

FLORAE MALESIANAE PRECURSORES XLVI
NOTES ON SOME S.E. ASIAN CYPERACEAE X

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I. CAREX COMMIXTA STEUD., A MISINTERPRETED SPECIES. Fig. 1

Zollinger, *Plantae Javanicae* n. 1254, collected 'in sylvis umbrosis M. Pulusari', and distributed as *Carex indica* L., is a mixture of two related but clearly distinct *Carex* both belonging in Section *Indicae*. This was already known to Steudel, who worked up Zollinger's *Cyperaceae* and described part of the 1254 collection as a new species in his *Synopsis* (16, p. 207):

'*Carex commixta*. Steud. Radice valide fibrosa; culmo triquetro glabro laevi toto fere vaginato et foliato (3-pedali), basi vaginis efoliatis brevibus ovato-lanceolatis et foliiferis vestito; foliis lanceolatis elongatis latis (ultra pedalibus, 4—7''' latis) striatis pallidis subglaucescentibus margine scaberrimis; paniculis axillaribus et terminali, omnibus pedunculatis simplicibus; radiis remotis alternis distiche iterum remotiuscule spiculatis; spiculis sessilibus a basi floriferis, subteretibus acutis basi bracteolis 1—2 setaceis munitis; squamis pallidis oblongis striatulis nervo medio in mucronem extenuato; fructu lanceolato scabrato squamam aequante. Cum *Carex indica commixta* in Hrbro *Zoll. Mor.* nr. 1254. *Carex Horsfieldii Boott* videtur affinis. Java.'

Before he published this new species, Steudel must have informed Zollinger about it, for in the latter's *Verzeichniss* (17, p. 60), issued earlier than Steudel's *Synopsis*, *H(erbarium normale)* 1254 is still mentioned as *Carex indica* L., but *Carex commixta*, here published as a *nomen nudum*, is given a new number: 'HZ (= *Herb. propr. Zoll.*) 1502, ex Pr. Bandong.' The original description of *Carex commixta* is almost literally and without comment copied in Miquel's *Flora Indiae Batavae* (8, p. 349), but the name is not accounted for in Koorders's *Exkursionsflora* (5) nor in the emergency edition of Backer's *Flora van Java* (1). In Kükenthal's *Carex*-monograph (7, p. 273) it is cited in the synonymy of *Carex horsfieldii* Boott.

To Nelmes (10, p. 267) the very immature specimen of Zollinger 1254 in the Zürich Herbarium, which appears to be a form of the polymorphous *Carex rafflesiana* Boott, seemed to be the plant described as *Carex commixta*, so that the broad-leaved specimen of this number in the British Museum must have been misidentified by Steudel as *Carex indica*. Consequently Nelmes referred *Carex commixta* to the synonymy of *C. rafflesiana* (10, p. 290), and maintained the name *C. blepharolepis* Nelmes for the broad-leaved plant. The last name was published in 1946 (9, p. 18 *in nota*) with the short diagnosis: 'affinis *C. spatiosae* Boott, sed squamis femineis brevioribus glabris, utriculis brevioribus, praecipue differt. Type: Van Steenis 5457. Priangan, Java.'

To me, on the contrary, it seemed that Steudel's description fits rather the specimen in the British Museum than *Carex rafflesiana*, which has linear leaves. Broad, lanceolate leaves are but seldom found in *Carex*, and they are extremely rare in *Indocarices*. Besides, the said specimen is characterized by its short, ovate-lanceolate cataphylls at the stem-base, the pale-glaucous leaves, the open inflorescence, and the pale glumes, characters

mentioned in the description, but not to be found in *C. rafflesiana*. I supposed that Steudel, after having separated the specimens with broad leaves from those with linear ones, considered the former a new species and took the latter for *C. indica* (see his description of this species, *l.c.*).

My supposition was confirmed by the three specimens of Zollinger 1254 in the Paris Herbarium. One of them is a narrow-leaved, immature plant labelled in Zollinger's handwriting: '1254. E.B. Im Schatten des Waldes auf dem Pulusari bis oben. Cyperaceae. An = V 43'. This is indeed *Carex rafflesiana* Boott. The two broad-leaved specimens belong to what Nelmes described as *Carex blepharolepis*. One of them was determined by Spach as *Carex spatiosa* Boott, the other one (fig. 1), originally forming part of Steudel's private herbarium, bears a label in Steudel's handwriting: '*Carex commixta* Steud. Carici indica erat adjecta. Carici Horsfieldii Boott videtur maxime affinis. — Ego nec C. indicam nec C. commixtam possideo cum utriusque unicum adsit specimen. St.' This was probably a personal information to Zollinger, who added the new number of his Verzeichniss (1502 Z) and presented Steudel with the specimen which is undoubtedly the holotype of *Carex commixta*. An error must have crept into Steudel's statement that the leaves are 4–7 lines wide, for actually they are about $1\frac{1}{2}$ – $2\frac{1}{2}$ cm (14–7''?) wide. This error may have led Nelmes to take the narrow-leaved specimens of Zollinger 1254 for *Carex commixta*.

Boeckeler (2, p. 349), like Spach, determined the broad-leaved Zollinger specimen in the Berlin Herbarium (1284 is obviously a printer's error for 1254) as *Carex spatiosa* Boott. Steudel's name was either unknown to him or — what is more likely — deliberately omitted. This determination is perfectly justifiable. Boott's type specimen of *Carex spatiosa*, Gaudichaud 67 from Indo-China in the Paris Herbarium, the description (3, p. 86), and the excellent plate 246 accompanying the description, leave no doubt that *Carex commixta*, if not conspecific with *C. spatiosa*, is very near to it.

The name *Carex spatiosa* for a Javan *Carex* turns up again in Clarke's 'List of the Carices of Malaya' (4, p. 12). The record is based on a Kurz specimen in the Kew Herbarium, which is certainly conspecific with *Carex commixta*. Clarke distinguished it from typical *C. spatiosa* as 'var. *bogorensis*; utriculis ovoideis; rostro cum $\frac{1}{2}$ – $\frac{3}{8}$ parte utriculi aequilongo, scabro.'

Remains therefore the question whether the Javan *Carex commixta* (1855) and the Indo-Chinese *C. spatiosa* (1860) are specifically distinct. Comparison of Nelmes's long and very detailed description of *C. spatiosa* (12, p. 111) with that of *C. blepharolepis* (10, p. 265) results in no other noteworthy differences than the following: in the former the glumes are said to be about 2 mm long, adpressed-hispidulous, ciliate-erose round the apex, and the utricles 5–6 mm long inclusive of the 2–3 mm long beak; in the latter the glumes are described as being 2–3 mm long (see, however, the original diagnosis!), ciliate-erose especially at the apex, and the utricles 4–5 mm long inclusive of the $1\frac{1}{2}$ –2 mm long beak.

In the Indo-Chinese collections at my disposal I find the utricles on the whole, but not always, slightly longer than in the Malesian plants mainly because of the slenderer beak, and the glumes usually somewhat more hairy. Evaluation of those slight differences is of course subjective; to my mind there is no reason whatever to accept *C. commixta* and *C. spatiosa* as specifically or even varietally distinct.

Recently Raymond (15, p. 255 f. 1) described *Carex smitinandii* from N. Thailand, 'close to *C. spatiosa* Boott and *C. balansae* Franch. of French Indo-China, both bearing wide leaves and an open panicle.' In the Leyden isotype (*Smitinand 7046*), which is obviously better developed than the holotype, I fail to see noticeable differences with



Fig. 1. Photograph of type-specimen of *Carex commixta* Steud.

the Malesian specimens of *Carex commixta*. In the Malesian plants the utricles are 4—5 mm long, in Smitinand 7046 about 4 mm, not 3 mm as was stated in the original description (see, however, his f. 1).

I have not seen *Carex chuniana* Wang & Tang, *C. humbertii* Wang & Tang, and *C. hypolytrifolia* Koyama, which are all referred to the synonymy of *C. spatiosa* Boott by Raymond (14, p. 40). As to *C. hypolytrifolia*, I doubt whether this reduction is right. From Koyama's description I might infer that it belongs in Sect. *Mapaniifoliae* and is either *C. helferi* Boeck. or a closely allied species.

Carex commixta appears to be a rare species of primary—and less frequently secondary—forests, known from Hainan, Burma, N. Thailand, Tonkin, Annam, S. Sumatra, and W. Java. For an enumeration of the collections see Nelmes (10, 11, 12) and Raymond (14, 15).

Carex commixta Steud., Syn. 2 (1855) 207. — Type: Java: Zollinger Pl. Jav. 1254 p.p. typ. (= HZ 1502) (P).

C. spatiosa Boott, Illustr. 2 (1860) 86, t. 246. — Type: Indo-China: Gaudichaud 67 (P).

C. spatiosa Boott var. *bogorensis* C. B. Clarke, Journ. Linn. Soc., Bot 37 (1904) 12. — Type: Java: Kurz s.n. (K).

C. blepharolepis Nelmes, Kew Bull. 1946, p. 18 in nota. — Type: Java: Van Steenis 5457 (BO, K, L).

C. smitinandii Raym., Dansk Bot. Arkiv 23 (1965) 255, f. 1. — Type: Thailand: Smitinand 7046 (BKF, n.v.; isotype in L).

II. NOTES ON FIMBRISTYLIS SECT. FUSCAE

From recent *Fimbristylis* collections it has become clear that the group distinguished by Ohwi (13, p. 571) as Sect. *Fuscae* comprises several S.E. Asian taxa new to science. Ohwi described *Fimbristylis malayana*, a well-characterized species from Pulu Langkawi, and I myself found another interesting new species from that islet among the indeterminate in the Singapore Herbarium, *F. calcicola*. They are apparently endemic species of the limestone rocks of Pulu Langkawi. The late Dr. C. A. Backer collected a new, dwarfish species with gland-dotted glumes in Kangean Island, *F. adenolepis* Kern, which species turned out to occur also in Thailand and Indo-China. Thanks to the careful collecting of *Cyperaceae* by Dr. H. O. Sleumer, Mr. Tem Smitinand, and the Danish Thailand Expedition 1958/59, it appeared that the *Fuscae* are richly developed in N. Thailand and that this region harbours three new species of the section, *F. trichoides*, *F. phaeolepis* and *F. sleumeri*. Two of them were published earlier, the publication of *F. sleumeri* had to wait until I had had the opportunity to examine *F. narayanii* C. E. C. Fischer from India, which proved to be closely related but clearly distinct. Lastly, *F. onchnidiocarpa* is new, dwarfish annual from Indo-China. A synopsis of the section follows here.

Koyama (6, p. 100) united Sect. *Abildgaardia* (Vahl) Benth. and Sect. *Fuscae* Ohwi into a single Series, *Monostachyae* Ohwi. In my opinion the former section is well distinct by the simple inflorescence frequently consisting of a single terminal spikelet and the large nuts. In Asia it is represented by two species only, *F. ovata* (Burm. f.) Kern and *F. triflora* (L.) K. Schum., but in Australia several other *Abildgaardiae* occur: *F. oxystachya* F. v. M., *F. macrantha* Boeck., *F. squarrolosa* F. v. M., *F. brownii* Benth., *F. odontocarpa* S. T. Blake, and *F. pachyptera* S. T. Blake. They have been excluded from the present treatment.

Thus circumscribed *Sect. Fuscae* forms a network of close allies, the interrelationships of which are difficult to understand. The differences between them are mainly found in their being either short-living annuals or perennials, in the presence resp. absence of hairs and 'glands' on the floral glumes, the number of stamens, the length of anthers, style and stigmas, and the shape of the nut and of its epidermal cells. On the whole those seemingly trifling characters are surprisingly constant, but to decide which of them must come first in a more or less natural arrangement is practically impossible. It is, however, remarkable that several of the perennial species have an annual counterpart: *Fimbristylis eragrostis* in *F. phaeolepis*, *F. fusca* in *F. sleumeri*, *F. cinnamometorum* in *F. adenolepis* and *F. fuscoides* in *F. trichoides*. The differences between the species of each pair run parallel for the greater part.

In the majority of the species the number of stamens is constantly three. In *F. calcicola* and *F. straminea* I always found two stamens, in *F. adenolepis* and *F. onchmidocarpa* only one. In *F. fimbristylodes* and *F. disticha* the number is variable. The term 'glands' for the protruding cells in the glumes of a number of species, used by C. B. Clarke and others, has been maintained, though, strictly speaking, we should call them secretion cells.

The distribution of the commoner perennials is approximately known. The often dwarfish annuals are apparently very rare, and their areas often very disjunct (*F. intonsa*, *F. adenolepis*!), but it should be remembered that their occurrence in a certain locality can be ascertained only with difficulty, not only because they are readily overlooked, but also because they are not to be found but in the rainy season. Too little is also known about the ecology. All the species prefer open localities, such as savannahs, moist grass-fields, and swampy places. *Fimbristylis malayana* and *F. calcicola* are only known from limestone screes, and *F. fuscoides* grows on the heathy grounds in Borneo known as kerangas. Intensive field work will undoubtedly add many new data to the following survey of this interesting but difficult group. Several taxa were based on a few collections or even on a single one; it is as yet impossible to say whether they represent 'true' species. Especially the relations between *F. fusca* and *F. fulvescens*, and between *F. narayanii*, *F. fimbristylodes*, *F. straminea* and *F. sleumeri* need to be elucidated.

KEY TO THE SPECIES OF FIMBRISTYLIS SECT. FUSCAE

Annuals or perennials. *Stems* angular, usually glabrous and smooth, rarely pilose, or scabrid at the top. *Leaves* basal and often 1—2 shorter ones somewhat higher on the stem, often falcate; ligule absent except in *F. savannicola*. *Inflorescence* anthelate, simple or compound, rarely (in dwarfish specimens) reduced to a single spikelet. *Involucral bracts* usually much shorter than the inflorescence. *Spikelets* strongly laterally compressed, except in *F. phaeolepis* and sometimes in *F. eragrostis*. *Glumes* with 1—3-nerved keel and nerveless sides, distichous, the distichous arrangement in mature spikelets sometimes less pronounced by torsion of the rhachilla, very rarely glumes subspiral. *Rhachilla* distinctly winged. *Style* triquetrous; stigmas 3. *Nut* trigonous, small.

Readily mistaken for *Cyperus* species, but belonging in *Fimbristylis* on account of the deciduous style pyramidally thickened at the base and articulated with the nut 1

- 1a. Glumes densely gland-dotted, thinly membranous, erect, muticous. Leaves very narrow, setaceous or almost so, $\frac{1}{8}$ —1 mm wide. Stems smooth. Spikelets few-flowered 2
- b. Glumes not gland-dotted, either glabrous or hairy. Style glabrous 6
- 2a. Nut finely transversely lineolate by the linear or oblong-linear epidermal cells, verruculose. Spikelets solitary. Rays of the inflorescence glabrous and smooth. 3
- b. Nut inconspicuously reticulate by the isodiametric epidermal cells, not or hardly umbonulate. Stamens 3. Spikelets lanceolate 4
- 3a. Perennial with creeping, woody rhizome. Stems $\frac{1}{2}$ —1 mm thick. Leaves rigid, acute, scabrid at the top, $\frac{1}{8}$ — $\frac{1}{2}$ mm wide; lower sheaths horny. Inflorescence compound or decompound, with many to numerous spikelets, 3—6 cm long. Involucral bracts erect, much shorter to slightly longer

than the inflorescence, the lowest up to 4 cm. Spikelets oblong or oblong-linear, 4-5 by 1 mm. Glumes ovate-lanceolate, $2\frac{3}{4}$ -4 mm long. Stamens 3; anthers linear, (1-) $1\frac{1}{8}$ -2 mm long. Style shortly hairy at the base, 3- $3\frac{1}{2}$ mm long; stigmas very short, $\frac{1}{2}$ - $\frac{3}{4}$ mm. Nut oblong-obovoid, umbonulate, $\frac{3}{4}$ - $\frac{2}{10}$ by $\frac{2}{5}$ - $\frac{7}{10}$ mm. 25-50 cm. 2.

I. F. cinnamometorum (Vahl) Kunth

- b. Delicate, tufted annual with fibrous roots. Stems $\frac{1}{4}$ - $\frac{1}{3}$ mm wide. Leaves weak, rather obtuse, smooth, $\frac{1}{2}$ mm wide; lower sheaths herbaceous. Inflorescence simple or almost so, with (1-) $3\frac{1}{2}$ -5 spikelets, up to 2 cm long. Lowest involucre bract $\frac{1}{2}$ -1 cm long. Spikelets lanceolate, 3-5 by 1 mm. Glumes elliptic-ovate, $1\frac{1}{4}$ -2 mm long. Stamen 1; anther oblong, c. $\frac{1}{2}$ mm long. Style glabrous, 1- $1\frac{1}{4}$ mm long; stigmas c. $\frac{1}{2}$ mm. Nut oblong-obovoid, umbonulate, $\frac{3}{6}$ - $\frac{3}{4}$ by $\frac{1}{4}$ - $\frac{1}{2}$ mm. 5-12 cm ☉ 2. **F. adenolepis** Kern
- 4a. Leaves densely pubescent by antrorse white hairs, rigid, $\frac{1}{4}$ -1 mm wide; ligule a row of white hairs. Stems tufted, pilose especially towards the base, or glabrescent, $\frac{2}{3}$ -1 mm thick. Inflorescence subsimple, with several spikelets, 1- $2\frac{1}{2}$ cm long; rays glabrous or pubescent. Involucre bracts 3-5, setaceous, pubescent, the lowest conspicuously overtopping the inflorescence, up to 7 cm long. Spikelets often paired, 4-5 by 2 mm. Glumes ovate, acutish, fuscous, 4- $4\frac{1}{2}$ mm long. Anthers linear, 2 mm long. Style glabrous, 3- $3\frac{1}{2}$ mm long; stigmas about $\frac{1}{2}$ as long as the style. Nut obovoid, densely verruculose, c. 1 by $\frac{2}{3}$ mm. 20-40 cm 2. 5. **F. savannicola** Kern
- b. Leaves glabrous, $\frac{1}{4}$ - $\frac{2}{3}$ mm wide. Ligule absent. Stems setaceous, $\frac{1}{4}$ - $\frac{1}{2}$ mm thick. Rays of the inflorescence glabrous and smooth. Lowest bract much shorter than the inflorescence. Spikelets solitary 5
- 5a. Densely tufted, glaucous or greyish perennial. Leaves rigid, acute, scabrid at the top. Inflorescence simple or compound, with 4-18 spikelets, 2-4 cm long; rays 1-2 cm. Spikelets 4-6 by 1- $1\frac{1}{2}$ mm. Glumes lanceolate, acutish, 3- $3\frac{1}{4}$ mm long. Anthers linear, 1- $1\frac{1}{2}$ mm long, with subulate, $\frac{1}{4}$ mm long appendage of the connective. Style hairy at the base, $2\frac{1}{2}$ - $3\frac{1}{2}$ mm long; stigmas $\frac{1}{2}$ -1 mm. Nut obovoid, smooth, $\frac{2}{5}$ - $\frac{3}{4}$ by $\frac{2}{5}$ - $\frac{1}{2}$ mm. 10-20 cm. 2. 3. **F. fuscoideis** C. B. Clarke
- b. Very slender annual with fibrous roots, not glaucous. Inflorescence simple or almost so, with 1-3(-4) spikelets, up to 1 cm long; rays up to 6 mm. Spikelets 4-5 by 1- $1\frac{1}{2}$ mm. Glumes elliptic-ovate, obtusish, c. $2\frac{1}{2}$ mm long. Anthers oblong, $\frac{1}{2}$ - $\frac{2}{3}$ mm long, with very short appendage of the connective. Style glabrous, $1\frac{1}{4}$ - $1\frac{1}{2}$ mm long; stigmas about as long as the style. Nut obovoid, 3-costate, verrucose-tuberculate, $\frac{2}{5}$ by $\frac{1}{2}$ mm. 5-12 cm ☉ 4. **F. trichoides** Kern
- 6a. (1). Outer leaf-sheaths coriaceous, shining purplish or fuscous. Leaves long-acuminate, with bristle-like, readily caducous top, more or less hispid especially beneath, $\frac{1}{3}$ -1 mm wide. Rhizome shortly creeping-ascending. Stems solitary or somewhat tufted, $\frac{1}{3}$ - $\frac{2}{4}$ mm thick, glabrous or pilose. Inflorescence simple or subcompound, with (1-) $5\frac{1}{2}$ -15 spikelets, up to 4 cm long; rays glabrous and smooth, 1-2 cm. Involucre bracts hispid at least at the base, the lowest up to $2\frac{1}{2}$ cm long. Spikelets solitary, or partly paired or in threes, oblong-ovate, 6-9-flowered, 5-8 by 2- $2\frac{1}{2}$ mm. Glumes chartaceous, triangular-ovate, apiculate, dull fuscous, scaberulous with short white hairs but finally glabrescent, 3-4 mm long. Stamens 3; anthers linear, $1\frac{1}{2}$ -2 mm long. Style 2-3 mm long; stigmas about $\frac{1}{2}$ as long as the style. Nut obovoid, minutely umbonulate, sparsely verruculose, 1- $1\frac{1}{10}$ by $\frac{2}{4}$ - $\frac{4}{5}$ mm; epidermal cells isodiametric. 20-30 cm 2. 6. **F. vanoverberghii** Kük.
- b. Outer leaf-sheaths not shining purplish or fuscous. Leaves without setulose top 7
- 7a. Nut finely longitudinally striate and transversely lineolate by the transversely linear epidermal cells in 3-4 vertical rows on each face, not verruculose, oblong-ovoid, c. $\frac{2}{5}$ by $\frac{1}{3}$ mm. Very slender, tufted annual with fibrous roots. Leaves $\frac{1}{2}$ -1 mm wide. Inflorescence simple or subcompound, with 3-9 spikelets, $1\frac{1}{2}$ -4 cm long; rays glabrous, smooth, 1- $2\frac{1}{2}$ cm. Involucre bracts setaceous, the lowest $\frac{1}{2}$ -1 cm long. Spikelets solitary, linear-lanceolate, many-flowered, 3-7(-12) by $1\frac{1}{4}$ mm. Glumes membranous, ovate, acute, muticous or apiculate, densely pubescent, ferruginous, $1\frac{1}{2}$ - $1\frac{3}{4}$ mm long. Stamens 2; anthers oblong-linear, c. $\frac{1}{2}$ mm long. Style 1 mm long; stigmas much shorter. 10-20 cm ☉ 19. **F. calcicola** Kern
- b. Marking of the nut otherwise; epidermal cells isodiametric or almost so 8
- 8a. Base of the nut abruptly truncate, conspicuously broader than the short but distinct stipe. Stems antrorsely scabrid-hispid at least at the top, $\frac{1}{8}$ - $\frac{1}{2}$ mm thick. Leaves abruptly pointed, (1-) $2\frac{1}{2}$ mm wide. Inflorescence simple or subcompound, with 3-10 spikelets, $1\frac{1}{2}$ -4 cm long; rays scabrid-pilose, up to 3 cm. Involucre bracts much shorter than the inflorescence, the lowest up to $1\frac{1}{2}$ (- $2\frac{1}{2}$) cm. Spikelets solitary, lanceolate, pale to dark brown, 6-12-flowered, 4-10 by (1-) $1\frac{1}{2}$ -2 mm. Glumes membranous, broadly hyaline-margined, ovate-lanceolate, acute, often minutely mucronulate, scabrid by minute hairs, (2-) $2\frac{1}{2}$ -3 mm long, the keel straight or nearly so. Stamens (1-) 2 (-3); anthers oblong, $\frac{1}{2}$ - $\frac{1}{3}$ mm long. Style (1-) $1\frac{1}{2}$ -2 mm long; stigmas $\frac{1}{2}$ - $\frac{2}{4}$ mm. Nut pyriform, smooth or verruculose, umbonulate, $\frac{2}{5}$ - $\frac{5}{6}$ by $\frac{1}{4}$ - $\frac{2}{3}$ mm. 7-12 cm. ☉ 12. **F. firmbristylloides** (F. v. M.) Druce

- b. Nut not truncate at the base 9
- 9a. Nut perfectly smooth, obovoid or broadly obovoid, tricostate, reticulate, $\frac{2}{3}$ — $\frac{3}{4}$ by $\frac{1}{5}$ — $\frac{1}{2}$ mm. Stems smooth, rigid, $\frac{1}{2}$ —1 mm thick. Leaves much shorter than the stems, obtuse, $1\frac{1}{2}$ —2 mm wide. Inflorescence simple or subcompound, with 2—7 spikelets, 3—4 cm long; rays suberect, glabrous, smooth, 1—3 cm. Involucral bracts very short, often glume-like, the lowest sometimes up to $1\frac{1}{2}$ cm. Spikelets solitary, lanceolate or linear-lanceolate, often contorted, several-flowered, 8—10 by 2— $2\frac{1}{2}$ mm. Glumes chartaceous, oblong-ovate, long-acuminate, whitish hyaline-margined, minutely puberulous at the top, $3\frac{3}{4}$ —4 mm long. Stamens 3; anthers linear, $1\frac{1}{4}$ — $1\frac{1}{2}$ mm long. Style $2\frac{1}{2}$ —3 mm long; stigmas $\frac{1}{2}$ —1 mm. 20—40 cm. 24
- 15. F. malayana** Ohwi
- b. Nut verruculose or tuberculate 10
- 10a. Glumes hairy, at least in the upper part or on the back. Stamens 3. Spikelets solitary 11
- b. Glumes quite glabrous. Rays of the inflorescence glabrous and smooth 15
- 11a. Glumes 4— $6\frac{1}{2}$ mm long. Style 4—6 mm long. Anthers linear, $1\frac{1}{2}$ —2 mm long. Perennials (always?) 12
- b. Glumes at most 3 mm long. Style 1— $2\frac{1}{2}$ mm long. Anthers oblong or oblong-linear, $\frac{1}{2}$ — $\frac{2}{3}$ (—1) mm long. Inflorescence simple or subcompound. Annuals 13
- 12a. Leaves much shorter than the stems, often scarcely $\frac{1}{4}$ as long, abruptly pointed, (1—)2—4 mm wide. Stems often scabrid-pilose just below the inflorescence, $\frac{1}{2}$ —1 mm thick. Inflorescence compound to supradecomposed, with several to numerous spikelets, up to 10 cm long; rays glabrous or pilose, up to 7 cm. Involucral bracts very short, the lowest rarely up to 3 cm. Spikelets lanceolate, 5—10 by 2— $2\frac{1}{2}$ mm. Glumes subchartaceous, lanceolate, gradually acuminate, scabrid by very short, stiffish hairs, fulvous with broad, whitish-hyaline, glabrous margins, 4— $6\frac{1}{2}$ by 2— $2\frac{1}{2}$ mm. Stigmas much shorter than the style. Nut obovoid, umbonulate, densely verruculose, $\frac{9}{10}$ — $1\frac{1}{4}$ by $\frac{3}{4}$ — $\frac{5}{8}$ mm. 20—50 cm 24 9. **F. fusca** (Nees) C. B. Clarke
- b. Leaves longer, up to 35 cm, 1—2 mm wide. Inflorescence simple, rarely one of the glabrous rays with a short secondary ray, with 3—7 spikelets, $1\frac{1}{2}$ —3 cm long. Spikelets oblong-lanceolate, 5—10 by 2—4 mm. Glumes ovate-lanceolate, pubescent by soft hairs, not or hardly hyaline-margined, ciliate in the upper part, dull fuscous, $4\frac{1}{2}$ —5 by $2\frac{1}{2}$ — $3\frac{1}{2}$ mm. Nut oblong-obovoid, sparsely verruculose, $1\frac{1}{4}$ — $1\frac{1}{3}$ by $\frac{7}{10}$ mm. Other characters as in *F. fusca*, from which it is possibly not specifically distinct. (20—)50—60 cm. 24 (?) 10. **F. fulvescens** (Thwaites) Thwaites
- 13a. Glumes very broadly ovate, very obtuse, with curved keel, apiculate or minutely mucronulate, very densely white-pubescent almost all over, ciliate, subchartaceous, $1\frac{3}{4}$ —2 by $1\frac{1}{2}$ — $1\frac{3}{4}$ mm. Spikelets oblong-ovate, densely many-flowered, (3—)5—10 by $1\frac{1}{2}$ — $1\frac{3}{4}$ mm. Stems scabrid at the top, $\frac{1}{2}$ mm thick. Leaves obtuse, $1\frac{1}{2}$ —2 mm wide. Inflorescence with (1—)3—8(—15) spikelets; rays scabrid, up to 3 cm. Lowest bract subfoliaceous, up to 12 mm long. Anthers $\frac{1}{2}$ mm long. Style 1— $1\frac{1}{3}$ mm long, stigmas much shorter. Nut obovoid or oblong-obovoid, densely verruculose, $\frac{2}{3}$ — $\frac{4}{5}$ by $\frac{2}{5}$ — $\frac{1}{2}$ mm. 5—15(—25) cm ☉ 13. **F. intonsa** S. T. Blake
- b. Glumes ovate, acutish, with straight keel, muticous, not ciliate, $2\frac{1}{2}$ —3 mm long. Spikelets many-flowered, 2— $2\frac{1}{2}$ mm wide. Stems smooth, $\frac{1}{3}$ mm thick. Leaves 1— $1\frac{1}{2}$ mm wide. Inflorescence simple or subcompound; rays glabrous and smooth. Involucral bracts glumiform or the lowest up to $\frac{1}{3}$ cm. Style 2— $2\frac{1}{3}$ mm long. Nut coarsely tuberculate 14
- c. In case the glumes are glabrous except for the ciliate-scabrid keel and distinctly mucronate see 18b.
- F. straminea**
- 14a. Nut obovoid, rounded at the apex, $\frac{7}{10}$ —1 by $\frac{3}{8}$ mm. Inflorescence with 3—8 spikelets. Glumes pubescent in the upper half, castaneous or brown. Spikelets ovate-lanceolate, 4—7 mm long. Anthers $\frac{2}{3}$ —1 mm long. (5—)10—15 cm ☉ 11. **F. sleumeri** Kern
- b. Nut obpyramidal-subpyriform, truncate at the apex, $\frac{2}{3}$ by $\frac{1}{2}$ mm. Inflorescence with 3—4 spikelets. Glumes on both sides of the midrib with a narrow band of short, bristly, white hairs, ultimately more or less glabrescent, stramineous. Spikelets oblong-lanceolate, 6—9 mm long. Anthers 1 mm long. 10—30 cm ☉ 14. **F. narayanii** C. E. C. Fischer
- 15a. (10). Nut pyriform, truncate or slightly depressed at the apex, umbonulate, $\frac{2}{3}$ — $\frac{3}{4}$ by $\frac{1}{2}$ mm. Stamen 1; anther $\frac{1}{3}$ mm long. Stems $\frac{1}{4}$ — $\frac{1}{3}$ mm thick. Leaves $\frac{1}{2}$ —1 mm wide. Inflorescence simple, loose, with (1—)2—5 spikelets. Lowest involucral bract up to 8 mm long. Spikelets solitary, lanceolate to linear-lanceolate, 5—15 by $1\frac{1}{2}$ —2 mm. Glumes membranous, ovate, acute, apiculate or minutely mucronulate, $2\frac{1}{2}$ —3 mm long. Style 2 mm long, stigmas $\frac{1}{3}$ — $1\frac{1}{2}$ mm. 3—8 cm. ☉
- 17. F. onchnidiocarpa** Kern
- b. Nut obovoid, oblong-obovoid, or obpyramidal, rounded at the apex. Stamens 2 or 3 16
- 16a. Perennial with short, woody rhizome in old specimens clothed with the remains of old leaf-sheaths. Stems smooth, or scabrid just below the inflorescence, ($\frac{1}{2}$ —)1—2(—3) mm thick. Leaves obtuse, (2—)3—5 mm wide. Inflorescence compound, with several to numerous spikelets. Involucral bracts

short, the lowest up to $1\frac{1}{2}$ cm. Spikelets solitary or partly paired. Glumes exactly distichous or subspirally, chartaceous, shining, broadly ovate, distinctly mucronate, 3—5 mm long. Stamens 3; anthers linear, $1\frac{1}{2}$ —2 mm long. Style 2—3 mm long; stigmas about as long as the style. Nut obovoid or broadly obovoid, verruculose, $\frac{4}{5}$ —1 by $\frac{3}{5}$ —1 mm. 30—70 cm. 2.

7. *F. eragrostis* (Nees) Hance

- b. Annuals with fibrous roots. Stems smooth. Leaves $1\frac{1}{2}$ —2 mm wide. Spikelets solitary. Anthers $\frac{1}{2}$ —1 mm long. Style 1—2 mm long 17
- 17a. Glumes not exactly distichous, subspirally arranged, chartaceous, broadly ovate, distinctly mucronate, brown with dark castaneous submarginal zone, c. 3 by $2\frac{1}{2}$ — $2\frac{1}{2}$ mm. Stems $\frac{1}{2}$ — $\frac{1}{2}$ mm thick. Leaves $1\frac{1}{2}$ —2 mm wide. Inflorescence simple or almost so, with (1—)2—5 spikelets; rays 10—18 mm long. Involucral bracts short, the lowest up to 12 mm. Spikelets lanceolate, acute, subterete, 10—15-flowered, 5—9 by c. 2 mm. Stamens 3; anthers oblong, $\frac{3}{4}$ mm long. Style 2 mm long, stigmas $\frac{1}{2}$ — $\frac{1}{2}$ mm. Nut broadly obovoid, 3-costate, obtuse, minutely umbonulate, coarsely tuberculate, $\frac{3}{4}$ by $\frac{3}{8}$ mm. 10—20 cm ☉ 8. *F. phaeolepis* Kern
- b. Glumes exactly distichous. Leaves 1—2 mm wide. Stamens usually 2. Nut more or less verruculose 18
- 18a. Glumes very small, $1\frac{1}{2}$ —2(— $2\frac{1}{2}$) mm long, rather obtuse, minutely apiculate just below the apex, thinly membranous. Inflorescence subcompound to decompound, very loose, with several to many spikelets. Lowest involucral bract $\frac{1}{2}$ — $2\frac{1}{2}$ cm long. Spikelets oblong-lanceolate, 4—6 by $1\frac{1}{2}$ mm. Stamens 2(—3); anthers oblong, $\frac{1}{2}$ (—1) mm long. Style 1— $1\frac{1}{2}$ (—2) mm long; stigmas much shorter than the style. Nut obovoid or narrowly obovoid, $\frac{3}{5}$ — $\frac{2}{10}$ by $\frac{1}{5}$ — $\frac{1}{2}$ mm. 10—35 cm. ☉
16. *F. disticha* Boeck.
- b. Glumes 3 mm long, acute, conspicuously mucronate from the apex, membranous. Inflorescence simple, with (1—)2—5 spikelets. Spikelets linear-lanceolate, 5—15 by $1\frac{1}{2}$ —2 mm. Stamens 2; anthers $\frac{1}{2}$ mm long. Style 2— $2\frac{1}{2}$ mm long, stigmas much shorter. Nut obovoid, $\frac{3}{4}$ — $\frac{4}{5}$ by $\frac{1}{2}$ mm. 6—12 cm ☉ 18. *F. straminea* Turr.

1. *Fimbristylis cinnamometorum* (Vahl) Kunth, En. 2 (1837) 229. Based on *Scirpus cinnamometorum* Vahl. — *Scirpus cinnamometorum* Vahl, En. 2 (1806) 278. Type: Habitat in cinnamometis Zeylonae: König (L). — *F. cyperoides* R. Br., Prodr. (1810) 228. Type: Nov. Holl., littus intra Tropicum: R. Brown 5961 (BM). — *F. biflora* Boeck., Linnaea 38 (1874) 393. Type: Australia: Fr. Schultz 658 (fide Bentham; n.v.). — *F. kamphoeveneri* Boeck., Bot. Jahrb. 5 (1884) 505. Type: Teressa-insula: Kamphoevener 2485 (KIEL). — *Iriha cinnamometorum* (Vahl) O.K., Rev. Gen. Pl. 2 (1891) 753. — *F. cyperoides* R. Br. var. *cinnamometorum* (Vahl) C. B. Clarke, Fl. Br. Ind. 6 (1893) 650.

Distr. From S. and S.E. Asia (Ceylon, India, Thailand, Indo-China, S. China) through Malesia (Sumatra, Luzon, New Guinea) to tropical Australia (Queensland).

Though widely distributed little variable.

2. *Fimbristylis adenolepis* Kern, Blumea 8 (1955) 123, f. 3. Type: Malesia (Kangean Island): Backer 27049 (BO, holotype; L).

Distr. S.E. and Peninsular Thailand, Indo-China (Cochin-China, Tonkin, Annam), Malesia (Kangean Island).

3. *Fimbristylis fuscooides* C. B. Clarke in Ostenf., Bull. Herb. Boiss. sér. 2, 5 (1905) 719; Kew Bull. add. ser. 8 (1908) 25. Syntypes: Borneo: Barber 356 (K, lectotype); Labuan: Ridley 9042 (K); Cochin-China: Leboeuf 891 (K). — *F. angustifolia* Ridl., Journ. Str. Br. Roy. As. Soc. no. 59 (1911) 223. Syntypes: Peninsular Thailand, Satul: Ridley 14822 (K, lectotype; BM, SING); Labuan: Ridley 9042 (K, SING), Bp. Hose (K, SING). — *F. erythradenia* Camus, Notulae Syst. 1 (1910) 247. Type: Cochin-China: Thorel 506 (P).

Distr. Thailand, Cochin-China, Cambodia, W. Malesia (Malay Peninsula: Perlis; Billiton; N. Borneo: dist. Papar, Labuan).

4. *Fimbristylis trichoides* Kern, *Blumea* 13 (1965) 119, f. 2. Type: Thailand, Khao Khico: *Sleumer & Smitinand 8323a* (L).

Distr. Only known from the type collection.

5. *Fimbristylis savannicola* Kern, *Blumea* 10 (1960) 635, f. 1. Type: Thailand (Udawn, Lôi, Pu-Tong: *Kerr 8862* (K, holotype; BM).

Distr. Only known from the type collection, but it is likely that *F. trichocaulis* C. B. Clarke, *Kew Bull. add. ser.* 8 (1908) 25 from Upper Burma, Kachin Hills: *Shaik Mokim 134* is an earlier synonym. The type was not to be found in BM, CAL, E, and K. The inadequate description runs as follows: 'Undique pilosa, foliis angustis, umbellâ laxiuscule compositâ, ramis ramulisque ob capillos tenues pallidos longiusculos hirtis; ceteroquin ut *F. fulvescens*, Thwaites. Culmi 4—5 dm longi. Folia 20—25 cm longa, admodum pilosa.'

6. *Fimbristylis vanoverberghii* Kük., *Pflanzenr. Heft* 101 (1936) 631. Based on *Cladium cyperoides* Merr. — *Cladium cyperoides* Merr., *Philipp. Journ. Sci.* 7 (1912) Bot. 74, non *F. cyperoides* R. Br. (1810). Type: Luzon, Bontoc Subprov., Bauco: *Vanoverbergh 173* (BM, K, L, P). — *Mariscus fallax* Fern., *Rhodora* 25 (1923) 53, nom. illeg. (non *Mariscus fallax* Chermesz. 1919). Based on *Cladium cyperoides* Merr. — *F. fusca* var. *hispidissima* Kük., *Mitt. Thür. Bot. Ver., N. F.* 50 (1943) 11. Type: N.E. New Guinea, Morobe Dist., Boana: *M.S. Clemens 8286A* (B, GH). — *Machaerina cyperoides* (Merr.) Koyama, *Bot. Mag. Tokyo* 69 (1956) 63.

Distr. Malesia: N. Sumatra, N. Borneo (Brunei), Philippines (Luzon), New Guinea.

7. *Fimbristylis eragrostis* (Nees) Hance, *Journ. Linn. Soc., Bot.* 13 (1873) 132. Based on *Abildgaardia eragrostis* Nees¹⁾. — *Abildgaardia eragrostis* Nees & Mey. ex Nees in Wight, *Contr. Bot. Ind.* (1834) 95. Type: In China: *Potts, Meyen (n.v.)*. — *F. nigrobrunnea* Thwaites, *En. Pl. Zeyl.* (1864) 434. Type: Ceylon: *Thwaites CP 3779* (CGE). — *F. subtetrastachya* Boeck., *Linnaea* 37 (1871) 50. Type: M. Khasia, Indiae, alt. 4—6000 ped.: *Hooker & Thomson* (CGE, L, LD). — *F. pycnostachya* Hance, *Journ. Bot. Lond.* 15 (1877) 338. Type: Cambodia, in summo monte Kam chai, prov. Kampot: *L. Pierre 19314* (BM). — *Iriha eragrostis* (Nees) O.K., *Rev. Gen. Pl.* 2 (1891) 753. — *Iriha subtetrastachya* (Boeck.) O.K., *l.c.* — *F. lepidota* Camus, *Notulae Syst.* 1 (1910) 247. Type: Cambodge, mont Cam-chay près de Kampot: *Pierre* (P). — *F. tortispica* Turr., *Kew Bull.* 1911 (1911) 348. Type: Thailand, Chiengmai, Doi Sootep: *Kerr 1271* (K). — *F. schlechteri* Kük., *Bot. Jahrb.* 59 (1924) 50. Type: N.E. New Guinea, Sangueti Etappe: *Schlechter 18871* (K, L, P).

Distr. S.E. Asia, from Ceylon and India extending eastwards to S. China, Hainan, and Formosa, through Malesia (Malay Peninsula, Timor, Aru Islands, New Guinea) southwards to tropical Australia (Queensland).

Fimbristylis eragrostis in the wide sense here accepted is a most polymorphous species. However different the types of *F. eragrostis*, *F. nigrobrunnea*, *F. pycnostachya* and *F. lepidota* may be, they are connected by numerous intermediates, so that I am unable to trace dividing lines. The characters often used for separating *F. nigrobrunnea* (spikelets often clustered, glumes darker than in *F. eragrostis* and imperfectly spirally arranged) let one down when extensive materials are studied. For instance, in the specimens of *Put 4170* from Thailand, Surat, Kantuli (L) with solitary spikelets in an open inflorescence, the

¹⁾ Hance wrongly ascribed this binomial to Vahl.

arrangement of the glumes varies from exactly distichous to almost regularly spiral, and the colour of the glumes ranges between stramineous and dark castaneous; in *Van Steenis 18129* from E. Timor, Muapitine (L), otherwise typical *F. eragrostis*, the spikelets are partly clustered, etc. It is significant that a specimen in the Leiden Herbarium of *Hooker & Thomson 20. Trichelostylis*, the type collection of *F. subtetrastachya* Boeck. and perfectly answering the original description of that species, was annotated by Boeckeler: '*Abildgaardia Eragrostis* Nees et Meyen forma *umbella subsimplici*.' Also in this collection, referred by Clarke to *F. nigrobrunnea* on account of the dark, clustered spikelets, the glumes are partly distichously arranged, partly spirally.

Fimbristylis pycnostachya (= *F. lepidota* which was based on the same collection) with its robust stems, thick rhizomes, rigid coriaceous leaves, castaneous leaf-sheaths, subcapitate inflorescences, and subspiral dark glumes, still more deviates from typical *F. eragrostis*, but *Kerr 17756* (ABD, BK, BM, L), and *Kerr 8684* (BK, BM, K) from Thailand, and *Boden Kloss s.n.* (K) from S. Annam approach *F. pycnostachya* in one or other respect.

F. tortispica and *F. schlechteri* are in my opinion typical *F. eragrostis*.

By the often subspiral arrangement of the glumes *F. eragrostis* and its annual counterpart *F. phaeolepis* weaken the circumscription of *Sect. Fuscae* considerably.

8. *Fimbristylis phaeolepis* Kern, Adansonia 7 (1967) 183, Pl. I, f. 1—5.

Distr. N.E. Thailand.

9. *Fimbristylis fusca* (Nees) C. B. Clarke, Fl. Br. Ind. 6 (1893) 649. Based on *Abildgaardia fusca* Nees. — *Gussonea cyperoides* Presl, Rel. Haenk. 1 (1828) 183, t. 33, non *F. cyperoides* R. Br. (1810). Type: Manila ("California" is an error): *Haenke* (n.v.). — *Gussonea pauciflora* Brongn. in Duperr., Voy. Bot. 2 (1829) 171, t. 34B, non *F. pauciflora* R. Br. (1810). Type: Moluccas, ins. Amboina et Bourou: *Gaudichaud* (P). — *Abildgaardia fusca* Nees in Wight, Contr. Bot. Ind. (1834) 95. Type: Nepalia: *Wall. Cat. n. 3530* (CGE, holotype; L, LD, P). — *Abildgaardia cyperoides* (Presl) Nees, l.c. — *Abildgaardia pauciflora* (Brongn.) Kunth, En. 2 (1837) 249. — *Rhynchospora ? anomala* Steud., Syn. 2 (1855) 149. Type: Java, pr. Tjikoya: *Zollinger 700* (P, holotype; BM, FI, G, K, L). — *Iriha fusca* (Nees) O.K., Rev. Gen. Pl. 2 (1891) 753. — *F. subfusca* Camus, Notulae Syst. 1 (1910) 248. Type: Cochín-China: *Pierre* (P). — *F. rigidifolia* Ridl., Journ. Str. Br. Roy. As. Soc. no. 59 (1911) 223. Type: Peninsular Thailand, Setul: *Ridley 14877* (K, SING). — *F. stenochlaena* Kük., Mitt. Thür. Bot. Ver., N.F. 50 (1943) 11. Type: Papua, Western Div., Lake Daviumbu, Middle Fly R.: *Brass 7840* (BM, BO, GH, K, LAE, U).

For a discussion of the synonymy see *Blumea* 8 (1955) 125—127.

Distr. Nepal, India, Thailand, Indo-China, S. China, Japan (Shikoku, Kuyushu), Malesia (Sumatra, Malay Peninsula, W. Java, Borneo, Philippines, Celebes, Ambon, New Guinea).

10. *Fimbristylis fulvescens* (Thwaites) Thwaites, En. Pl. Zeyl. (1864) 434. Based on *Abildgaardia fulvescens* Thwaites. — *Abildgaardia fulvescens* Thwaites, l.c., p. 347. Type: Ceylon, Reigam Corle: *Thwaites C.P. 679* (BM, CGE, K, L, P). — *Abildgaardia fusca* var. *longifolia* Boeck., *Linnaea* 37 (1871) 55. Type: Ceylon: *Thwaites C.P. 679*.

Distr. Ceylon, Malay Peninsula (Pulu Penang).

For a discussion of this inadequately known species see *Blumea* 8 (1955) 127.

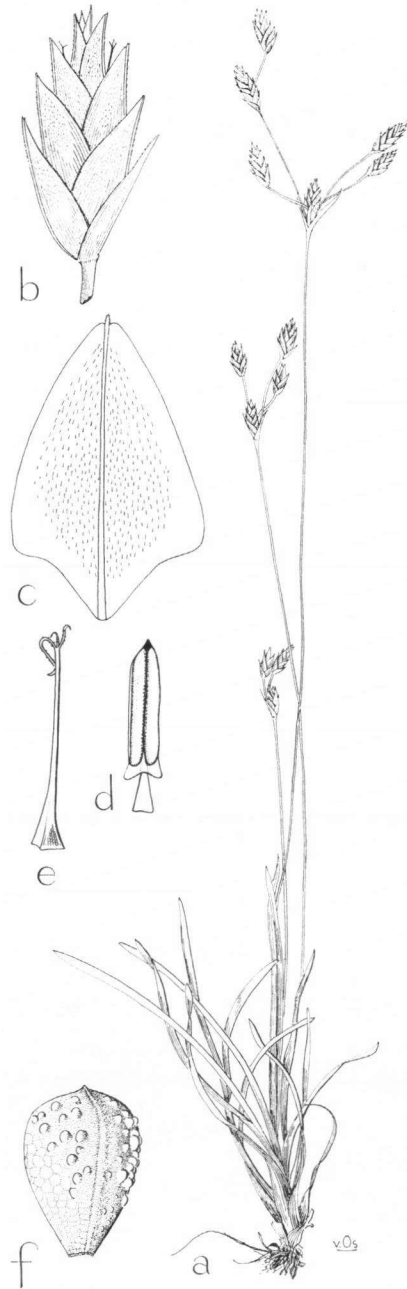


Fig. 2. *Fimbristylis sleumeri* Kern. — a. Habit, nat. size, b. spikelet, $\times 7\frac{1}{2}$, c. glume $\times 15$, d. anther, $\times 30$, e. style $\times 15$, f. nut, $\times 30$ (all after the type-specimen, Smitinand & Sleumer c. al. 4755).

11. *Fimbristylis sleumeri* Kern, sp. nov. — Sect. *Fuscae* Ohwi. — Fig. 2.

Herba annua, gracilis, glumis exceptis glabra, radicibus fibrosis. Culmi fasciculati, erecti vel oblique erecti, setacei, angulato-costati, leves, (5—)10—15 cm alti, $\frac{1}{8}$ mm crassi, ad basin vaginis 1—2 tubulosis laminis 1—3 cm longis praeditis cincti. Folia radicalia culmo 2—3-plo breviora, saepe falcata, plana, abrupte acuminata, marginibus incrassatis apice antrorse scaberula, utrinque nervosa, supra distincte celluloso-reticulata, eligulata, usque ad 6 cm longa, 1—1 $\frac{1}{2}$ mm lata. Inflorescentia anthelata, simplex vel subsimplex, laxa, 3—8-spiculata, 1—3 cm longa, 1—2 cm lata. Bractee involucrales 2—3, brevissimae, oblique erectae, inflorescentia multo breviores, basi dilatatae, bractea ima 4—7 mm longa. Radii anthelae 2—5, oblique patentes, compressi, leves, 1(—2)-spiculati, usque ad 2 cm longi; radioli si adsunt brevissimi, c. $\frac{1}{2}$ cm longi. Spiculae solitariae, lanceolatae, acutae, valde compressae, 8—10-florae, 4—7 mm longae, c. 2 mm latae. Rhachilla alata. Glumae exacte distiche dispositae, chartaceae, oblique erectae, ovatae, acutiusculae, apiculatae, nervo medio prominente acute carinatae, dimidio superiore dense pubescentes, castaneae, marginibus hyalinis anguste albo-marginatae, 2 $\frac{1}{2}$ —3 mm longae, 2—2 $\frac{1}{2}$ mm latae, inferiores 2 vacuae, mucronatae. Stamina 3; antherae oblongo-lineares, $\frac{3}{8}$ —1 mm longae, connectivo in appendicem perbreve levem albidam producto. Stylus triquetus, basin versus pyramidato-incrassatus, glaber, 2—2 $\frac{1}{2}$ mm longus, stigmatibus 3 brevissimis, $\frac{1}{8}$ — $\frac{1}{2}$ mm longis. Nux trigona, obovoidea, apice rotundata, breviter stipitata, minute umbonulata, tuberculata, cellulis extimis isodiametricis reticulata, albida, $\frac{5}{8}$ mm longa, c. $\frac{3}{8}$ mm lata.

N.E. THAILAND. Loei, Phu Krading, common in open pine-forest, c. 1300 m, local name Yah Bai Bit, Aug. 19, 1950: Dee 317 = RFD 4908 (L); same locality, common in savannah on rocks, 1300 m, Sept. 17, 1954: Smitinand 1943 p.p. (L); same locality, sandy path, 1300 m, Nov. 29, 1958: Sørensen, Larsen & Hansen, Danish Expedition 6337 (C; dupl. in L); same locality, plateau, in swampy grass-land, 1300 m, Sept. 11, 1963: Smitinand & Sleumer c. al., Sleumer 4755 (L, type; dupl. in K).

Related to *Fimbristylis fusca* (Nees) C. B. Clarke, which is, however, a much stouter perennial with woody rhizome covered with the remains of old leaf-sheaths and emitting short surculi, thicker stems up to 50 cm tall, leaves up to 4 mm wide (exceptionally less than 2 mm), compound to supradecomposed inflorescences, 2—3 mm wide spikelets, fulvous (rather than fuscous), very acute glumes 4—6 $\frac{1}{2}$ mm long and 2—2 $\frac{1}{2}$ mm wide, 1 $\frac{1}{2}$ —2 mm long anthers, 4—6 mm long style, and a c. 1 mm long nut.

The following collection may belong here, though the leaves are somewhat broader (2 mm), the glumes lighter coloured, and the nuts slightly smaller ($\frac{3}{8}$ by $\frac{1}{2}$ mm), more densely tuberculate. The plants were originally determined as *F. lacei* Turr. (= *F. fimbristylis* (F. v. M.) Druce), to which they are very similar in habit, but they differ in the quite different shape of the nut, the number of stamens (see under *F. fimbristylis*) and the smooth stems and rays of the inflorescence.

BURMA. Maymyo Plateau, alt. 3500 ft., Sept. 29, 1912: J. H. Lace 5964 (CAL, K).

12. *Fimbristylis fimbristylis* (F. v. M.) Druce, Rep. Bot. Exch. Club Brit. Isl. 1916 (1917) 623. Based on *Abildgaardia fimbristylis* F. v. M. — *Abildgaardia fimbristylis* F. v. M., Fragm. Phyt. Austr. 8 (1874) 273. Type: Queensland, ad oram Rockingham's Bay: Dallachy (K). — *F. dallachyi* F. v. M. ex Benth., Fl. Austr. 7 (1878) 309. Based on *Abildgaardia fimbristylis* F. v. M. — *Iriha fimbristylis* (F. v. M.) O.K., Rev. Gen. Pl. 2 (1891) 753. — *F. lacei* Turr., Kew Bull. 1911 (1911) 348. Syntypes: Burma, Upper Chindwin Dist.: Lace 4210 (K, lectotype); Borneo, Tenom: Gibbs 2771 (BM, K). *F. stramina* (non Turr.) Ohwi, Mem. Coll. Sc. Imp. Univ. B 18 (1944) 60. — *F. nanofusca*

Tang & Wang, Fl. Reipubl. Pop. Sin. 11 (1961) 229. Type: Chekiang, Jianshan: *T.N. Liou 586* (dupl. in L).

Distr. Burma, E. Thailand, S. China, Ryu Kyu Isl., S. Korea, Malesia (N. Sumatra, W. and C. Java, Madura, Kangean Isl., N. Borneo, Celebes, New Guinea), tropical Australia (Queensland).

The number of stamens is 2, or in a few flowers 1. In the type collection of *F. nanofusca* I found 3 stamens (as indicated by the authors), but this is apparently the only difference with typical *F. fimbriatylodes*.

13. *Fimbristylis intonsa* S. T. Blake, Journ. Arn. Arb. 35 (1954) 221. Type: New Guinea, Papua Western Div., Lake Daviumbu, Middle Fly R.: *Brass 7841* (BM, BO, GH, LAE, U). — *F. disticha* var. *kurzii* C. B. Clarke, Fl. Br. Ind. 6 (1893) 651. Type: Sikkim Terai, Bengal, between Titallya and Dauknuddee, along pools: *Kurz s.n.* (K).

Distr. Bengal, Malesia (Sumatra, New Guinea).

14. *Fimbristylis narayanii* C. E. C. Fischer, Kew Bull. 1931 (1931) 46. Type: Travancore: *V. Narayanaswami 1357* (K, holotype; CAL).

Distr. India.

15. *Fimbristylis malayana* Ohwi, Blumea 8 (1955) 96, f. 1. Type: Malay Peninsula, Pulu Langkawi: *Henderson SF 29052* (BO, K, SING).

Distr. Endemic in Pulu Langkawi, three times collected.

16. *Fimbristylis disticha* Boeck., Linnaea 38 (1874) 393. Type: Tenasserim et insul. Andaman: *Herb. Helfer 6143/1* (L). — *Iriha disticha* (Boeck.) O.K., Rev. Gen. Pl. 2 (1891) 753.

Distr. Burma, Central and Peninsular Thailand, Cochín-China, Tenasserim and Andamans, Teresa, Mergui, S. China (not mentioned in Fl. Reipubl. Pop. Sin. 11), Malesia (N. Sumatra).

Rather variable. Stamens usually 3, sometimes 2. The specimens of the type collection have anthers about $\frac{1}{2}$ mm long, glumes about 2 mm, styles 1—1 $\frac{1}{3}$ mm, and oblong-obovoid, sparsely verruculose nuts about $\frac{2}{3}$ by $\frac{1}{3}$ mm. The Chinese collections are taller, with anthers about 1 mm long, glumes 2 $\frac{1}{2}$ mm, styles about 2 mm, and obovoid, densely verruculose nuts about $\frac{2}{3}$ by $\frac{1}{2}$ mm. Several other collections connect the two extremes.

For the specimens I examined see Blumea 8 (1955) 130 and Reinwardtia 6 (1961) 43. Additional collections:

SUMATRA. Mid-Habinsaran; near Sibosan, dry almost bare grass-land, 1200—1300 m, March 18, 1929: *Lörzing 15468* (L).

S. CHINA. Kwantung: Kwai Leng, Ting Woo Shan (Kao Yao Dist.), half way on the mountain, July 22—29, 1932: *Lau 20182* (L); Na Leung and vicinity (Fang Ch'eng Dist.), on dry clayey soil among scattered shrubs, Aug. 1—10, 1936: *Tsang 26581* (K); id., in grassy field: *Tsang 26612* (K).

17. *Fimbristylis onchnidiocarpa* Kern, Adansonia 7 (1967) 183, Pl. 1 f. 6—10. Type: Cochín-China: *Thorel s.n.* (L, holotype; P). — *F. nigrobrunnea* Thwaites var. *thorelli* Camus, Notulae Syst. 1 (1910) 248, p.p.

Distr. Cochín-China, Tonkin.

18. *Fimbristylis straminea* Turr., Kew Bull. 1911 (1911) 192. Type: Thailand, Chiangmai, Doi Sootep, 550—600 m: *Kerr 832* (K). — Here also collected in 1957:

common in dry gravelly soil in dry deciduous forest: *Smitinand RFD 16098* (L).
Distr. N. Thailand.

19. *Fimbristylis calcicola* Kern, *Blumea* 8 (1955) 129, f. 5. Type: Malay Peninsula, Kedah, Pulu Langkawi: *E. J. H. Corner s.n.* (SING).

Distr. As far as known an endemic species of the limestone screes on Pulu Langkawi.

Not seen:

Fimbristylis rufoglumosa Tang & Wang, *Fl. Reipubl. Pop. Sin.* 11 (1961) 228. — 'Culmi caespitiosi glabri 10—30 cm alti. Folia lanceolata leviter curvata culmo $\frac{1}{4}$ — $\frac{1}{3}$ breviora 1—2.5 mm lata utrinque strigosa demum glabrata ciliata apice acuta, vaginae apice oblique fissae ore brunneo-membranaceae. Bracteeae 2 vel ultra ad 28 cm [sic] longae apicem versus attenuatae. Anthela decomposita multiradiata. Spiculae solitariae ovatae vel oblongo-ovatae subcompressae 3—6 mm longae 1.5—2.5 mm latae. Squamae inferiores 1—2 vacuae, reliquae fertiles late ovatae glabrae circa 2.5 mm longae rubro-brunneae, costa media carinata apiculato-producta. Stamina 3. Stylus trigonus basi dilatata ciliatus, stigmata 3. Nux trigona obovata circa 0.7 mm longa albescens verruculosa.'

CHINA. Kwantung: Beijiang, Qingjiang, roadside, No 9733, *typus!* VIII. 1934.

Fimbristylis nanningensis Tang & Wang, *Fl. Reipubl. Pop. Sin.* 11 (1961) 229. — 'Culmi graciles 18—55 cm alti basi plurifoliati. Folia linearia utrinque strigosa usque culmo breviora rarissime eum aequantia apicem versus attenuata. Bracteeae foliaceae inflorescentia multo longiores ad 1 mm latae strigosae apice acuminatae. Anthela decomposita laxiuscula multiradiata multispiculata, radii glabri graciles. Spiculae solitariae lanceolatae subcompressae circa 5 mm longae 1 mm latae 2—3-florae. Squamae oblongo-ovatae circa 3 mm longae membranaceae brunneo-punctatae apice acuminatae 2—3-nervulosae, nervus medianus subcarinatus. Stamina 3. Ovarium cylindricum leviter triquetrum albescens, stylus longus triquetus basi subdilatata, stigmata 3 usque irregulariter circinata.'

CHINA. Kwangsi: Nanning, grassy slope, Kwangsi expedition, No 2858, *typus!* VII. 1953.

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