

CYPERACEAE OF EAST AFRICA - II

By

D.M. NAPPER

SCLERIA Berg.

One of the largest genera of sedges, Scleria is distributed throughout the tropics and subtropics but does not extend into the Mediterranean region and the Near East. These leafy herbs are usually to be found in wet places, pools, marshes and streams, in open grass-land or forest and are most abundant in areas of high rainfall; their altitudinal tolerance seems high, as in East Africa they are found from sea level to 8,000 or 9,000 ft.

Though all are leafy herbs, the African species of Scleria exhibit a wide range of habit, from slender annual plants only a few inches high to erect perennials sometimes as much as 15 ft. and semiscandent forest plants with stems up to 30 ft. long. The majority of the species however are erect leafy herbs ½ - 5 ft. high. The mouth of the leaf sheath on the side opposite the blade is usually truncate or slightly concave, but in a few species it is produced into a distinct tongue or pseudoligule. The spikelets may be clustered in terminal ebracteate spikelike inflorescences sparingly branched in some species (section Hypoporum), or borne in lateral and terminal panicles arising from the sheaths of the leafy bracts (sections Scleria and Ophyroscleria). In some species all the spikelets are unisexual, in others there are male and androgynous spikelets. The spikelets are composed of spirally arranged glumes of which the 2 - 4 lowest are empty with either several male or one female and several male flowers above them. The ovary of the female flowers has a three-branched non-persistent style and develops into an ovoid, ellipsoid or subglobose nutlet with a smooth and shining or variously reticulated, tuberculate or otherwise sculptured surface, sometimes bearing minute hairs. The mature gynophore, which is inconspicuous in section Hypoporum (species 21 - 44), is dilated at the apex into a trilobed or cuplike hypogynous disc with smooth margins in the section Scleria (species 4 - 20), with ciliate margins in Ophyroscleria (species 1 & 2) and reflexed in Acriulus (species 3).

The little known species S. greigiifolia has for many years been treated as a separate genus, Acriulus, and is so given in my Key to Genera (this journal, vol. 24, no.2,3), but recently published studies (Kern 1964) have demonstrated that there are insufficient grounds for keeping it so. I have therefore included it in Scleria, as was done by Clarke in the Flora of Tropical Africa.

Key to Species

- 1. Inflorescence of terminal and axillary panicles; bracts leafy (excepting S. poaeformis) 2
- Inflorescence terminal only, an interrupted spike, sometimes sparingly branched; bracts not leafy (excepting S. lithosperma) 23

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7. Female glumes 7 - 11 mm. long; nutlets
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1. S. racemosa Poir. (Fig. 7)
 Stout broad-leaved perennial 3 - 13 ft. high. Panicles fairly
 dense, long exerted from the leafy bracts. Female glumes 4 - 5 mm.
 long. Nutlets smooth, glabrous and conspicuously beaked. Swamp
 forest and shady places in swamps; sea level - 4,000 ft.
 KENYA - Shimba Hills.
 TANGANYIKA - Lake Tanganyika, Usambara Mts., Morogoro,
 Dar es Salaam, Mafia Island, Ulanga, Lindi.
 UGANDA - Entebbe, Kigezi.
 ZANZIBAR - Zanzibar Island, Pemba Island.

2. S. verrucosa Willd.
 Robust perennial 3 - 16 ft. high with broad scabrid-margined
 leaves. Panicles rather dense. Female glumes 4 - 6 mm. long, with
 ciliate margins. Nutlets more or less warted below with reddish
 bristles on the warts and smooth at the tip, conspicuously beaked.
 Rain and swamp forest, always in water; 3,500 - 4,000 ft.
 TANGANYIKA - Bukoba.
 UGANDA - Sese Islands, Entebbe.

3. S. greigiifolia (Ridl.) C. B. Cl. (Figs. 6, 8)
 (Acriulus madagascariensis Ridl., Scleria acriulus C. B. Cl.)
 Densely tufted perennial forming clumps 3 - 5 ft. high; leaves
 with coarsely serrate margins and scabrid-angled sheaths. Panicles
 long-exserted and pendulous with brown spikelets. In seasonally
 swampy grassland and beside streams; 3,000 - 4,000 ft.
 TANGANYIKA - Bukoba, Songea.
 UGANDA - Masaka.

4. S. poaeformis Retz.
 (S. oryzoides Presl)
 Stout perennial 4 - 7 ft. high with scabrid-margined leaves.
 Panicles terminal without conspicuous bracts. Female glumes 3.5 - 5
 mm. long. Nutlets smooth and glabrous. In shallow water; sea level
 - 100 ft.
 TANGANYIKA - Dar es Salaam, Mafia Island.
 ZANZIBAR - Pemba Island.

5. S. melanomphala Kunth
 Stout perennial 1½ - 6 ft. high with broad scabrid-margined
 ligulate leaves. Panicles dense, the lateral ones pendulous. Female
 glumes 7 - 9 mm. long, black and green. Nutlets smooth or faintly
 warted. Swamps, marshes, boggy grassland and streams; 1,500 - 6,000
 ft.
 KENYA - Nyanza, Meru.
 TANGANYIKA - Lake and Western Regions, Southern Highlands. Ulanga,
 Songea.
 UGANDA - W. Nile, Kampala, Entebbe, Mubende, Buddu.

6. S. pterota Presl

Robust perennial 1 - 4 ft. high with scabrid-margined ligulate leaves. Panicles solitary, scarcely exerted. Female glumes dark red, 3.5 - 5 mm. long. Nutlets smooth, usually with tufts of hairs below. Damp wooded places; sea level - 2,500 ft.

TANGANYIKA - Moshi, Ulanga.

ZANZIBAR - Pemba Island.

7. S. barteri Boeck. (Fig. 10)

Perennial climber with scabrid-margined leaves. Panicles solitary, rather loose. Female glumes 5 - 6 mm. long. Nutlets lilac, minutely hairy, 3 - 3.5 mm. long. Rain forest and damp shady places, sea level - 4,000 ft.

UGANDA - Sese Islands, Entebbe.

ZANZIBAR - Pemba Island.

8. S. iostephana Nelves

Stout perennial 2 - 7 ft. high with scabrid-margined often ligulate leaves. Panicles solitary. Female glumes dark red, glabrous or hairy, 4 - 5.5 mm. long. Nutlets smooth, blue-black above and violet below. Swamp forests and dense evergreen woodland; 3,000 - 4,000 ft.

TANGANYIKA - Bukoba, Sumbawanga, Ulanga.

UGANDA - Sese Islands, Masaka, Entebbe.

9. S. pachyrhyncha Nelves

Robust perennial up to 3½ ft. high with ligulate leaves. Panicles solitary, scarcely exerted. Female glumes green or brown, 4 - 5 mm. long. Nutlets 3 - 4 mm. long, smooth and glabrous. Forests; 5,500 ft.

TANGANYIKA - Uluguru Mts.

10. S. laxiflora R. Gross

Slender glabrous perennial up to 3 ft. high, often with prostrate stems. The stem-bases are thickened and packed tightly together forming a knotted mass or dense row. Panicles narrow, solitary, distant. Female glumes 4 - 5.5 mm. long. Nutlets almost completely smooth. Vegetatively very similar to S. bequaertii, which has a sparingly branched rhizome 3 - 4 mm. thick, of which I have yet to see any East African material. Swampy grassland; 3,000 - 5,500 ft.

TANGANYIKA - Songea.

11. S. nyasensis C.B.Cl.

Slender perennial 1½ - 3 ft. high with ligulate leaves. Panicles few, the lateral ones several at each node, pendulous on long slender peduncles. Female glumes green, 5 - 7 mm. long. Nutlets faintly pitted with tufts of hairs along the ridges. Swamps and stream sides; 4,000 - 6,500 ft.

TANGANYIKA - Bukoba, Sumbawanga, Southern Highlands, Songea.

UGANDA - Entebbe, Kampala, Kipayo, Kingwe.

12. S. achtenii De Wild.

(S. nyasensis auctt. pro parte)

Perennial very similar to S. nyasensis, but easily distinguished by the solitary shorter stout peduncles of the lateral panicles.

Peaty bogs and swamps; sea level - 4,000 ft.

TANGANYIKA - Bukoba, Mafia Island.

13. S. canaliculato-triquetra Boeck.

Robust rhizomatous perennial up to 6 ft. high. Panicles few, the lateral ones on long peduncles solitary or paired. Female glumes glabrous, dark red, 4 - 5 mm. long. Nutlets 3 - 4 mm. long, smooth or faintly pitted. Valley woodland and riverine grassland; 2,500 - 3,500 ft.

TANGANYIKA - Kigoma, Usambara and Uluguru Mts., Songea.

UGANDA - Mugamba.

ZANZIBAR - Pemba Island.

14. S. addresso-hirta (Kukenth.) E.A. Robinson

(S. canaliculato-triquetra var. addresso-hirta Kukenth.)

Perennial up to 3 ft. high with the upper part of the stems and the leaves hairy. Panicles several, the lateral ones solitary or paired. Swamps and seasonally swampy grassland; 3,000 - 4,500 ft.

TANGANYIKA - Ujiji.

15. S. hildebrandtii Boeck.

Loosely tufted annual 1 - 2 ft. high. The lateral panicles on stout erect peduncles, paired or solitary. Female glumes 5 - 6 mm. long, pale or reddish. Nutlets somewhat transversely wrinkled or almost smooth.

KENYA - Mombasa.

TANGANYIKA - Usambara Mts.

16. S. gracillima Boeck.

Slender annual up to over 1 ft. high with narrowly linear leaves. Panicles small and delicate, pendulous on long slender peduncles.

Female glumes 4 - 4.5 mm. long. Nutlets smooth and glabrous. Marshy grassland and seasonally boggy ground; 3,000 ft.

TANGANYIKA - Songea.

17. S. schimperiana Boeck.

Loosely tufted annual $\frac{1}{2}$ - $2\frac{1}{2}$ ft. high and very similar to S. foliosa. Panicles few, the lateral ones solitary, pendulous, on slender hairy peduncles. Female glumes 5 - 7 mm. long dark brownish-red. Nutlets smooth and glabrous. Swamps and seasonally flooded grassland; 2,500 - 3,500 ft.

TANGANYIKA - Songea.

UGANDA - Eastern Acholi.

18. S. foliosa A. Rich.

Annual $\frac{1}{2}$ - 5 ft. high, with numerous shortly ligulate subglabrous leaves. Panicles few, the lateral ones solitary and shortly exerted on stout peduncles. Female glumes 3 - 5 mm. long, green to blackish-red. Nutlets glabrous, warted. Depauperate plants are easily confused with S. bambariensis. In standing water, marshes and seasonally swampy grassland; sea level - 5,500 ft.

KENYA - Nairobi, Fort Hall.

TANGANYIKA - Bukoba, Shinyanga, Tabora, Arusha, Usambara Mts., Tanga, Ulunga District.

UGANDA - Bunyoro, Teso.

ZANZIBAR - Zanzibar Island.

19. S. tessellata Willd.

Densely tufted annual up to 3 ft. high. Panicles few, the lateral ones on short stout peduncles, solitary. Female glumes 5 - 7 mm. long, glabrous, pale. Nutlets glabrous, faintly pitted. Wet grassland and swamps; 3,000 - 4,000 ft.

TANGANYIKA - Songea.

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20. S. bambariensis Cherm.

(S. parvula auctt.)

An erect densely tufted and usually hairy annual $\frac{1}{2}$ - 3 ft. high. Panicles few, the lateral ones solitary on long slender peduncles. Female glumes 4 - 5 mm. long, yellowish green or scarious, Nutlets pitted. A very variable species. Swampy places and seasonally wet grassland; 400 - 4,000 ft.

KENYA - Mombasa, Kwale.

TANGANYIKA - Tanga, Handeni, Sumbawanga, Songea.

21. S. globonux C.B.Cl. (Figs. 1,5)

Sparingly hairy perennial $1\frac{1}{2}$ - 3 ft. high, very similar to the above, but with the lateral panicles solitary and pendulous on very long, more or less villous, peduncles. Female glumes 5 - 6 mm. long. Nutlets pitted, with minute hairs on the ridges. Swamps and marshy ground; 3,000 - 4,000 ft.

UGANDA - Soroti.

22. S. lithosperma (L.) Schwartz

(S. puzzolanea K. Schum.)

Tall slender rather hairy perennial 1 - 3 ft. high. Panicles several, leafy, with green or brownish spikelets 4 - 5 mm. long in clusters of 1 - 3. Nutlets smooth and pearly, shortly beaked. Damp places in forest and evergreen thicket; sea level - 2,000 ft.

KENYA - Rabai Hills, Kwale.

TANGANYIKA - Usambara Mts., Tanga, Uzaramo and Ulanga Districts.

ZANZIBAR - Pemba Island.

23. S. poaeoides Ridl.

Slender glabrous perennial $\frac{1}{2}$ - $2\frac{1}{2}$ ft. high. Inflorescence of solitary or clustered spikelets, branched from the lower clusters. Spikelets 3.5 - 5 mm. long, dark red. Nutlets small, up to 1.5 mm. long, tuberculate. Marshy grassland and swamps; 3,000 - 6,000 ft.

KENYA - Bungoma.

TANGANYIKA - Buha, Southern Highlands, Songea.

24. S. glabra Boeck.

Glabrous annual 2 - 4 ft. high. Inflorescence paniculate, often twice branched from the lower clusters of spikelets. Spikelets blackish, 3.5 - 5 mm. long. Nutlets small, shallowly pitted or somewhat transversely wrinkled. Seasonally swampy grassland and seepage zones on rocky outcrops; 3,000 - 6,500 ft.

TANGANYIKA - Southern Highlands, Songea.

25. S. welwitschii C.B.Cl.

Slender perennial 1 - $3\frac{1}{2}$ ft. high, with glabrous or hairy ligulate leaves. Inflorescence sparingly branched with clusters of 5 - 7 mm. long spikelets. Female glumes 3 - 4 mm. long, dark chestnut.

Nutlets smooth. Vlei, swamp or seasonally wet grassland; 8,000 ft.

TANGANYIKA - Mbeya Mts.

26. S. rehmannii C.B.Cl. (Fig. 11)

Slender perennial 1 - 5 ft. high with more or less hairy ligulate leaves. Inflorescence with simple branches arising from the lower clusters of dark red 4 - 5 mm. long spikelets. Nutlets smooth or warty in transverse lines. Damp places and seasonally flooded grassland; 1,500 - 3,500 ft.

TANGANYIKA - Southern Region.

27. S. woodii C.B.Cl. var. woodii

Slender glabrous perennial 1 - 3 ft. high. Inflorescence with several simple branches from the lower clusters of greenish, 4 - 5 mm. long spikelets. Nutlets up to 2 mm. long, pale, strongly warted or transversely ridged. Damp and swampy places in grassland and seasonal swamps; 3,000 - 4,500 ft.

TANGANYIKA - Tabora, Southern Highlands.

var. ornata (Cherm.) Schultze-Motel

(S. rehmannii var. ornata Cherm., S. striatonux De Wild.)

Very similar to the above but differing in the more compact, smaller inflorescence and the almost smooth nutlets. Damp and swampy places in grassland; 3,000 - 4,500 ft.

KENYA - Mt. Elgon.

TANGANYIKA - Usambara Mts., Tabora - Kigoma, Ulanga District, Southern Highlands.

UGANDA - West Nile, Busoga, Bugoye, Kampala.

28. S. paupercula E.A. Robinson (in press)

Slender erect glabrous perennial ½ - 1½ ft. high. Inflorescence very small, of 2 - 6 clusters of spikelets, simple or with a solitary branch at the base. Spikelets glabrous, dark red, 3 - 4 mm. long. Nutlets small, smooth. Permanently marshy places; 4,500 - 5,000 ft.

TANGANYIKA - Songea.

29. S. richardsiae E.A. Robinson

Slender weak-stemmed perennial up to 4 ft. high with sparingly hairy often ligulate leaves. Inflorescence with simple branching from the lower clusters of dark red 3.5 - 5 mm. long spikelets. Nutlets glabrous, transversely wrinkled. Streams and boggy places; 6,000 - 7,000 ft.

TANGANYIKA - Sumbawanga, Southern Highlands.

30. S. delicatula Nelmes

(Including S. spondylogona Nelmes)

Slender glabrous annual up to 1½ ft. high. Inflorescence unbranched, of clusters of pale or reddish-brown spikelets 3 - 5 mm. long. Nutlets brownish, finely transversely wrinkled. In pools and seepage zones on rocky outcrops; 3,000 - 4,500 ft.

TANGANYIKA - Tabora - Kigoma.

31. S. pulchella Ridley

Citrus-scented slender annual up to 6 ins. high. Inflorescence simple or with short branches from the lowest clusters of glabrous dark red, 2 - 4 mm. long spikelets. Nutlets small, faintly transversely ridged or pitted. Seasonally swampy places and seepage zones; 5,000 - 7,000 ft.

TANGANYIKA - Sumbawanga, Southern Highlands.

32. S. pergracilis (Nees) Kunth var. brachystachys Nelmes

Slender glabrous annual ½ - 2 ft. high. Inflorescence simple with numerous clusters of dark red spikelets 4 - 5 mm. long. Nutlets glabrous, with shallow pits in transverse rows. Wet grasslands and seasonal swamps; 2,500 - 5,000 ft.

TANGANYIKA - Songea, Southern Highlands.

33. S. dregeana Kunth
Slender perennial up to 3½ ft. high. Inflorescence simple, with close-set clusters of blackish, 4.5 - 6 mm. long spikelets. Nutlets smooth or papillose. Swampy grassland and near streams; 3,000 - 6,000 ft.
TANGANYIKA - Songea, Southern Highlands.
34. S. longispiculata Nelmes
Stout rhizomatous perennial up to 4 ft. high. Inflorescence sparing branched with clusters of greenish or pale brown minutely hispidulous 8 - 9 mm. long spikelets. Nutlets 3.5 - 4 mm. long, smooth. Brachystegia woodlands; 2,500 - 4,000 ft.
TANGANYIKA - Songea.
35. S. erythrorrhiza Ridley
Rhizomatous perennial up to 2½ ft. high with ligulate, glabrous or hairy leaves. Inflorescence simple with numerous clusters of dark 5 - 6 mm. long spikelets, whitish ciliolate above. Nutlets smooth. Seasonally swampy grasslands and permanent swamps; 3,000 - 6,000 ft.
TANGANYIKA - Songea, Southern Highlands.
36. S. flexuosa Boeck.
Slender hairy perennial up to 2½ ft. high with a very slender rhizome. Inflorescence simple with clusters of 4.5 - 6 mm. long spikelets, the female glumes sparingly hairy. Nutlets glabrous, with interrupted transverse ridging. Seasonally swampy grassland; 3,000 - 6,000 ft.
TANGANYIKA - Songea, Southern Highlands.
37. S. bulbifera A. Rich. (Figs 2,4)
S. schweinfurthiana Boeck., S. schliebenii R. Gross)
Rhizomatous perennial up to 3 ft. high, with swollen bulbous-based stems. Inflorescence simple with clusters of 4 - 6.5 mm. long dark reddish spikelets. Nutlets glabrous, smooth or faintly pitted. Seasonally damp places, vlei, rocky wooded hillsides; 3,500 - 8,000 ft.
KENYA - Kitale.
TANGANYIKA - Lake and Western Regions, Usambara Mts., Morogoro, Mpwapwa, Southern Highlands, Southern Region.
UGANDA - West Nile, Ruwenzori Mts., Lango, Karamoja.
38. S. hispidula A. Rich.
Slender glabrous or hairy perennial ½ - 1½ ft. high. Inflorescence simple, of clusters of blackish 3 - 4 mm. long spikelets with white or red cilia. Nutlets glabrous, tessellate. Damp vlei and swampy places; 3,500 - 5,500 ft.
TANGANYIKA - Singida and Moshi Districts, Southern Highlands.
39. S. glomerulata Oliv.
Slender sparingly hairy annual up to 9 ins. tall. Inflorescence of few clusters of pale or reddish ciliate 4 - 6 mm. long spikelets. Nutlets faintly, transversely pitted. Seasonally wet places among rocks.
UGANDA - Madi.
40. S. hispidior (C.B.Cl.) Nelmes
(S. hispidula var. hispidior C.B.Cl.)
Slender hairy annual with tufted stems up to 1 ft. high. Inflorescence of few erect clusters of dark 3 - 6 mm. long spikelets with blackish cilia. Nutlets reddish, faintly transversely wrinkled.

Swampy grassland; 6,000 - 8,000 ft.
UGANDA - Mt. Elgon.

41. S. nutans Kunth

(S. hirtella auctt. non Swartz)

Perennial $\frac{1}{2}$ - 4 ft. high with solitary stems arising from the rhizome with the lower leaves very reduced, and the upper ones well developed. Inflorescence simple of numerous reflexed clusters of dark 4 - 6 mm. long spikelets with long white or black cilia. Nutlets smooth. Swampy and seasonally flooded grassland; 3,500 - 7,500 ft.

KENYA - Kisii, Lolgorien Swamp.

TANGANYIKA - Bukoba, Kilimanjaro, Usambara Mts., Kigoma, Southern Highlands, Songea.

UGANDA - Sese Islands.

42. S. catophylla C.B.Cl. (Fig. 3)

Perennial up to 4 ft. high with glabrous or hairy stems and leaves. Very similar to S. nutans excepting that all the basal leaves are well developed. Inflorescence of numerous reflexed clusters of dark, ciliate, 4 - 6 mm. long spikelets. Nutlets smooth. Swampy grasslands and permanent swamps; 3,000 - 4,000 ft.

TANGANYIKA - Songea.

43. S. grata Nelmes

Slender usually hairy annual 4 - 10 ins. high. Inflorescence simple of a few reflexed clusters of dark ciliate, 3 - 4 mm. long spikelets. Nutlets tuberculate in transverse ridges, glabrous. On rocky summits above mist forest; 4,000 ft.

TANGANYIKA - Ulunga District.

44. S. melanotricha A. Rich.

Slender hairy annual $\frac{1}{2}$ - 1 $\frac{1}{2}$ ft. high. Inflorescence simple, with numerous reflexed clusters of dark ciliate spikelets. Nutlets glabrous, transversely wrinkled. Damp places in grassland and seepage zones on rocky outcrops; 2,500 - 5,000 ft.

TANGANYIKA - Western Region, Ulunga.

DIPLACRUM R.Br.

Of the eight species of Diplacrum which for the most part occur in the tropical and subtropical regions of the Old World, only one is found in East Africa.

All the species are small leafy annual herbs bearing sessile axillary fascicles or clusters of small unisexual spikes, which serve to distinguish them from Scleria with its large unisexual spikes in pedunculate inflorescences. In the female spikes the fertile flower is terminal, a condition rarely occurring in Scleria though the male rudiments above the female flowers may be so small as to be overlooked.

D. africanum C.B.Cl. (Fig. 9)

Slender leafy annual 1 - 6 ins. high with unbranched stems. Spikelets lanceolate, green or yellowish, scarcely over 1 mm. long. Nutlets white, subglobose, longitudinally striate. Seasonally swampy places and shallow soil over lateritic outcrops; 3,000 - 4,000 ft.

TANGANYIKA - Songea, N.W.Tanganyika without locality.

UGANDA - Madi.

COLEOCHLOA Gilly

Coleochloa (Eriospora A. Rich. non Berkeley & Broome) is a small genus of fewer than ten species which occur in tropical and southern Africa. The four species so far recorded from East Africa usually occur on rock pavements, cliffs and among boulders at altitudes between 4,000 and 9,000 ft.

The East African representatives of the genus are densely tufted narrow-leaved perennials with slender stems bearing branched inflorescences with dense pedunculate or sessile clusters of dense spikes composed of several - many male and bisexual spikelets. The spikelets are composed of 4 - 5 distichous glumes of which the two lowest are empty, the 2 - 3 upper either subtend male flowers only, or 1 - 2 female and 1 - 2 male flowers. The female flowers are surrounded by a sac-like utricle from which the 3 stigmas are only just exerted. The numerous hypogynous hairs are unicellular and simple, or multicellular and simple or branched.

Key to Species

1. Stems 3 - 10 mm. broad, glabrous, loosely tufted; leaves flat or folded, narrow, glabrous except for the upper surface of the midrib 2
 Stems 1 - 3 mm. broad, glabrous or villous, densely tufted; leaves convolute, very narrow, glabrous or hairy 3
2. Spikes 5 - 9 mm. long; utricles 4.25 - 6 mm. long 1. C. abyssinica var. castanea
 Spikes 3 - 6 mm. long; utricles 3 - 4 mm. long 2. C. microcephala
3. Spikes pedicelled, panicle open; lower surface of leaves and stems more or less hairy or villous 3. C. setifera
 Spikes sessile, panicles dense; lower surface of leaves and stems glabrous 4. C. virgata

1. C. abyssinica (A. Rich.) Gilly var. castanea (C.B.Cl.) Pichi-Serm. (Fig. 24)

(Eriospora abyssinica A. Rich. var. castanea C.B.Cl.)

Tufted perennial 1 - 3 ft. high. Leaves flat or with inrolled margins, golden brown. Panicle lax and slender; spikelets 3 - 6 mm. long with dark reddish glumes and numerous fine simple hairs. Differs from the nominate variety, which does not occur in East Africa, in the darker glumes and the wider leaves and utricles. Rocky pavements, commonly forming clumps on wet rocks; 6,000 - 8,500 ft.

TANGANYIKA - Usambara Mts., Ufipa Plateau.

UGANDA - Karamoja, Imatong Mts.

2. C. microcephala Nelves

(Eriospora abyssinica var. brevirostrata R. Gross ex Peter)

Tufted perennial 1 - 3 ft. high with flat or folded green leaves. Panicle lax and slender; spikelets 2.5 - 3 mm. long with mucronate reddish brown glumes and fewer stouter hairs than the above, often branched. Rocky hillocks in mist forest, on cliffs and among tall

grasses on rock faces; 4,500 - 6,000 ft.
TANGANYIKA - Ulanga District, Uluguru Mts.

3. C. setifera (Ridley) Gilly (Figs. 15,16)
(Eriospora oliveri (Boeck.) C.B.Cl., E. setifera (Ridley) C.B.Cl.)
Tufted perennial from a few inches to 3 ft. high. Panicle lax and slender; spikelets 2 - 3 mm. long with reddish-brown short mucronate glumes, glabrous or hairy. Rocky outcrops, granite slabs and pavements, often with Vellozia; 1,500 - 5,000 ft.
KENYA - Kitui District.
TANGANYIKA - Tabora District and Southern Region.

4. C. virgata (K. Schum.) Nelmes
(Eriospora virgata K. Schum.)
Tufted perennial 1 - 2 ft. high with the root-masses often forming stilts. Panicle dense and interrupted; spikelets 3.5 - 4 mm. long with dark red usually mucronate glumes. Shallow soils on rocky pavements; 6,000 - 8,000 ft.
TANGANYIKA - Mt. Meru.

HYPOLYTRUM L.C. Rich.

Hypolytrum, a genus of about fifty species, occurs throughout the tropics and, though largely represented in Africa, only two species have so far been recorded from the rain forests of East Africa, one from the region of the great lakes and the other from the eastern mountain ranges (Usambara, Uluguru Mts. etc.) from about 2,000 to 4,000 ft.

All are rhizomatous perennial herbs with relatively broad flat leaves having either quite stout leafy stems bearing a terminal corymbose panicle with leaf-like bracts, or a lateral leafless slender stem with small scarious bracts in the panicle. The spikelets are small and crowded into numerous dense ovoid to cylindric spikes which may be in sessile or shortly pedicellate clusters. The spikelet consists of a few spirally arranged glumes, the lowest is empty, the next 2 are male flowers and in the species recorded here the terminal female flower is without a glume. The style is bifid. The nutlets are biconvex, more or less wrinkled and very much alike.

Key to Species

- Flowering stems leafless; bracts not longer than the panicle branches; spikes 5 - 23 mm. long. 1. H. heteromorphum
- Flowering stems leafy; bracts foliaceous, longer than the panicle branches; spikes 3 - 8 mm. long 2. H. testui

1. H. heteromorphum Nelmes (Figs. 13,14)
(formerly confused with H. africanum Steud.)
Stout rhizomatous perennial with stems ½ - 3 ft. high and numerous flat leaves 7 - 20 mm. wide, longer than the panicles. Panicle corymbiform with numerous cylindric spikes. Damp sandy places in rain and swamp forests; 3,000 - 4,000 ft.
TANGANYIKA - Bukoba District.
UGANDA - Sese Islands, Mengo, Masaka.

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2. H. testui Cherm. (Fig. 12)
 (H. nemorum Spreng. in Fl. Trop. Afr.)
 Stout perennial 3 - 5 ft. high with numerous flat leaves often longer than the panicles. Panicle corymbiform with numerous ellipsoid or subglobose spikes. Swamp forests and damp shady places; 2,500 - 4,000 ft.
 TANGANYIKA - Usambara, Uluguru and Muhulu Mts. (Ulanga).

ASCOLEPIS Nees

Ascolepis, a small genus of annual and perennial herbs, is confined almost entirely to tropical and southern Africa, but there is one species occurring in Madagascar and South America. To date seven species have been recorded in eastern Africa where they may be found in swamps, dambos and seasonally wet hollows in grassland between 2,000 and 6,000 ft.

All are small leafy herbs rarely exceeding 2 ft. tall with white or yellow Kyllinga-like heads with long green bracts. In some species the length of the squamellae (hypogynous scales) of the outer spikelets is greatly exaggerated so that they resemble the petals of the ray florets found in many of the Compositae. In others all the squamellae are of similar length. Floral structure is complex. The head consists of a flattish receptacle bearing numerous spikelets, the glumes are small and subtend the squamellae which are completely fused along one margin and partially free on the others and more or less completely surround the ovary with its 2 - 3-fid style and the stamens.

Key to Species

1. Slender annuals up to 6 ins. high; squamellae terete with an apical opening 6
 Perennials with fibrous remains of the old leaf-sheaths; squamellae laterally compressed, solid at the top, and with the opening about the middle 2
2. Glumes about half the length of the squamellae 3
 Glumes only 1/6 of the length of the squamellae 5
3. Glumes linear or linear-lanceolate, acute or acuminate 4
 Glumes obovate, triangular at the apex, heads sometimes lobed 1. A. capensis
4. Heads whitish, sometimes pale yellow when young 2. A. protea
 Heads golden yellow 5. A. anthemiflora
5. Mature heads 4 - 5 cm. diameter when fully expanded 4. A. pinquis
 Mature heads 2 - 3 cm. diameter when fully expanded 3. A. elata
6. Squamellae orange and green, narrowed gradually towards the tip 6. A. peteri
 Squamellae whitish, wedge-shaped, with an awn on one side 7. A. pusilla

1. A. capensis (Kunth) Ridley (Fig. 23)
(A. braziliensis (Kunth) C.B.Cl.)
Perennial up to 2½ ft. high with narrow leaves. Heads 8 - 15 mm. diam. entire or obscurely lobed, white; squamellae 4 - 6 mm. long, broadly ovate and laterally winged with a short obtuse beak. Swamps with tall grasses and Drosera etc.; 3,500 - 6,000 ft.
KENYA - Kitale.
TANGANYIKA - Kigoma, Sumbawanga, Southern Highlands.
UGANDA - Masaka District.
2. A. protea Welw. (Figs. 20,21)
Slender perennial up to 1½ ft. high sometimes with bulbous stem-bases; leaves shorter than in most species, under half the stem length. Heads 10 - 18 mm. diam. white, rarely pale yellow, with ligulate squamellae 4 - 8 mm. long, the outer ones usually longer than the inner. Swampy grassland and damp places; 3,500 - 4,500 ft.
TANGANYIKA - Western Region.
3. A. elata Welw. (Fig. 22)
(A. protea var. bellidiflora in part)
Tufted perennial up to 1½ ft. high, similar to A. protea. Heads 2 - 3 cm. diam. white, or sometimes rather yellowish with reflexed squamellae, the outer ones narrowly linear and much longer than the inner, varying from 4 - 12 mm. long in a single head. Swamps and swampy grassland; 3,500 - 4,500 ft.
TANGANYIKA - Usinge.
4. A. pinquis C.B.Cl.
Stout tufted perennial 1 - 3 ft. high. Heads very large, white, with squamellae 10 - 20 mm. long, all more or less equal. Swamps, dambos, and damp grasslands; 2,500 - 5,000 ft.
KENYA - Bungoma.
TANGANYIKA - Kigoma, Sumbawanga, Ulanga, Southern Highlands, Tunduru.
UGANDA - Soroti.
5. A. anthemiflora Welw.
Perennial 1 - 2 ft. high, with black basal sheaths and rather swollen culm-bases. Heads 1 - 2.5 cm. diam. with golden yellow ligulate squamellae up to 8 mm. long. Rather like A. protea, but the plants are larger. Swamps, dambos, and seasonally damp grassland; 4,500 - 6,000 ft.
TANGANYIKA - Northern Rhodesia border.
6. A. peteri Kukenth. (Fig. 18)
Minute slender annual 2½ - 6 ins. high. Heads up to 8 mm. diam., yellowish green, of 3 - 5 small spikes up to 4 mm. long with squamellae narrowing towards the apex. Wet rocky outcrops in grassland, sandy hollows near saline lake shore; 3,000 - 6,500 ft.
KENYA - Elgon.
TANGANYIKA - Western Region and near Lake Manyara.
7. A. pusilla Ridley (Fig. 19)
Minute slender annual 2 - 6 ins. high. Heads 3 - 5 mm. diam., pale, with conical terete squamellae with a wide apical orifice. Seasonally swampy grassland, dambos; 3,000 - 5,000 ft.
TANGANYIKA - Sumbawanga.

CLADIUM P. Browne

Cladium is a fairly large genus widespread throughout the tropics with most of its species occurring on islands or near the sea. Only two species occur in East Africa both of which are fairly robust plants with paniculate inflorescences and clustered spikelets. The spikelets have about 8 glumes of which the lower ones are empty, the middle 1 - 3 are bisexual and the top ones empty. Hypogynous bristles are small or absent. The style is 3-branched and the trigonous nutlets are crowned by the persistent style-base.

Key to Species

- Leaves scabrid-margined; spikelets small, 2 - 4 mm.
 long 1. C. mariscus
 Leaves with smooth margins; spikelets 5 - 6 mm.
 long 2. C. sp. near anceps

1. C. mariscus (L.) Pohl var. jamaicense (Crantz) Kukenth. & Peter
 (Fig. 33) (C. jamaicense Crantz)
 Stout perennial herb 4 - 12 ft. high. Panicle very large, 1 - 2 ft. long with terminal and lateral panicles supported by foliaceous bracts. Panicle lax with numerous clusters of 2 - 4 mm. long oblong or ovoid spikelets. Swamps; 6,000 - 6,500 ft.
 UGANDA - Kigezi.
2. C. sp. near anceps (Poir.) Hook. (Fig. 34)
 Stout perennial up to 3 ft. high with entire-margined leaves. Panicle smaller than the above with sessile clusters in narrow panicles and longer spikelets. Forming solitary tufts by a stream; 1,000 - 1,500 ft.
 TANGANYIKA - Rondo Plateau (Lindi District).

CARPHA R. Br.

Carpha is a small genus of about twelve species recorded from the more or less temperate regions of the southern hemisphere. In East Africa the only species so far recorded occurs at high altitudes in boggy places with high rainfall.

The relatively large spikelets borne on the slender branches of a narrow panicle have 4 - 7 glumes of which the basal ones are empty, the succeeding 1 - 3 mature a trigonous nutlet and the apical ones are empty. Hypogynous bristles are present. The style is 3-branched.

C. eminii (K. Schum.) C.B.Cl. var. eminii (Fig. 17)
 (Oreogrostis eminii K. Schum.)

Glabrous shortly rhizomatous perennial 1 - 2 ft. high with narrow leaves. Panicles narrow, dense, up to 12 ins. long with foliaceous bracts. Spikelets 5 - 9 mm. long with oblong shining brown glumes. Hypogynous bristles scabrid, barbed. Nutlet small, reticulate. Rare, in mountain bogs; 10,000 ft.
 UGANDA - Ruwenzori Mts., endemic.

var. angustissima (Cherm.) Kukenth.

Differs from the above in the narrower leaves, not more than 2 mm. wide, the more slender habit, and the more scanty panicle with spikelets

only 5 - 6 mm. long. Mountain bogs; 10,000 ft.
UGANDA - Ruwenzori Mts., endemic.

TETRARIA Beauv.

Tetralia is a small genus almost entirely confined to South Africa, but there is one species which has been recorded from as far north as the mountains of East Africa. Most of the species are small perennial herbs with narrow panicles. The spikelets have 5 - 12 glumes of which all the lower ones are empty. The terminal glume is female, the one below it is male. Hypogynous bristles are present in some species, including the East African one, but absent in others. The style is 3-branched and the trigonous nutlets are crowned by the persistent style-base. In the Key to Genera, on p. 3-6 of the preceding paper, Tetralia will key out with Carpha. The 2 species which concern us differ markedly in habitat and the length of the hypogynous bristles.

T. circinalis (Schrad.) C.B.Cl. var. usambarensis (K. Schum.)Kukenth.
(T. usambarensis K. Schum.)

Slender herb up to 1 ft. high with leafy stems, the leaves often as long as the stems. Panicle 2 - 6 ins. long and usually rather dense, with numerous cylindrical brown spikelets about 8 mm. long. Hypogynous bristles scabrous, shorter than the trigonous nutlet. Sandy places, often with Erica spp.
TANGANYIKA - Mlalo, Usambara Mts..

REMIREA Aubl.

Remirea is a monotypic genus whose only species is widely distributed on sandy shores throughout the tropics. This small creeping leafy perennial has solitary dense heads made up of several spikes. The spikelets have about 3 empty glumes below an apparently terminal bisexual floret. The style is 3-branched and the nutlet trigonous. Hypogynous bristles are absent.

R. maritima Aubl. (Fig. 30)

Glabrous rhizomatous creeping herb with short erect leafy stems about 5 ins. high. The dense pale brownish heads are subsessile among the leaves. The spikelets are 4 - 5 mm. long and have a smooth ellipsoid or linear-oblong nutlet. On dunes and sandy shores; sea level.
ZANZIBAR - Zanzibar Island.

RHYNCHOSPORA Vahl

Rhynchospora is one of the larger genera of sedges having a world wide distribution, with its main centre in the southern hemisphere, in South America. Only about ten species have been recorded in Eastern Africa where they mostly occur in the lower lying swampy grasslands, dambos etc. below 4,000 ft.

Many of the African species of Rhynchospora are slender leafy annuals with setaceous leaves and a more or less corymbose or subumbelliform inflorescence of brown spikelets. The perennial species are more varied with corymbose inflorescences or with one or more dense spherical heads of white or brown spikelets. The spikelets are composed of numerous glumes of which the lowest 3 are empty, the succeeding 1 - 4 female and the uppermost male or empty. Hypogynous

bristles may be conspicuous and at least as long as the nutlet, small, or absent. The style is bifid either at the tip only, or with the branches longer than the style; the style-base is swollen and persistent on the biconvex, obovoid or narrowly oblong, smooth or transversely wrinkled, nutlet.

One anomalous species in the past included here is R. erinacea (Ridley) C.B.Cl. which has a three-branched style and a more or less compressed nutlet not unlike that of some Rhynchosporae but without the persistent swollen style-base so characteristic of the genus. This species has also been placed in Cyperus - C. erinaceus (Ridley) Kukenth. - but it has many features inappropriate to such a position too. It is probably necessary to create a new monotypic genus for this very distinctive sedge, but in the meantime it seems preferable to utilise C.B.Clarke's name as its affinities appear to lie more with Rhynchospora.

Key to Species

1. Heads solitary up to 25 mm. wide; style 3-fid; anomalous species 10. R. erinacea
Spikelets variously arranged, but if in dense solitary heads then these much smaller; style 2-fid or subentire 2
 2. Styles entire or bifid at the tip only (Haplostyleae) 3
Styles deeply bifid (Diplostyleae)..... 5
 3. Small annual with a dense solitary head 3. R. parva
Perennials with paniculate or usually several-headed inflorescences 4
 4. Spikelets pedicellate, in fascicles 1. R. corymbosa
Spikelets sessile, in dense globose heads... 2. R. holoschoenoides
 5. Hypogynous bristles always conspicuous (use hand lens)..... 6
Hypogynous bristles absent 7
 6. Spikelets less than 5 mm. long, 2 - 3-flowered 4. R. rugosa
Spikelets over 5 mm. long, many-flowered 5. R. africana
 7. Stout-culmed perennial; spikelets whitish, obtuse... 9. R. candida
Slender-culmed annuals; spikelets acute, brownish 8
 8. Nutlets smooth 6. R. brevirostris
Nutlets transversely rugose 9
 9. Corymbs on peduncles $\frac{3}{4}$ - 1 in. long; rhachilla of the spikelet a zigzag; nutlet finely rugose. 7. R. subquadrata
Corymbs shortly pedunculate or sessile; nutlets coarsely rugose, rhachilla not zigzag 8. R. perrieri
1. R. corymbosa (L) Britt. (Fig. 31)
(R. aurea Vahl)
Stout glabrous perennial 4 - 10 ft. high with flat leaves up to 1 in. wide. Panicle compound, copious, of terminal and lateral corymbs of brown spikelets about 10 mm. long. Rivers and swampy places,

usually in shade ; sea level - 5,500 ft.

TANGANYIKA - Bukoba, Mafia Island, Southern Highlands.

UGANDA - Sese Islands.

ZANZIBAR - Zanzibar Island.

2. R. holoschoenoides (L.C. Rich.) Herter (Fig. 32)

(R. cyperoides (Sw.) Mart., R. mauritii Steud.)

Stout glabrous perennial with inflated cross-veined leaf-sheaths. Inflorescence of several globose pale brownish or greenish heads up to 10 mm. wide borne on long peduncles, more rarely the heads solitary. Spikelets 4 - 5 mm. long with dark brown nutlets 2 mm. long. In very wet sandy places, shallow streams, rice fields and seasonally flooded grasslands; sea level - 4,000 ft.

TANGANYIKA - Mafia Island.

3. R. parva (Nees) Steud. (Fig. 26)

(R. minor Nelmes, R. wallichiana in Fl. Trop. Afr.)

Glabrous narrow-leaved annual about 6 ins. high. Inflorescence a solitary bracteate head 5 - 12 mm. wide. Spikelets 3 - 4 mm. long. Brackish and fresh water marshes; sea level - 100 ft.

TANGANYIKA - Mafia Island.

ZANZIBAR - Zanzibar Island.

4. R. rugosa (Vahl) Gale (Fig. 29)

(R. brownii Roem. & Schult., R. glauca Vahl)

Tufted perennial 1½ - 3 ft. high with narrow leaves. Corymbs rather dense, with brown spikelets 3 - 4 mm. long and brown finely rugose nutlets 2 - 3 mm. long. Swampy grassland; 4,000 - 5,000 ft.

TANGANYIKA - Bukoba, Songea.

5. R. africana Cherm. (Fig. 28)

(R. glauca ssp. africana (Cherm.) Bos)

Tufted perennial up to 2 ft. high with filiform leaves. Corymbs usually scanty, with large brown spikelets 6 - 10 mm. long and brown finely rugose nutlets 3 - 4 mm. long. Swampy ground; 1,500 - 4,000 ft.

TANGANYIKA - Bukoba, Southern Region.

6. R. brevirostris Griseb.

(R. barteri C.B.Cl.)

Slender annual 6 - 9 ins. high with filiform leaves. Inflorescence small, corymbose, congested, with brownish spikelets 3 - 4 mm. long and smooth shining nutlets. Seasonally swampy soils, often on lateritic outcrops; 3,000 - 4,000 ft.

TANGANYIKA - Songea.

7. R. subquadrata Cherm.

Densely tufted slender plant, probably annual, ½ - 2½ ft. high. Panicle rather scanty with brown spikelets 5 - 10 mm. long and whitish or grey finely rugose nutlets. Damp places, dambos and swampy grasslands; 2,000 - 5,000 ft.

TANGANYIKA - Sumbawanga, Songea.

8. R. perrieri Cherm. (Fig. 27)

Slender annual ¼ - 1½ ft. high. Inflorescence contracted, dense, with brown spikelets 4 - 5 mm. long and transversely rugose nutlets becoming almost black. Damp shady places; sea level - 100 ft.

ZANZIBAR - Pemba Island.

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9. R. candida (Nees) Boeck. (Fig. 25)

Stout perennial 2 - 3 ft. high with narrow leaves. Inflorescence a corymb of rather large white spikelets 8 - 14 mm. long, with dark grey smooth shining nutlets. Flooded grassland, and drainage lines; sea level - 4,000 ft.

TANGANYIKA - Bukoba, Kigoma, Bagamoyo, Mafia Island, Southern Region.

UGANDA - Masaka, Sese Island.

10. R. erinacea (Ridley) C.B.Cl.

(Cyperus erinaceus (Ridley) Kukenth.)

Stout rhizomatous perennial up to 4 ft. high with stem leaves 4 - 5 mm. wide. Heads dense with 2 - 3 long reflexed green bracts.

Spikelets terete, whitish, with 5 - 6 opposite empty glumes and a bisexual terminal flower. Hypogynous bristles absent. Style-base neither enlarged nor persistent on the large, narrowly oblong nutlet. Brachystegia woodland, locally common; 4,000 - 5,500 ft.

TANGANYIKA - Sumbawanga, Songea.

Excluded species. From the description of R. setacea (Berg.) Boeck. var. semisetacea by Kukenthal, the material collected by Holtz near Dar es Salaam seems to be very distinct from the S. American species and to be more akin to R. subquadrata and R. perrieri. Possibly it should be placed with one of these species, but its identity must remain in abeyance until the specimen can be re-examined.

CYPERACEAE OF EAST AFRICA - II

Explanation of Figures

PLATE I

- Figs. 1, 5. *Scleria globonux* - 1,x 1; 5,x 2
Figs. 2, 4. *Scleria bulbifera* - 2,x 1; 4,x 2
Fig. 3. *Scleria catophylla* - x 1
Figs. 6, 8. *Scleria greigiifolia* - 6,x 2; 8,x 1
Fig. 7. *Scleria racemosa* - x 2
Fig. 9. *Diplacrum africanum* - x 1
Fig. 10. *Scleria barteri* - x 1
Fig. 11. *Scleria rehmannii* - x 1

PLATE II

- Fig. 12. *Hypolytrum testui* - x ½
Figs. 13,14. *Hypolytrum heteromorphum* - x 1
Figs. 15,16. *Coleochloa setifera* - 15,x 2; 16,x ½
Fig. 17. *Carpha eminii* - x ½
Fig. 18. *Ascolepis peteri* - x 10
Fig. 19. *Ascolepis pusilla* - x 10
Figs. 20,21. *Ascolepis protea* - 20,x 2; 21,x 5
Fig. 22. *Ascolepis elata* - x 5
Fig. 23. *Ascolepis capensis* - x 5
Fig. 24. *Coleochloa abyssinica* - x 2

PLATE III

- Fig. 25. *Rhynchospora candida* - x 1
Fig. 26. *Rhynchospora parva* - x 1
Fig. 27. *Rhynchospora perrieri* - x 1
Fig. 28. *Rhynchospora africana* - x 1
Fig. 29. *Rhynchospora rugosa* - x 1
Fig. 30. *Remirea maritima* - x ½
Fig. 31. *Rhynchospora corymbosa* - x ½
Fig. 32. *Rhynchospora holoschoenoides* - x ½
Fig. 33. *Cladium mariscus* - x ½
Fig. 34. *Cladium* sp. near *anceps* - x ½

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PLATE I



PLATE II



PLATE III