Cyperaceae for the Flora of Ceylon, a project under the auspices of the Smithsonian Institution (Koyama 1970), I have had the opportunity of revising important historical collections of Ceylonese Cyperaceae that are housed in the Herbarium of the National Botanic Gardens, Peradeniya. These old collections, of which only a part is represented at Kew and elsewhere, have not received the attention of specialists since Trimen published his Handbook (1900). In addition, a series of field expeditions recently sent to Ceylon (Koyama 1970, 1974) resulted in an accumulation of a substantial number of critical gatherings, among which are several cyperoid taxa that are new to the flora of Ceylon. In the present paper 59 species of the tribe Cyperae are recognized as valid for the flora of Ceylon and are classified under four genera, *Cyperus*, *Pycreus*, *Mariscus* and *Kyllinga*. The treatment not only identifies the collections mentioned above but also updates the nomenclature with particular emphasis on the coordination to the two recent important works on the Cyperae (Kükenthal 1935-36; Kern 1974). The remarkable richness of cyperoid taxa in Ceylon rests on the fact that besides the so-called Indo-Malesian and the Pantropic elements, on this little island there occur Western Asiatic elements reaching Ceylon as well as those interesting endemic ones which are confined to the southern part of Deccan Peninsula and Ceylon. Special attention was paid to these entities of phytogeographic interest.

I appreciate the assistance of Dr. F. Raymond Fosberg, who has given me this opportunity of studying Ceylonese Cyperaceae. Messrs R. Cooray, T. Herat, N. Balakrishnan, A. H. M. Jayasuria and K. Sumithraarachchi certainly deserve my sincere thanks for their help in the field. The financial assistance from the Smithsonian Office of International Program is gratefully acknowledged for their research grant in defraying my field expenses.

## KEY TO GENERA

1. Rhachilla not articulated, persistent, hence glumes falling apart from rhachilla
  2. Achenes triquetrous or dorsi-ventrally flattened with one side facing rhachilla ..... *Cyperus*
  2. Achenes laterally flattened with one angle facing rhachilla ..... *Pycreus*
1. Rhachilla articulated, hence spikelets falling in entirety
  3. Achenes triquetrous with one side facing rhachilla ..... *Mariscus*
  3. Achenes laterally flattened with one angle facing rhachilla ..... *Kyllinga*

## CYPERUS L.

1. Stigmas 3, or style more or less undivided (sp. no. 33)
2. Spikelets spicately disposed on conspicuously elongated rhachis, thus forming spikes
3. Rhachilla of spikelets winged with base of glumes, which is decurrent along the rhachilla internode
4. Spikelets many to numerous; spikes with long rhachis, cylindrical, normally 3–7 cm long
5. Leaves with elongated blade
  6. Spikelets linear, terete or subterete, 0.5–1 mm wide
    7. Spikelets patent to spreading; spikes as a rule peduncled; leaves 4–15 mm wide; culm smooth on angles ..... **1** *C. digitatus*
    7. Spikelets erect to suberect; spikes subfastigate, subsessile; leaves 20–30 mm wide; culms scabrous on upper angles ..... **2** *C. platyphyllus*
    6. Spikelets lanceolate to lance-oblong, ca. 1.5 mm wide, flattened ..... **3** *C. exaltatus*
  5. Leaves reduced to bladeless sheaths ..... **4** *C. papyrus*
4. Spikelets several to teens, occasionally up to 30; spikes with rather short rhachis broadly ellipsoid or ovoid, normally 1–4 cm long
8. Plants with creeping rhizomes or stolons (except in *C. bulbosus*, which bears tunicate bulb at base of culm)
9. Culms thick, normally more than 5 mm wide and 60 cm tall, clothed at base with bladeless sheaths
  10. Culms obtusely trigonous to subterete; glumes lance-ovate, acute-tipped; bracts much shorter than corymb
  11. Culms not septate ..... **5** *C. corymbosus*
  11. Culms transversely septate ..... **6** *C. articulatus*
  10. Culms acutely triquetrous; glumes oblong, obtuse at apex; bracts much surpassing corymb ..... **7** *C. pangorei*
9. Culms slender, mostly 1–2 mm wide and less than 60 cm tall; leaves with elongated blade
  12. Culms arising from bulbous base, tufted ..... **8** *C. bulbosus*
  12. Stolons present; culm bases forming a corm-like enlargement
    13. Glumes 2–2.5 mm long; spikelets slightly swollen; leaves normally as long as the culm ..... **9** *C. stoloniferus*
    13. Glumes 3–4 mm long; spikelets strongly flattened; leaves normally much shorter than the culm
    14. Culms 10–30 cm tall; bracts as long as or shorter than the inflorescence ..... **10** *C. rotundus*
    14. Culms 30–60 cm tall; bracts 2 to 3 times as long as the inflorescence

15. Spikelets linear-lanceolate, gradually narrowed to an acute apex, 2.2–3 mm wide; glumes ovate
  16. Glumes 3–3.5 mm long, red-brown, close together not exposing achene between two glumes; spikelets 2.2–2.5 mm wide ..... **11** *C. tuberosus*
  16. Glumes 4 mm long, yellow-brown, slightly spaced exposing portion of achene between two glumes; spikelets 3–3.2 mm wide ..... **12** *C. retzii*
15. Spikelets linear, rather suddenly obtusish at apex, 1.5–2 mm wide glumes oblong ..... **13** *C. scariosus*
8. Plants without creeping rhizomes or stolons
  17. Spikelets linear to lanceolate, 1.5–2 mm wide; weakly flattened with two acute edges; glumes close together, acute at apex
    18. Glumes distinctly colored with red-brown, brown or dark brown; plants perennial with culms more or less enlarged at base
      19. Glumes 2.2–2.5 mm long, pale-green and strongly colored with dark or purple-brown ..... **14** *C. sphacelatus*
      19. Glumes 3–3.5 mm long, straw-colored and tinged with reddish brown or brown ..... **15** *C. tenuiculmis*
    18. Glumes pale or stramineous-green, not at all brown-colored; plants annual with fibrous roots only; culms not thickened at base ..... **16** *C. zollingeri*
  17. Spikelets filiform, subterete, less than 1 mm thick; glumes spaced, obtuse at apex
    20. Spikelets spreading, ca. 0.75 mm wide; glumes rounded-obtuse at apex with moderately narrow hyaline margins ..... **17** *C. distans*
    20. Spikelets erect-patent, ca. 1 mm wide; glumes shallowly emarginate at apex with very broad hyaline margins ..... **18** *C. nutans*
3. Rhachilla of spikelets without conspicuous wings, base of glumes not decurrent along the rhachilla internode
  21. Plants perennial with stolons
    22. Rhachis of spikes glabrous; glumes obtuse at white-hyaline apex ..... **19** *C. procerus*
    22. Rhachis of spikes densely hispid; glumes acute at apex without broad hyaline apex ..... **20** *C. pilosus*
  21. Plants annual, with fibrous roots only

23. Spikelets 1–2.5 cm long, 2–3 mm wide; glumes 2–3.5 mm long, acute at apex, tightly disposed
24. Glumes 3.5 mm long; achenes 1.5 mm long; inflorescence usually open with elongated rays ..... **21b** *C. compressus* ssp. *compressus*
24. Glumes 2 mm long; achenes 1 mm long; inflorescence congested in a head-like cluster ..... **21b** *C. compressus* ssp. *micranthus*
23. Spikelets 0.5–1 cm long, 1–1.5 mm wide; glumes 0.75–1.25 mm long, obtuse at apex, loosely disposed ..... **22** *C. iria*
2. Spikelets digitately disposed or capitately congested at apices of inflorescence rays, thus forming heads without rhachis
25. Inflorescences open with elongated rays
26. Large-sized perennials with conspicuous rhizome; at least some leaves and bracts more than 10 mm wide; culms 30–90 cm tall
27. Leaves with elongated blade; leafy bracts 5–10
28. Achenes with acute angles; spikelets in clusters of 2 or 3, sometimes solitary, weakly compressed
- 28a. Spikelets 4–6 mm long, up to 12-flowered ..... **23a** *C. diffusus* ssp. *diffusus*
- 28a. Spikelets 10–20 mm long, up to 40-flowered ..... **23b** *C. diffusus* ssp. *macrostachyus*.
28. Angles of achenes spongy-thickened; spikelets in clusters of 5 to 8, strongly compressed ..... **24** *C. platystylis*
27. Leaves reduced to bladeless sheaths, leafy bracts more than 15 ..... **25** *C. alternifolius* ssp. *flabelliformis*
26. Small to medium-sized annuals or short-lived perennials; leaves and bracts at most 5 mm wide; culms up to 40 cm tall
29. Umbel rays longer than or nearly as long as the culm ..... **26** *C. radians*
29. Umbel rays much shorter than the culm
30. Glumes awnless; achenes obovate; leaves flattish
31. Spikelets digitate in clusters of 3–15; glumes acutish at apex
32. Roots brownish; basal sheaths straw-brown or pale-brown; spikelets dark green ..... **27** *C. pulcherrimus*
32. Roots purplish; basal sheaths purple-brown; spikelets brown or purple-brown

33. Glumes densely imbricate and close together so that achenes not shown between glumes; rhizome often conspicuous, rather frequently elongated ..... **28** *C. haspan*

33. Glumes subclaxly imbricate and slightly spaced, thus achenes exposed between glumes; plants tufted with fibrous roots only ..... **29** *C. tenuispica*

31. Spikelets many, congested in globose heads ..... **30** *C. difformis*

30. Glumes awned at apex; achenes oblong; leaves canaliculate

34. Glumes with straight awn ..... **31** *C. castaneus*

34. Glumes with recurved awn ..... **32** *C. cuspidatus*

25. Inflorescences congested a single head

35. Style 3-cleft; achenes acute on angles

36. Rhizome with long creeping stolons; culms 5–20 cm tall; heads 1–2 cm wide ..... **33** *C. arenarius*

36. Rhizome short, culms tufted, 20–60 cm tall; heads more than 3 cm across ..... **34** *C. conglomeratus*

35. Style scarcely divided at apex; achenes with spongy-thickened angles; plants floating on water ..... **35** *C. cephalotes*

## 1. Stigmas 2

37. Tall perennial; culms ca. 100 cm tall; inflorescences umbelliform with elongated rays up to 18 cm long ..... **36** *C. alopecuroides*

37. Small annual; culms 5–18 cm tall; inflorescence a head ..... **37** *C. pygmaeus*

1. *Cyperus digitatus* Roxburgh, [Hort. Beng. 81, 1814, nomen, &] Fl. Indica ed. 1, 1: 209, 1820; C. B. Clarke, Fl. Brit. India 6: 618, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 36, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 55, 1935; Kern, Fl. Males. I, 7 (3): 601, 1974.

'*Cyperus venustus* R. Br.' *sensu* Nees, Contrib. Bot. India 86, 1834. — '*Cyperus neesii* Kunth' *sensu* Thwaites, Enum. Pl. Zeyl. 344, 1868. — *Cyperus hookeri* Böckeler, Linnaea 36: 308, 1870. — *Cyperus digitatus* Roxb. var. *hookeri* (Böckl.) C. B. Clarke, Fl. Brit. India 6: 618, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 37, 1900.

Jaffna District: Ca. 5 miles W of Paranthan, south shore of Jaffna Lagoon, T. Koyama et al. 14043 (NY, PDA, US); Paranthan, Clayton 5263 (K, PDA). Anuradhapura District: Wilpattu National Park, East Intermediate Zone, along

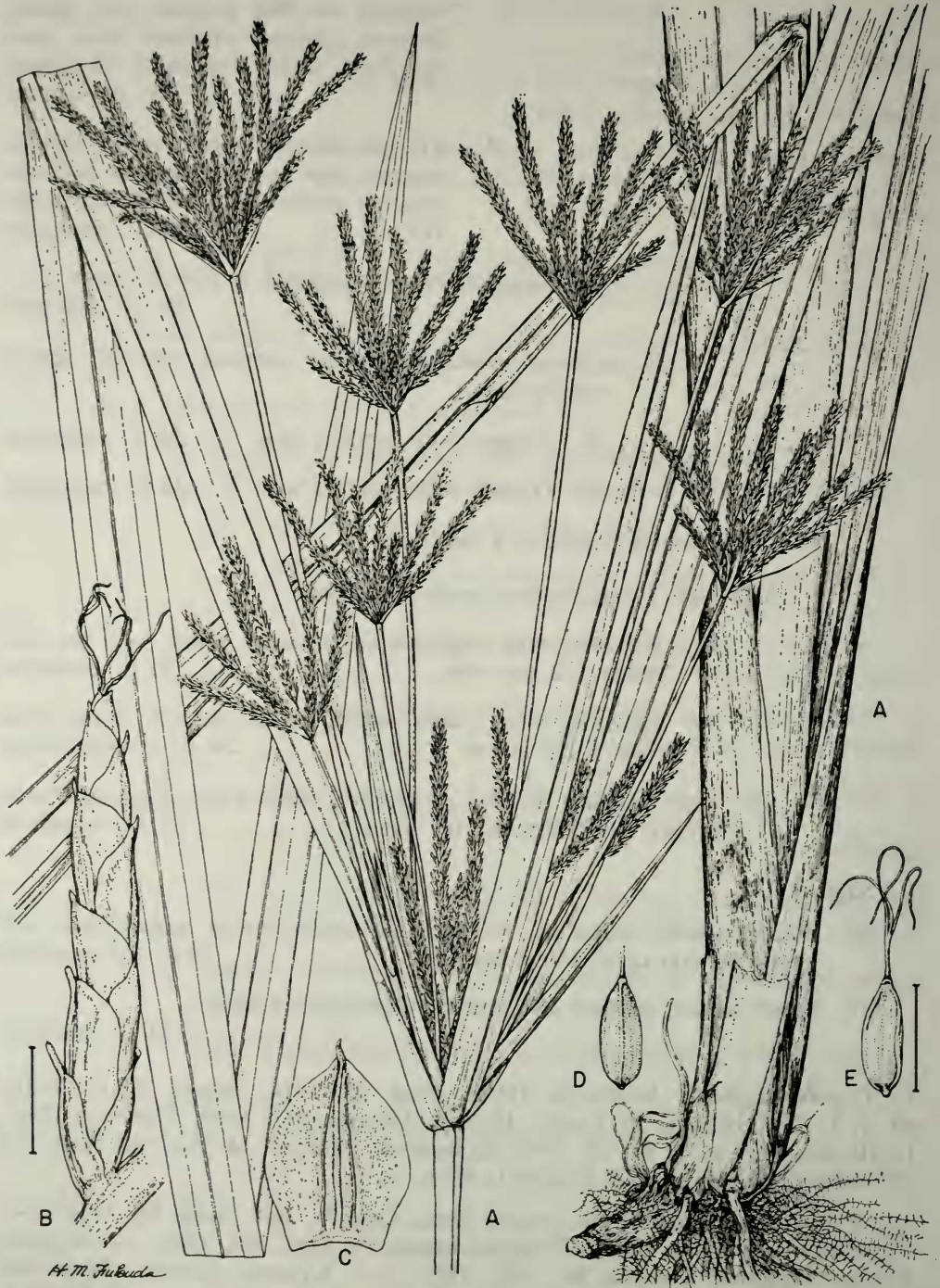


Fig.1. *Cyperus platyphyllus* Römer & Schultes. AA, habit. B, spikelet with its prophyll. C, glume. D, dorsal view of achene. E, ventral view of achene with style. Scales = 1 mm.

the Wildlife Dept. trail, ca. 2 miles from barrier gate, *T. Koyama & Jayasuria 13965* (NY, PDA, US). Kandy District: Ramboda, *Thwaites C. P. 3043 ex p.* (K, PDA); Pusselawa, *Thwaites C. P. 3043 ex p.* (PDA). Colombo District: *Ferguson s.n.* (PDA).

*Distribution.* Pantropic with its range extending north into southern China and Formosa; abundant in South America and southern Asia, relatively scarce in tropical Africa and Australia.

Plants from India and Ceylon have often been treated as var. *hookeri*, which was segregated by its more copiously spiculate spikes. My observation of this species on a world-wide basis does not support this variety.

2. *Cyperus platyphyllus* Römer & Schultes, *Syst. Veg.* 2: 876, 1817; C. B. Clarke, *Fl. Brit. India* 6: 618, 1893, & *Illustr. Cyper. t. 20, f. 3-4*, 1909; Trimen & Hook. f., *Handb. Fl. Ceylon* 5: 38, 1900; C. E. C. Fischer in Gamble, *Fl. Madras* 9: 1642, 1931; Kükenthal, *Pflanzenr.* 4 (20), 101 Heft: 59, f. 87, 1935. — **Fig. 1.**

"*Cyperus elatus* L.," *sensu* Roxburgh, *Fl. Indica* ed. 1, 1: 207, 1820. — *Cyperus roxburghii* Nees in Wight, *Contrib. Bot. India* 84, 1834; Thwaites, *Enum. Pl. Zeyl.* 70, 1864. — *Cyperus eminens* Klein ex Kunth, *Enum. Pl.* 2: 70, 1837. — *Papyrus latifolia* Willdenow, *Abhandl. Akad. Berlin* 1812/13: 74, 1816.

Trincomalee District: Trincomalee, *Glenie* in 1864 (PDA). Matara District: Kukul Corale, *Thwaites C. P. 3041 ex p.* (K, PDA); Matara, *Trimen* 23 Feb. 1881 (PDA). Amparai District: Mile 205 on Rd. A 4, ca. 3 miles N of Pottuvilp, *T. Koyama et al. 14011* (NY, PDA, US).

*Distribution.* Confined to southern India and Ceylon. Marshy places at low altitudes.

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. The distribution range of this species, covering the southern part of Indian Peninsula and Ceylon only, shows the same pattern as those of *Mariscus clarkei*, *Fimbristylis tenuifolia*, *Carex lobulirostris* and *Carex leucostachya*.

3. *Cyperus exaltatus* Retzius, *Obs. Bot.* 5: 11, 1789; Thwaites, *Enum. Pl. Zeyl.* 343, 1864; C. B. Clarke, *Fl. Brit. India* 6: 617, 1893; Trimen & Hook. f., *Handb. Fl. Ceylon* 5: 32, 1900; Kükenthal, *Pflanzenr.* 4 (20), 101 Heft: 64, f. 9 A-F, 1935; Kern Reinwardtia 2: 99, f. 2, 1952 & *Fl. Males. I.* 7 (3): 602, 1974.

*Cyperus venustus* R. Brown, *Prodr. Fl. Nov. Holl.* 217, 1810; Thwaites, *Enum. Pl. Zeyl.* 432, 1864. — *Cyperus altus* Nees in Wight, *Contrib. Bot. India* 84, 1834. — *Cyperus exaltatus* Retz, var. *amoenus* C. B. Clarke, *Journ. Linn. Soc.* 21: 187, 1886; Trimen & Hook. f., *Handb. Fl. Ceylon* 5: 33, 1900.

Jaffna District: Jaffna, *Silva 110* (PDA); Murukan, *Silva* in 1917 (PDA). Vavunia District: Illukkulama, ca. 6 km SW of Vavunia, *T. Koyama & Herat 13603* (NY, PDA, US). Anuradhapura District: Anuradhapura, at margin of Nuwara Wewa Tank, *T. Koyama et al. 13939* (NY, PDA, US); Anuradhapura, *Brodin C. P. 3040 ex p.* (PDA); Minneriya, ca. 15 miles E of Habarana, *T. Koyama et al. 13568* (NY, PDA, US). Mannar District: ca. 10 miles S E of Mannar, *T. Koyama et al. 13922* (NY, PDA, US). Polonnaruwa District: Yoda Ela, *Silva* in 1905 (PDA); Mannampitiya, ca. 5 miles ESE of Polonnaruwa, *T. Koyama & Herat 13572* (NY, PDA, US). Kandy District: Peradeniya, *Trimen C.P. 3040* in part (PDA). Badula District: ca. 8 miles E of Mahiyangana, 3.5 miles N. of Mile 53 on Mahiyangana-Padiyatalam Rd., *T. Koyama et al. 13980* (NY, PDA, US). Trincomalee District: Trincomalee, *Glenie C.P. 3788* (PDA). Batticaloa District: Batticaloa, *Trimen C.P. 3040* in part (PDA). Monaragala District: E of south end of Jayanthiwewa, *T. Koyama et al. 13988* (NY, PDA, US). Ratnapura District:

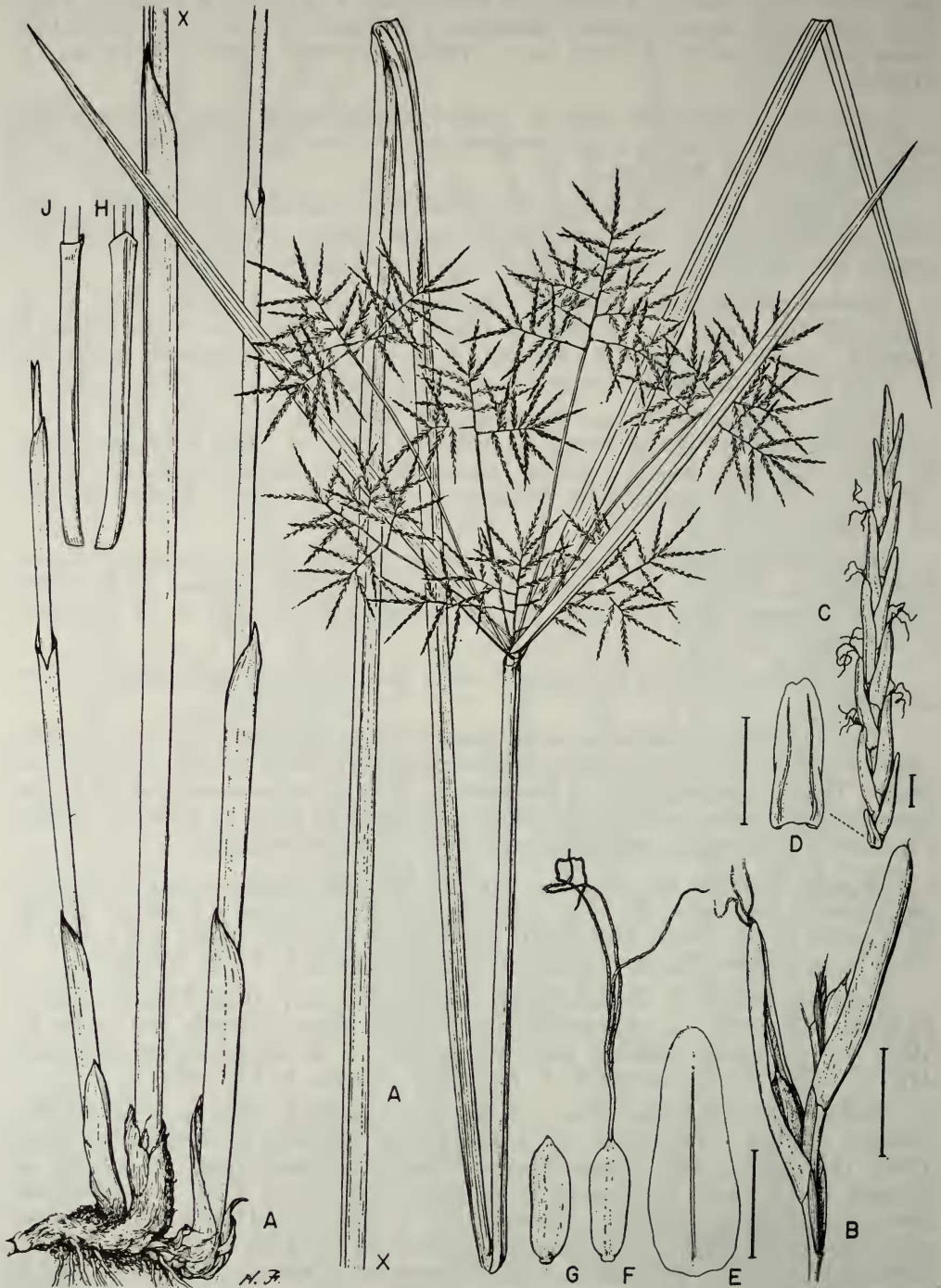


Fig. 2. *Cyperus pangorei* Rottboell. AA, habit. B, portion of spikelet showing two glumes and their bases forming wings on the rachilla. C, spikelet. D, prophyll. E, glume. F & G, achenes. H & J, prophylls at the base of umbel ray. Scales = 1 mm.



Ratnapura, *Trimen C.P. 3040* in part (PDA); Ranwala, *Amaratunga 670* (PDA). Kurunegala District: Hettipola, *Amaratunga 670* (PDA); Uhuniya, *Amaratunga 182* (PDA). Ruhuna National Park: Andunoruwa Wewa, *Cooray 16 Dec. 1969* (US).

*Distribution.* Pantropic, with its range extending northwards to eastern China and Japan. Rare in South America. In Ceylon very common in wet places at low altitudes, and often noted in rice fields.

4. *Cyperus papyrus* L., Sp. Pl. ed. 1, 47, 1753.

Kandy District: cultivated in the Botanic Gardens, Peradeniya, *Amaratunga 197* (PDA). Native of East Tropical Africa with a subspecies in Madagascar. Widely cultivated in Ceylon as an ornamental.

5. *Cyperus corymbosus* Rottboell, Descr. Icon. Rar. Nov. Pl. 42, t. 7 f. 4, 1773; Thwaites, Enum. Pl. Zeyl. 344, 1864; C. B. Clarke, Fl. Brit. India 6: 612, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 29, 1900; C. E. C. Fischer in Gamble, Fl. Madras 9: 1641, 1931; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 80, f. 10, 1936.

Anuradhapura District: between Ramboda and Madawachchiya, *T. Koyama & Herat 13602* (NY, PDA, US). Matale District: between Naula and Dambulla, vicinity of Mile 40, *Jayasuria 56* (US, PAD). Kandy District: Peradeniya, *Amaratunga 199* (PDA). Kegalle District: Baddewela, *T. Koyama & Samarakoon 13546* (NY, PDA, US). Badula District: 5 miles WNW of Mahiyangana, *Davidse 7595* (MO, NY, PDA). Batticaloa District: Vandeloos Bay, *T. Koyama & Herat 13579* (NY, PDA, US). Monaragala District: E of south end of Jayanthiwewa, *T. Koyama et al. 13987* (NY, PDA, US). Galle District: Moragoda, left bank of Bentota Ganga, *Amaratunga 2357* (PDA). Puttalam District: Irranonillu Madampe, *Amaratunga 2574* (PDA).

*Distribution.* Tropical West Africa, Madagascar, Nepal, India, Burma, northern Australia, West Indies and tropical South America (Venezuela and Brazil). Marshy places at low altitudes.

In Ceylon this species called *Gal-éhi* is occasionally more or less cultivated, because its straight culms are preferred by natives as material for making a kind of rough mats. The culms of *Scirpus grossus* L.f. are also used for the same purpose but is not cultivated.

6. *Cyperus articulatus* L., Sp. Pl. ed. 1, 44, 1753; Thwaites, Enum. Pl. Zeyl. 343, 1864; C. B. Clarke, Fl. Brit. India 6: 611, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 29, 1900; C. E. C. Fischer in Gamble, Fl. Madras 9: 1641; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 77, 1936.

Polonnaruwa District: Kentalai, *Trimen* in 1885 (PDA). Batticaloa District: Batticaloa, *Thwaites C.P. 3561* (K, PDA).

*Distribution.* Mediterranean Region, Tropical Africa, India, Indo-China, southeastern U.S.A. to Central and South America. More frequent in the Neotropics.

It is rather interesting that this species has never been collected since Trimen's time.

7. *Cyperus pangorei* Rottboell, Descr. Icon. Rar. Nov. Pl. 31, t. 7 f. 3, 1773; Thwaites, Enum. Pl. Zeyl. 344, 1864; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 76, 1936. ——— Fig. 2.

*Cyperus tegetum* Roxburgh, Fl. Indica ed. 1, 1: 208, 1820; C. B. Clarke, Fl. Brit. India 6: 613, 1893, & Illustr. t. 17, f. 1, 1909. ——— *Cyperus dehiscens* (Nees) Nees, Linnaea 9: 286, 1835; Kunth, Enum. Pl. 2: 56, 1837; Trimen & Hook. f. Handb. Fl. Ceylon 5: 30, 1900. ——— *Papyrus pangorei* (Rottb.) Nees in Wight, Contrib. Bot. India 88, 1834, in major part, concerning basionym. ——— *Papyrus dehiscens* Nees in Wight, l.c. 89, 1834.

Anuradhapura District: ca. 25 miles W of Trincomalee, along Rd. A 12, *T. Koyama et al.* 14056 (NY, PDA, US); 2 km N of Yakalla, *T. Koyama* 13595 (NY). Monaragala District: road between Maha Oya and Mullajama at Mile 14, *T. Koyama et al.* 13981 (NY, PDA, US); Kotagoda, Siyambaladuwa to Inginiyagala, *Clayton* 5825 (K, PDA). Colombo District: Ja-al on Gampaha Rd., *Comanor* 1026 (US).

*Distribution.* Ceylon, India, Nepal and Burma. According to Kükenthal (op. cit.) also cultivated in Mauritius for mat-making.

Like *C. malaccensis* and *C. corymbosus* this species provides material for making mats. Trimen (op. cit.) mentions that in the Dambara area along Mahaweli Ganga this species is exclusively used for this purpose, and the mats are named after the locality.

8. ***Cyperus bulbosus*** Vahl, Enum. Pl. 2: 342, 1806; C. B. Clarke, Fl. Brit. India 6: 611, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 22, 1900; C. E. C. Fischer in Gamble, Fl. Madras 9: 1641, 1931; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 125, f. 15 C-E, 1936; Kern, Fl. Males. I, 7 (3): 605, 1974.

Puttalam District: Karapitiya, *Kundu & Balakrishnan* 363 (US); Chilaw, *Ferguson*, Nov. 1881 (PDA). Trincomalee District: beach S of Elizabeth Point, sea level, *Davidse* 7523 (MO, NY, PDA, US). Hambantota District: Ruhuna National Park, Patangala, beach, *Cooray* 16 Nov. 1969 (NY); Block III, 2 miles E. of Vaddangewardiya, N of Kataragama, *Wirawan* 658 (NY).

*Distribution.* Tropical Africa, southern Asia, Malesia and northern Australia. Sandy beach; in Ceylon rather scarce.

In southern Asia the bulbs of this species is sometimes eaten by natives.

9. ***Cyperus stoloniferus*** Retzius, Obs. Bot. 4: 10, 1786; C. B. Clarke, Fl. Brit. India 6: 615, 1893 & Illustr. Cyper. t. 19 f. 1-3, 1909; Trimen & Hook. f., Handb. Fl. Ceylon 5: 36, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 106, 1935; Blake, Univ. Queensl. Papers 2 (2): 9, t. 7, 1942; Kern, Fl. Males. I, 7 (3): 606, f. 50, 1974.

Jaffna District: Punkudutivu, lagoon edge, *Kundu & Balakrishnan* 670 (US). Mannar District: End of the Causeway at Mile 145, *T. Koyama et al.* 13923 (NY, PDA, US). Puttalam District: Puttalam Lagoon, ca. 6 miles N of Mampuri, *T. Koyama et al.* 13912 (NY, PDA, US); Pallugaturai. W of Wilpattu National Park, *Davidse et al.* 8217 (NY, PDA, US). Trincomalee District: Irrakkakandi, N of lagoon, ca. 12 miles NNW of Trincomalee, *T. Koyama et al.* 14067 (NY, PDA, US). Colombo District: Negombo, *Simpson* 7926 (PDA); Mount Lavinia, *Trimen* in 1981 (PDA); Kalagedihena, *Amaratunga* 1406 (PDA).

*Distribution.* Madagascar, Mauritius, India, Indo-China, Malesia and Australia. In Ceylon rather frequent at margins of brackish lagoons, often forming a large community.

10. ***Cyperus rotundus*** L., Sp. Pl. ed. 1, 45, 1753; Thwaites, Enum. Pl. Zeyl. 343, 1864; C. B. Clarke, Fl. Brit. India 6: 614, 1893; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 107, f. 13, 1935; S. T. Blake, Univ. Queensl. Papers 2 (2): 8, t. 4, 1942; Kern, Fl. Males. I, 7 (3): 604, f. 49, 1974.

Jaffna District: Jaffna, *Gardner C.P.* 804, ex p. (PDA). Anuradhapura District: Minneriya Tank, *Thwaites C.P.* 804 ex p. (K, PDA); Anuradhapura, *Sinniah* in 1926 (PDA). Polonnaruwa District: Kanniyai, *Ramanathan* 421 (PDA); Mile 79 on Rd. A 15, 1 m alt., *Davidse* 7568 (MO, NY). Kurunegala District: Melsiripura, *Amaratunga* 1333 (PDA). Matale District: Nalande, *Alston* 640 (PDA). Kandy District: Peradeniya, *Thwaites C.P.* 804 in part (PDA); Kadugannawa, *Alston* 1089 (PDA); between Balana and Alagalla, *Comanor* 1187

(PDA, US); Haragama, *Alston* in 1926 (PDA); Gannoruwa, *Alston 300* (PDA); Katugastota, *Amaratunga 1088* (PDA).

*Distribution.* A cosmopolitan weed seen in tropical, subtropical and temperate regions of all the world.

11. *Cyperus tuberosus* Rottboell, Descr. Icon. Rar. Nov. Pl. 28, t. 7 f. 1, 1773; C. B. Clarke, Fl. Brit. India 6: 616, 1893, in part.

*Cyperus rotundus* L. subsp. *tuberosus* (Rottb.) Kükenthal, Pflanzenr. 4 (20), 101 Heft: 113, 1936.

Trincomalee District: Trincomalee, *Ramanathan s.n.* (PDA). Polonnaruwa District: Polonnaruwa, *Alston 292* (PDA). Mannar District: opposite to Mannar, Mile 145 on A 14, end of the causeway, *T. Koyama et al. 13924* (NY, PDA, US); along Rd. A 14, Mile 123, near the junction with Madhu Rd., *T. Koyama et al. 13918* (NY, PDA, US). Vavuniya District: Palayanalankulan, Mile 120 on Rd. A 14, *T. Koyama et al. 13936* (NY, PDA, US). Matale District: between Dambula and Habarane, at Mile 96 on Rd. A 6, *T. Koyama & Herat 13563* (NY, PDA, US); vicinity of Mile 40, between Naula and Dambula, *Jayasuria 59* (PDA).

*Distribution.* Eurasia.

12. *Cyperus retzii* Nees in Wight, Contrib. Bot. India 82, 1834.

*Cyperus rotundus* L. subsp. *retzii* (Nees) Kükenthal, Pflanzenr. 4 (20), 101 Heft: 114, 1935.

Central Province: without definite locality, *Thwaites C.P. 3750* (PDA).

*Distribution.* So far known from India, Ceylon and Australia; rare.

*Thwaites' C.P. 3750* cited above is the only Ceylonese collection of this species. In this specimen relatively broad spikelets ranging from 2.8 to 3.25 mm in width bear lance-ovate glumes which have two closely situated parallel veins on both sides of the mid-nerve and attain as much as 4 mm in length. Its achenes, average being 1.25 mm long, tend to be slightly larger than those of *C. rotundus*. Because of these characters the identity of *C.P. 3750* seems certain though I have not seen as yet the type of *C. retzii*.

13. *Cyperus scariosus* R. Brown, Prodr. 216, 1810; C. B. Clarke, Fl. Brit. India 6: 612, 1893 & Illustr. Cyper. t. 15 f. 2-3, 1909; S. T. Blake, Univ. Queensl. Papers 2 (2): 9, t. 2, 1942; Kern, Reinwardtia 2: 103, f. 3, 1952 & Fl. Males. I, 7 (3): 607, 1974.

*Cyperus corymbosus* Rottb. var. *scariosus* (R. Br.) Kükenthal, Pflanzenr. 4 (20), 101 Heft: 83, 1935. — *Cyperus mitis* Steudel, Synops. Pl. Glumac. 2: 316, 1855; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 103, 1935; Abeywickrama, Ceylon Journ. Sci., Biol. Sci., 2 (2): 134, 1959.

Jaffna District: between Poonaryn and Elephant Pass, along Jaffna Lagoon, *T. Koyama et al. 14048* (NY, PDA, US); Jaffna, *Silva* in 1920 (PDA); near Ampan, *Clayton 5235* (K, PDA); Keerimalai, Point Pedro, *Clayton 5203* (K, PDA); Puttalam District: between Puttalam and Kurunegala, *Trimen* Aug. 1883 (PDA); Madampe, *Amaratunga 2577* (PDA). Matale District: between Dambula and Habarane at Mile 96 on Rd. A 6, *T. Koyama & Herat 13564* (NY, PDA, US); Dambula, *Thwaites C.P. 3966* (K, PDA). Hambantota District: Tissamaharama, *Trimen* Dec. 1882 (PDA).

*Distribution.* Madagascar, India to Indo-China, Malesia, Australia.

Among very confusing nut-grasses *C. scariosus* can be easily recognizable by its filiform, obtuse-tipped spikelets which are only 1.5 to 2 mm wide. In Ceylon I saw this species growing together with *C. tuberosus* and *C. rotundus* respectively in two habitats, where I have seen no evidence of hybrids with the latter species.

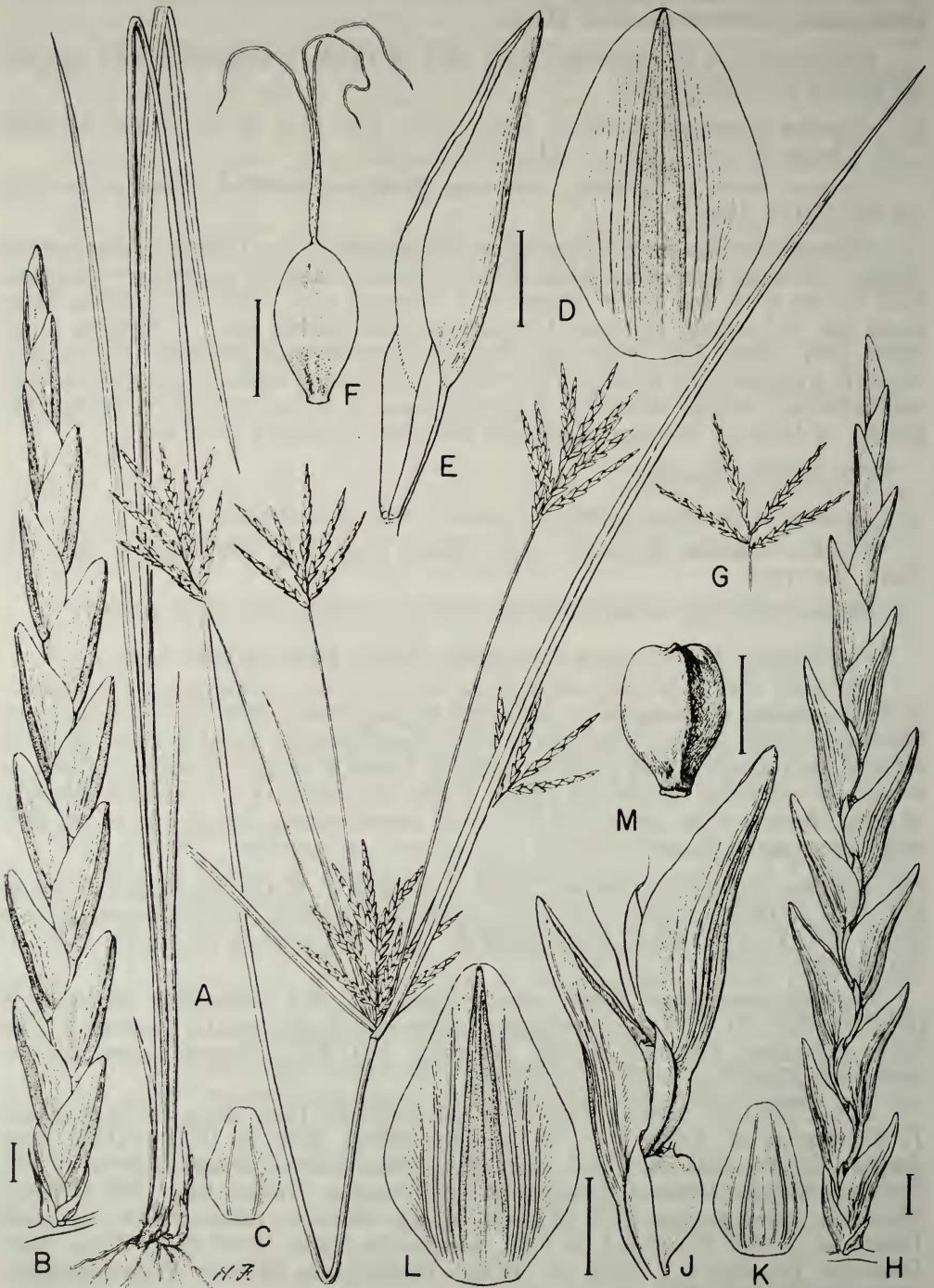


Fig. 3. *Cyperus tenuiculmis* Steudel. A, habit. B, spikelet. C, prophyll at the base of spikelet. D, glume. E, lateral view of glume showing its hyaline extension of the base. F, achene.

*Cyperus zollingeri* Steudel. G, cluster of spikelets. H, spikelet. J, portion of spikelet showing glumes and achenes. K, prophyll. L, glume. M, achene. = 1 mm.

14. *Cyperus sphacelatus* Rottboell, Descr. Pl. Rar. Progr. 21, 1772 & Descr. Icon. Rar. Nov. Pl. 26, 1773. Kükenthal, Pflanzenr. 4 (20), 101 Heft: 129, 1935; Kern, Reinwardtia 2: 107, f. 5, 1952, & Fl. Males. I, 7 (3): 609, 1974.

Kandy District: Peradeniya, Univ. of Ceylon Campus, 500 m alt., *Comanor* 321 (NY, US); ca. 5 miles SE of Gampaha, Mile 18/6 on Rd. A 5, 720 m alt., *Davidse et al.* 7922 (MO, NY, PDA, US). Colombo District: Horana, *Alston* 976 (PDA).

*Distribution.* Tropical America and tropical Africa; introduced to Ceylon, Malesia, Queensland and Tahiti.

The introduction of this species into Ceylon seems pretty old as it was already collected by Alston in the beginning of 1900.

15. *Cyperus tenuiculmis* Böckeler, Linnaea 36: 286, 1870; Kern, Reinwardtia 3: 30, 1954, & Fl. Males. I, 7 (3): 608, 1974. ——— Fig. 3 A-F

"*Cyperus zollingeri* Steudel" *sensu* C. B. Clarke, Fl. Brit. India 6: 613, 1893, & Illustr. Cyper. t. 8 f. 1-2, 1909; Trimen & Hook. f., Handb. Fl. Ceylon 5: 35, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 133, 1935.

Kandy District: Hantana, *Mueller-Dombois et al.* June 18, 1968 (PDA). Nuwara-Eliya District: Ramboda, 1180 m alt., *T. Koyama* 13620 (NY); Hakgala, *Mueller-Dombois et al.* Jan. 1968 (PDA, US). Badulla District: ca. 8 miles E of Mahiyangana, 3.5 miles N of Mile 53 on Mahiyangana-Pediyatalawe Rd., *T. Koyama et al.* 13977 (NY, PDA, US); Diyatalawa, *Mueller-Dombois et al.* Jan. 14, 1968 (PDA). Monaragala District: E of the south end of Jayanthiwewa Tank, *T. Koyama et al.* 13993 (NY, PDA, US).

*Distribution.* Throughout the tropics of the Old World with the range extending northwards to southern Japan in eastern Asia.

16. *Cyperus zollingeri* Steudel [in Zollinger, Syst. Verz 1: 62, 1854, name only, &] Synops. Pl. Glumac. 2: 17, 1855; Kern, Reinwardtia 3: 28, 1954 & Fl. Males. I, 7 (3): 608, 1974. ——— Fig. 3 G-M

*Cyperus ramosii* Kükenthal in Fedde, Repert. Sp. Nov. 21: 326, 1925, & Pflanzenr. 4 (20), 101 Heft: 136, 1935; Kern, Reinwardtia 2: 109, f. 7, 1952.

Hambantota District, Ruhuna National Park: Yala Dunes, Ecology Project Plot R26, *Cooray* 8 Dec. 1969 (NY, PDA, US); Block I, at Rugamtota, *Mueller-Dombois et al.* 7 Mar. 1969 (NY, US); Kumbukkan Oya, ca. 2 miles above mouth, at Magabakanda Meda Duwa, Block II, *Fosberg et al.* 51107 (NY, PDA, US).

*Distribution.* Tropical Africa, Madagascar, Malesia, northern Australia. In Ceylon rare in open grassy places on sandy soil.

New to the flora of Ceylon. This species differs from the better known *C. tenuiculmis* by the softer leaves and bracts, annual tufted habit without stolons, and smaller floral parts as illustrated in Fig. 3.

17. *Cyperus distans* L. f., Suppl. Sp. Pl. 103, 1781; Thwaites, Enum. Pl. Zeyl. 344, 1864; C. B. Clarke, Fl. Brit. India 6: 607, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 30, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 137, 1935; Kern, Fl. Males. I, 7 (3): 610, 1974.

Polonnaruwa District: W of Siva Devale in Sacred Area Section 2A, *Ripley* 369 (PDA). Kegalle District: Kadugannawa, *Grupe* 213 (PDA, US). Nuwara Eliya District: Hakgala Botanic Garden, *Clayton* 5784 (K, PDA); Maturata, *Ferguson* in 1906 (PDA). Kandy District: Peradeniya, *Thwaites C.P. 810* ex p. (K, PDA); Gannoruwa, *Alston* 319 (PDA); ca. 2 miles E. of Maddakele, slope N.W. of Kunckles Peak, 1440 m alt., *Davidse* 8320 (MO, NY, PDA, US). Batticaloa District: Batticaloa, *Thwaites C.P. 810* in part (PDA).

*Distribution.* Pantropic.

18. *Cyperus nutans* Vahl, Enum. Pl. 2: 363, 1806; C. B. Clarke, Fl. Brit. India 6: 607, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 31, 1900; C. E. C. Fischer in Gamble, Fl. Madras 9: 1640; 1931; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 144, f. 5 A-D, 1935; Kern, Fl. Males. I, 7 (3): 609, 1974.

*Cyperus distans* L. var. *major* Thwaites, Enum. Pl. Zeyl. 432, 1864.

18a. Subsp. *nutans*.

Anuradhapura District: Anuradhapura, *Thwaites* in 1881 (PDA); Wilpattu National Park, ca. 2.7 miles to Ranger's Office along pass from southern entrance, *T. Koyama & Jayasuria 13967* (NY, PDA, US). Trincomalee District: Trincomalee, *Brodie C.P. 3844* (PDA). Matale District: Dambulla, *Thwaites C.P. 3966* in part (PDA). Colombo District: Galapitamada, *Amaratunga 1148* (PDA). Monaragala District: E of south end of Jayanthiwewa Tank, *T. Koyama et al. 13992* (NY, PDA, US). Hambantota District: Ruhuna National Park, Yala Plain, *Comanor 863A* (NY, US).

*Distribution.* India. southern China and Malesia.

18b. Subsp. *eleusinoides* (Kunth) T. Koyama, *stat. nov.*

*Cyperus eleusinoides* Kunth, Enum. Pl. 2: 29, 1937; C. B. Clarke, Fl. Brit. India 6: 608, 1893; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 144, 1936. ——— *Cyperus nutans* Vahl var. *eleusinoides* (Kunth) Haines, Bot. Bihar Orissa 5: 898, 1924; Kern, Fl. Malesiana I, 7 (3): 610, 1974.

Kandy District: Haragama, *Trimen C.P. 3044* (PDA). Hambantota District: Ruhuna National Park, *Mueller-Dombois et al.* Jul. 1967 (PDA).

*Distribution.* Tropical Africa, India to Malesia and northern Australia, also extending northwards to the Ryukyus.

*Cyperus nutans* and *C. eleusinoides* are very similar to one another, and the only reliable difference between the two is the more densely disposed, longer spikelets in the latter. But, this difference becomes obscure as ssp. *subprolixus* of the Ryukyus and Taiwan comes between the two as to the density and the number of florets in the spikelet. I, therefore, regard *C. eleusinoides* as a subspecies of *C. nutans*.

19. *Cyperus procerus* Rottboell, Descr. Icon. Rar. Nov. Pl. 29, t. 5 f. 3, 1773; Thwaites, Enum. Pl. Zeyl. 343, 1864; C. B. Clarke, Fl. Brit. India 6: 610, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 34, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 91, 1935; Kern, Fl. Males. I, 7 (3): 611, f. 51, 1974. ——— **Fig. 4**

Jaffna District: Murunkan, *Silva* in 1917 (PDA). Vavunia District: Vavunia, *Clayton 5306* (K, PDA); near Kokkavil, *Clayton 5292* (K, PDA). Anuradhapura District: Anuradhapura, *Trimen* Dec. 1884 (PDA); Alankulam, *Trimen* Oct. 1883 (PDA); Mile 123 on Rd. A 14, E of Medachchiya, *T. Koyama et al. 13921* (NY, PDA, US). Wilpattu National Park: Kuda Pathessa, *T. Koyama & Herat 13394* (NY, PDA, US); Periya Naga Villu, *Wirawan et al. 903* (US); Manikepola Uttu, *T. Koyama 13461* (NY, PDA, US); Wilpattu West Sanctuary, Mari Villu, *T. Koyama 13972* (NY, PDA, US). Batticaloa District: Batticaloa, *Thwaites C.P. 3752* (K, PDA); Ottawady, opposite to Valaichchenai, *T. Koyama & Herat 13582* (NY, PDA, US). Mannar District: Murunkan, *Silva* in 1917 (PDA); Illupadichchennai, *Lord s.n.* (PDA). Puttalam District: Madampe, *Amaratunga 2575* (PDA). Matale District: Dambulla, *Thwaites C.P. 3752* in part (K, PDA); between Naula and Dambulla, vicinity of Mile 40, *Jayasuria 60* (PDA). Kandy District: Siyambalatenna, *Alston 390* (PDA); Peradeniya, *Thwaites C.P. 802* (PDA), *Alston 1181* (PDA). Kurunegala District: Kurunegala, *Thwaites C.P. 3752* in part (PDA). Colombo District: Colombo, *Ferguson s.n.* (PDA). Hambantota District: Tissamaharama, *Alston 1179* (PDA); Ruhuna National Park, Block II, 7 m alt.



Fig. 4. *Cyperus procerus* Rottboell. AA, habit. B, spikelet. C, prophyll. D, glume. E, achene. Scales for floral parts = 1 mm.

*Comanor 1037* (PDA), US). Amparai District: Helawe Eliya, ca. 7 miles S. of Panama, E. of Helawe Lagoon, *T. Koyama et al. 14024* (NY, PDA, US).

*Distribution.* India, Ceylon, Indo-China, Taiwan, Malesia, Australia (Queensland). In Ceylon abundant in marshy places at low altitude.

20. *Cyperus pilosus* Vahl, Enum. Pl. 2: 354, 1806; Thwaites, Enum. Pl. Zeyl. 344, 1864; C. B. Clarke, Fl. Brit. India 6: 609, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 32, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 92, 1935; Kern, Fl. Malesi I, 7 (3): 611, f. 52, 1974.

*Cyperus marginellus* Nees in Wight, Contrib. Bot. India 83, 1834. — *Cyperus obliquus* Nees in Wight, l.c. 86, 1834.

Nuwara Eliya District: between Pussellawa and Ramboda, Mile 32/8 on Nuwara-Eliya-Kandy Rd., 1000 m alt., *T. Koyama 13617* (NY, PDA, US). Badulla District: Haptale, *Silva* in 1906 (PDA). Kandy District: Rangala, *Ferguson* Sept. 1885 (PDA). Kalutara District: Korosduwa, *Amaratunga 2541* (PDA); Kande Kanda, *Amaratunga 2523* (PDA). Kegalle, District: Kegalle, *Amaratunga 1651* (PDA); Kattiyakumbura, *Amaratunga 1589* (PDA); Nayinankada, 700 m alt., *T. Koyama & Samarakoon 13561* (NY, PDA, US). Kurunegala District: Naramunala, *Amaratunga* in 1966 (PDA); Malsiripura, *Amaratunga 1330* (PDA). Ratnapura District: 11 miles E of Deniyaya at Mile 62 on Rd. A 17, 750 m alt., *Davidse 7876* (MO, NY, PDA, US). Galle District: Akeemana, *Alston 1187* (PDA); Moragoda, *Amaratunga 2359* (PDA). Monaragala District: Inginiyagala National Park, between Baduluwila and "Westminster Abbey", *T. Koyama et al. 13994* (NY, PDA, US); E of south end of Jayanthiwewa, *T. Koyama et al. 13988* (NY, PDA, US).

*Distribution.* Rather widely distributed in tropical and subtropical regions of the Old World from tropical West Africa through Central Asia and Indian Sub-Continent eastwards to Malesia and northern Australia. In eastern Asia the range extending northwards as far as to warm-temperate Japan.

Although this species is highly variable in the dimension of leaves and inflorescences, it is well demarcated by the subdensely hispid rhachis of spikes.

21. *Cyperus compressus* L., Sp. Pl. ed. 1, 46. 1753; Thwaites, Enum. Pl. Zeyl. 342, 1864; C. B. Clarke, Fl. Brit. India 6: 605, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 33, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 156, f. 4 A-D, 1935; Kern, Fl. Males. I, 7 (3): 617, 1974.

21a. Subsp. **compressus**.

Jaffna District: Jaffna, *Trimen* Feb. 1890 (PDA), *Silva* in 1920 (PDA). Vavunia District: S of Mullaittivu, *Fosberg & Balakrishnan 53527* (NY, US). Polonnaruwa District: Gal Oya Reservoir, near the spillway, 270 m alt., *Comanor 561b* (US). Trincomalee District: 7 miles S of Dambulla on Kandy Rd., *Clayton 5078* (K, PDA); between Naula and Dambulla, vicinity of Mile 40, *Jayasuria 57* (PDA). Kurunegala District: Kurunegala, *Thwaites C.P. 812* (K, PDA). Kandy District: Peradeniya, *Trimen C.P. 812* (PDA); Kandy, *Alston* in 1926 (PDA). Colombo District: Danowita, *Amaratunga 1450* (PDA). Hambantota District: Ruhuna National Park, Gonalabbe, Block I, *Cooray & Balakrishnan* 20 Jan. 1969 (US). Monaragala District: E of the south end of Jayanthiwewa, *T. Koyama et al. 13991* (NY, PDA, US); way to Nilgola, *Trimen* Jan. 1888 (PDA); Inginiyagala, *Amaratunga 1706* (PDA).

*Distribution.* Cosmopolitan; tropical, subtropical and temperate regions of all world; weed of cultivated and waste places, more frequent along sea coast.



21b. Subsp. *micranthus* T. Koyama, *subsp. nov.*

Planta omnibus partibus minor; inflorescentia semper in capitulum unicum congesta; glumae 2 mm longae; achaenia obovato-orbicularia, basi valde attenuantia, vix 1 mm longa, 0.75 mm lata; caeteroquin sicut ssp. *compressus*.

Trincomalee District: exposed eastern bottom of Kantalai Tank at Mile 134 on Habarana-Trincomalee Rd., *Davidse 7561* (NY, holotype; MO, isotype).

*Distribution.* Thus far known only by the collection cited above.

Subspecies *micranthus* differs from the typical phase primarily by the smaller glumes (2 mm vs. ca. 3.5 mm in length) and achenes (1 by 0.75 mm vs. 1.5 by 1 mm in size) in addition to its comparatively smaller habit with always congested inflorescences. Besides the fertile achenes every detail of floral parts shows no evidence of the possible hybrid nature of this subspecies, though it has been known that *C. compressus* rather freely hybridize with several species. So far I have not come across as yet any specimen of *C. compressus* bearing such smaller glumes and achenes from its total range.

22. *Cyperus iria* L., Sp. Pl. ed. 1, 45, 1753; Thwaites, Enum. Pl. Zeyl. 344, 1864; C. B. Clarke, Fl. Brit. India 6: 606, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 18, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 150, 1935; Kern, Fl. Males. I, 7 (3): 616, 1974.

Jaffna District: *Jaffna*, Silva Nov. 1920 (PDA). Trincomalee District: Trincomalee, *Ramanathan* Jul. 1926 (PDA). Anuradhapura District: Mile 123 on Rd. A 14, *T. Koyama et al. 13920* (NY, PDA, US); Wilpattu National Park, Manikepola Uttu, *T. Koyama & Jayasuria 13951* (NY, PDA, US). Matale District: between Mirisgoniyawa and Dambulla, *Silva* Nov. 1926 (PDA); between Naula and Dambulla, vicinity of Mile 40, *Jayasuria 55* (PDA); Matale North, *Jayasuria 53* (PDA). Kandy District: Peradeniya, *Trimen C.P. 811* (K, PDA); Pundaluoya, *Hughes* Dec. 1902 (PDA). Kurunegala District: Kurunegala, *Thwaites C.P. 811* in part (PDA). Colombo District: Giriulla, *Amaratunga 998* (PDA); Veyangoga, *Amaratunga 1946* (PDA). Kalutara District: Bolgoda, *Amaratunga 2524* (PDA). Ruhuna National Park: Buttawa Plain, near Ecology Project Plot R35, *Cooray* 12 Dec. 1969 (US); Yala Plain, Patanagala Beach, 3 m alt., *Comanor 863B* (NY, US).

*Distribution.* Widely distributed in Asia from Iran and Afghanistan through Indian Subcontinent northeastwards to China and Japan, and eastwards to Malesia and Australia; also in East Africa. Apparently introduced to southeastern U.S.A., West Indies and South America. Common weed in cultivated ground and rice field.

23. *Cyperus diffusus* Vahl, Enum. Pl. 2: 321, 1806; C. B. Clarke, Fl. Brit. India 6: 603, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 28, 1900 Kükenthal, Pflanzenr. 4 (20), 101 Heft: 208, 1936; Kern, Fl. Males. I, 7 (3): 619, 1974.

*Cyperus nigro-viridis* Thwaites, Enum. Pl. Zeyl. 344, 1864.

23a. Subsp. *diffusus*.

Kurunegala District: Kurunegala, *Thwaites C.P. 2879* (PDA).

*Distribution.* India, Indo-China, southern China and Malesia.

23b. Subsp. *macrostachyus* (Böckleler) T. Koyama, *stat. nov.*

*Cyperus diffusus* Vahl var. *macrostachyus* Böckeler, Linnaea 35: 534, 1868; Trimen & Hook. f., Handb. Fl. Ceylon 5: 28, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 209, 1936; Kern, Fl. Males. I, 7 (3): 619, f. 54, 1974. ——— *Cyperus pubisquama* Steudel [in Zollinger, Syst. Verz. 1: 62, 1854, nomen.] Synops. Pl. Glumac. 2: 20, 1855.

Kurunegala District: Kurunegala, *Thwaites C.P. 3931* (PDA); Mallawapitiya, *Amaratunga 1101* (PDA); Athagala, *Amaratunga 678* (PDA). Matale District: Matale, *Ferguson Oct. 1884* (PDA).

*Distribution.* From India through Indo-China eastwards to Malesia.

Subspecies *macrostachyus* differs from the typical phase in its generally larger habit, far more copious inflorescence and longer spikelets as mentioned in the key to species. In Ceylon subsp. *diffusus* is very rare, and has so far been documented only by *Thwaites C.P. 2879*.

24. **Cyperus platystylis** R. Brown, Prodr. Fl. Nov. Holl. 214, 1810; C. B. Clarke, Fl. Brit. India 6: 598, 1893; Trimen & Hook, f., Handb. Fl. Ceylon 5: 24, 1900; C. E. C. Fischer in Gamble, Fl. Madras 9: 1639, 1931; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 185, f. 21, 1936; Kern, Fl. Males. I, 7 (3): 618, 1974. ——— Fig. 5

*Cyperus pallidus* Nees [Linnaea 9: 284, 1835, nomen nudum, &] in Wight, Contrib. Bot. India 79, 1834; Thwaites, Enum. Pl. Zeyl. 34, 1864. Not of Willdenow ex Link, 1820, nor of Savi, 1830. ——— *Anosporum pallidum* (Nees) Böckeler, Linnaea 36: 412, 1870.

Kurunegala District: Kurunegala, *Trimen C.P. 3559* in part (PDA); Wariyapola, *Amaratunga 1104* (PDA). Batticaloa District: Kalmunai, *Ahmed Aug. 1940* (PDA); Batticaloa *Trimen C.P. 3559* in part (K, PDA). Amparai District: Lahu-gala Tank, *T. Koyama et al. 14030* (NY, PDA, US). Colombo District: Mutu-rajawela, *Amaratunga 144* (PDA).

*Distribution.* India and Ceylon to Taiwan, and through Malesia eastwards to northern and eastern Australia. In marshes and ponds usually growing in large communities.

This rare species is easily discernible in its achenes with spongy thickened angles and densely spiculose hemispherical umbel. The rhizomes are often more or less elongated and obliquely ascending, but do not emit stolons.

25. **Cyperus alternifolius** L., Mant. 2: 28, 1771.

This species, known from East Africa and Madagascar, is represented in Ceylon by the following.

Subsp. *flabelliformis* (Rottboell) Kükenthal, Pflanzenr. 4 (20), 101 Heft: 193, 1936.

*Cyperus flabelliformis* Rottboell, Descr. Pl. Rar. Progr. 22, 1772, & Descr. Icon. Rar. Nov. Pl. 42, t. 12 f. 2, 1773.

Badulla District: Rawanaella Waterfall, ca. 2 miles SE of Ella, Mile 13, 780 m alt., *Davidse et al. 8858* (MO, NY, PDA, US). Monaragala District: 4 miles N of Wellawaya, *Wheeler 12689* (PDA, US).

*Distribution.* A native of tropical Africa and Arabia. Widely cultivated as an ornamental; in Ceylon escaped and established in grassy places.

26. **Cyperus radians** Nees & Meyen [ex Nees, Linnaea 9: 285, 1835, nomen nudum,] ex Kunth, Enum. Pl. 2: 95, 1837, as "*radicans*"; C. B. Clarke, Fl. Brit. India 6: 605, 1893; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 214, 1936; Kern, Fl. Males. I, 7 (30): 623, 1974.

Trincomalee District: seashore several miles E of Toppur, ca. 15 miles SE of Trincomalee, *T. Koyama 14060b*. (NY).

*Distribution.* Indo-China, Malay Peninsula, southeastern China, Borneo. Sporadically noted in sandy sea coast.

New to the flora of Ceylon. The above collection marks a considerable range extension of this southeastern Asian species into the Indian Subcontinent. This is a



Fig. 5. *Cyperus platystylis* R. Brown. AA, habit. B, spikelet. C, glume. D, dorsal view of achene. E, ventral side of achene. Scales = 1 mm.

peculiar looking species growing in sand. Since the culms are normally extremely abbreviated and hidden in the leaf tuft, the elongated umbel rays look like tufted culms.

27. *Cyperus pulcherrimus* Willdenow ex Kunth, Enum. Pl. 2: 1837; C. B. Clarke, Fl. Brit. India 6: 600, 1893, & Illustr. Cyper. t. 10 f. 1-3, 1909; Trimen & Hook. f., Handb. Fl. Ceylon 5: 27, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 242, 1936; Kern, Fl. Males. I, 7 (3): 624, 1974.

“*Cyperus silletensis* Nees” sensu Thwaites, Enum. Pl. Zeyl. 343, 1864.

Wilpattu National Park: between Kattankandal Kulam and Occapu Junction, *Wirawan et al.* 977 (US); Manikepola Uttu, *T. Koyama et al.* 13462 (NY, PDA, US); between Kunbuk Wila and Kokkare Villu, *T. Koyama & Jayasuria* 13946b (NY); Malimaduwa Guards Quater, *Wirawan & Cooray* 1141 (NY, PDA). Batticaloa District: Batticaloa, *Trimen C.P.* 3558 (K, PDA). Kurunegala District: Kurunegala, *Rasanayaka* in 1927 (PDA). Matale District: 8 miles E. of Habarane, *T. Koyama & Herat* 13567 (NY, PDA, US). Colombo District: Kotugoda, *Amaratunga* 2027 & 2262 (PDA).

*Distribution.* India, Indo-China, Malasia.

28. *Cyperus haspan* L., Sp. Pl. ed. 1, 45, 1753; Thwaites, Enum. Pl. Zeyl. 343, 1864; C. B. Clarke, Fl. Brit. India 6: 600, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 26, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 247, f. 28 E-G, 1936; Kern, Fl. Males. I, 7 (3): 624, ff. 56 & 57, 1974.

Anuradhapura District: Anuradhapura, *Brodie C.P.* 799 (K, PDA); Wilpattu National Park, Manikepola Uttu, *T. Koyama & Jayasuria* 13953 (NY, PDA, US). Trincomalee District: Trincomalee, *Glenie C.P.* 799 in part (PDA); Periya Kulam, ca. 7 miles NW of Trincomalee, *T. Koyama et al.* 14066 (NY, PDA, US). Puttalam District: Wilpattu West Sanctuary, Marai Villu, *T. Koyama* 13973 (NY, PDA, US); Madape, *Amaratunga* 2569 (PDA). Vavunia District: Kokkavil, *Clayton* 5294 (K, PDA). Nuwara Eliya District: Rangalla to Corbett's Gap, *Ballard* 1416 (K, NY). Kurunegala District: Kurunegala, *Rasanayake* in 1927 (PDA); Ibbagamuwa, *Amaratunga* 1581 (PDA). Kandy District: Peradeniya, *Alston* 311 (PDA); Upper Hantana Rd., *Comanor* 314 (PDA, US); Hantane, *Thwaites C.P.* 965 in part (K, PDA). Kegalle District: Alapalawala, along river Watura Oya, ca. 500 m alt., *T. Koyama & Samarakoon* 13558 (NY, PDA, US); Mawanella, *Amaratunga* 1199 (PDA). Badulla District: Rd. A 4, ca. 3 miles W of Koslanda, ca. 900 m alt., *T. Koyama et al.* 14032 (NY, PDA, US). Ratnapura District: 11 miles E of Deniyana at Mile 62 on Rd. A 17, 750 m alt., *Davidse* 7885 (MO, NY, PDA, US); Kuruwita, *Trimen* in 1895 (PDA). Colombo District: Muthurajawela, *Amaratunga* 135 (PDA). Kalutara District: Nugegoda, Bolgoda Lake Scheme, *Amaratunga* 2538 (PDA). Galle District: Galle, *Thwaites C.P.* 965 (PDA); Bentota Ganga, *Amaratunga* 2332 (PDA); Ambalangoda, *Amaratunga* 2642 (PDA). Monaragala District: ca. 3 miles W. of Wellawaya at Mile 135/10 on Rd. A 4, 990 ft. alt., *Davidse* 7731 (MO, NY).

*Distribution.* Tropical and subtropical regions of all the world with its range extending northwards into Japan in East Asia. Abundant in wet places; frequent in rice fields.

This species is sometimes divided into two subspecies, ssp. *haspan* and ssp. *junciformis* Kükenthal, the latter differing from the typical phase in having long-creeping rhizome along which the culms are disposed in a row in a more or less spaced manner. In plants from Asia these two subspecies seem quite well circumscribed, and consequently, appear to be recognizable. Typical ssp. *haspan*, with the culms tufted without conspicuous rhizome, is often confused with closely related *C. tenuispica*. The only reliable character to separate these two are floral glumes. In *C. tenuispica* the floral glumes are spaced exposing a considerable part of the

subtending achene between two glumes, while in *C. haspan* the achenes are completely hidden by the closely disposed glumes.

29. **Cyperus tenuispica** Steudel, Synops. Pl. Glumac. 2: 11, 1855; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 245, f. 28 A-D, 1936; Kern, Fl. Males. I, 7 (3): 625, f. 58, 1974.

“*Cyperus flavidus* Retzius” sensu C. B. Clarke, Fl. Brit. India 6: 600, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 27, 1900.

Jaffna District: Mullaitiva, *Ferguson s.n.* (PDA); south shore of Jaffna Lagoon, ca. 8 miles SE of Poonaryn, *T. Koyama et al. 14046* (NY, PDA, US). Wilpattu National Park; Kuda Pathessa, *T. Koyama 13387* (NY). Matale District: Matale north, *Jayasuria 54* (PDA). Kandy District: Paradeniya, *Alston* in 1926 (PDA), *Trimen C.P. 805* (PDA); Gannoruwa, *Alston 315* (PDA). Colombo District: Gampaha, *Simpson 8602* (PDA); Makawita, *Amaratunga 1779* (PDA). Hambantota District: Ruhuna National Park, Block I, Rakinawala, *Cooray 7 Dec. 1969* (US).

*Distribution.* Tropical Africa, India, Nepal, Indo-China, Malesia, south-eastern China, Japan. Wet places; often as a weed in rice field.

30. **Cyperus difformis** L., Cent. Pl. 2: 6, 1756; C. B. Clarke, Fl. Brit. India 6: 599, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 25, 1900; Kükenthal Pflanzenr. 4 (20), 101 Heft: 237, f. 27 F-H, 1936; Kern, Fl. Males. I, 7 (3): 629, 1974.

Trincomalee District: Trincomalee, Ramanathan in 1926 (PDA). Polonaruwa District: ca. 1 mile E of Kolakanaweli, at Mile 56/7 on Rd. A 11, *T. Koyama 13577* (NY). Batticaloa District: Batticaloa, *Thwaites C.P. 3042* (K, PDA). Kandy District: Gannoruwa, *Alston 316* (PDA). Matale District: Ereula Tank, ca. 5 miles SE of Dambulla, 650 ft. alt., *Davidse 7390* (MO, NY). Colombo District: Danowita, *Amaratunga 192* (PDA). Amparai District: Tandiadi Kalapu Lagoon, S of Mile 215 on Rd. A 4, *T. Koyama et al. 14015* (NY, PDA, US). Ruhuna National Park: Komawa Wewa, *Cooray 10 Dec. 1969* (NY, US); Uraniya, *Cooray 22 Mar. 1970* (NY).

*Distribution.* 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 South Africa possibly with rice.

31. **Cyperus castaneus** Willdenow, Sp. Pl. 1: 278, 1797; Thwaites, Enum. Pl. Zeyl. 343, 1864; C. B. Clarke, Fl. Brit. India 6: 598, 1893; Trimen & Hooks. f., Handb. Fl. Ceylon 5: 25, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 264, 1936; Kern, Fl. Males. I, 7 (3): 630, 1974.

Anuradhapura District: Wilpattu National Park, East Intermediate Zone, along Wildlife Dept. Path, ca. 2 km from its barrier gate, *T. Koyama & Jayasuria 13966* (NY, PDA, US). Polonnaruwa District: SE of Giritale Wewa near Circuit Bangalow, *Fosberg et al. 51955* (PDA, US); Polonnaruwa, *Clayton 5115* (K, PDA). Matale District: Dambulla Rock, *Trimen* in 1896 (PDA). Kegalle District: *Simpson 8358* (PDA). Badulla District: between Ratupahana and Haldunmulla, *Ormiston* in 1909 (PDA). Ruhuna National Park: Block I, *Cooray 7 Dec. 1969* (US); between Buttawa and Karangaswela, *Cooray 3 Dec. 1969* (NY, US).

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

32. **Cyperus cuspidatus** Kunth in Humb., Bonpl. & Kunth, Nov. Gen. et Sp. Pl. 1: 204, 1815; C. B. Clarke, Fl. Brit. India 6: 598, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 26, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 261, f. 29 E, 1936; Kern, Fl. Males. I, 7 (3): 629, f. 59, 1974.

*Cyperus angustifolius* Nees in Wight, Contrib. Bot. India 79, 1834.

Anuradhapura District: Wilpattu National Park NE of Kuruttu Pondi Villu, *T. Koyama 13413* (NY). Polonnaruwa District: 7 miles NW of Polonnaruwa, SE of Giritalle Wewa, *Fosberg & Ripley 51955* (US). Nuwara Eliya District: ca. 15 miles NW of Nuwara Eliya, at Mile 32/8 on Road A 5, 1020 m alt., *Davidse et al. 7946* (MO, NY, PDA). Monaragala District: Inginiyagala National Park, between Baduluwila and "Westminster Abbey," *T. Koyama et al. 13997* (NY, PDA, US); ca. 25 miles W of Pottuvil on road to Wellawaya, near Mile 76, *Davidse et al. 8934* (MO, NY, PDA). Hambantota District: Ruhuna National Park, Karasugawela, *Cooray 12 Dec. 1969* (NY, PDA).

*Distribution.* Pantropic, with its range extending north to southern China and Formosa.

33. *Cyperus arenarius* Retzius, Obs. Bot. 4: 9, 1786; Nees in Wight, Contrib. Bot. India 77, 1834; Thwaites, Enum. Pl. Zeyl. 342, 1864; C. B. Clarke, Fl. Brit. India 6: 602, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 23, 1900; C. E. C. Fischer in Gamble, Fl. Madras 9: 1640, 1931; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 270, 1936. — **Fig. 6**

*Bobartia indica* L., Fl. Zeyl. 17, 1747. — *Cyperus conglomeratus* Rottb. var. *arenarius* (Retzius) Cosson, Explor. Algir. Bot. 2: 245, 1855.

Mannar District: Talaimannar, *Silva* in 1916 (PDA). Trincomalee District: Trincomalee, *Glenie C.P. 798* (K, PDA); Puttalam District: Kalpitiya, *Trimen* in 1883 (PDA); Chilaw, *Trimen* in 1880 (PDA); Wilpattu National Park, West Intermediate Zone, Pallugaturai Beach, *Wheeler 12104* (PDA). Batticaloa District: Passikudah, *Mueller-Dombois* in 1968 (PDA); Batticaloa, *Gardener C.P. 798* (PDA). Colombo District: Colombo, *Ferguson C.P. 794* (PDA); Uswetakeiyawa, *Amaratunga 126* (PDA). Amparai District: Pottuvil, Rest House beach, *Bala-krishnan 389* (PDA); Arugam Bay, *T. Koyama et al. 14029* (NY, PDA, US), *Fosberg & Sachet 53043* (NY, US). Hambantota District: Bentota, beach behind rest house, *Ballard 1510* (K, PDA); Ruhuna National Park, beach E of Buttawa Modera, 2-3 m alt., *Fosberg 50315* (US); Patanagala Beach, *Cooray 17 Nov. 1969* (PDA, US).

*Distribution.* Southern Iran, Pakistan, India, Ceylon, Cochinchina.

A coastal species easily recognizable by the whitish head with broad spikelets and extensive rhizome system, with which it usually forms a large pure community.

34. *Cyperus conglomeratus* Rottboell, Descr. Icon. Rar. Nov. Pl. 21, t. 15 f.7, 1773; Thwaites, Enum. Pl. Zeyl. 343, 1864; C. B. Clarke, Fl. Brit. India 6: 602, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 23, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 272, f. 30, 1936.

*Cyperus pachyrrhizus* Nees ex Böckeler, Linnaea 35: 545, 1868; C. B. Clarke, Fl. Brit. India 6: 603, 1893; C. E. C. Fischer in Gamble, Fl. Madras 9: 1640, 1931. — *Cyperus conglomeratus* Rottb. var. *pachy[r]rhizus* (Nees ex Böckeler) Trimen in Trimen & Hook. f., Handb. Fl. Ceylon 5: 23, 1900.

Puttalam District, Wilpattu National Park: Kollankanatta Beach, *Cooray 28 Sept. 1969* (US); Pallugaturai, *T. Koyama & Jayasuria 13960* (NY, PDA, US), *Fosberg et al. 50917* (NY, US), *Wheeler 12105* (PDA).

*Distribution.* Mediterranean Region, North Africa, East Africa, Iran, Arabia, Madagascar, southern India and Ceylon.

This is one of the western Asian element reaching Ceylon. Having compared a good series of Indian and Ceylonese specimens with those from western Asia I am unable to separate Indian plants from western Asian ones.

35. *Cyperus cephalotes* Vahl, Enum. Pl. 2: 311, 1806; C. B. Clarke, Fl. Brit. India 6: 597, 1893, & Illustr. Cyper. t. 6 f. 1-7, 1909; Trimen & Hook. f., Handb. Fl. Ceylon 5: 17, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 292, 1936; Kern, Fl. Males. I, 7(3): 633, ff. 61-62, 1974.

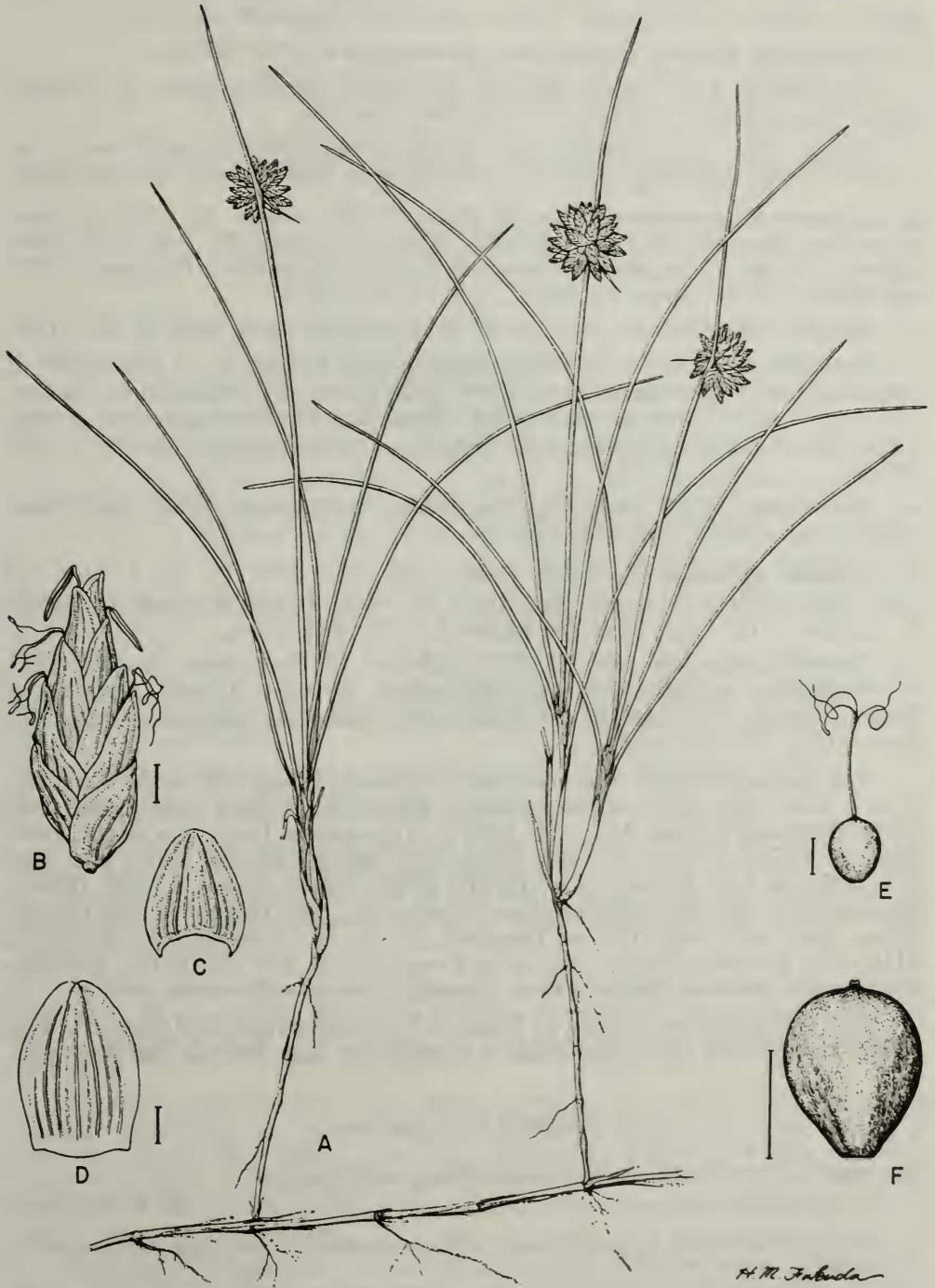


Fig. 6. *Cyperus arenarius* Retzius. A, habit. B, spikelet. C, prophyll. D, glume. E, pistil. F, achene. Scales = 1 mm.

*Cyperus hookerianus* Thwaites, Enum. Pl. Zeyl. 342, 1864. — *Anosporum cephalotes* (Vahl) Kurz, Journ. Asiat. Soc. Bengal 45 (2): 159, 1876.

Kurunegala District: Ibbagamuwa, *Amaratunga* in 1967 (PDA).

*Distribution.* From India through Indo-China northeastwards to southern China, and eastwards to Malesia and northern Australia.

Trimen (op. cit.) reported this species from Galle, Lunugala and Uva. Currently in the Peradeniya Herbarium the specimen cited above is the only sheet.

36. *Cyperus alopecuroides* Rottboell, Descr. Pl. Rar. Progr. 20, 1772, & Descr. Icon. Rar. Nov. Pl. 38, t. 8 f. 2, 1773; Thwaites, Enum. Pl. Zeyl. 342, 1864; Trimen & Hook. f., Handb. Fl. Ceylon 5: 38, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 71, 1935; Kern, Fl. Males. I, 7 (3): 603, 1974

*Juncellus alopecuroides* (Rottb.) C. B. Clarke, Fl. Brit. India 6: 595, 1893.

Anuradhapura District: between Ratmale and Talawa, ca. 7 miles SSW of Anuradhapura, *T. Koyama & Herat 13608* (NY, PDA, US). Polonnaruwa District: Minnariya Tank, *Trimen* in 1884 (PDA). Batticaloa District: Batticaloa, *Trimen C.P. 3560* (K, PDA). Hambantota District: Tissamaharama, *Trimen* in 1882 (PDA).

*Distribution.* North and Tropical Africa, Madagascar, India, Indo-China, Malesia and northern Australia.

37. *Cyperus pygmaeus* Rottboell, Descr. Icon. Rar. Nov. Pl. 20, t. 14 f. 4-5 1773; Nees in Wight, Contrib. Bot. India 72, 1834; Trimen & Hook. f., Handb. Fl. Ceylon 5: 18, 1900; Kern, Fl. Males. I, 7 (3): 634, 1974.

*Juncellus pygmaeus* (Rottb.) C. B. Clarke, Fl. Brit. India 6: 596, 1983.

— *Cyperus michelianus* (L.) Delile subsp. *pygmaeus* (Rottb.) Aschers. & Graebn., Synops. Mitteleur. Fl. 2 (2): 273, 1903; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 312, f. 35 F-G, 1936.

Polonnaruwa District: Gal Oya Reservoir, near spilway, 270 m alt., *Comanor, 561a & 561b* (NY, US). Puttalam District: Palavi Atta Villu, *Cooray* 6 Oct. 1969 (NY); Puttalam, *Trimen* Aug. 1883 (PDA). Trincomalee District: Kantalai Tank, Mile 134 on Rd. A 6, *Davidse 7518* (MO, NY). Mannar District: Aruvi Aru, Mile 125 on Rd. A 4, *T. Koyama et al. 13934B* (NY); Palavi, *Cooray* in 1969 (PDA). Anuradhapura District: Anuradhapura, *Trimen* Oct. 1883 (PDA). Matale District: Eruwa Tank, ca. 5 miles ESE of Dambulla, 650 ft. alt., *Davidse 7391* (MO, NY, PDA, US). Colombo District: Colombo, *Ferguson C.P. 3947* (K, PDA). Hambantota District: Ruhuna National Park, Attaville, *Cooray* 6 Oct. 1969 (NY).

*Distribution.* Widely spread in Eurasia, from Mediterranean Region and East Africa through Asia Minor and India to southeastern Asia, Malesia and Australia.

### PYCREUS P. Beauvois

1. Achenes transversely wrinkled with oblong epidermal cells ..... 38 *P. stramineus*
1. Achenes smoothish to punctulate with isodiametrical or hexagonal epidermal cells
  2. Culms few- to several-nodose below the middle, the lower part decumbent or obliquely ascending, branching and rooting at lower nodes; glumes furrowed on both sides of costa ..... 39 *P. sanguinolentus*
  2. Culms not nodose above the base, erect from very base; glumes not furrowed



3. Culms 20–90 cm tall; glumes acute to subobtusate at apex, never emarginate nor cuspidate
  4. Glumes orbicular-obovate, ca. 1 mm wide in half view, the margins very broadly whitish-hyaline, rounded to apex, spikelets 3 mm wide; culms 2–3 mm thick, mostly solitary ..... **40** *P. puncticulatus*
  4. Glumes ovate to lance-ovate, ca. 0.5 mm wide in half view, hardly or very narrowly hyaline on margins, acute at apex; spikelets ca. 1.5 mm wide; culms 0.7–2 mm thick, as a rule tufted
    5. Lowest bract as long as to at most 2.5 times as long as the umbel, when longer than that, then inflorescence congested in a head; spikelets rusty brown to yellowish brown ..... **41** *P. polystachyos*
    5. Lowest bract 3 to 5 times as long as the umbel; spikelets dark purplish-brown to chestnut-brown ..... **42** *P. flavidus*
3. Culms 1–8 cm tall; glumes truncate to emarginate at apex, the midvein excurrent beyond the glume apex into a recurved mucro
  6. Glumes ovate, close together not exposing achenes; rays normally poorly developed ..... **43a** *P. pumilus* ssp. *pumilus*
  6. Glumes oblong to lance-oblong, spaced, so that achenes exposed between glumes; rays well developed ..... **43b** *P. pumilus* ssp. *membranaceus*

**38. *Pycreus stramineus*** (Nees) C. B. Clarke, Fl. Brit. Ind. **6**: 589, 1893; Alston in Trimen & Hook. f., Handb. Fl. Ceylon **6**: 306, 1931.

*Cyperus stramineus* Nees in Wight, Contrib. Bot. India **74**, 1834; Trimen, Handb. Fl. Ceylon **5**: 19, 1900. Not of Desf. ex Link, 1820. ——— *Cyperus sub-stramineus* Kükenthal, Pflanzenr. **4** (20), 101 Heft: 398, 1936; Kern, Fl. Males. Ser. 1, **7** (3): 653, 1974.

Kurunegala District: Kurunegala, *Trimen C.P. 3776* (PDA).

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

Thus far known from Ceylon by a single collection only. This species closely resembles *P. flavescens* of much wider distribution, from which it differs primarily in its longer spikelets that are 8 to 35 mm long bearing many acute-tipped glumes in contrast to shorter spikelets (6 to 10 mm in length) with several obtuse glumes in the latter.

**39. *Pycreus sanguinolentus*** (Vahl) Nees [Linnaea **9**: 283, 1835. Invalid combination] ex C. B. Clarke, Fl. Brit. India **6**: 590, 1893; C. E. C. Fischer in Gamble, Fl. Presid. Madras **9**: 1627, 1931; Alston in Trimen & Hook. f., Handb. Fl. Ceylon **6**: 307, 1931.

*Cyperus sanguinolentus* Vahl, Enum. Pl. **2**: 351, 1806; Nees in Wight, Contrib. Bot. India **75**, 1834; Thwaites, Enum. Pl. Zeyl. **342**, 1864; Trimen & Hook. f., Handb. Fl. Ceylon **5**: 20, 1900; Kükenthal, Pflanzenr. **4** (20), 101 Heft: 385, 1936; Kern, Fl. Males. Ser. 1, **7** (3): 646, 1974. ——— *Cyperus eragrostis* Vahl, Enum. Pl. **2**: 322, 1806; Trimen, Syst. Cat. Flow. Pl. & Ferns Ceylon **99**, 1885. Not of Lamarck, 1791.

Wilpattu National Park: Manikepola Uttu, *T. Koyama et al. 13460* (NY, PDA, US). Kandy District: Peradeniya, near water fall above University campus, *Comanor 690* (NY): ca. 5 miles S.E. of Gampola, at Mile 18/6 on Gampola-Nuwara Eliya Rd., 720 m alt., *Davidse et al. 7924* (MO, NY). Ratnapura District: 11 miles E. of Diniyaya on Rd. A17, 750 m alt., *Davidse 7586* (MO, NY). Amparai District: Senanaike Samudra, Padagoda, *T. Koyama et al. 13983* (NY, PDA, US).

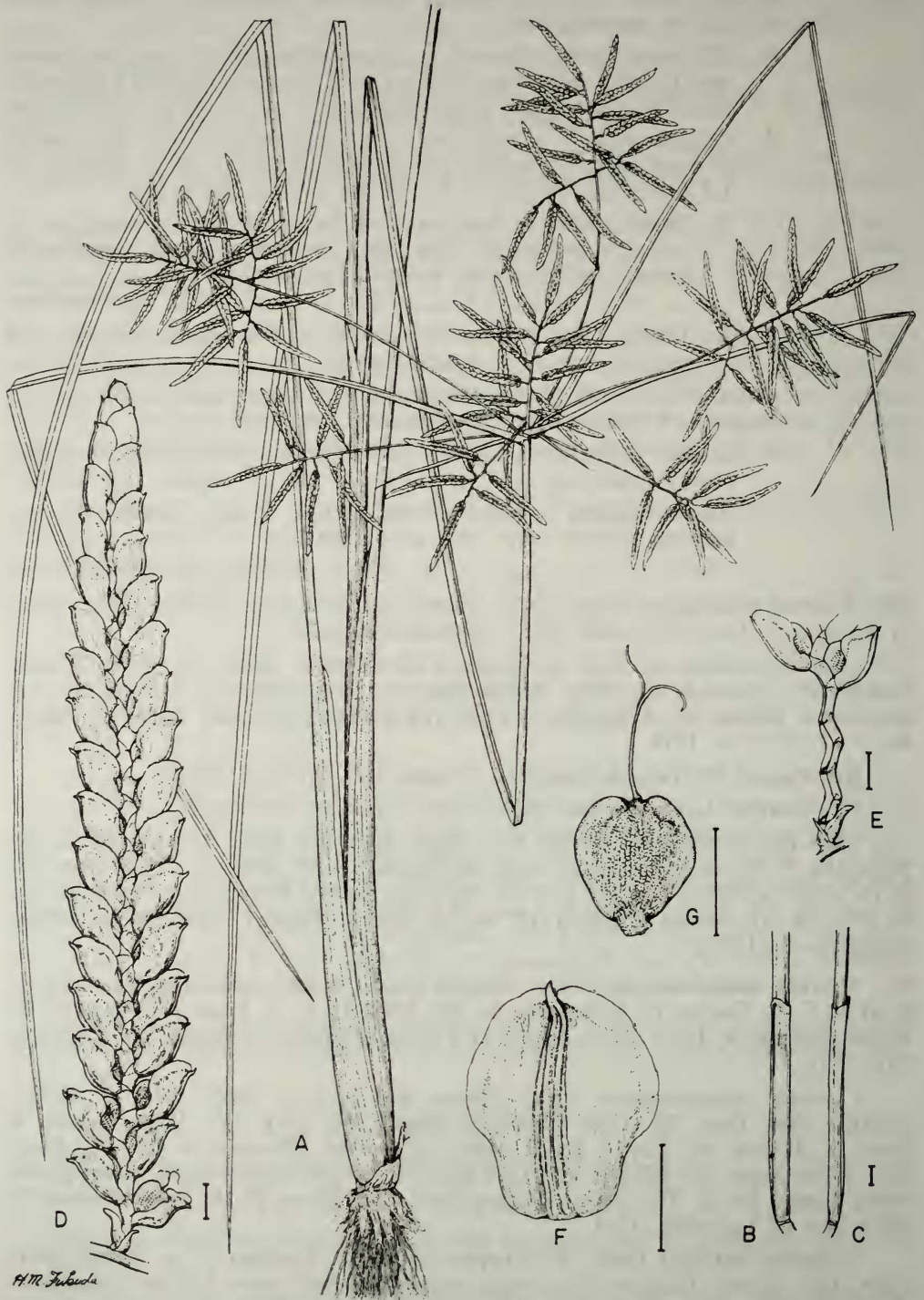


Fig. 7. *Pycurus puncticulatus* (Vahl) Nees. A, habit. B & C, two views of prophyll. D, spikelet. E, portion of rhachilla with two flowers. F, glume. G, lateral view of achene. Scales = 1 mm.

Rather widely distributed in the Old World from northeastern Africa through Afghanistan, India and Indo-China northeastwards to China and Japan, eastwards to Malesia.

40. *Pycreus puncticulatus* (Vahl) Nees, Fl. Brasil. 2 (1): 10, in note, 1842; C. B. Clarke, Fl. Brit. India 6: 593, 1893; C. E. C. Fischer in Gamble, Fl. Presid. Madras 9: 1628, 1931; Alston in Trimen & Hook. f., Handb. Fl. Ceylon 6: 307, 1931. ——— Fig. 7.

*Cyperus puncticulatus* Vahl, Enum. Pl. 2: 348, 1806; Thwaites, Enum. Pl. Zeyl. 342, 1864; Trimen & Hook. f., Handb. Fl. Ceylon 5: 21, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 362, 1936. ——— *Cyperus baccha* Kunth, Enum. Pl. 2: 115, 1837. ——— *Pycreus baccha* (Kunth) Nees, [Linnaea 9: 283, 1835. Invalid combination] Fl. Brasil. 2 (1): 10, 1842. In note.

Trincomalee District: Mavadichchenai, *Alston 544* (PDA); Trincomalee, *Glenie C.P. 3751* in part (PDA). Matale District: Dambulla, *Thwaites C.P. 3751* (K, PDA). Kurunegala District: Kurunegala, *Ranasinghe 843* (PDA). Galle District: Haburagala, *Amaratunga 2315* (PDA). Amparai District: E of Kunukala Kalapuwa Lagoon, ca. 4 miles S of Panama, sea level, *T. Koyama et al. 14027* (NY, PDA, US); Helawe Eliya, ca. 7 miles S of Panama, E of Helawe Lagoon, sea level, *T. Koyama et al. 14025* (NY, PDA, US). Ruhuna National Park: Uraniyawala, ca. 1 mile W of Buttawa, *Fosberg et al. 51018* (US); Palugaswela, Ecology Project Block I, *Cooray 23 Mar. 1970* (NY).

*Distribution.* Rather sporadically noted from southern India (Bombay, Mysore and Madras), Malay Peninsula and Cochinchina.

In the genus *Pycreus* this species is well demarcated by its relatively loose, large umbel with broad, red-brownish spikelets, in which it resembles superficially *Cyperus procerus*, a stoloniferous perennial with trigonous achenes.

41. *Pycreus polystachyos* (Rottboell) P. Beauvois, Fl. d'Oware 2: 48, t. 86, f. 2, 1807; C. B. Clarke in Hook. f., Fl. Brit. India 6: 592, 1893; Alston in Trimen & Hook. f., Handb. Fl. Ceylon 6: 307, 1931.

*Cyperus polystachyos* Rottboell, Descr. Icon. Rar. Nov. Pl. Illustr. 39, t. 11, f. 1, 1773; Nees in Wight, Contrib. Bot. India 75, 1834; Thwaites, Enum. Pl. Zeyl. 342, 1864; Trimen & Hook. f., Handb. Fl. Ceylon 5: 20, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 367, 1936; Kern, Fl. Males. Ser. 1, 7 (3): 649, 1974. ——— *Cyperus paniculatus* Rottboell, Descr. Icon. Rar. Nov. Pl. Illustr. 40, 1773. ——— *Pycreus paniculatus* (Rottb.) Nees [Linnaea 9: 283, 1835. Invalid combination] ex Alston in Trimen & Hook. f., Handb. Fl. Ceylon 6: 307, 1931. ——— *Cyperus polystachyos* Rottb. var. *laxiflorus* Benth. Fl. Austral. 7: 261, 1878; Kükenthal, Pflanzenr. 4 (20), Heft. 101: 370, 1936. ——— *Pycreus polystachyos* P. Beauv. var. *laxiflorus* (Benth.) C. B. Clarke, Fl. Brit. India 6: 592, 1893.

Jaffna District: Jaffna, *Ferguson C.P. 800* (PDA). Anuradhapura District: Anuradhapura, *Alston 638* (PDA). Wilpattu National Park: Kuda Patessa, *Wirawan et al. 1035* (US); Kollankanatta, *Mueller-Dombois et al. 27 Apr. 1969* (US); N.E. of Kuruttu Pondi Villu, *T. Koyama 7560* (NY). Trincomalee District: Trincomalee, *Glenie C.P. 800* (PDA); Ottawady, valley of downstream of Mahaweli Ganga, ca. sea level, *T. Koyama 13652* (NY, PDA, US); Mile 97 on Rd. A 15, *Davidse 7560* (MO, NY). Polonnaruwa District: ca. 1 mile NE of Elahera along Amban Ganga, 400 ft. alt., *Davidse 7357* (MO, NY). Batticaloa District: Batticaloa, *Thwaites C.P. 800*, March 1868 (K, PDA). Nuwara Eliya District: Ramboda Rd., near Ramboda, 3200 ft., *Ballard 1136* (K, NY); Maskeliya, *Wright 11 Nov. 1926* (PDA). Matale District: Bata-Anduwa Gap, Sevastine, at marker 34/6, 1300 m alt., *Tirvengadum et al. 17* (PDA). Kandy District: Hantane, *Silva 296* (PDA); Peradeniya, *Alston 280* (PDA); Gampola-Dolosbage Rd., *Grupe 159* (PDA).

Kurunegala District: Kurunegala, *Thwaites C.P. 800* (PDA); Beddegama, *Alston 1397* (PDA). Colombo District: Maturajawela, *Amaratunga*, 18 Jan. 1971 (PDA). Galle District: Horawala, left bank of Bentota Ganga, *Amaratunga 2495* (PDA), Haburagola, *Amaratunga 2381* (PDA). Amparai District: Tandiadi Kalapu Lagoon, S of mile 215 on Road A4, *T. Koyama et al. 14018* (NY, PDA, US); 3 miles NW of Maha Oya, 50 m alt., *Davidse et al. 9008* (MO, NY.); Inginiyagala National Park, between Baduluwela and "Westminster Abee", *T. Koyama et al. 13995* (PDA). Ruhuna National Park: Uraniya, Ecology Project Block I, *Cooray 22 Mar. 1970* (PDA, US).

*Distribution.* Cosmopolitan, tropical and subtropical regions. The range is extending into warm-temperate regions in eastern Asia as far as to central Japan, and into Mediterranean Region.

This species is extremely variable in the color of spikelets and in the inflorescences, which vary from a rather open umbel with spicately disposed spikelets to a head through an intermediate state bearing fasciated spikelets on short rays. In Ceylon plants with open inflorescences are common. Although Alston (in Trimen & Hook. f., *Handb. Fl. Ceylon* 6: 307, 1932) listed *P. ferrugineus* as occurring in Ceylon without citation of specimens, I have so far been unable to see any documentation of this essentially African species from Ceylon and India. *Pycreus ferrugineus* distinctly differs from *P. polystachyus* at least in its spreading spikelets that are much broader than those of the latter at 2 to 3 vs. 1.25 to 1.5 mm in width, and it can no way be confused with the latter. Hence, Alston's note under *P. ferrugineus* mentioning that "This is doubtfully distinct from *P. polystachyus*," and "Up to 5000 ft.; common" implies that his *P. ferrugineus* may constitute a misidentification for *P. polystachyos* itself.

42. *Pycreus flavidus* (Retzius) T. Koyama, *Journ. Jap. Bot.* **51** (10): 313, 1976.

*Cyperus flavidus* Retzius, *Obs. Bot.* **5**: 13, 1788; Vahl, *Enum. Pl.* **2**: 334, 1806; Kern, *Fl. Males. Ser. 1*, **7** (3): 648, 1974. — [ *Cyperus globosus* Allioni, *Auctuar. Fl. Pedemont.* **49**, 1789; Trimen & Hook. f., *Handb. Fl. Ceylon* **5**: 21, 1900; Kükenthal, *Pflanzenr.* **4** (20), 101 Heft: 352, 1936. *Not of Forskael, 1775.* ] — *Cyperus strictus* Roxburgh, *Fl. Ind. ed. 1*, **1**: 203, 1820. — *Cyperus capillaris* König ex Roxburgh, *l.c.* **1**: 198, 1820; Nees in Wight, *Contrib. Bot. Ind.* **76**, 1834. — *Pycreus globosus* (Allioni) Reichenbach, *Fl. Germ. Excurs.* **140**, 1830. — *Pycreus capillaris* (König ex Roxb.) Nees [*Linnaea* **9**: 283, 1834. Invalid combination] ex C. B. Clarke, *Fl. Brit. India* **6**: 591, 1893. — *Pycreus strictus* (Roxb.) Alston in Trimen & Hook. f., *Handb. Fl. Ceylon* **6**: 307, 1931. — "*Cyperus flavescens* L." sensu Thwaites, *Enum. Pl. Zeyl.* **342**, 1864.

Polonnaruwa District: ca. 1 mile N.E. of Amban Ganga, 400 ft. alt., *Davidse 7357A* (MO). Kandy District: ca. 5 miles SE of Gampola at mile 18/6 on Road A5, 720 m alt., *Davidse et al. 7925* (MO, NY); ca. 2 miles E. of Maddakele, slope N.W. of Krinckles, 1440 m alt., *Davidse 8332* (MO); Pallekale, *Alston 278* (PDA); Gordindhela, *Willis, 27 Feb. 1906* (PDA); Upper Hantane Rd., above the University Campus, *Comanor 317* (PDA, US). Kurunegala District: Kurunegala, *Gardner C.P. 801* (PDA). Nuwara Eliya District: Nuwara Eliya, *Trimen C.P. 801* (PDA), *Amaratunga 230 & 1305* (PDA); Pattipola, *Lazarides 7291* (PDA, US); between Hakgala and Nuwara Eliya, 5400 ft., *Ballard 1269* (K, NY); Corbett's Gap, 4000 ft., *Ballard 1050* (K, NY); Moon Plains, 6000 ft., *Ballard 1217A* (K, NY). Ratnapura District: 11 miles E of Deniyaya at mile 62 on Rd. A17, 750 m alt., *Davidse 7884* (MO, NY); Ratnapura, *Thwaites C.P. 801* (K, PDA). Colombo District: Mount Lavinia, *Trimen Oct. 1881* (PDA). Monaragala District: ca. 3 miles W. of Wellawaya at mile 135/10 on Rd. A4, 990 ft., *Davidse 7742* (MO, NY). Ruhuna National Park: Kumbukkan Oya, Ecology Project Block II, *Cooray 31 July 1969* (NY, US). Hambantota District: 2 miles E of Katuwana, *Lazarides 7350* (PDA, US).

Widely distributed from Mediterranean Region and tropical Africa eastwards to Central and southern Asia, and northeastwards to Japan.

This widespread species is variable particularly in the width and the color of spikelets. Ceylonese plants from up countries at altitudes of over 750 m generally possess strongly compressed, dark purplish-brown spikelets that are mostly less than 1.5 mm in width, a form resembling plants from Japan and temperate India. A few specimens collected at low altitudes such as *Cooray* 31 July 1969 and *Davidse 7357A* cited above bear less compressed, broader spikelets with stramineous-brown scales.

43. ***Pycreus pumilus* (L.) Nees** [Linnaea 9: 283, 1935. Invalid combination] ex C. B. Clarke, Fl. Brit. India 6: 591, 1893, concerning the nomenclature, but excluding basionym; Domin, Bibl. Bot. Heft. 85: 417, 1915; C. E. C. Fischer in Gable, Fl. Madras 9: 1627, 1931.

*Cyperus pumilus* L., Cent. Pl. 2: 6, 1756; Trimen & Hook. f., Handb. Fl. Ceylon 5: 19, 1900; Kükenthal, Pflanzenr. 4 (20), Heft. 101: 375, f. 44 A-E, 1936; Kern, Fl. Males. Ser. 1, 7 (3): 650, f. 66, 1974. ——— *Cyperus pluviniatus* Nees & Meyen in Wight, Contrib. Bot. India 74, 1834; Thwaites, Enum. Pl. Zeyl. 342, 1864. ——— *Pycreus nitens* Nees, Nova Acta Nat. Cur. 19, Suppl. 1: 53, 1843; C. B. Clarke, Fl. Brit. India 6: 591, 1893. ——— *Pycreus pulvinatus* (Nees & Meyen) Nees & Meyen ex Nees [Linnaea 9: 283, 1835, invalid combination, &] Nova Acta Nat. Cur. 19, Suppl. 1: 53, 1843. ——— *Dichostylis nitens* (Nees) Palla, Bot. Jahrb. 10: 296, 1889. ——— "*Pycreus patens* (Vahl)" sensu Alston in Trimen & Hook. f., Handb. Fl. Ceylon 6: 306, 1931. Invalid combination.

43a. Subsp. ***pumilus***.

Jaffna District: Jaffna Lagoon, north shore at ca. 10 miles SE of Navatkuli, *T. Koyama et al. 14040* (NY, PDA, US); Jaffna, *Gardner* in 1846 (PDA). Anuradhapura District: Maradaukadewela, *Trimen* 21 Jan. 1896 (PDA); Wilpattu National Park, East Intermediate Zone, along Wildlife Dept. path at ca. 2 miles from barrier gate, *T. Koyama & Jayasuria 13966* (NY, PDA, US). Polonnaruwa District: Tamankaduwa, *Townsend 73/250* (K, US). Trincomalee District: Periya Kulam, ca. 7 miles NW of Trincomalee, *T. Koyama et al. 14064* (NY, PDA, US); Trincomalee, west side of Welcombe Hotel, *Wheeler 12411* (PDA). Mannar District: Aruvi Aru, mile 125 on Rd. A14, *T. Koyama et al. 13931* (NY, PDA, US). Puttalam District: Chilaw, *Trimen*, Dec. 1880 (PDA). Kandy District: Peradeniya, *Thwaites C.P. 806* in part (PDA); Gannoruwa, *Alston 298* (PDA); Hara-gama, *Alston 3 Oct. 1926* (PDA).

*Distribution.* From India through Indo-China and southern China eastwards to Malesia and Australia (rare in Queensland).

Alston (l.c., 1931) applied *Cyperus patens* Vahl to the Ceylonese plants then passing as *Cyperus pumilus*, and proposed a combination, *Pycreus patens* (Vahl). Typical *C. patens* from Africa closely resembles subsp. *membranaceus*, and it may not be sufficiently different from the latter. However, *C. patens* without doubt does not represent the common phase of Ceylonese *C. pumilus*.

43b. Subsp. ***membranaceus* (Vahl) T. Koyama, stat. nov.**

*Cyperus membranaceus* Vahl, Enum. Pl. 2: 330, 1806. ——— *Cyperus nitens* Retz. var. *membranaceus* (Vahl) Böckeler, Linnaea 35: 484, 1868. ——— *Cyperus pumilus* L. var. *membranaceus* (Vahl) Kükenthal, Pflanzenr. 4 (20), 101 Heft: 376, 1935. ——— *Cyperus pumilus* L. forma *membranaceus* (Vahl) C. B. Clarke, Journ. Linn. Soc. 21: 44, 1884.

Hambantota District: Ruhuna National Park, between the Entrance and Ecology Project Plot R9, *Cooray s.n.*, 11 Dec. 1969 (NY, US); Uraniya, *Cooray*, 22 Mar. 1970 in part (NY).

*Distribution.* India, Ceylon and Thailand; rather frequent in southern India, but rare in Thailand.

Cooray's record, cited above, makes a new entry of subsp. *membranaceus* to the flora of Ceylon. The difference between subsp. *membranaceus* and the typical phase exists mainly in the relatively minor details of floral glumes and achenes. In subsp. *membranaceus* the oblanceolate to oblong-obovate glumes are only ca. 1/3 mm wide in half view, being broadest much above the middle, and are considerably loosely disposed on the rhachilla exposing the greater portion of achenes between the glumes just as in *Cyperus tenuispica*, whereas in subsp. *pumilus* its broader elliptic to ovate-elliptic glumes are 1/2 to 3/5 mm wide in half view being broadest just below the middle, and are closely arranged, there being no space between two glumes. In general, the achenes of subsp. *membranaceus* are truly obovate and cannot be seen through the membranous glumes, while in subsp. *pumilus* its elliptic to lance-elliptic achenes are usually seen through the hyaline glumes. The spikelets of subsp. *membranaceus* are shorter and more laxly disposed on well elongated rays in contrast to the usually more congested nearly head-like inflorescence in subsp. *pumilus*. Though minute, these differences are sufficiently consistent as far as I have examined materials, and hence I regard subsp. *membranaceus* a valid taxon.

#### MARISCUS Gaertner

1. Spikelets more or less flattened with acute edges, bearing 3 to many achenes; glumes folded with a conspicuous keel, laxly holding achene
2. Plants perennial; culms more than 50 cm tall; leaves septate-nodulose; glumes without recurved awn
  3. Spikelets lanceolate, 2 mm wide, straw-coloured, disposed in a spike ..... 44 *M. javanicus*
  3. Spikelets linear, 1 mm wide, reddish-brown, densely congested in a globose head ..... 45 *M. compactus*
2. Plants annual; culms 4–20 cm tall; leaves not septate-nodulose; glumes with recurved awn, heance spikelets squarrose ..... 46 *M. squarrosus*
1. Spikelets terete without conspicuous edges, bearing 1 or 2 achene(s) only; glumes involute without distinct keel, tightly surrounding achene
  4. Rhachilla slender, not at all spongy-thickened; spikelets 1- or 2-fruited
    5. Base of culms hardly enlarged or slightly globose with a corm-like enlargement; basal leaf sheaths purplish-brown
    6. Spikelets mostly 2-fruited, greenish to greenish-straw-coloured, patent to ascending at maturity, mostly 4–5 mm long; achenes 2 mm long
    7. Spikes umbellate with elongated rays; spikelets spreading or the lower ones weakly reflexed at maturity ..... 47 *M. sumatrensis*
    7. Spikes sessile, nearly capitate; spikelets at least the lower ones obliquely patent at maturity
    8. Rhizome short, not stoloniferous; leaves 2–5 mm wide; umbel truly terminal ..... 48a *M. cyperinus* ssp. *cyperinus*
    8. Rhizome emitting slender stolons; leaves as a rule 0.7–1 mm wide; umbel quasi-lateral with the lowest bract continued down to the culm ..... 48b *M. cyperinus* ssp. *laxatus*

6. Spikelets 1-fruited, whitish-green, spreading at maturity, mostly 2–3 mm long; achenes ca. 1.3 mm long ..... 49 *M. paniceus*
5. Base of culm quasi-bulbose, i.e., with an ovoid to ovoid-oblong thickening clothed with leaf sheaths; basal leaf sheaths straw-brown.
9. Rhizome emitting slender stolons; spikes sessile yet recognizable. .... 50 *M. clarkei*
9. Rhizome loosely tufted without stolons; spikes congested in an ovoid or conical head, not readily recognizable ..... 51 *M. dubius*
4. Rhachilla spongy-thickened; achenes sunken in a depression of spongy rhachilla-internodes; spikelets 1-fruited ..... 52 *M. pedunculatus*
44. **Mariscus javanicus** (Houttuyn) Merrill & Metcalfe, Lingnan Sci. Journ. 21: 4, 1945.

*Cyperus javanicus* Houttuyn, Nat. Hist. II, 13 Aanw. Pl. (1), t. 88 f. 1, 1782; Kern, Fl. Males. I, 7 (3): 635, f. 63, 1974. — *Cyperus pennatus* Lamarck, Illustr. 1: 144, 1791; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 476, f. 53 A-G, 1936. — *Mariscus albescens* Gaudichaud in Freyc., Boy. Bot. 415, 1826; C. B. Clarke, Fl. Brit. India 6: 623, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 40, 1900. — *Mariscus pennatus* (Lamarck) Domin, Bibl. Bot. Heft. 85: 440, 1915.

Wilpattu National Park: Manikepola Uttu, *T. Koyama 13456* (NY, PDA, US). Anuradhapura District: Ritigala Strict Natural Reserve, approach to Weweltenna along southern slope, 700 ft. alt., *Jayasuria 1294* (PDA); Anuradhapura, Trimen in 1881 (PDA). Trincomalee District: Mile 79 on Road A 4, *Davidse 7558* (MO, NY). Batticaloa District: Batticaloa, *Trimen C.P. 678* p.p. (PDA, K). Monaragala District: Crossing of Rd. A 2 and Kirindi Oya at Mile 183/2, ca. 15 miles S of Wellawaya, 400 ft. alt., *Davidse 7760* (MO, NY, PDA, US). Ratnapura District: Raigam Korale, *Thwaites C.P. 678* p.p. (PDA). Galle District: Bentota, *Ballard 1507* (K, NY). Hambantota District: N of Kataragama, *Wirawan 644* (PDA); Ruhuna National Park: Block 3, *Cooray 23* May 1968 (PDA, US).

*Distribution.* Tropical Africa, Madagascar through Indian Subcontinent to southern China and the southern Ryukyus, as well as to Malesia, northern Australia and the Pacific Islands.

45. **Mariscus compactus** (Retzius) Boldingh, Zakfl. Landb. Java 77, 1916; Druce, Rep. Bot. Exch. Club Brit. Isls. 1916: 634, 1917; Fischer in Gamble, Fl. Madras 9: 1645, 1931. ——— Fig. 8

*Cyperus compactus* Retzius, Osb. Bot. 5: 10, 1789; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 423, 1936; Kern, Fl. Males. I, 7 (3): 638, 1974. ——— *Cyperus dilutus* Vahl, Enum. Pl. 2: 357, 1806. — *Mariscus microcephalus* Presl. Reliq. Haenk. 1: 182, 1828; C. B. Clarke, Fl. Brit. India 6: 624, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 40, 1900. — *Mariscus dilutus* (Vahl) Nees in Wight, Contrib. Bot. India 90, 1834.

Badulla District: ca. 8 miles E of Mahiyangana, 3.5 miles N of Mile 53 on Mihiyangana-Padiyatalawe Rd., *T. Koyama et al. 13979* (NY, PDA, US).

*Distribution.* India, southern continental China, Taiwan and Malesia.

This species, easily recognizable by its characteristic globose spikes, occurs very sporadically in the low countries in Ceylon. I have not seen Gardner's collection from Kornegalle, which was cited by both Thwaites and Trimen as *C.P. 815*, and which seems to be the only other documentation of this species from Ceylon.

46. **Mariscus squarrosus** (L.) C. B. Clarke, Fl. Brit. India 6: 623, 1893, concerning the basionym.

*Cyperus squarrosus* L., Cent. Pl. 2: 6, 1756; Kern, Fl. Males. I, 7 (3): 631, 1974. — *Cyperus aristatus* Rottboell, Descr. Pl. Rar. Progr. 22, 1772; C. B. Clarke, Fl. Brit. India 6: 606, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 24, 1900; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 502, f. 55 F-J, 1936. — *Mariscus aristatus* (Rottboell) Chermezon, Bull. Soc. Bot. France 85: 366, 1938; Tang & Wang, Fl. Reipubl. Pop. Sin. 11: 178, pl. 59, 1961.

Jaffna District: north shore of Jaffna Lagoon, ca. 10 miles SE of Navatkuli, sea level, *T. Koyama et al.* 14037 (NY, PDA, US); Keerimalai to Point Pedro, *Clayton* 5205 (K). Wilpattu National Park: near Sadpuda Kallu, 2 miles E of Kattankandal Kulam, 30 m alt., *Fosberg et al.* 50830 (NY, US). Trincomalee District: Trincomalee, *Glenie C.P.* 966 ex p. (PDA). Puttalam District: Puttalam, *Ferguson* in 1881 (PDA). Polonnaruwa District: Polonnaruwa, *Clayton* 5116 (K, PDA); 13 miles E of Polonnaruwa on Trincomalee Rd., *Clayton* 5135 (K, PDA); ca. 1 mile E of Kolakanaweli, Mile 56/7 on Batticaloa Rd., *T. Koyama* 13575 (NY). Mannar District: Aruvi Aru, Mile 125 on Rd. A 14, *T. Koyama et al.* 13934 (NY, PDA, US). Anuradhapura District: Galpitiyala, a few miles from Ritigala, *Ballard* 1451 (K, NY). Vavunia District: Palayanalankulan, Mile 120 on Rd. A 14, *T. Koyama et al.* 13938 (NY, PDA, US). Kandy District: Hantane, *Thwaites C.P.* 966 (K, PDA); Giragama, *Amaratunga* 359 (PDA). Hambantota District: Tissamaharama, *Trimen* Dec. 1882 (PDA); Ruhuna National Park, Kohombagaswala, Block I, *Cooray et al.* 22 Jan. 1969 (US); Uraniya, *Cooray* 22 Mar. 1970.

*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 south to Argentina and Chile. In Ceylon common on wet sandy soil in open grasslands.

In the Linnaean Herbarium the specimen marked as “*squarrosus*” in Linnaeus’ hand represents this taxon, while the second sheet with a single inflorescence is *Cyperus maderaspatanus*. Consequently, *Cyperus squarrosus* is the correct name of what has generally been called *C. aristatus*. Although I place this species in *Mariscus* following Chermezon and Wang & Tang (*locis cit.*), as was already pointed out by O’Neill (*Rhodora* 44: 47, 1942) and Kern (*op. cit.*) the caducity of the rhachillas of this species is not constant. In Ceylonese specimens I noticed in a few specimens that the glumes fall off apart from the rhachilla, which eventually falls off the rhachis. This species, which is characteristically intermediate between *Cyperus* and *Mariscus*, requires more detailed anatomical studies which might elucidate the systematic link between the two genera.

47. ***Mariscus sumatrensis* (Retzius) T. Koyama, *comb. nova***

*Scirpus cyperoides* L., Mant. 2: 181, 1771. — [*Kyllinga umbellata* Rottboell, Descr. Icon. Rar. Nov. Pl. 15, 1773, excluding *t.* 4 *f.* 2. Illegitimate name.] — *Kyllinga sumatrensis* Retzius, Obs. Bot. 4: 13, 1786. — *Kyllinga umbellata* Rottb. var. *sumatrensis* (Retz.) Willdenow, Sp. Pl. 1: 258, 1797. — [*Mariscus umbellata* (Rottb.) Vahl, Enum. 2: 376, 1806. Combination based on illegitimate name.] — *Mariscus sieberianus* Nees [Linnaea 9: 286, 1835, nomen nudum] ex C. B. Clarke, Fl. Brit. India 6: 622, 1893, & Illustr. *Cyper. t.* 23 *f.* 5-6, 1909; Trimen & Hook. f., Handb. Fl. Ceylon 5: 42, 1900. — *Mariscus cyperoides* (L.) Urban, Symb. Antill. 2 (1): 164, 1900. Not of Dietrich, 1833. — *Cyperus cyperoides* (L.) O. Kuntze, Rev. Gen. Pl. 3 (2): 333, 1898; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 514, 1936; Kern, Fl. Males. I, 7 (3): 642, 1974.

Nuwara Eliya District: Hakgala, *Alston* 633 (PDA), *Mueller-Dombois* May 1968 (PDA, US); Talawakele, *Bond* 17 Feb. 1944 (PDA).

*Distribution.* Tropical Africa, tropical and subtropical Asia, Malesia, northern Australia; also introduced to the West Indies. In Ceylon rarely found in up countries.





Fig. 8. *Mariscus compactus* (Retzius) Boldingh. *A*, habit. *B*, orifice of a cladophyll at the base of umbel ray. *C*, spikelet. *D*, prophyll. *E*, lateral view of two glumes showing their base forming the wings on the rachilla. *F*, glume. *G*, fruiting pistil. *H*, achene. Scales = 1 mm.

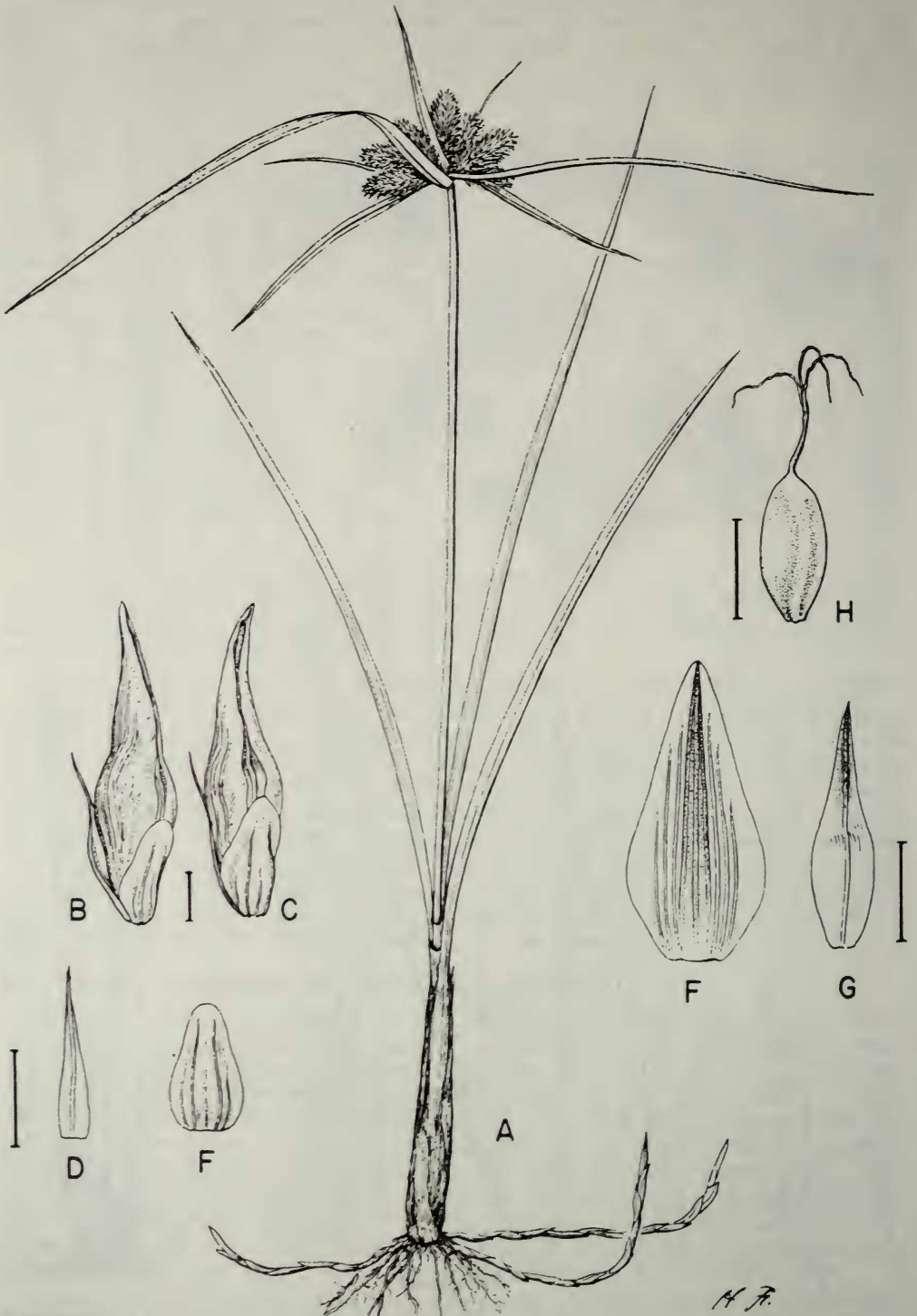


Fig. 9. *Mariscus clarkei* (T. Cook) T. Koyama. A, habit. B & C, two views of spikelet. D, bracteole subtending a spikelet. E, prophyll. F, fruiting glume. G, empty glume. H, achene. Scales = 1 mm.

When this taxon is placed in *Mariscus*, its earliest valid name, *Scirpus cyperoides*, cannot be transferred because of Dietrich's homonym. Next earliest name, *Kyllinga umbellata*, is illegitimate since Rottboell cited *Scirpus cyperoides* in the synonymy. *Kyllinga sumatrensis*, therefore, needs to be transferred to *Mariscus* to form the correct name of this species under the genus.

48. ***Mariscus cyperinus*** (Retzius) Vahl, Enum. Pl. 2: 377, 1806; C. B. Clarke, Fl. Brit. India 6: 621, 1893, & Illustr. Cyper. t. 12 f. 3-4, 1909; Trimen & Hook. f., Handb. Fl. Ceylon 5: 42, 1900; C. E. C. Fischer in Gamble, Fl. Madras 9: 1644, 1931.

*Kyllinga cyperina* Retzius, Obs. Bot. 6: 21, 1791. ——— *Cyperus cyperinus* (Retzius) Suringar, Het. Gesl. Cyper. Mal. Archip. 154, t. 6 f. 10, 1898; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 518, 1936; Kern, Fl. Maels. I, 7 (3): 641, 1974.

48a. Subsp. ***cyperinus***.

Ceylon: without definite locality, *Trimen C.P. 816* (PDA). Kandy District: ca. 2 miles N of Hunnasgiriya, near Mile 23, 380 m alt., *Davidse 8457* (MO, NY); Pusselawa, *Alston 1170* (PDA); Peradeniya, *Thwaites C.P. 816* (K, PDA), *Amaratunga 643* (PDA), *Alston 593* (PDA); Morakande Estate, *Alston 594* (PDA); Gannoruwa, *Alston 851* (PDA); Gampola, *Alston 592* (PDA). Matale District: 33/7 Midlands, 1200 m alt., *Tirvengadam et al. 14* (US); Matale, *Tirvengadam et al. 16* (PDA). Nuwara Eliya District: Ramboda Pass, 3200 ft. alt., *Ballard 1142A* (K, NY). Badulla District: Rawanaella Waterfall, ca. 2 miles SE of Ella, 750 m alt., *Davidse et al. 8868* (NY, PDA, US). Colombo District: Dewalgama, *Amaratunga 1162* (PDA); Ekala, *Alston 2389* (PDA).

*Distribution.* From India to Malesia and northern Australia, also in Eastern Asia extending northwards to southern China and the Ryukyus. Open grassy places in hilly countries.

48b. Subsp. ***laxatus*** (C. B. Clarke), T. Koyama, *stat. nov.*

*Cyperus umbellatus* C. B. Clarke var. *laxatus* C. B. Clarke, Journ. Linn. Soc. 21: 201, 1888. ——— *Cyperus cyperinus* Suringar forma *curvata* Suringar, Het Gesl. Cyper. Mal. Archip. 156, 1898; Kern, Fl. Males. I, 7 (3): 624, 1974. ——— *Mariscus tenuifolius* Schrader ex Nees, Fl. Brasil. 2 (1): 46, 1842; C. B. Clarke, Fl. Brit. India 6: 622, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 43, 1900; C. E. C. Fischer in Gamble, Fl. Madras 9: 1644, 1931.

Kandy District: Hunnasgiriya, collector unknown 590 (PDA); Peradeniya, *Alston 387* (PDA), *Thwaites C.P. 817*, ex p. (PDA); Maturata, *Thwaites C.P. 817* ex p. (PD). Matara District: Weligama, *Alston 1172* (PDA). Monaragala District: ca. 3 miles W of Wellawaya, near Mile 135/10, 990 ft. alt., *Davidse 7741* (MO, NY). Ruhuna National Park: Ecology Project Prot R19, *Cooray 11 Dec. 1969* (US).

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

Subspecies *laxatus* differs from the typical phase in its narrow habit with long-creeping slender stolons and the few-spiked contracted umbels that tend to become pseudo-lateral being subtended by the lowest leafy bract continued down to the culm. As far as the Ceylonese plants are concerned this combination of characters appears to be rather constant, on which basis I regard this slender phase to be a subspecies of *M. cyperinus*.

49. ***Mariscus paniceus*** (Rottboell) Vahl, Enum. Pl. 2: 373, 1806; C. B. Clarke, Fl. Brit. India 6: 620, 1893, incl. var. *roxburghianus*, & Illustr. Cyper. t. 22 f. 1-2, 1909; Trimen & Hook. f., Handb. Fl. Ceylon 5: 41, 1900, incl. var. *roxburghianus*.

[*Schaenoides paniceus* Rottboell, Descr. Pl. Rar. Progr. 15, 1772, provisional name.] — *Kyllinga panicea* Rottboell, Descr. Icon. Rar. Nov. Pl. 15, t. 4 f. 1, 1773. — *Cyperus paniceus* (Rottboell) Böckeler, Linnaea 36: 381, 1870, in part, incl. basionym; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 526, 1936; Kern, Fl. Males. I, 7 (3): 643, 1974.

Anuradhapura District: Ritigala Nature Reserve, 2400 ft. alt., *Jayasuria* 1710 (NY, PDA). Mannar District: Aruvi Aru, Mile 125 on Rd. A 4, *T. Koyama et al.* 13928 (NY, PDA, US). Polonnaruwa District: SE of Giritala Wewa, 7 miles N.W. of Polonnaruwa, *Fosberg & Ripley* 51935 (US); Polonnaruwa, *Ripley* 339 (PDA); Galoya Reservoir, near spillway, 270 m alt., *Commanor* 568 (NY). Nuwara Eliya District: Ramboda Pass, 3200 ft., *Ballard* 1142A (K, NY); Hakgala Botanic Gardens, *Clayton* 5783 (K, PDA); between Pusselawa and Ramboda, at Mile 32/8 on N. Eliya Rd., 1100 m alt. *T. Koyama & Herat* 13613 (NY, PDA, US). Matale District: ca. 8 miles ESE of Dambulla, ca. 900 ft. alt., *Davidse* 7433 (MO, NY). Kandy District: Hantane, *Thwaites C.P.* 814 (K, PDA); Hewaheta, *Thwaites C.P.* 2878 (PDA); Maragala, *Alston* 1629 (PDA); Haragama, *Alston* 306 (PDA); Aladeniya, *Amaratunga* 644 (PDA); between Alagalla and Balana Rd., *Comanor* 440 (PDA, US). Kurunegala District: Kurunegala, *Thwaites C.P.* 2878 ex p. (PDA); Kurunegala Rock, *Alston* 699 (PDA); Wariyapola, *Trimen* Aug. 1883 (PDA); Siyambalatenna, *Alston* 596 (PDA). Ratnapura District: ca. 13 miles N.E. of Deniyaya at Mile 64 on Rd. A 17, 1050 m alt., *Davidse* 7899 (MO, NY, PDA, US). Galle District: Galle, *Alston* 289 (PDA). Ruhuna National Park: Rugamtota, *Cooray* 16 Nov. 1969 (NY, US).

While in Ceylon I was able to investigate the variation ranges of leaf width and the intensity of the umbels in this very common species. My conclusion is that var. *roxburghianus* should not be retained. It was claimed to differ from the typical phase in the relatively broader leaves and larger umbels.

50. ***Mariscus clarkei*** (T. Cook) T. Koyama, Journ. Jap. Bot. 51 (10): 313, 1976. — Fig. 9

*Cyperus clarkei* T. Cook, Fl. Presid. Bombay 2: 873, 1908; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 540, f. 58, 1936. — [*Mariscus pictus* Nees in Wight, Contrib. Bot. India 90, 1834, in part excluding type.] — [*Mariscus bulbosus* C. B. Clarke, Fl. Brit. India 6: 620, 1893; C. E. C. Fischer in Gamble, Fl. Madras 9: 1644, 1931. Not. of Steudel, 1855.] — [*Kyllinga bulbosa* Vahl, Enum. Pl. 2: 376, 1806, invalid name mentioned in note; Römer & Schultes, Syst. Veg. 2: 247, 1817, in note.]

Monaragala District ca. 11 miles W of Tanamalwila, 125 m alt., *Davidse & Sumithraarachchi* 8812 (MO, NY, PDA, US). Hambantota District: Ruhuna National Park, Kohombagaswala, *Cooray* 23 Nov. 1969 (NY, PDA, US).

*Distribution.* Confined to southern India and Ceylon.

This species, newly found in Ceylon, rarely grows on wet shallow soil over rock outcrops. It is well demarcated by the peculiar bulb-shaped base, which emits a few slender stolons. The umbel of this species resembles that of *M. cyperinus*, and hence it is never confused with *M. dubius*, another bulbous *Mariscus* in Ceylon.

51. ***Mariscus dubius*** (Rottboell) Kükenthal ex Fischer in Gamble, Fl. Madras 9: 1644, 1931.

*Cyperus dubius* Rottboell, Descr. Icon. Rar. Pl. 20, t. 4 f. 5, 1773; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 563, 1936; Kern, Fl. Males. I, 7 (3): 643, 1974. — *Cyperus kyllingaeoides* Vahl, Enum. Pl. 2: 312, 1806. — *Mariscus dregeanus* Kunth, Enum. Pl. 2: 120, 1837; C. B. Clarke, Fl. Brit. India 6: 620, 1893, & Illustr. Cyper. t. 21 f. 1-6, 1909; *Trimen & Hook. f.*, Handb. Fl. Ceylon 5: 39, 1900.

Anuradhapura District: Ritigala Natural Reserve, on summit rock, 2500 ft. alt., *Jayasuria* 905 (PDA). Polonnaruwa District: Lankatilaka, *Silva* 182 (PDA). Kurunegala District: Kurunegala, *Thwaites C.P.* 2942 (K, PDA) & *C.P.* 855 (K, PDA). Kandy District: Aladeniya, *Amaratunga* 642 (PDA); between Balane and Alagalla, 440 m alt. *Comanor* 1194 (NY, US). Badulla District: Rawanaella Waterfall, ca. 2 miles SE of Ella, 750 m alt., *Davidse et al.* 8866 (MO, NY, PDA, US); Lunugala, *Trimen* Jan. 1888 (PDA). Monaragala District: ca. 11 miles W of Tanamalwila, 125 m alt., *Davidse et al.* 8802 (MO, NY, US, PDA). Galle District: Galle, *Gardner C.P.* 855 (K, PDA). Ruhuna National Park: Bambowa, *Cooray* 17 Nov. 1969 (NY, US); Rugamtota, *Cooray* 16 Nov. 1969 (NY, US).

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

52. ***Mariscus pedunculatus*** (R. Brown) T. Koyama, *comb. nov.*

*Remirea maritima* Aublet, Hist. Pl. Guian. Franc. 1: 45, t. 16, 1775. Not *Mariscus maritimus* Miquel, 1860, nor of C. B. Clarke, 1896. ——— *Remirea pedunculata* R. Brown, Prodr. Fl. Nov. Holl. 236, 1810. ——— *Cyperus pedunculatus* (R. Brown) Kern, Act. Bot. Neerl. 7: 798, 1958.

Jaffna District: Jaffna, *Thwaites C.P.* 3227 (K, PDA). Colombo District: Colombo, *Ferguson C.P.* 3227 (PDA); Mt. Lavinia, *Trimen* Oct. 1881. (PDA).

*Distribution.* Southern Asia, Malesia and northern Australia; also in tropical America from eastern Venezuela through the Guianas south to Brazilian Paraná Sand dunes and sandy shores of sea coast.

The cyperoid morphology exhibited by this species was fully discussed by Kern (op. cit.), with whom I concur. When *Cyperus* sensu lato is divided into a few genera, this species properly belongs to *Mariscus* because of its continuous rhachilla jointed at its base.

### KYLLINGA Rottb.

1. Inflorescence open, umbelliform with elongated rays ..... 53 *K. hyalina*
1. Inflorescences congested in a head
  2. Glumes not winged
    3. Rhizome short; culms tufted
      4. Central spike cylindrical or oblong, 8–15 mm long, ca. 5 mm wide; spikelets broadly ovate, 2 mm long; culms slightly or hardly enlarged at base ..... 54 *K. odorata* ssp. *cylindrica*
      4. Central spike globose or ovoidal, 5–6 mm long, 3–4 mm across; spikelets oblong-elliptical, 1.7–2 mm long; culms bulbouse-thickened at base ..... 55 *K. triceps*
    3. Rhizome horizontally creeping or stoloniferous; culms distantly or closely arranged in one row along rhizome
      5. Culms 30–50 cm tall, close together
        6. Leafy bracts 2 or 3 ..... 56 *K. melanosperma*
        6. Leafy bracts 6 to 8 ..... 57 *K. polyphylla*
      5. Culms as a rule 7–30 cm tall, more or less spaced ..... 58 *K. brevifolia*
  2. Glumes winged ..... 59 *K. nemoralis*



Fig. 10. *Kyllinga hyalina* (Vahl) T. Koyama. A, habit. B, portion of rhachis with bracteoles and prophylls remaining after spikelets falling off. C, spikelet. D, prophyll. E, lateral view of two glumes. F, lateral view of achene. Scales = 1 mm.

53. *Kyllinga hyalina* (Vahl) T. Koyama, Journ. Jap. Bot. **51** (10): 313, 1976.  
 ——— Fig. 10

*Cyperus hyalinus* Vahl, Enum. Pl. 2: 329, 1806; Trimen & Hook. f. Handb. Fl. Ceylon **5**: 19, 1900; Kükenthal, Pflanzenr. **4** (20), 101 Heft: 498, 1936; Kern, Fl. Males. I, **7** (3): 655, t. 68, 1974. ——— "*Cyperus pumilus* L.": sensu Nees in Wight, Contrib. Bot. Ind. 74, 1834. ——— "*Pycreus pumilus*" C. B. Clarke, Fl. Brit. Ind. **6**: 591, 1893, concerning description. ——— *Pycreus hyalinus* (Vahl) Domin, Bibl. Bot. Heft **85**: 417, 1915, in obs. ——— *Queenslandiella mira* Domin, Bibl. Bot. Heft **85**: 416, t. 11 f. 7-13, 1915. ——— *Mariscopsis suaveolens* Chermeson, Bull. Mus. Paris **25**: 60, 1919. ——— *Mariscopsis hyalinus* (Vahl) Ballard, Kew Bull. **1932**: 457, 1932. ——— *Queenslandiella hyalina* (Vahl) Ballard in Hook., Icon. Pl. **33**: t. 3208, 1933.

Anuradhapura District: Anuradhapura, *Trimen* 18 Dec. 1881 (PDA). Kurunegala District: Kurunegala, *Trimen C.P. 3787* (K, PDA); Kuliyaipitiya, *Simpson 9159* (PDA). Ruhuna National Park; near turn off to Andunoruwa Wewa, *Cooray* 10 Dec. 1969 (NY, PDA, US); Ecology Project Block I, Plot R 13, *Cooray* 7 Dec. 1969 (US).

*Distribution.* Tropical East Africa, Mascarene Is., India, Indo-China, Malesia and northern Australia. Sporadically occurring in dry grasslands.

When we split the genus *Cyperus* of broad meaning into several genera of smaller size, the systematic attribution of *Cyperus hyalinus* deserves special mention. Morphologically this species doubtlessly falls within the generic criterion of *Kyllinga*, from which it slightly deviates in having open inflorescences and in the spikelets of which nearly all the glumes are fruit-bearing. However, in the genus *Kyllinga*, umbel rays really develop as seen in *K. transitoria* for instance, and further where in all the cyperoid genera both open and head-like inflorescences occur without any clear border, thus showing that these conditions of inflorescences do not warrant generic segregation. Similarly the number of fruit-bearing glumes in a spikelets also does not serve as a distinguishing character between genera. In *Mariscus*, the genus most closely related to *Kyllinga*, both multi- and few-flowered spikelets coexist (cfr. *M. cyperinus* vs. *M. javanicus*, for example). It is therefore permissible to include *Cyperus hyalinus* in *Kyllinga* in spite of the multi-flowered spikelets. In reality *Cyperus hyalinus* strikingly resembles *Kyllinga* ssp. not only in its bilaterally flattened oblong-elliptic achenes but also in its thinly membranous glumes with several prominent veins on both sides of the midrib.

54. *Kyllinga odorata* Vahl, Enum. Pl. 2: 382, 1906.

This species, occurring in tropical America and Africa, is represented in Ceylon by:

subsp. *cylindrica* (Nees ex Wight) T. Koyama, *comb. nov.*

*Kyllinga cylindrica* Nees ex Wight, Contrib. Bot. Ind. 91, 1834; C. B. Clarke, Fl. Brit. Ind. **6**: 588, 1893, incl. var. *subtriceps* Nees; Trimen & Hook. f., Handb. Fl. Ceylon **5**: 44, 1900. ——— *Kyllinga odorata* Vahl var. *cylindrica* (Nees) Kükenthal ex Merrill, Journ. Str. Branch Roy. As. Soc. **76**: 80, 1917. ——— *Cyperus sesquiflorus* (Torrey) Mattfeld & Kükenthal var. *cylindricus* (Nees) Kükenthal, Pflanzenr. **4** (20), 101 Heft: 593, 1936. ——— *Cyperus sesquiflorus* Mattfeld & Kükenthal subsp. *cylindricus* (Nees) T. Koyama, Bot. Mag. Tokyo **83**: 187, 1970. ——— *Cyperus sesquiflorus* Mattfeld & Kükenthal var. *subtriceps* (Nees) T. Koyama, Quart. Journ. Taiwan Mus. **14**: 191, 1961; Kern, Fl. Males. I, **7** (3): 659, 1974.

Kandy District: Pusselawa, *Alston* 19 Sept. 1926 (PDA). Badulla District: Haldummulla, *Thwaites C.P. 3754* (K, PDA). Nuwara Eliya District: Ohiya, *Mueller-Dombois* 18 May 1968 (PDA, US); Hakgala, *Simpson 9041* (PDA);

Ramboda, along N. Eliya Rd., 1180 m alt., *T. Koyama & Herat 13619* (NY, PDA, US). Hambantota District: Ruhuna National Park, *Cooray 30* November 1967 (PDA, US).

*Distribution.* Tropical Africa, tropical and subtropical Asia.

The morphological differences between subsp. *cylindrica* and the typical phase were discussed in my previous paper (Koyama, op. cit. 1970).

55. **Kyllinga triceps** Rottboell, Descr. Icon. 14, t. 4 f. 6, 1773; C. B. Clarke, Fl. Brit. Ind. 6: 587, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 45, 1900.

[*Schaenoides triceps* Rottboell, Descr. Pl. Rar. Progr. 15, 1772, invalid name.]

— *Cyperus triceps* (Rottb.) Endlicher, Cat. Hort. Acad. Vindb. 1: 94, 1842; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 578, 1936; Kern, Fl. Males. I, 7 (3): 659, 1974.

Mannar District: Aruvi Aru, Mile 125 on Rd. A 14, *T. Koyama et al. 13932* (NY, PDA, US). Polonnaruwa District: Polonnaruwa Sacred Area, Sect. 3A, 61 m alt., *Ripley 334* (US); Polonnaruwa-Trincomalee Rd., *Clayton 5136* (K, PDA). Matale District: 33/7 Midlands, *Tilvengadum et al. 12* (US). Puttalam District: Anamaduwa, *Trimen* Aug. 1883 (PDA); Puttalam, *Brodie C.P. 3234* in part (PDA). Colombo District: Colombo, *Thwaites C.P. 3234* (K, PDA). Monaragala District: ca. 11 miles W of Tanamalwila, 125 m alt., *Davidse et al. 8810* (MO, NY, PDA). Ruhuna National Park: Komawa Wewa, *Cooray 16* Nov. 1969 (PDA, US); Gonlabbe, *Cooray 24* Nov. 1969 (NY, PDA); Yala, Andunoruwa Wewa, *Comanor 673* (NY, US).

*Distribution.* From tropical Africa through India and Indo-China north-eastwards to southern China, and eastwards to Malesia and northern Australia.

56. **Kyllinga melanosperma** Nees in Wight, Contrib. Bot. India 91, 1834; C. B. Clarke, Fl. Brit. India 6: 588, 1893; Trimen & Hook. f., Handb. Fl. Ceylon 5: 45, 1900.

*Cyperus melanospermus* (Nees) Suringar, Het. Gesl. Cyperus Mal. Archip. 50, t. 2 f. 8, 1898; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 583, 1936; Kern, Fl. Males. I, 7 (3): 655, 1974.

Kandy District: Peradeniya, Lower Hantana Rd., near the waterfall, 535 m alt., *Comanor 692* (NY, US); between Pusselawa and Ramboda, *Comanor 950* (PDA); between Laxapana and Maskeliya Rd., *Kostermanns 24079* (PDA); Ambagamuwa, *Amaratunga 2014* (PDA), between Udahentenna and Nawalapitiya, *Amaratunga 909* (PDA); Aladeniya, *Amaratunga 1643* (PDA). Nuwara Eliya District: Hakgala, *Wheeler 12371* (PDA); Nuwara Eliya, *Thwaites C.P. 818* (K, PDA); Horton Plains, forest opposite to the Horton Plains Farm, along Pattipola Rd., 7200 ft. alt., *T. Koyama 13506* (NY, PDA, US); base of Hakgala Mtn. 1870 m alt., *Davidse et al. 7981* (MO, NY, PDA, US). Badulla District: ca. 3 miles W of Koslanda, along Rd. A 4, ca. 900 m alt., *T. Koyama et al. 14033* (NY, PDA, US). Colombo District: Wattala, *Comanor 1153* (PDA, US); Danowita; *Amaratunga 193* (PDA); Kimbulapitiya, *Amaratunga 2157* (PDA). Ratnapura District: 11 miles E of Diniyaya, near Mile 62 on Rd. A 17, 750 m alt., *Davidse 7875* (MO, NY, PDA, US). Galle District: Corbett's Gap. 4500 ft. alt., *Ballard 1052* (K, NY).

*Distribution.* Tropical and subtropical Africa, southern Asia, Fiji and Malanesia. In Ceylon common on the grassy beds of montane forests.

This species, well characterized by its relatively thick leafless culms and large heads, can be easily located in the field because of its strong odor of essential oil, which is contained in the thick rhizome.



57. **Kyllinga polyphylla** Willdenow ex Kunth, Enum. Pl. 2: 134, 1937.

*Kyllinga aromatica* Ridley, Trans. Linn. Soc. II, Bot. 2: 146, 1884. ———  
*Cyperus aromaticus* (Ridley) Mattfeld & Kükenthal, Pflanzenr. 4 (20), 101 Heft: 581, 1936; T. Koyama, Bot. Mag. Tokyo 83: 186, 1970; Kern, Fl. Males. I, 7 (3): 656, 1974.

Nuwara Eliya District: between Pussellawa and Ramboda, at Mile 28/10 along Kandy-N. Eliya Rd., 950 m alt., *Comanor 328* (NY, PDA, US).

*Distribution.* E. Africa. Also introduced to Singapore, Ceylon, Solomon Islands, Samoa and Fiji.

This African species can be separated from the closely allied indigenous species, *K. melanosperma*, by its head subtended by 6 to 8 leafy bracts in contrast to 2 or 3 in the latter. In Ceylon it is thus far known only by the collection cited above, and is apparently of rather recent introduction.

58. **Kyllinga brevifolia** Rottboell, Descr. Icon. Rar. Nov. Pl. 13, t. 4 f. 3, 1773; C. B. Clarke, Fl. Brit. India 6: 588, 1893, & Illustr. Cyp. t. 1 f. 1-4, 1909; Trimen & Hook. f., Handb. Fl. Ceylon 5: 45, 1900.

[*Schaenoides brevifolius* Rottb., Descr. Pl. Rar. Progr. 15, 1772, invalid name.] ——— *Cyperus brevifolius* (Rottb.) Hasskarl, Cat. Hort. Bogor. 24, 1884; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 600, 1936; Kern, Fl. Males. I, 7 (3): 656, f. 70, 1974.

Wilpattu National Park: Kali Villu, *Wirawan et al. 990* (US). Mannar District: Aruvi Aru, Mile 125 on Rd. A 4, *T. Koyama et al. 13926* (NY, PDA, US). Kandy District: Peradeniya, Upper Hantana Rd., 550 m alt., *Comanor 315* (NY, US); Ambewela, *Mueller-Dombois 12 Jan. 1968* (PDA, US). Nuwara Eliya District: Kande Ela Reservoir, *Mueller-Dombois 18 May 1968* (PDA). Colombo District: Dompe, *Amaratunga 2182* (PDA); Ranmuthugal, *Amaratunga 2221* (PDA). Galle District: Galle, *Trimen C.P. 3755* (K, PDA).

*Distribution.* Pantropic; in Asia extending northwards into the warm regions of continental China and the temperate region of Japan.

This cosmopolitan weedy sedge is rather poorly documented in Ceylon. Since it frequently grows in and around rice fields, it is quite possible that this sedge extended its range with the introduction of rice as assumed for *Cyperus iria* and *Fimbristylis miliacea*.

59. **Kyllinga nemoralis** (J. R. & G. Forster) Dandy ex Hutchinson & Dalziel, Fl. W. Trop. Africa 2: 486, in Key, & 487, 1936.

[*Kyllinga monocephala* Rottboell, Descr. Icon. Rar. Nov. Pl. 13, t. 4 f. 4, 1773, invalid name; C. B. Clarke, Fl. Brit. India 6: 588, 1893 & Illustr. Cyp. t. 2 f. 1-2, 1909; Trimen & Hook. f., Handb. Fl. Ceylon 5: 44, 1900.] ——— *Cyperus kyllingia* Endlicher, Cat. Hort. Acad. Vindb. 1: 94, 1842; Kükenthal, Pflanzenr. 4 (20), 101 Heft: 606, f. 64, 1936; Kern, Fl. Males. I, 7 (3): 659, 1974. ——— *Thyrocephalon nemoralis* J. R. & G. Forster, Char. Gen. Pl. 130, 1776.

Trincomalee District: Mutur, *Wheeler 12425* (PDA). Kandy District: Roseneath, 2101 ft. alt., *Ballard 1014* (K, NY). Monaragala District: ca. 3 miles W of Wellawaya at Mile 135/10 on Rd. A 4, 990 ft. alt. *Davidse 7728 & 7732* (MO, NY, PDA, US). Ruhuna National Park: Rugantota, Block I, *Cooray 16 Nov. 1969* (NY, US); Ecology Project Block I, Rugantota on Minik Ganga, *Fosberg et al. 50191* (NY, US).

*Distribution.* Pantropic, relatively scarce in tropical America.

It is unfortunate that to this common species, which has long been known as *Kyllinga monocephala*, must be assigned an unfamiliar epithet as its correct name. Rottboell's *Kyllinga monocephala* is invalid as the name was published with an earlier legitimate name, *Schoenus coloratus* L., cited in the synonymy.

**Literature Cited outside Taxonomic Enumerations**

- Kern, J. H. 1974. Cyperaceae. *Flora Malesiana Ser. I*, **7** (3): 435-753.
- Koyama, T. 1970. Beiträge zur Cyperaceenflora von Ceylon. *Bot. Mag. Tokyo* **83**: 183-192.
- 1974. Additional notes on Ceylonese Cyperaceae. *Bull. National Sci. Mus. Tokyo* **17**: 65-73.
- Kükenthal, G. 1935-36. Cyperaceae-Scirpoideae-Cypereae. *Pflanzenr.* **4** (20), **101** Heft: 1-671.
- Trimen, H. & J. D. Hooker. 1900. *A Handbook to the Flora of Ceylon* **5**: 1-477.