

NOTES ON MALAYSIAN CYPERACEAE

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This is the first paper of a series, in which preparatory to a more comprehensive treatment for "Flora Malesiana," some noteworthy Malaysian Cyperaceae will be dealt with. It is based on the material of this family in the Herbaria at Bogor (BO), Leiden (L), and Singapore (S). My sincere thanks are extended to the Directors of these institutions for giving me the opportunity to study their rich collections.

In 1935—36 Kiikenthal's excellent monograph on the genus *Cyperus* in Engler's "Pflanzenreich" appeared. Unfortunately that author revised only a few specimens of the herbaria already mentioned, so that the basis for the distribution of the genus in Malaysia, as given in his invaluable work, compares unfavourably with that of the species of other regions. Kiikenthal's delimitation of the genus is readily accepted; in general his arrangement of the species is also followed, although I cannot agree with Kiikenthal's assertion that his system should be in close accordance with the genetic development of the genus.

On the whole only the synonymy important for the Malaysian region is given below. For a more complete account the reader is referred to Kiikenthal's monograph, in which of course the literature of merely regional interest could not always be fully considered.

The accompanying plates are part of a series, drawn under my supervision by two of the draughtsmen of Herbarium Bogoriense, Sukirno and Md. Anwar.

CYPERUS OHWII Kiikenth.—Fig. 1

Cyperus ohwii Kiikenth. in Fedde, Repert. 29: 197. 1931; in Engl., Pflanzenr., Heft 101: 60 f. S A-E. 1935; Ohwi in Mem. Coll. Sci. Kyoto 18: 127. 1944. — Kiuhiu, Fukuoka, Y. Doki.

Cyperus elahis var. *macronux* C. B. Clarke in J. Linn. Soc., Bot. 21: 190. 1884; in Hook. 1, Fl. Br. Ind. 6: 618. 1893; Kükenth. in Engl., Pflanzenr., Heft 101: 60. 1935, pr. p.; *non nensu* E. G. Camus in Lecomte, Fl. gen. Indo-Ch. 7: 72. 1912. — Bengal, Comilla, C. B. Clarke 14188.

Up to now this beautiful species is only known from southern Japan: Kiuhiu, Fukuoka (type collected by Y. Doki). Among the sheets of

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FIG. 1. *Cypripedium ohwii* Kuentz.

Cyperus elatus L. in the Bogor Herbarium I found some Javanese specimens, obviously belonging to it. Although I have not seen the type specimen, the characters given by Kükenthal and Ohwi are so clear that in my opinion there can be no doubt as to this identification.

Cyperus ohwii is very near to *C. elatus*; usually the plant is still more robust, the leaves are still broader (up to 18mm wide), the keels of the cladophyll usually quite smooth (scabrous in *C. elatus*), the spikes thicker (6—8 mm), the spikelets somewhat broader, obliquely patent, not linear but linear-oblong, about 1.5 mm wide, the crest of the connective is longer (about half the length of the anthercells), the achene oblong-elliptic, 1.1—1.2 mm long (in *C. elatus* elliptic, 0.8—0.9 mm).

Since the spikelets are more patent than in *Cyperus elatus*, and the achene larger, there is some resemblance to *C. digitatus* Roxb., especially to its variety *hookeri* (Boeck.) C. B. Clarke. However, apart from the general habit, it may always be distinguished by the long setulose appendix of the anthers.

On account of the characters of *Cyperus elatus* var. *macronux* given by Clarke I concluded from literature that this taxon might be identical with *C. ohwii*, and this supposition was supported by the examination of the spikelets of Clarke 14188, which were kindly sent to me by Mr. E. Nelmes at Kew. Later on I found an isotype at Bogor under *Cyperus spectabilis* Link, the name which Clarke applied to it in 1871. It seems that Clarke at first took the plant for a distinct species (*i.e.*, 1884), and this would have been the correct course to follow. To my mind the Cochinchina specimen, determined by E. G. Camus as *Cyperus elatus* var. *macronux*, of which also some spikelets could be studied, does not belong to *C. ohwii*, not even to *C. elatus*. I take it for one of the numerous forms of *C. exaltatus* Retz. The specimen in the Singapore Herbarium, collected at Saigon by J. S. Goodenough (1892), I would refer to *C. ohwii*, although one keel of the cladophyll is scaberulous at the top.

JAVA. B a n t e n. Danau swamp, here and there on sudds, 90—100 m, Aug. 9, 1937, van Steenis 10483 (BO)! D j a k a r t a. Rawah Tembaga near Bekasi, among floating *Colocasia esculenta* and *Eichhornia crassipes*, scattered but not rare, 1940, van der Meer 91,5 (BO)!, den Hoed & van der Meer CE.7 (BO)!

CYPERUS EXALTATUS Retz.—Fig. 2

Cyperus exaltatus Retz., Observ. 5: 11. 1789; Miquel, Fl. Ind. bat. 3: 276. 1855; Boeck. in Linnaea 36: 319. 1870; Valck. Snr., Gesl. Cyperus Mai. Arch. 139 pl. f. iO. 1898; 7C. B. Clarke in Philip. J. Sci. 2 Bot.: 86. 1907 (*cf.* Merrill, Enum. Phil. fl. Pl. 1: 109. 1923); Koorders, Exkursionsfl. Java 1: 191. 1911¹; 4 (Atlas); l. 227. 1922;

Koorders interchanged the descriptions of *Cyperus imbricatus* and *C. exaltatus*.

FIG. 2. *Cyperus exaltatus* Retz.

Kiikenth. in Engl., Pflanzenr., Heft 101: 64 f.9 A-E. 1935; Backer, Bekn. Fl. Java, Nooduitg., Fam. 246: 37. 1949.

Cyperus venustus E. Br., Prodr. PL Nov. Holl. 217. 1810; Miquel, Fl. Ind. bat. 3: 280. 1855; Ridley in Forbes, Nat. Wand. 520. 1885.

Cyperus altus Nees in Wight, Contr. Bot. Ind. 84. 1834; Miquel, Fl. Ind. bat. 3: 276. 1855.

?*Cyperus iwasakii* Makino in Bot. Mag., Tokyo 6: 47. 1892 (nomen); 17: 49. 1903; Nakai in Bot. Mag., Tokyo 26: 193. 1912; Ohwi in Mem. Coll. Sci. Kyoto 18: 129. 1944.

Cyperus digitatus (-non Roxb.) sensu Valck. Sur. in Nova Guinea 8: 699. 1912, pr. p. (Versteeg 1917), non al.

Cyperus exaltatus is closely allied to *C. imbricatus* Retz., from which it is sometimes hardly to be distinguished, as both species are very polymorphous. Usually it is more robust than *C. imbricatus*, the spikes are less dense, the internodes of the rhachilla longer. In habit the specimens cited below resemble *C. digitatus* Roxb. (the New Guinea specimen was accordingly determined by Valckenier Suringar), but the spikelets are broader, the glumes broader, distinctly mucronate, and the achenes smaller.

The Malaysian specimens are not quite identical with the Indian ones I saw, and possibly belong to *C. iwasakii* from Korea and Japan, from which I did not see any specimen. Whether or not the latter is really a distinct species I cannot decide.

The only record for Java, without exact locality, is to be found in Boeckeler. Recently I found the species in abundance near Djakarta. The specimen from Sumatra (leg. Waitz; L!), according to Valckenier Suringar representing *C. exaltatus*, is in my opinion much too young for identification.

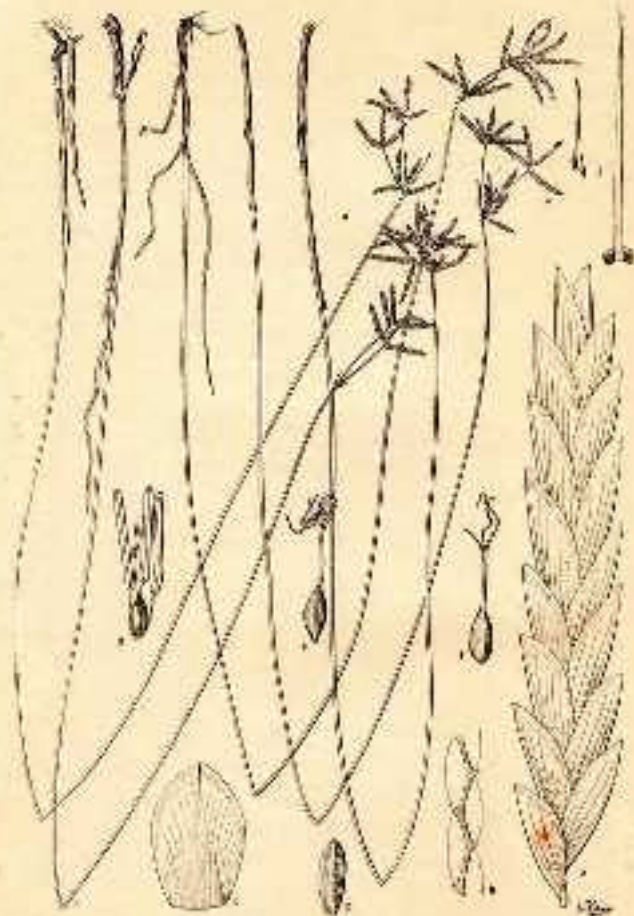
JAVA. Djakarta. Muara Anke, near Djakarta, embankment in tidal forest, abundant, April 28, 1951, Kern 8413 (BO)! — NEW GUINEA. Merauke, 1907, Versteeg 1917 (BO)!

CYPERUS ALOPECUROIDES Rottb.

Cyperus alopecuroides Rottb., Descr. et Icon. 38 pL 8 f.2. 1773; Miquel, Fl. Ind. bat. 3: 261. 1855; Valek. Sur., Gesl. Cyperus Mai. Arch. 72 pl.2 f.sl. 1898; Koorders, Exkursionsfl. Java 1: 186. 1911 [non 4 (Atlas): f. 200. 1922]; Kükenth. in Engl., Pflanzenr., Heft 101: 71. 1935; in Bull. Jard. bot. Buitenz. T6: 300. 1940. — *Juncellus alopecuroides* (Rottb.) C. B. Clarke in Hook, f., Fl. Br. Ind. 6: 595. 1893; Backer, Bekn. Fl. Java, Nooduitg., Fam. 246: 42. 1949.

Cyperus alopecuroides var. *dignus* Boeck. in Linnaea 36: 322. 1870.

It is remarkable that this species, which occurs both in continental tropical Asia and in tropical Australia, is so extremely rare in the Malaysian region. Kiikenth. (*I.e.*, 1935) mentions it from the Malay Peninsula

FIG. 3. *Cyperus scariosus* R. Br.

("Penang and Kelantan, according to Ridley"), but neither in the "Materials" nor in the "Flora of the Malay Peninsula" it is to be found. Malaysian specimens are lacking in the Singapore Herbarium. In Java it was not collected recently. The only statement for this island reaches back to Junghuhn ("swamp behind the dunes near Depok, close by mouth of Opak River"). Of late it was only collected in the Lesser Sunda Islands Bali and Sumba¹ by Van Steenis and Dammerman respectively (*cf.* Kükenthal, *I.e.*, 1940). Additional specimens from Sumba were encountered in the Bogor and Leiden Herbaria: Nabeso, swamp, March 23, 1925, Iboet 94!

Although Clarke (*in* J. Linn. Soc, Bot. 21: 30. 1884) and Kükenthal (*I.e.*, 1935) expressly state that there are two stigmas in this species, I always found some to several trigynous flowers among the digynous ones, also in the few Indian and African specimens I had the opportunity to examine. Undoubtedly the genus *Juncellus*, solely based on the dorsiventrally compressed ovary with two stigmas, is still more artificial than

Pycnosia.

CYPERUS SCARIOSUS R. Br.—Fig. 3

Cyperus scarwus E. Br., Prodr. Fl. Nov. Holl. 216. 1810; C. E. Clarke, Illustr. Cyper. pi 16 f.2-8. 1909; *non sensu* Valck. Sur. in Nova Guinea 8: 699. 1912. — *Cyperus corymbosus* var. *scariosus* (R. Br.) Kükenthal. *in* Engl., Pflanzenr., Heft 101: S3. 1935. — Trop. Australia, R. Brown 5893.

Cyperis diphyllus (*non* Retz.) *sensu* Valck. Sur. in Nova Guinea 8: 698. 1912.

The specimen Koch XI1a, cited by Valckenier Suringar under the herbarium-number "Herb. Lugd. Bat. 909,89-756" and by Kükenthal as "Koch 909," originating from Netherlands New Guinea, is the only record of *Cyperus scariosus* from Malaysia. However, it does not belong to this species, but is a juvenile specimen of the widely spread *Cyperus zollingeri* Steud.

On the other hand the specimens cited below, referred by Valckenier Suringar to *Cyperus diphyllus* Retz., represent typical *C. scariosus*. They perfectly agree with the published descriptions and with the figure in Clarke's "Illustrations," drawn after R. Brown 5893.

As far as I know the species has not been collected in New Guinea afterwards.

NEW GUINEA. Netherlands New Guinea. Merauke, Oct. 31, 1907, G. M. Versteeg 1555 (Valckenier Suringar erroneously cites 1857) (BO)! S-coast, 1904—05, Koch CC40 (L no. 909, 89—33)!

¹Kükenthal erroneously indicates "Sumbawa".

FIG. 4. *Cyperus babakan* Steud.

CYPERUS BABAKAN Steud.—Fig. 4

Cyperus babakan Steud., Syn. Plant, glum. 2: 6. 1855; Backer, Bekn. Fl. Java, Nooduitg., Fam. 246: 34. 1949—Java, Tjikoja, Zollinger H93.

Cyperus babakensis Steud. in Zoll., Syst. Verz. Ind. Arch. Heft 1: 62. 1854 (nomen nudum); ex Miq., Fl. Ind. bat. 3: 257. 1855; Boeck. in Linnaea 35: 521. 1868; C. B. Clarke in Hook, f., Fl. Br. Ind. 6: 610. 1893; Illustr. Cyper. pl. 15 f.l.-S. 1909; E. G. Camus in Lecomte, Fl. gen. Indo-Ch. 7: 61. 1912; Ridl., Fl. Mai. Pen. 5: 144. 1925; Kükenth. in Engl., Pflanzenr., Heft 101: 94. 1935. — *Cyperus pilosus* var. *babakensis* (Miq.) C. B. Clarke in J. Linn. Soc., Bot. 21: 151. 1884. — *Cyperus pilosits* i. *babakensis* (Miq.) Valck. Sur., Gesl. Cyperus Mai. Arch. 129 pi. i f.ss. 1898. — *Dnval-Jouvea babakensis* (Miq.) H. Pfeiff. in Mitt. Inst. Bot. Hamburg 7: 167. 1928.

Cyperus benghalensis C. B. Clarke in J. Linn. Soc., Bot. 21: 151. 1884.

Cyperus babakan differs from the closely allied *C. pilosus* Vahl mainly by the simple inflorescence, the dense spikes, the scabrous keels of the glumes, and the somewhat larger achenes. In the Malay Archipelago it was only known from the type collection ("ad paludem pr. Babakan terrae Tjikoya," Zollinger 693), and from an old collection from Borneo (Korthals *s.n.*). Some supplementary specimens were found among the material of *Cyperus pilosus* in Herbarium Bogoriense. The general distribution is still insufficiently known. Up to the present it has only been recorded from a few localities in Hindustan, Farther India, the Malay Peninsula, and the Malay Archipelago.

Steudel and Miquel wrongly placed this plant in their section and subgenus *Pycneus* respectively, not under "stylus trifidus," as Valckenier Suringar (*op. cit.* p. 130) says they did.

The name *C. babakensis* Steud. ex Miq. and its variant *C. babakan* Steud. were both validly published in 1855. As Miquel cited "*C. babakan* Steud. Syn. Glum, t.c.p. 6 (nomen rectius adjectivi more adhib.)," the form *C. babakensis*, accepted by nearly all authors, was still a nomen nudum when *C. babakan* was already validly published. Therefore it can not be upheld.

MALAY PENINSULA. Wellesley. Aor gading, *Burkill 6SS1* (S)! Peril. Talang Test Station, [illegible] 21 (S)! Pahang: *Ridley 1S19* (S)! Selangor. Kuala Lumpur, *Ridley s.n.* (S)! Malacca. Chabau, *Alvins Still* (S)! P. Penang. Marsh at airport, 11th mile, Bayan Lepas Road, *Sinclair S.FJ9287* (BO)! — JAVA. Without exact locality, *Blume s.n.* (L)! B a n t e n. Rangkasbetung, *Backer 2167* (BO)! D j a k a r t a, Tjikoja, *Zollinger 69S* (L)! D j a k a r t a, *Backer 32.160* (BO)! — BORNEO. Without exact locality, *Korthals a.n.* (L)! South Borneo. Bajar, *Landb. consulent Tlandiermsin s.n.* (BO)!; between Bandjermasin and Martapura, *Bhmenvissierij s.n.* (BO)! — CELEBES. Lasoa, *Kjellberg 1179* (BO)!

The Singapore specimens were already referred to this species by Prof. R. E. Holttum.

FIG. 5. *Cyperus sphacelatus* Rottb.

CYPEEUS BULBOSUS Vahl

Cyperus bulboaus Vahl, Enum. 2: 342. 1806; Miquel, Pl. Ind. bat. 3: 274. 1855; Valck. Sur., Gesl. Cyperus Mai. Arch. 116 pi. 4 f.27, pi. 5 f.8. 1898; Kiiikenth. in. Engl., Pflanzenr., Heft 101: 125 f.15 C-E. 1935.

Zippelius collected *Cyperus bulbosus* in Timor (*cf.* Valck. Sur., *I.e.*). Up to now this locality has remained the only one known in Malaysia. In the Bogor Herbarium I came across a few specimens from one of the Coral Islands in the Bay of Djakarta, and from Madura.

Although *Cyperus bulbosus* is much less wide-spread in Malaysia than is *C. hyalinus* Vahl, its distribution shows agreement with that of the latter species, which is known from the same localities, and moreover from the Kangean Islands and the Moluccas.

JAVA. P. Damar Besar (I. of Edam, Bay of Djakarta), neighbourhood of light-house, common, 1921, *Boschnw*, Sl₂, 352 (BO)!; open part of southern coast, rather common, 1921, *Boachma* 353 (BO)! — MADURA. Sapulu, sea-shore, 1915, *Backer 19495* (BO)!; sandy fields behind sea-shore, abundant, *Backer 19425* (BO, L)! — TIMOR: seashore, *Zippelius 11* (L)!

CYPERUS SPHACELATUS Rottb.—Fig. 5

Cyperus sphacelatus Rottb., Descr. et Icon. 26. 1773; Kiiikenth. in Engl., Pflanzenr., Heft 101: 129. 1935; Backer, Bekn. Fl. Java, Nooduitg., Fam. 246: 39. 1949.

A species of *Cyperus*, found among the material of *C. zollingeri* Steud. and the indeterminata of the Bogor Herbarium, turned out to be *Cyperus sphacelatus* Rottb., previously known only from tropical Africa and America. The Malaysian specimens agree perfectly with the American ones studied, except for the New Guinean specimen, which has much larger epikelets, about 50-flowered. Kükenthal calls the spikelet 8—24-flowered. Prof. R. E. Holttum informed me that some years ago he already determined a *Cyperus* from the Malay Peninsula as *C. sphacelatus*. The specimens in the Singapore Herbarium identified by him are indeed identical with those in the Bogor Herbarium.

The only record of *Cyperus sphacelatus* in Malaysia is to be found in Backer (*I.e.*), where it is mentioned as having been collected by Molhuysen at Lawang (East Java) in 1905. Backer doubts this statement, since the collections of Molhuysen include several plants from Africa etc., which certainly are not native to East Java (see also *Flora Malesiana* 1: xxiii, 366. 1950).

Cyperus sphacelatus greatly resembles *C. zollingeri* (Fig. 6) but it can easily be distinguished by the smaller glumes (2.5—3 mm long, in the other species about 3.5 mm), which are distinctly imbricate, the internodes of



FIG. 1. *Cyprina zollingeri* Steud.

the rhachilla being but 0.75—1 mm long (in *C. zollingeri* the glumes are not or hardly imbricate, the internodes 1.5—1.75 mm), the oblong anthers (linear in *C. zollingeri*), the somewhat smaller achene, and the purple spot on either side of the lower portion of each glume (sometimes only on one side), giving the impression that there is a red stripe along the centre of the spikelet.

The plant has very likely been introduced into Malaysia, but the occurrence in New Guinea is rather surprising, the more so as it is represented here by such a striking form.

SUMATRA. East Coast. Seidang, Pantaitjermin, 1—2.5 m alt., swampy or at least moist localities near the sea, Nov. 5, 1922, *Lorzing 9205a* (BO) !; same locality, May 19, 1928, *Lorzing 13135a* (BO) ! — MALAY PENINSULA. P. Penang. Penang Hill, 2000 ft, Aug. 20, 1941, *Nanen S.F38063* (BO, L, S)'. Johore. Pengkalan Raja, Pontian, low elevation, common on peat by forest edge, July 5, 1939, *Ngadiman S.F36776* (BO, S)J Singapore: Sept. 20, 1943, *Ohwi s.n.* (BO)! Dec. 14, 1948, *Sinclair s.n.* (L)! — NEW GUINEA. Netherlands New Guinea. Vogelkop, McCluer-golf, Babo, 10 m, Aug. 14, 1941, *Aet 671 (exp. Lundquist)* (BO)!

CYPERUS RAMOSII Kükenth.—Fig. 7

Cyperis ramosii Kükenth. *hi* Fedde, Repert. 21: 326. 1925; in Engl., Pflanzentr., Heft 101: 186. 1935; in Bot. Jb. 69: 255- 1938. — Luzon, Ilocos Norte, Ramos 7672.

?*Cyperus rubroviridis* Chermesz. in Bull. Soc. bot. France 66: 350. 1919; *i»* Ann. Mus. colon. Marseille 30 (III. 10): 38. 1922; Kükenth. in Engl., Pflanzenv., Heft 101: 135 *pi. 16 f.G-J.* 1935.

?*Cyperus sphacelate* var. *tenuior* C. B. Clarke in Durand & Schinz, Et. Fl. Congo 1: 577. 1896; in Thiselt.-Dyer, Fl. trop. Afr. 8: 347. 1902.

According to Kükenth *Cyperus ramosii* is known only from the Philippines, New Guinea, and North Queensland. The specimens, collected by Van Steenis in Bali, prove that it also occurs in the Lesser Sunda Islands.

I am nearly convinced that *C. ramosii* is not specifically distinct from the African *C. rubroviridis* Chermesz. and that hence the name *Cyperis ramosii* should be referred to synonymy. Unfortunately I have not seen the type specimens of either *C. ramosii* or *C. rubroviridis*. *Cyperus ramosii* is said to be distinguishable by its shorter culms, the shorter involucre bracts, often shorter than the inflorescence, the narrower, in cross-section not rhomboidal, spikelets, the hardly flexuous, blackish rhachilla with oblong (not lanceolate-elliptic) wings, the nearly uni-coloured, muticous, more obtuse glumes with narrower green keels, and by the shape of the achene, which is not truncate at the top. Presumably Ramos 7672, the type, cited by Merrill (Enum. Philip. fl. Pl. 1: 108. 1923) under *C. zollingeri*

FIG. 7. *Cyperus ramosii* Kukenth.

Steud., is a depauperate, immature specimen, for Carr 11414 and 11869, both referred by Kiiikenthal to his *Cyperus ramosii*, comprise specimens with stems up to 3 dm tall, involucrel bracts much overtopping the inflorescence, spikelets about 1.5 mm wide, distinctly rhomboidal in cross-section, strongly flexuous rhachilla, glumes with slightly excurrent midrib, the short mucro setulose at the top, and distinctly truncate achenes (usually even somewhat depressed), fully agreeing with those of the Madagascar specimens of *C. rubroviridis* I examined, and with Kiiikenthal's figure (pi. 16 f. J), representing the achene of *C. rubroviridis*. There may be some slight differences between *C. ramosii* and *C. rubroviridis*, but I greatly doubt whether they justify specific separation. In the examined specimens of the latter the keels of the glumes are somewhat broader and one side of them is often tinged with red, the internodes of the rhachilla are somewhat shorter, and the wings of the rhachilla spotted with red.

LESSER SUNDA ISLANDS. Bali. NW Peninsula, Perapatagung, forest on lime-stone rocks, 100m, April 2, 1936, *van Steenis 76U* (BO)! — PHILIPPINES. Luzon, Ilocos Norte, *Ramos 7672* (type of *C. ramosii*, not seen). — NEW GUINEA. Papua. Port Moresby, sea shore, April 12, 1936, *Carr 11869* (L, S)! Hisiu, open sandy places, sealevel, Feb. 17, 1935, *Carr 11414* (L, S)!

CYPERUS ELEUSINOIDES Kunth

Cyperitis ehusinoides Kuntb, Enum. 2: 39. 1837; Miquel, Fl. Ind. bat. 3: 270. 1855; Valck. Sur., Gesl. Cyperus Mai. Arch. 1S8 pi. i f. Sl. 1898; C. B. Clarke in Philip. J. Sci. 2 Bot.: 84. 1907; Merrill, Enum. Philip, fl. PI. 1: 105. 1923; Kiiikenth. •in Engl., Pflanzenz., Heft 101: 144. 1935. — *Cyperitis nuUms* var. *eleusinoides* (Kunth) Haines, Bot. Bihar Orissa 5: 898. 1924.

As I saw only a few specimens of *Cyperus eleusinoides*, I follow Clarke, Valckenier Suringar, and Kiiikenthal, who all treated it as a distinct species, although I think Haines might be right in considering it a mere form of *C. nutans* with more fascicled, denser, shorter spikes and with denser anthelas. Obviously neither Clarke nor Kiiikenthal succeeded in finding well-marked differences. In the "Flora of British India" Clarke distinguished *C. eleusinoides* by the 20—40-flowered spikelets, scarcely becoming red or chestnut-brown as in *C. distans* and *C. nutans*. In the "Flora of tropical Africa," however, the spikelets are said to be about 10-flowered, the spikes shorter, and the glumes mucronate, the species otherwise very much resembling *C. nutans*. I agree with Valckenier Suringar that the Javanese specimen from Kotabaru (leg. Boerlage), determined by Clarke in 1897 as *C. eleusinoides*, belongs to *C. nutans*. So up to the present *C. eleusinoides* was not really known from the Malay Archipelago. The specimens cited below differ from *C. nutans* by the

compound anthela with suberect primary rays, and secondary ones spiculate nearly to the base. The spikes are shorter, denser, about 2 cm long, 7 mm wide, about 30-spiculate. The glumes are 2 mm long, less remote because of the shorter (about 0.5 mm long) internodes of the rhachilla, and often more distinctly mucronate. The achene is more obovate, shorter, 1.1—1.2 mm long.

LESSER SUNDA ISLANDS. Timor. Supul, swamp, 750m, abundant, March 8, 1929, *Walsh 212* (BO)!; without exact locality, *Ass. Resident Timor e.n.* (BO), incomplete specimen, doubtful determination).

CYPEBUS LUZULAB (L.) Eetz.

Cyperus hzulae (L.) Retz.; Valck. Sur., Gesl. Cyperus Mai. Arch. 89 1.4 f.H. 1898; Kükenth. in Engl., Pflanzenr., Heft 101: 170. 1936.

Courtoisia cyperoides (non Nees) *sensu* Miquel, Fl. Ind. bat. 3: 295. 1855.

The specimen upon which the statements of Miquel and Valckenier Suringar are based (Herb. Lugd. Bat. 902,9-407), belongs undoubtedly to *C.luzulae*, not to *C.pseudokyllingoides* Kükenth. (= *Courtoisia cyperoides* Nees), as was assumed by Miquel and Kiikenthal. Any authentic indication by Junghuhn is wanting and I greatly doubt whether the specimen originates from Java or Sumatra. The species has never turned up again from Malaysia; so it would seem that it should be excluded from the flora of this region.

CYPERUS PLATYSTYLIE R. Br.—Fig. 8

Cyprus platystylis R. Br., Prodr. Fl. Nov. Holl. 214. 1810; Valck. Sur., Gesl. Cyperus Mai. Arch. 103 pi. 4 f. 21. 1898; Kidl., Mat. 3: 63. 1907; Koorders, Exkursionsfl. Java 1: 189. 1911; 4 (Atlas): f.214 1922; Merrill, Bibl. Enum. Born. Pl. 55. 1921; Ridl., Fl. Mai. Pen. 5: 141. 1925; Backer, Onkruidfl. Jav. Suikerrietgr. 134 pi. ISO. 1928; Kükenth. in Engl., Pflanzenr. Heft 101: 185 pi 21. 1936; S. T. Blake in 3. Arn. Arb. 28: 215. 1947; Backer, Bekn. Fl. Java, Nooduitg., Fam. 246: 31. 1949. — N. S. Wales, R. Brown 5907.

Kiikenthal (*I.e.*) mentions only a few localities in Malaysia of this rare species (only Wallich 3359d, Scheffer 6471, Edeling 6494, Nagler *s.n.*, and Motley 995 are cited). Therefore it may be useful to give a survey of the distribution in this region more in accordance with our actual knowledge.

MALAY ARCHIPELAGO. Without exact locality; 6373HB (BO)! 6410HB (BO)! — SUMATRA. Atjeh. Takegeun (Takengon), swamp along the lake, 1180m, 1934, *van Steenis 6049* (BO)! Palembang. Bandingagung, NW side of Lake Ranau, flooded rice-field, 500 m, 1929, *van Steenis 3975* (BO)! — MALAY PENINSULA. Perak. Parit Buntar, 1941, *Agric. Officer S.F.Z7284* (BO, S)!; same

FIG. 8. *Cyperum platystylis* E. Br.

locality, common in rice-fields, 1941, *Agric. Officer K121* (S)! Negri Sembilan. Kuala Pemas, 1898, *Ridley 10068* (S)! Malacca. Ching, 1882, *Ridley s.n.* (S)! P. Penang. Kampong Paya near Genting-, rare, 1951, *Sinclair S.F. 39414* (BO)! — JAVA. Banten. Danau swamp, deepest part of lake, gregarious, 100 m, 1912, *Koorders 40488f* (BO)!; same locality, on sudd, 90—100 m, *van Steenis 10484, 10485* (BO)!. Djakarta. Gunung Sahari Sentiong, pool, 10m, 1928, *Backer 24146* (BO)! Bidaratjina, *Edelmg 64.14* (BO)! Djakarta, very swampy places, *Olivier 2* (BO)! Bekasi, Kawah Tembaga, 1940, *van der Meer 834* (BO)!; same locality, on sudd, 20m, 1941, *van Sttenis 12546* (BO)!, 1951, *Kern 8455, 8654* (BO)! Bogor. Kuripan, *Scheffer 6471* (BO)! Priangan. Eawah Tjipangang, 1939, *Polalc s.n.* (BO)! — LESSEE SUNDA ISLANDS. Sumba. Kanangar, waterside, local name kebuamba, 1925, *Iboet 566* (BO)! — BORNEO. Bandjermasin, *Motley 395* (cited by Clarke and Kiiikenthal); W. Kutai, near Danau Siran, shore, common, 10 m, 1925, *Endert 2029* (BO)! — CELEBES. Manado. Tondano Lake, sudd, 1952, *Wisae 20* (BO)! — MOLUCCAS. Ceram. Waesamu, Telaga Sawan, forming ridges in swamp, 1—2 m, 1938, *Eyma -294!* (BO)! — NEW GUINEA. Papua. Western Division: Lake Daviumbu. Middle Fly R., common on swamp margins and floating islands of lake, 1936, *Brass 7631* (cited by Blake, *l.e.*).

CYPEEUS MULTISPICATUS Boecl.—Fig. 9

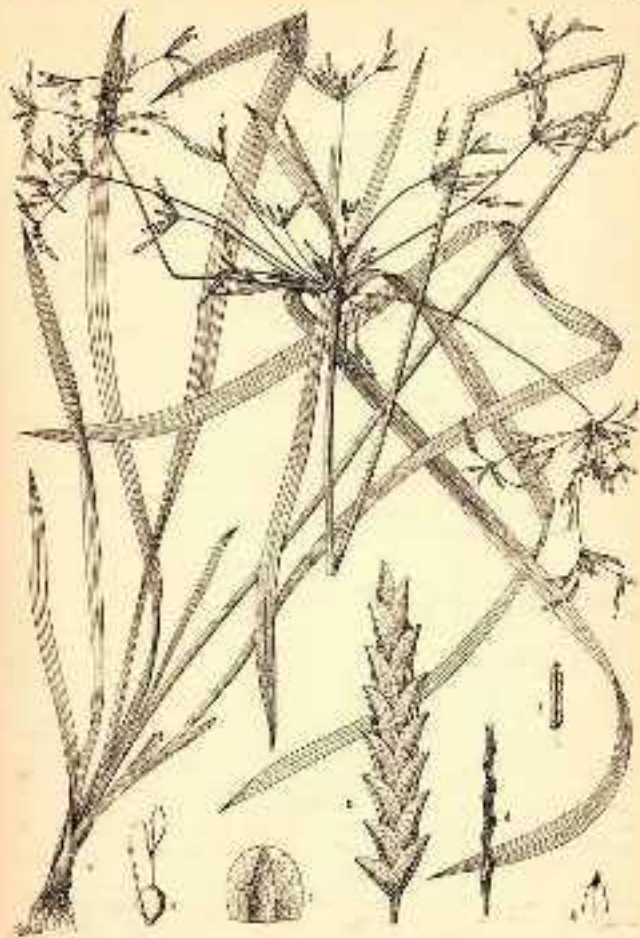
Cyijertts inultispicatus Boeck. in *Linnaea* 38: 362. 1874; C. B. Clarke in *J. Linn. Soc., Bot.* 21: 129. 1884, in *Hook, f., Fl. Brit. Ind.* 6: 604. 1893; *Illustr. Cyper. pi. 13 f. 1—3.* 1909; *Valcht. Sur., Gesl. Cyperus Mai. Arch.* 102. 1898; *Kukenth. in Engl., Pflanzenr., Heft 101:* 213. 1936. — Tenasserim et insul. Andaman, Heifer 6163.

Cyperus multispicatus is obviously a very rare species. It is known only from the type collection [Tenasserim or Andamans, Heifer 6163 (L)!] and from Assam, Cachar (Keenan). It now appears that Backer collected it in Java (Banten, West Java). His specimens agree very well with that of Heifer in the Rijksherbarium at Leiden, although the inflorescence is not so copiously developed. Boeckeler named the species after the innumerable spikelets, but he himself already stated "variat umbella depauperata," and the Javanese specimens are far from being depauperate.

Among the 'Diffusi,' *Cyperus multispicatus* is characterized by the often solitary spikelets, the nerveless, slightly sulcate sides of the glumes, the single stamen (it is incomprehensible that Clarke indicates "stamina 2"), and the small achene. However, the correct allocation of the species is still questionable. It can not be denied that there are strong affinities to section *Haspani*, although Clarke and Kiiikenthal place it in section *Diffusi*.

In my opinion the occurrence in Java is highly interesting for phyto-geographic reasons.

JAVA. Banten. Mt. Halimun near Nirmala, swampy open locality in primary forest, abundant, alt. 1500 m, Dec. 22, 1913, *Backer 10946*(BO)!

FIG. 9. *Cyperus multispicatus* Boeck.

CYPEBUS TENUI SPICA Steud.

Cypems tenuispica Steud., Syn. PI. glum. 2: 11. 1855; C. E. C. Fischer in Kew Bull. 1931: 262. 1931; in Gamble, Fl. Madras 9: 1640. 1931; Kiikenth. in Engl., Pflanzenr., Heft 101: 24B t. 28 f.A D. 1936; Ohwi in Mem. Coll. Sci. Kyoto 28: 145. 1944. — Mangalore, Hohenacker 1670.

Cypems haspan var. *indicus* Boeck. in Linnaea 35: 574. 1868, etiam quoad plant. jav. et born, cit.?

Cyperus flavidus (non Retz.) serum C. B. Clarke in J. Linn. Soc. 21: 122. 1884; in Hook, f, Fl. Br. Ind. 6: 600. 1893; in Philip. J. Sci., 2 Bot: 82. 1907; Haines, Bot. Bihar Orissa 5: 893. 1924. — *Cyperus kaspan* f. *flavidus* (Retz.) Valck. Sur., Gesl. Cyperus Mai. Arch. 92 pl.4 f. 10. 1898, quoad specim. cit., non tamen quoad synon. Retz.

Cyperus haspan (non L.) sensu Merrill, Enum. Philip, fl. PI. 1: 105. 1923, pr. p.

The characters of *Cyperus tenuispica*, as given by Clarke, Valekenier Suringar, Haines, Kiikenthal, and other authors, are so evident that in my opinion they undoubtedly justify specific distinction from *C. haspan* L. I cannot understand why Boeckeler (in Flora 42: 65 66. 1859) says that "sie sich von kleinen stumpfschuppigen Formen des *C. Haspan* L. in nichts unterscheidet," and why Merrill (*I.e.*) fails to see how the Philippine specimens referred to *C. flavidus* by Clarke can be distinguished from *C. haspan*.

The species is widely distributed in the warm regions of the eastern hemisphere; it occurs in Africa, India, Farther India, China, southern Japan, and North Australia. In Malaysia, however, it has practically been overlooked. Valekenier Suringar mentions it only from Bogor (Buitenzorg). Kiikenthal did not see any specimen from the Malay Archipelago, and he cites but a few specimens from the Philippines. As far as I know, it has been collected at the localities cited below. It is remarkable that *C. tenuispica* could not be found among the numerous specimens of *C. haspan* from the Malay Peninsula I revised.

SUMATRA. Without exact locality, *Wails s.n.* (L)! — JAVA. Djakarta. Bidaratjina, *Edeling 6344* (BO)! (cited by Valck. Sur., *op. cit.* p. 94 as *C. kaspan*); Krawang, *Blume s.n.* (L)! (cited by Valck. Sur. *op.cit.* p. 93 as *C. haspan*); Bogor, *Arsin s.n.* (BO)!, *Botrlage s.n.* (L)!, *Hallier 593a* (BO)!, *Ken 7360* (BO)!, Maseng, S of Bogor, *Backer 9422* (BO)! Priangan. Plain of Bandung, *Horsfield s.n.* (S)!, Buahbatu, *Popta 21* (BO)! Semarang. Kedungdjati, *Koorders 25263* (BO)! Sura karta. Klaten, *Achin es* (BO)! Madiun. Saradan, *Beumce 2233* (BO)! Surabaya. Brangkal, Mt. Ardjuno, *Arendsen Hein 27* (BO)! Malang. Malang, *Groenhart 8* (BO)!, Alkmaar, *Mousset 776* (BO)! — KANGAEAN ARCH. Kangean I., Ardjasa, *Backer 27362* (BO)!, SE of Ardjasa, *Backer 27060* (BO)!, Tjangkramaan, *Backer 27658* (BO)!, Sabuntan I., *Backer 29881* (BO)! — MADURA. Between Rapa and Pame kasan, *Backer 20189* (BO, L)!; N of Sumenep, *Backer 20710* (BO)! — LESSER SUN

DA ISLANDS. Timor. Without exact locality, *Monod de Froideville 1710* (BO)! — PHILIPPINES. Without exact locality, *Llanos s.n.* (cited by Clarke, 1907), *Ramos 7446, 14520* (cited by Kükenthal, 1936). Luzon: *Loher 718* (cited by Clarke, 1907); Bangui, Ilocos Norte, *Ramos 27624* (BO)!; Prov. of Bulacan, ramos 1448 (BO, L, S)!; Calooean, Prov. of Rizal, *Merrill 3657* (BO, L)!; Antipolo, Rizal Prov., *Merrill Spec. Blanc. Hi!* (BO, L)! — CELEBES. Without exact locality, *Noerkas 50* (*exp. van Vuuren*) (BO)!

CYFERUS CASTANEUS Willd.

Cyperus castaneus Willd., Spec. Pl. 1: 278. 1797; Vahl, Enum. 2: 317. 1806; Roemer & Schultes, Syst. veg. 2: 177. 1817; Roxb., Fl. ind. (ed. Wall.) 199. 1820; Nees in Wight, Contr. Bot. Ind. 79. 1834; Kunth, Enum. 2: 21. 1837; Steud., Syn. Plant. glum. 2: 13. 1855; Boeck. in Linnaea 35: 496. 1868 (excl. Wallich 3376B); Benth., Fl. austr. 7: 267. 1878; C. B. Clarke in J. Linn. Soc. Bot. 21: 87. 1884; in Hook. f., Fl. Br. Ind. 6: 598. 1893; Valck. Sur., Gesl. Cyperus Mai. Arch. 81 pi. 4 f.4. 1898; F. M. Bailey, Queensl. Fl. 6: 1737. 1902; Ridl., Mat. 3: 63. 1907; E. G. Camus in Lecomte, Fl. gén. Indo-Ch. 7: 46 f.4, 8-11. 1912; Domin in Bibl. bot., Heft 85: 421. 1915; Haines, Bot. Bihar Orissa 5: 894. 1924; Ridl., Fl. Mai. Pen. 5: 141. 1925; C. E. C. Fischer in Gamble, Fl. Madras 9: 1639. 1931; Kükenthal, in Engl., Pflanzenr., Heft 101: 264. 1936.

Of the specimens cited by Kükenthal I could examine Heifer 6202, King 10805, Ridley 14038, Wallich 3323, Wight 1821, besides a specimen from Ceylon, collected by Koenig, and the Malaysian ones cited below. In my opinion *Cyperus castaneus* remains a critical species, and many of the characters given by Kükenthal (*op. cit.* pp. 262, 264) will not hold. Even without mucros the spikelets of *Cyperus castaneus* are not 0.75 mm, but about 1.5 mm wide, inclusive of the mucros about 2 mm; the spikelets of *C. cuspidatus* are usually somewhat broader, 2.5(—3) mm. In *C. cuspidatus* the glumes are often, but not always, more patent, and the mucros often more curved. Clarke already stated, that the colour of the glumes fails us as a diagnostic mark. In general the chestnut colour of *C. castaneus* can be used as an auxiliary character, but sometimes we find nearly the same colour in *C. cuspidatus*; on the other hand in King 10805 (although in my opinion true *C. castaneus*) the glumes are ferruginous. The difference in length of the mucro is often difficult to observe. Probably one of the best characters is furnished by the number of stamens. All specimens of *C. castaneus* I examined were monandrous, which agrees with the statements of Roxburgh and Kunth, but Clarke, Camus, Ridley, and Kükenthal say that there are either two stamens or one. *Cyperus cuspidatus* (according to Clarke also with two to one, according to Kükenthal with three to one stamens), however, I found to be usually triandrous, rarely diandrous. Clarke thinks that, if the two species are to be distinguished, it should be done solely by the length and the shape

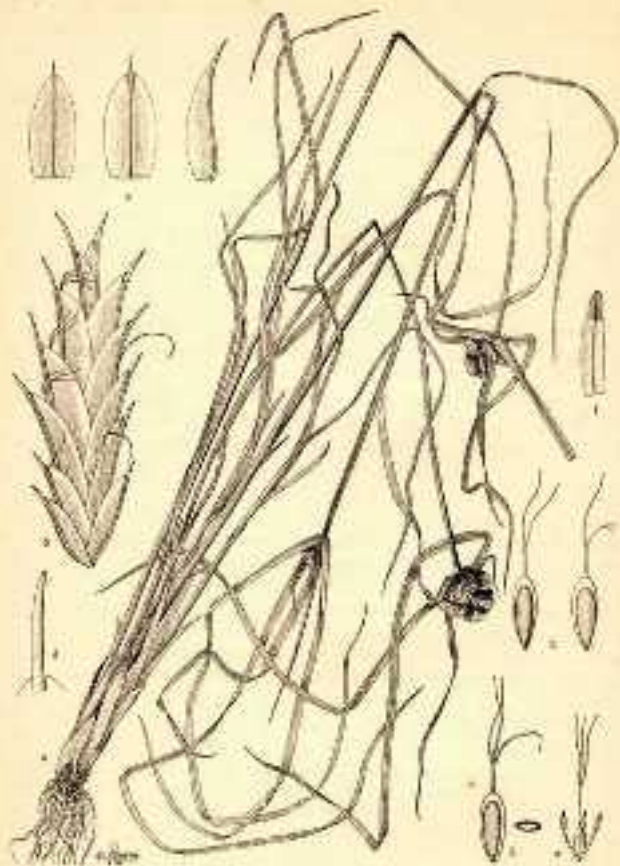


FIG. 10. *Cyperus pachycephalus* Kem

of the achene, as Boeckeler did. At the same time he says (rightly I think) that this character, though well marked in many specimens, becomes very obscure in others. As a rule the achene of *C. castaneus* is oblong with exactly parallel sides, about 0.9 mm long, 0.25(—0.3) mm wide, but in Symington 37944 only 0.6—0.7 mm long and more obovate, in Ridley 14038 even about 0.5 mm long and in shape hardly distinguishable from that of *C. cuspidatus*, which is usually obovate, (0.7)—0.75 mm long, 0.35—0.4 mm wide. Valckenier Suringar distinguished *C. castaneus* by the longer, castaneous glumes (1.25 mm), the shorter mucro, and the oblong achene, but he judged only by Wallich 3323.

Cyperus castaneus is rare throughout its area. As to the Malaysian legion, it was only mentioned from the Malay Peninsula (Perak); it occurs also in Banka and Borneo however.

SUMATRA. BANKA. Sungei Liat, ladang, 70 m, Oct. 23, 1917, *Bunnemeijer 1679* (BO, L)! — MALAY PENINSULA. Pent Tapah, near river, Nov. 1908, *Ridley 14038* (S); sand soil, open ground, 400—600 ft., Aug. 1886, *King's collector 10805* (S)! Kelantan. Gong Kedah, Oct. 16, 1934, *Symington 37944* (S)! — BORNEO. Colony of North Borneo. Mt. Kinabalu, Koug to Kabayo, bridle trail hill, 1000 ft., Dec. 28, 1931, *Clemm 27671*, (BO, L)!

Cyperus pachycephalus Kern, spec. nov.—Fig. 10

Subgen. *Cyperus*, sect. *Dichostylis* (P. Beauv.) Baillon. — Annuus, radicibus fibrosis. Culmi plures, dense caespitosi, basi haud bulbosi, erecti, usque ad 75 cm alti, 1—3 mm crassi, rigiduli, compresso-triquetri, laeves, inferne paucifoliati. Folia culmo breviora vel aequilonga, laete viridia, plana, longe acuminata, nervis marginibusque distincte spinuloso-scabra, (2—)3—4(—5) mm lata, vaginis basilaribus bruneis partim rubro-suffusis. Anthela in capitulum subtriangulare-ovatum vel subglobosum lobatum, 1.5—3 cm diametro, e glomerulis pluribus compositum, contracta, perdense multispiculata. Bractae involucrales plures, inferiores 4—5 inflorescentiam longe superantes, foliis consimiles, usque ad 4 dm longae, patentes, basi dilatata rufescentes. Spiculae saepe incurvatae aut tortae, lanceolatae, valde compressae, 4—8 mm longae 1.5—2(—3) mm latae, pallidae, 6—12-florae. Rhachilla recta, tenuis, exalata, 0.4—0.5 mm lata, internodiis 0.4—0.5 mm longis. Glumae 1/2—2/3 parte imbricatae, bifariam dispositae, carinato-naviculares, explanatae oblongae, absque mucrone 2—2.25 mm longae, 1 mm latae, distincte 7—9-nerviae, pellucido-membranaceae, lateribus pallide stramineae, nervis viridis percursae, saepe punctulis lineolisque fuscis conspersae, e carina laevi in mucronem subexcurvum validum laevem vel apice vix setulosum 0.15 mm (in glumis inferioribus) usque ad 0.6(—0.8) mm (in glumis superioribus) longum desinentes. Stamina 3; filamenta anguste ligulata, alba, denique ca. 2 mm longa; antherae parvae, oblongae, thecis ca. 0.3 mm longis, connectivo in appendicem ovatum laevem ca. 0.1 mm longam producto. Stylus 0.7—1

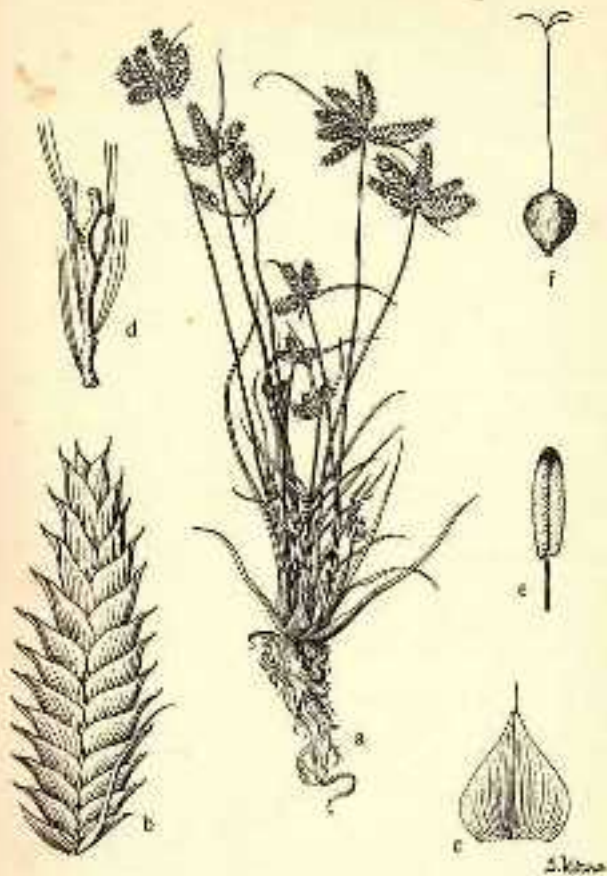
mm longus, 0,08—0,1 mm latus, epapillosus, stigmatibus 3 (interdum 2) 1,5—2 mm longis valde exsertis. Achenium dimidio glumae aequilongum, oblongum, biconvexum, valde compressum, facie in rhachillam obversa, angula dorsali plerumque carens, sectione transversa ellipticum, 1,1—1,4 mm longum, 0,45—0,55 mm latum, 0,25 mm crassum, pallide bruneum, fusco-lineolatum, haud quasi-marginatum.

TYPUS.—Lam 902 (in Herb. Bogor.).

A *Cypero pygmaeo* Rottb. differt culmis et capitulis plerumque multo robustioribus, foliis latioribus, glumis latioribus minus imbricatis distincte mucronatis 7—9-nervatis Carina laevibus, staminibus 3 antheris oblongis apice ovato-productis, stylo latiore stigmatibus fere semper 3, achenio majore.

In *Cyperus* as a rule the number of the stigmas corresponds with that of the carpels: the style is trifid or bifid according as the achene is trigonous or lenticular. In some trigynous species the achene is strongly flattened indeed, but then there is a raised dorsal angle. Kükenthal (in Engler, Pflanzenr., Heft 101: 17. 1935) mentions *C. subtrigonus* (C. B. Clarke) Kükenth., with two stigmas and almost trigonous fruits as an anomaly in this respect. I think some species of Sect. *Dichostylis* are very anomalous too. To be sure, in *C. nipponicus* Franch. et Sav. the number of the stigmas seems to correlate with that of the carpels. In many specimens of *C. pygmaeus* Rottb. and *C. michelianus* (L.) Link, however, distinctly trigonous achenes are more common than planoconvex ones, but usually there are also two stigmas to the trigonous achenes. I can not agree with Bentham (Fl. austr. 7: 262. 1878), who described the achene of *C. pygmaeus* as follows: "the broad flat inner face next the rhachis, the back convex or, when the style is 3-cleft, with a dorsal raised angle." Kükenthal's plate 35, figures D-E, shows planoconvex achenes of *C. michelianus* and *C. pygmaeus* with two stigmas, and trigonous ones with three stigmas, but this is far from being the rule. On the other hand in *C. pachycephalus* I found the achenes nearly always lenticular, although trigynous flowers by far prevail in it.

Brass 14083 was cited by S. T. Blake under *C. pygmaeus* Rottb. (in J. Arnold Arb. 28: 219. 1947) as greatly elongated plants "answering more or less to *C. Michelianus* subsp. *pygmaeus* f. *filifolius* (Franch. & Sav.) Kükenth." It seemed to him quite unnecessary to distinguish them taxonomically. In my opinion they are somewhat slender specimens of *C. pachycephalus*. The numerous important differences undoubtedly justify specific separation; the glumes, the fruits, the style, the rhachilla etc. are quite unlike those of *C. pygmaeus*. I have not seen specimens of the other collection (Brass 8439), also cited by Blake under *C. pygmaeus*.

FIG. 11. *Cypripedium teveriffae* Poir.

SPECIMENS EXAMINED.—NEW GUINEA. Netherlands New Guinea. Mamberamo R., Sept. 29, 1914, *Fenilletau de Bniyn 128*; near Prauwen-bivouac, in mud along small river, alt. 60 m, Aug. 25, 1920, *Lam 902* (type); same locality, alt. 90 m, Sept. 8, 1920, *Lam 1104*, Bernhard bivouac, mud-bank along river, in *Flmbristylis*-vegetation, alt. 50 m, Aug. 6, 1938, *Meyer Drees 543*; Bernhard Camp, Idenburg R., on legs floating in lagoons, April 1939, *Brass 14083*. All specimens, BO.

Ists- and paratype specimens will be distributed to the following Herbaria: Leiden, Kew, Arnold Arboretum, Singapore, Manila, Brisbane, Paris, Sydney, Calcutta, and Honolulu.

CYPERUS TENERIFFAE Poir.—Fig. 11

Cyperus teneriffae Poir. in Lam., *Encycl.* 7: 245. 1806; Kiikenth. in Engl., *Pflanzenr.*, Heft 101: 306 f. SA H-K. 1936; S. T. Blake in *Proc. roy. Soc. Queensl.* 5] : 40. 1940.

Cyperus calcicola Domin in *Bibl. bot.*, Heft 85: 422 pi. 17 f. 10-13. 1915 ("*caliculus*"), non *C. calcicola* Britt., 1915.

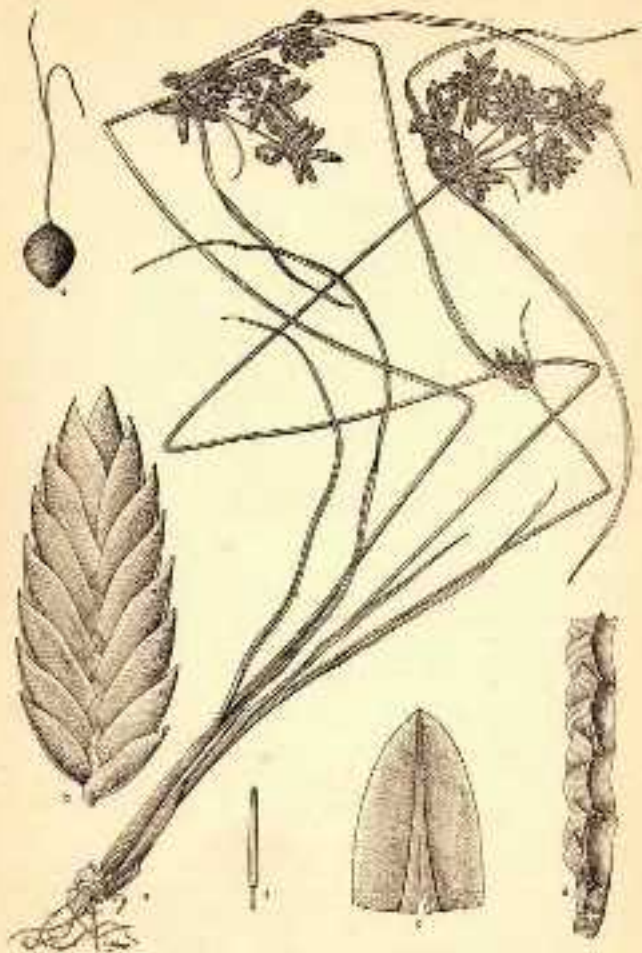
According to Kiikenthal the distribution of *Cyperus teneriffae* extends from Africa to India. Blake (*I.e.*) referred *C. calcicola* Domin, which he re-discovered at the type locality, Chillagoe (Queensland), to *C. teneriffae*. As the plants were observed at Chillagoe on only one of the numerous karst hills, he supposed it to have very likely been introduced into Queensland. In this connection it is interesting that *C. teneriffae* has been collected several times in Timor, where it is obviously not rare on calcareous rocks, associated with *C. antstatus* Rottb. and *C. hyalinus* Vahl.

TIMOR. Without exact locality, *Ass. Resident Timor*; Soe, abundant on calcareous rocks, 800 m, March 1929, *Walsh 107, 442*; near rainforest Nasimetan, 6 km S of Kapan, on calcareous soil, 900 m, local name pun metan, March 11, 1939, *Bloembergen 3449b, 3450*; between Soe and Kapan, cattle-grounds on calcareous soil, 800m, scattered, July 27, 1949, *Monod de Froideville 1237*; all specimens, BO!

CYPERUS LANCEUS Thunb.

Cyperus lanceus Thunb., *Prodr. Pl. capens.* 18. 1794; Valck. Sur., *Gesl. Cyperus* Mai. Arch. 70 pi. 2 f. 20. 1898; Kiikenth. in Engl., *Pflanzenr.*, Heft 101: 333. 1936.

Cyperus lanceus, a native of Africa, is very near to *C. unioides* R. Br. It can be distinguished by the distinct, robust stolons, the blunt glumes, the geniculate style, and the more oblong achene; usually its glumes are castaneous, in *C. unioides* yellowish to brown. Valckenier Suringar mentions *C. lanceus* from the Malay Archipelago on the basis of one collection: "specimina sine indicatione ulteriore." This record has been nowhere accounted for in Kukenthal's monograph. To my surprise the specimens cited belong indeed to *C. lanceus*. They were found by Valckenier

FIG. 12. *Cypripis unioloides* R. Br.

Suringar among the Indonesian indeterminata in the Rijksherbarium. However, I am fairly well convinced, that they do not originate from Malaysia, the more so as there is no accompanying authentic label. An analogous case is mentioned by Valckenier Suringar for *C. alternifolius* L., also a native of Africa, and also found among the Malaysian indeterminata (*op. cit.* p. 103). In this second case he did not treat the species as a Malaysian one, and I think we should do the same with *C. lanceus*.

CYPERUS UNILOIDES R. Br.—Fig. 12

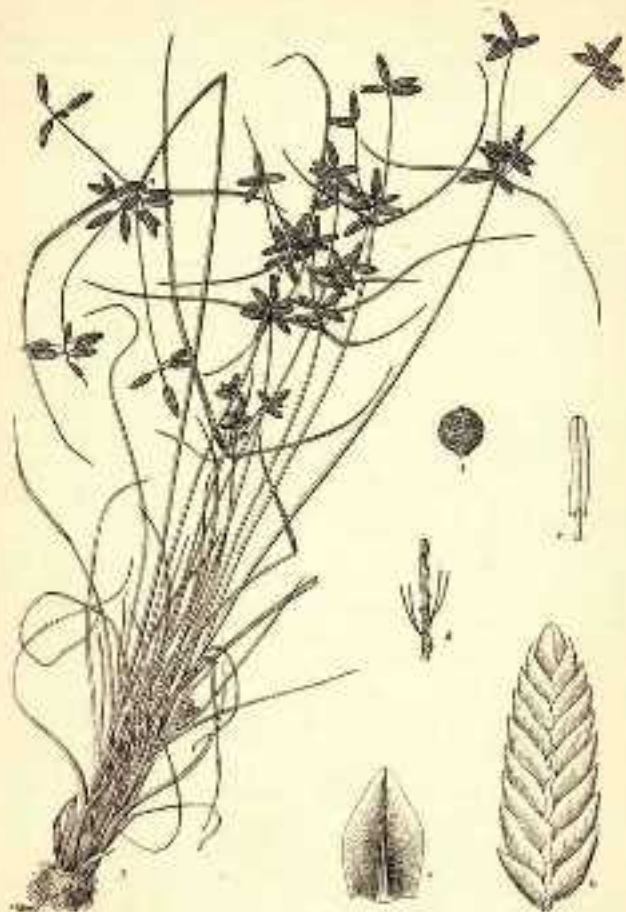
Cyperus unioloides R. Br., Prodr. Fl. Nov. Holl. 216. 1810; Valck. Sur., Gesl. Cyperus Mai. Arch. 71. 1898; Kükenth. in Bot. Jb. 59: 42. 1924; in Engl., Pflanzenr., Heft 101: 338. 1936; Ohwi in Bot. Mag., Tokyo 56: 200, 1942. — *Pycreus unioloides* (It. Br.) Urb., Symb. antill. 2: 164. 1900; Merrill, Enum. Philip. fl. Pl. 1: 111. 1923. — Queensland, R. Brown 5900.

In Malaysia this species is known from the Philippines (Luzon, Mindanao; *cf.* Merrill, *I.e.*). As to the rest of the Malaysian Archipelago, up to now it has only been recorded from New Guinea (Schlechter 1389S, Kanehira & Hatusima 13680). Although rarely, it proved to occur also in Sumatra and Java. On account of the description and figures published I at first believed that the specimens mentioned by Valckenier Suringar as *C. lanceus* Thunb. ("Arch. Mai.: Specimina sine indicatione ulterioriore") might belong to the Asiatic *C. unioloides*. After having seen them in the Leiden Herbarium, I am convinced that they are true *C. lanceus*, but, in my opinion, wrongly recorded for the Malaysian area.

SUMATRA. Atjeh. Takegeun (Takengon), frequent in swampy margin of lake, 1180 m, Aug. 30, 1934, *van Steenix 6058* (BO)! East Coast. Karo Highland, Lau Bedimbo (E Siosar), swamp, not rare, 1250 m, Nov. 12, 1921, *Lorzing 8549* (BO)! Timor Highland, near Seribudolok, 1400—1420 m, Nov. 21, 1928, *hiirzing 14668* (BO)! Mid Habinsaran, near Sibosov, moist sunny soil in ravine, scattered, 1250 m, Nov. 12, 1920, *Lorzing 7748* (BO)!; same locality, March 18, 1929, *horsing 15480* (BO)!; SW foot of Mt. Piso-piso (NW of Toba Lake), scattered, 1500m, Dec. 29, 1922, *Lorzing 9358* (BO)! — JAVA. Priangan. Danu Tjiharus, round the lake, common, 1500 m, Dec. 6—7, 1937, *Hoogenverf s.n.* (BO)! — NEW GUINEA. Netherlands New Guinea. Anggi, Arfak Mts., in open marsh by Iray, Anggi Giji (lake), 1900 m, April 6, 1940, *Kanehira & Hatusima 13680* (not seen); Wissel Lake Region, swamp NE and E of Bubeiro, 1750 m, March 24, 1939, *Eyma 4761* (BO)! Papua. Ramu R., Jan. 1902, *Schlechter 13898* (BO)!

CYPERUS LATESPICATUS Boeck.—Fig. 13

Cyperus latespicatus Boeck. in Flora 42: "433" [441]. 1859; in Linnaea 35: 467. 1868; C. B. Clarke in J. Linn. Soc, Bot. 21: 40. 1884; Kükenth. in Engl., Pflanzenr., Heft 101: 392. 1936. — *Pycreus latespicatus* (Boeck.) C. B. Clarke in Hook, f., Fl. Br. Ind. 6: 590. 1893; Illustr. Cyper. pi. S. 1909. — Bengal, Griffith.

FIG. 13. *Cypripedium latespdatum* Boeck.

According to Kiikenthal this species occurs from Central Asia to India and Farther India. Up to the present it has not been recorded from Malaysia. In the Bogor Herbarium I found some specimens originating from Sumatra and Celebes.

Cyperus latespicatus much resembles *C. unioloides* but may easily be distinguished from this species by the two stamens¹ (three in *C. unioloides*) and the longitudinal-celled outermost layer of the achene (in *C. unioloides* the cells are isodiametric). I doubt whether the varieties of *C. latespicatus*, enumerated by Kiikenthal, possess any systematic value. Like most *Cyperi*, this species is variable in the dimensions of nearly all its parts. The Malaysian specimens, too, vary in size; Lbrzing 15405a and 8021 are small, about 3 and 2 dm high respectively, with narrow spikelets (about 2.5 mm wide). They may belong to variety *gracilescens* Kukenth. (*op. cit.* p. 393). The Celebes specimen is much more robust, about 4 dm tall, with large spikelets, nearly 4 mm wide, and well-developed primary rays of the anthela (up to 7 cm long). Possibly it comes near to var. *laxus* Kukenth. (*I.e.*).

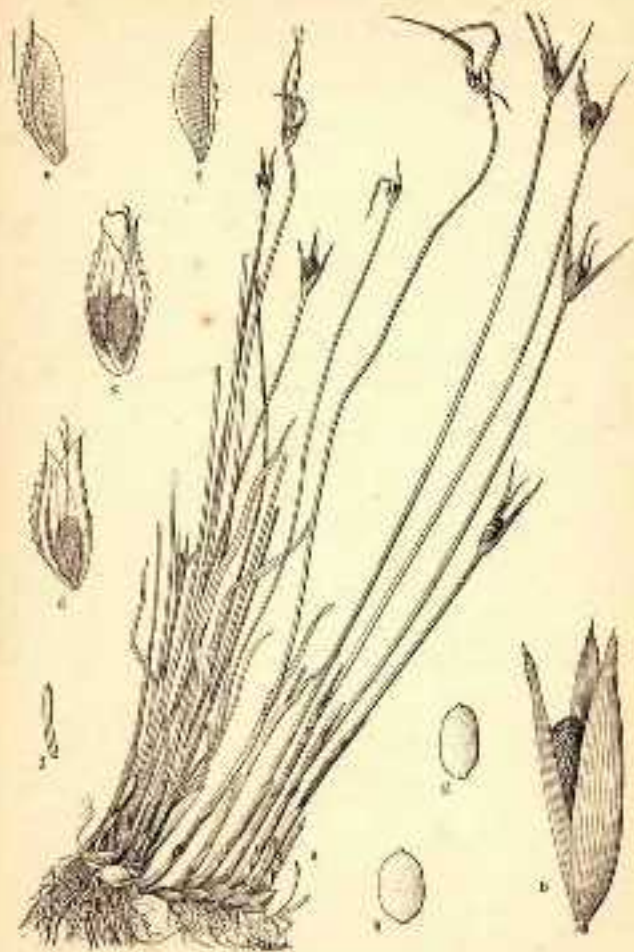
SUMATRA. Tapanuli. Uluan, hills between Perapat and Porsea, 925—1000 m, March 16, 1929, *Lbrzing 15405a* (together with *C. globosus* All., BO)!; W Batuhuda, in grassy wilderness, 1350 m, Nov. 18, 1920, *Lbrzing 8021* (BO)! West Coast. Mt. Talang, Laias Talang, in rice-fields, 1500m, Oct. 26, 1918, *Binnemeijer 5206a* (L, S)!, *5209* (BO, L)! — CELEBES. Mt. Galesong near Malino, in rice-field, 310 m, April 9, 1921, *Biiimemeyer 10934* (BO)!

CYPERUS COMPACTUS var. PAUCIFLORUS (H. Pfeiff.) Kukenth.

Mariscus microcephalus var. *pauciflorus* H. Pfeiff. in Mitt. Inst. Bot. Hamburg 7: 167 *f.l.* 1928. — *Cyperus compactus* var. *pauciflorus* (H. Pfeiff.) Kiikenth. in Engl., Pflanzenr., Heft 101: 424. 1936. — West Borneo, Lebang Hara, Hans Winkler 418.

The specimens upon which this variety was based are said to differ from *C. compactus* Retz. (= *Mariscus microcephalus* Presl) by the two- to three-flowered spikelets and two stamens. This is indeed the case, as is not surprising, because they do not belong to *C. compactus* at all, but represent typical *C. cyperoides* (L.) O. Kuntze, at least as far as the specimen Hans Winkler 418 in the Bogor Herbarium, and the figure given by Pfeiffer are concerned.

¹The figure of the achene and the diagram in Clarke's "Illustrations" show 3 stamens, very likely an error as Clarke himself (*I.e.*, 1884) says "filamenta 2." Plate 4 depicts the triandrous *C. unioloides* as having 2 stamens. There is no question of interchange of figures.

FIG. 14. *Cyperus crypsoides* Kern

Cyperus crypsoides Kern, *spec. nov.*—Fig. 14

Subgen. *Kyllinga*, sect. *Kyllinga*, subsect. *Pingues* Kükenth. — Perennis. Rhizoma lignosum, horizontaliter repens, usque ad 5 cm longum, 2—3 mm crassum, vaginis ovato-lanceolatis cuspidatis fuscis multistriatis punctulatisque imbricatim obtectum, internodiis brevibus. Culmi plures, approximati, rigidi, 10—25 cm alti, 1—1.5 mm crassi, angulati, compressi, sulcati, laeves, apice trigoni, inferne vaginis stramineo-bruneis ferrugineo-punctulatis opacis elaminatis vestiti; vagina summa in laminam brevem cuspidatam plerumque 1—2 cm longam (nonnunquam longioram) exeurrens. Bracteae involucales 3—4, erectae, breves, lanceolatae vel lineares, rigidae, pungentes, 1—2 (interdum usque ad 6) cm longae, 1—3 mm latae, apice scabrae. Capitulum solitarium, ellipsoideum, compactum, 5—12 mm longum, 3—5 mm latum, Rhachis cylindrica. Spiculae parvae, numerosae, suberectae, ovato-ellipticae, ca. 2 mm longae 1 mm latae, valde compressae, uniflorae. Bracteola spiculae (gluma vacua inferior) membranacea, fere 1 mm longa; prophyllum spiculae (gluma vacua superior) ovatum, membranaceum, tenuiter 3—5-nervatum, 1 mm longum. Glumae membranaceae, hyalinae, parce ferrugineo-lineolatae, ovatae, 2 mm longae, breviter mucronatae. in Carina viridi serrulato-spinulosae, gluma inferior utroque latere tenuiter 2-nervia, superior utroque 1-nervia. Stamina 1—2. Antherae lineares, 1 mm longae. Stylus 0.25—0.5 mm longus; stigmata stylo multo longiora. Achenium ellipticum, 1 mm longum, 0.6—0.7 mm latum, breviter apiculatum, luteo-bruneum.

TYPUS.—Eyma 4106 (BO).

Among the Malaysian species of *Cyperus* subgen. *Kyllinga* this species stands rather isolated because of the reduced leaves, the short involucre bracts, the small spikelets, and the minute achenes. The American-African species of subsection *Pingues* may be its nearest allies.

The species has been named after the resemblance of the inflorescences with those of the genus *Crypsis* Ait. (Gramineae).

CELEBES. Pendolo, shore of Lake Posso, Oct. 27, 1938, Eyma 4106 (BO)!: duplicates sent to Arnold Arboretum, Kew, Leiden, and Singapore.

EXPLANATION OF FIGURES

FIG. 1. *Cyperus ohwii* Kuenth.: *a*, part of inflorescence, 0.5 x; *b*, spikelet, 9 X; *c*, anther, 20 x; *d*, achene, dorsal and lateral view, 9 x; *e*, part of leaf, 0.5 x. — After Den Hoed & Van der Meer CE 7.

FIG. 2. *Cyperus exaltatus* Retz.: *a*, habit, 0.5 x; *b* spikelet, 10 x; *c*, glume, lateral view, 10 x; *d* glume, opened out, 10 x; *e*, *f*, achenes, 10 x; *g*, part of rhachilla, 10 X; *h*, flower, 10 x; *i*, stamen, 30 x. — After Kern 8413.

FIG. 3. *Cyperus scanosus* R. Br.: *a*, habit 0.5 x; *b*, spikelet, 10 x; *c*, glume, opened out, 10 x; *d*, flower, 15 x; *e*, *f*, pistils, 10 X; *g*, achene, 10 x; *h*, part of rhachilla, 10 x; *i*, involucre bracts, 25 X. — After Versteeg 1859.

FIG. 4. *Cyperus babakan* Steud.: *a*, habit, 0.5 X; *b*, spikelet, 5 X; *c*, glume, lateral view, 10 x; *d*, achene, 10 x; *e*, pistil, 10 x; *f*, part of rhachilla, 7.5 X; *g* stamen, 25 X; *h*, cross-section of achene 12.5 X. — After "Landb. consilient van Bandjermasin" s.n. (BO 13776).

FIG. 5. *Cyperus spliacelatus* Eottb.: *a*, habit, 0.7 X; *b* spikelet, 7 x; *c*, glume, 10 x; *d*, rhachilla 18 x; *e*, anther, 35 X; *f*, achenes, 18 x. — After Ohwi s.n.

FIG. 6. *Cyperus zoUingeri* Steud.: *a*, habit, 0.5 x; *b*, spikelet, 5 x; *c*, glume, opened out, 10 x; *d*, same, lateral view, 10 x; *e*, rhachilla, 10 x; *f*, deflorate flower, 10 x; *g*, achene, 10 x; *h*, stamen, 10 x. — After Eakhuizen van den Brink *4105.

FIG. 7. *Cyperus ramosii* Kuenth.: 1, habit, 0.5 X; 2 spikelet, 7.5 X; 3, rhachilla, 10 x; 4, glumes, 10 x; 5, deflorate flower, 10 x; 6, stamen and anther, 10 x; 7, achenes, 10 x. — After Carr 11414.

FIG. 8. *Cyperus platystylis* R. Br.: *a*, habit, 0.5 x; *b*, spikelet, 10 x; *c*, glume, opened out, 10 x; *d*, rhachilla, 10 X; *e*, stamen, 20 X; *f*, achene, 7.5 x. — After Wisse 20.

FIG. 9. *Cyperus multispicatus* Boeck.: *a*, habit, 0.5 x; *b*, spikelet, 10 X; *c*, glume, opened out, 10 X; *d*, part of rhachilla, 10 x; *e*, deflorate flower, 10 X; *f*, stamen, 25 X; *g*, tip of anther. — After Backer 10946.

FIG. 10. *Cyperus pachycephalus* Kern: *a*, habit, 0.5 X; *b*, spikelet, 10 X; *c*, glumes, 10 x; *d*, apex of glume, with mucro, 25 x; *e*, young flower, 10 x; *f*, anther, 50 x; *g*, achenes, 10 x; *h*, same, with cross-section, 10 x. — After Lam 902.

FIG. 11. *Cyperus teneriffae* Poir.: *a*, habit, 1 X; *b*, spikelet, 7.5 x; *c*, glume, opened out, 12.5 X; *d*, rhachilla, -with persistent filaments, 12.5 x; *e*, stamen; *f*, pistil, 20 X. — After Walsh 167.

FIG. 12. *Cyperus uniohides* R. Br.: *a*, habit, 0.5 x; *b*, spikelet, 7.5 x; *c*, glume, opened out, 10 x; *d*, part of rhachilla, 10 x; *e*, pistil, 10 X; *f*, stamen, 25 x. — After Lörz 8549.

FIG. 13. *Cyperus tatespicatus* Boeck.: *a*, habit, 0.5 X; *b*, spikelet, 5 x; *c*, glume, opened out, 10 X; *d*, part of rhachilla, with persistent filaments, 5 x; *e*, stamen, 25 X; *l*, achene, 10 x. — After Binnemeijer 10934.

FIG. 14. *Cyperus aypsoides* Kern: *a*, habit, 0.7 x; *b*, inflorescence, 3.5 x; *c*, spikelet, without bracteole and prophyll; *d*, spikelet, without bracteole; *e*, lower glume; *l*, upper glume; *g*, *h*, achenes; *c*—*h*, all, 15 X. — After Eyma 4106.

