

FLORAE MALESIANAE PRECURSORES XXI
NOTES ON MALAYSIAN AND SOME S.E. ASIAN CYPERACEAE VII¹⁾

J. H. KERN
(*Rijksherbarium, Leiden*)

(received September 22nd, 1958)

I. *SCHOENOXIPHIMUM* OR *KOBRESIA*?

Phylogenetic speculation can undoubtedly be a great stimulus to research and for this reason can be fully justified . . . The danger is that phylogenetic speculations tend to be presented as facts and even to become accepted as such, at least by the speculator.

W. B. TURRILL in "The Advancement of Science", No. 26: 11. Sept. 1950.

In 1940 KÜKENTHAL (1940) published a detailed description of a remarkable cyperaceous plant discovered by Van Steenis on some mountains in Atjeh (N. Sumatra) in 1937. In the ample discussion following the description the new species was considered the last link ("das letzte Verbindungsglied") between the genera *Schoenoxiphium* and *Kobresia*, a view also expressed in the binomial given to the plant, *Schoenoxiphium kobresioideum*.

While studying the material two questions forced themselves on me:

1. If the Sumatran plant is a link between *Schoenoxiphium* and *Kobresia*, on what grounds did Kükenthal refer it to the former genus?

2. If several living links between *Schoenoxiphium* and *Kobresia* exist, what are the reasons which compel us to keep the two genera apart?

For a better understanding of my objections to the way in which Kükenthal answered these important questions, a concise survey of the flower morphology and the history of the tribe *Cariceae*, to which *Schoenoxiphium kobresioideum* belongs, follows here.

In *Carex* all flowers are unisexual and without any trace of a perigone. The male flowers invariably consist of 3 stamens only, subtended by a glume. The female ones are reduced to a bi- or tricarpellate pistil; they are also subtended by a glume but, unlike the male ones, moreover enclosed in a bottle-shaped organ called utricle or perigynium, which has only a small opening at the top through which the style protrudes (fig. 1a). Botanists were puzzled for a long time by this utricle, but nowadays they are in entire agreement as to its homology with the prophyll which as a rule is borne at the base of every lateral branch in *Cyperaceae*. This homology was first pointed out by KUNTH (1835). If Kunth's view is right, each female flower must be inserted on a lateral branch, in other words it must be a 1-flowered, apparently reduced, spikelet. However, no trace

¹⁾ Part I in *Reinwardtia* 2: 97–130. 1952; II in *Reinwardtia* 3: 27–66. 1954; III in *Blumea* 8: 110–169. 1955; IV in *Reinwardtia* 4: 86–97. 1956; V in *Blumea* 9: 215–236. 1958; VI in *Blumea* Suppl. 4: 163–169. 1958.

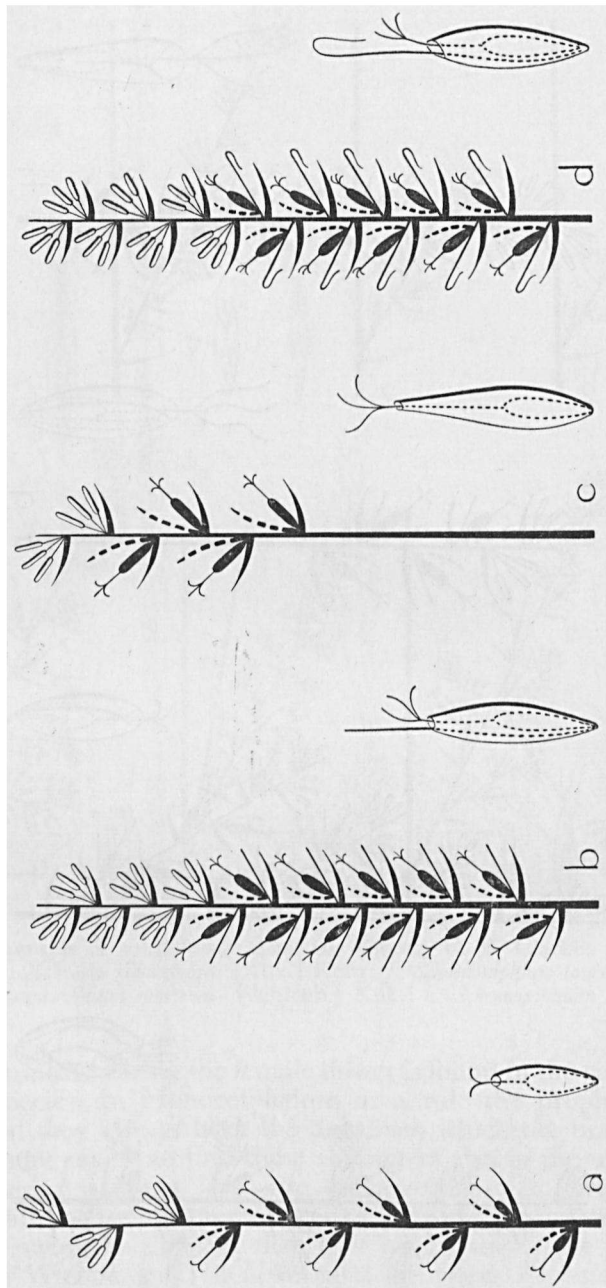


Fig. 1. Diagrams of a: *Carex pulicaris* L.; b: *Carex microglochis* Wahlenb.; c: *Carex pauciflora* Lightf.; d: *Uncinia* sp.;

(Continued on p. 788.)

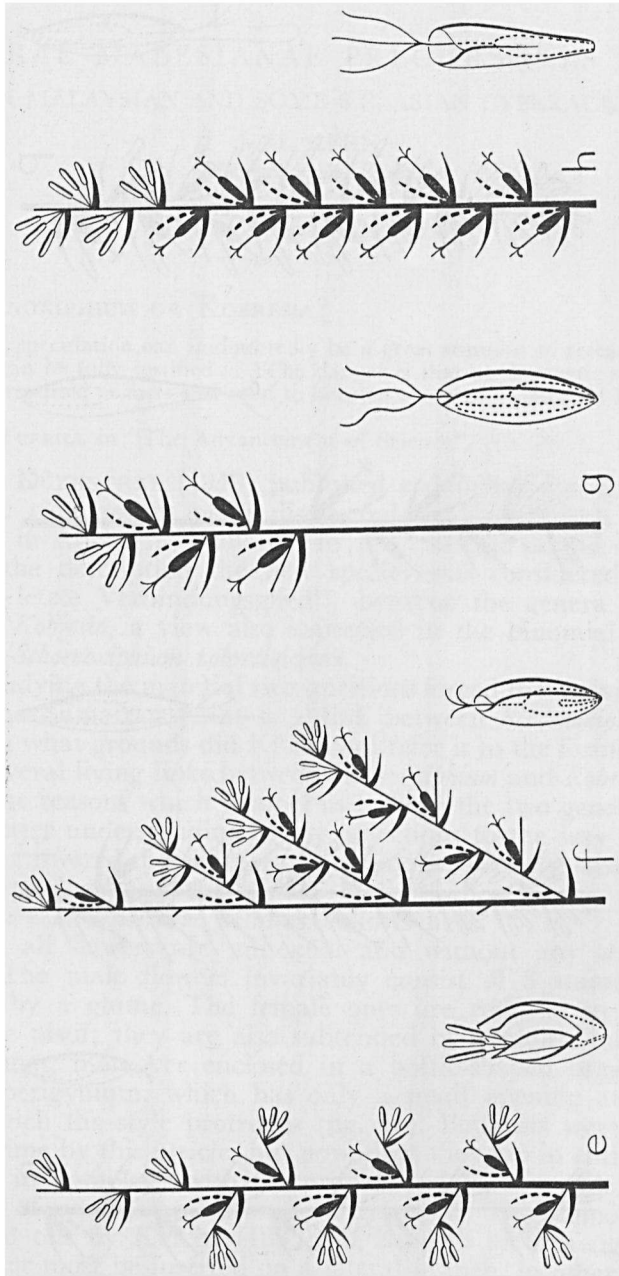


Fig. 1. (Continued from p. 787.)

Diagrams of *e*: *Kobresia myosuroides* (Vill.) Fiori & Paol. (= *K. scripina* Willd. = *Elyna spicata* Schrad.); *f*: *Kobresia simpliuscula* (Wahlenb.) Mack. (= *K. caricina* Willd.); *g*: *Kobresia pygmaea* C. B. Clarke; *h*: *Kobresia trinervis* (Nees) Boeck.

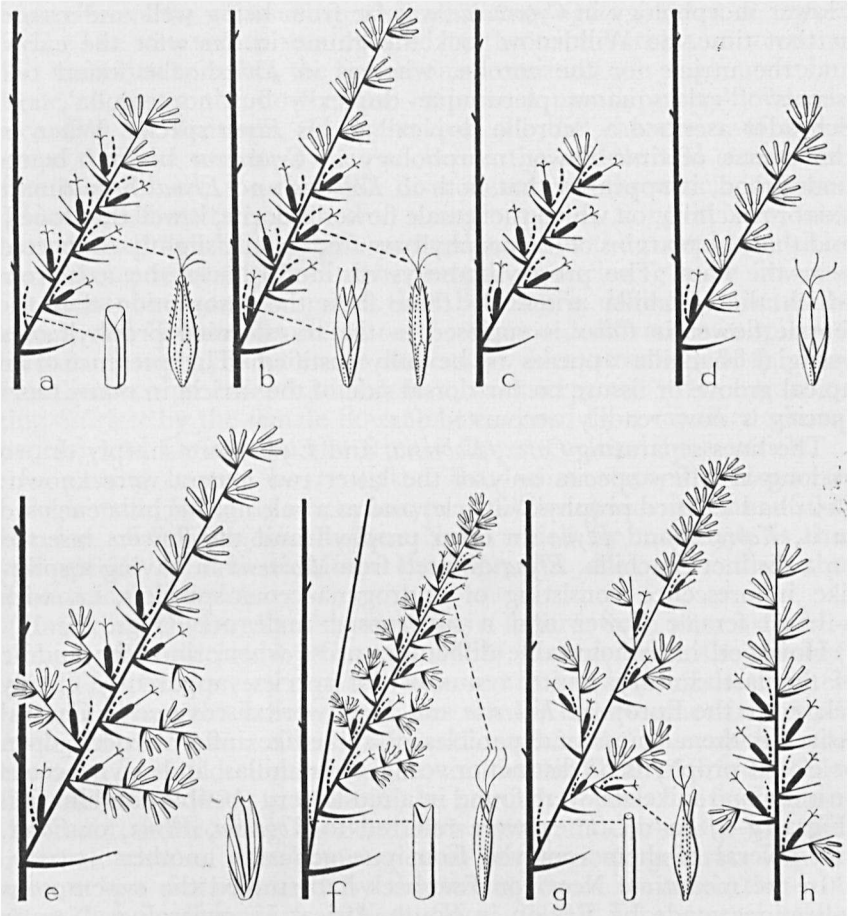


Fig. 2. Diagrams of a: *Kobresia uncinioides* (Boott) C. B. Clarke; b-d: *Kobresia laxa* Nees; e: *Kobresia kobresioidea* (Kük.) Kern; f: *Schoenoxiphium lanceum* (Thunb.) Kük.; g: *Schoenoxiphium sparteum* (Wahlenb.) Kük.; h: *Schoenoxiphium filiforme* Kük.

of such a branch bearing the female flower is found in the vast majority of *Carex* species. In Monocotyledons as a rule the prophylls are 2-keeled, and they always back the axis from which the branch arises. Thus we may expect to find these characters also in the utricule. Two more or less prominent keels are often found in it indeed, but its position with regard to the mother-axis can only be determined with difficulty, owing to the fact that it is closed up to the top.

In 1805 WILLDENOW (1805) created the genus *Kobresia*, based on three species, one of which is at present considered a *Cyperus* species [*Kobresia cyperina* Willd. = *Cyperus hermaphroditus* (Jacq.) Standl.]; the other two, *Kobresia scirpina* Willd. and *K. caricina* Willd., are very close to *Carex*. In the next year SCHRADER (1806) described the genus *Elyna*; his *Elyna spicata* is conspecific with *Kobresia scirpina* Willd.

Flower morphology in *Cyperaceae* was far from being well understood at that time. So Willdenow took the glume in *Carex* for the calyx, and the utricule for the corolla, whereas in *Kobresia* he found two 'sepals' ("cal. squama plerumque duplex") but no 'corolla', and Schrader ascribed a "corolla duplex" to his *Elyna* species. When in the course of time flower morphology in *Cyperaceae* became better understood, it appeared that both in *Kobresia* and *Elyna* the ultimate axis or rhachilla, on which the female flower is borne, is well developed, and that the margins of the prophyll are free or only slightly connected near the base. The prophyll always distinctly backs the axis from which the rhachilla arises. By these facts the assumption that the female flower in *Carex* is enclosed in the transformed prophyll of a vestigial rhachilla appears to be fully justified. The presence of an apical groove or fissure on the dorsal side of the utricule in many *Carex* species is now readily accounted for.

The lines separating *Carex*, *Kobresia*, and *Elyna* were sharply drawn as long as a few species only of the latter two genera were known: *Carex* had a closed prophyll (utricule) and as a rule no rhachilla enclosed in it, *Kobresia* and *Elyna* an open prophyll and the flowers inserted on a distinct rhachilla. *Elyna* differed from *Kobresia* in having a spike-like inflorescence consisting of androgynaeceous spikelets, *i.e.* with a basal female flower and a superposed male one (Figs. 1e, 1f).

However, insurmountable difficulties arose when, since the middle of the last century, quite a number of species, apparently closely related to the European *Kobresia* and *Elyna* were discovered in Central Asia. In them compound panicles or spike-like inflorescences, open or closed prophylls on distinct or vestigial rhachillas, androgynaeceous or unisexual spikelets, were found in almost every possible combination (Figs. 1g-h, 2a-d). They were referred to *Kobresia*, *Elyna*, or *Carex*, and several of them removed from one genus to another.

In the meantime Nees von Esenbeck had studied the cyperaceous collections made by Ecklon in South Africa. In cyperology Nees is known for the creation of numerous new genera, which have now nearly all fallen into oblivion. On one of the Ecklon collections he based the genus *Schoenoxiphium*, according to its author characterized by the much branched panicle, the closed prophyll, and the rhachilla bearing several male flowers above the female one (NEES 1832; 1835, p. 305). When later on several new species in *Schoenoxiphium* were described, the circumscription of the genus became much more vague, as was the case with *Kobresia* and *Elyna*.

BENTHAM (1881) was the first to be conscious of the confusion and its inevitable consequences. He held the view that the fact of the nut being enclosed in a utricule had been taken as too absolute a character, and that the relative position of the male and female flowers or spikelets in the inflorescence would afford more natural tribal and generic characters. He defined *Kobresia* as having androgynaeceous spikelets with one female flower at the base of one to many males, and transferred this genus to the tribe *Sclerieae*. The remaining Indian species not fitting this circumscription were included in the new

genus *Hemicarex*, comprising also all *Schoenoxiphium* (except *S. rufum* Nees). The new genus was referred to the tribe *Cariceae* on account of its unisexual spikelets, the female ones consisting of a single utricular glume enclosing the flower, the male ones usually many-flowered. According to Bentham, *Hemicarex* had all the characters of *Carex* except that the utricle is open to below the middle and sometimes quite to the base; the rhachilla does not exceed the utricle. *Schoenoxiphium* was drastically limited to a single species, *S. rufum* Nees, and characterized by the rhachilla protruding from the complete utricle and bearing several glumes either empty or enclosing male flowers.

It must be borne in mind that Bentham's distinction between *Sclerieae* and *Cariceae* was based on the supposed difference in spikelet structure (androgynaeceous or unisexual). HUTCHINSON (1934), who in outline accepted Bentham's system, misinterpreted it in characterizing *Sclerieae* by the female flower not enclosed by a modified glume (utricle) and *Cariceae* by the female flower enclosed in a utricle.

In passing it may be remarked that nomenclaturally *Hemicarex* is illegitimate, being a later synonym of *Schoenoxiphium* because of the inclusion of *Schoenoxiphium capense* Nees, which by monotypy is the type species of *Schoenoxiphium*. However, this does not affect the taxonomical situation.

Unfortunately Bentham's system was a failure. Soon after its publication it was criticized by CLARKE (1883), though "with the greatest hesitation". Clarke very properly observed that in some of the characters taken from the inflorescence the whole inflorescence in a well developed plant had not been sufficiently examined. *Schoenoxiphium* was reinstated in its old circumscription, and in the Flora of British India (CLARKE, 1893-1894, p. 694-699) he merged *Hemicarex* with *Kobresia*. The main shortcoming in Bentham's system undoubtedly was the undervaluation of the homologies in his various genera. This is perhaps best demonstrated by the consequences to which the said system led in *Kobresia laxa* Nees (Figs. 2b-d). Like several other *Kobresiae* and *Schoenoxiphium* this species shows a tendency to dioecism. The prophylls of the primary branches of its inflorescence are open and contain a female flower. Above this basal flower the branch may bear several male flowers or, in other specimens, several 1-flowered female spikelets usually with one to several superposed male flowers; the 1-flowered female spikelets have a distinct rhachilla and an almost complete utricle. So the specimens are either predominantly male or predominantly female, and according to Clarke, sometimes even wholly male or wholly female plants occur. In Bentham's system the predominantly male form is a *Kobresia*, whereas the predominantly female one belongs in *Hemicarex*, consequently in a different tribe.

Although PAX (1886, 1887) reinstated *Kobresia* in *Cariceae*, his system can not be considered an improvement as compared with that of Bentham's. Certainly it is still more artificial and unfit for practical use. *Elyna*, already united with *Kobresia* by KUNTH (1841), was re-established on account of its 2-flowered androgynaeceous spikelets, *Schoenoxiphium* characterized by its several-flowered androgynaeceous

spikelets, and *Kobresia* and *Hemicarex* (both with 1-flowered, rarely androgynaeceous spikelets) distinguished by the respectively free or more or less connate margins of the prophyll. Here it may be observed that in Pax's opinion the delimitation of the genera in *Cariceae* to a certain extent will always be arbitrary.

In reading the introductory part of Kükenthal's monograph of the *Caricoideae* (KÜKENTHAL, 1909), one soon realizes that, in spite of the removal of several species from *Carex* to *Kobresia* or *Schoenoxiphium* and conversely, could Kükenthal no more than his predecessors solve the problem satisfactorily. He agreed with Clarke as to the withdrawal of *Elyna* and *Hemicarex*. *Schoenoxiphium* was upheld, but its only morphological difference from *Kobresia* given by Kükenthal, is the flattened elongated rhachilla (inconspicuous in *Kobresia*), a character already found in Clarke's paper on *Hemicarex* and its allies (CLARKE, 1883). Kükenthal was well aware of the inadequacy of this character, for he expressly stated that *Schoenoxiphium* and *Kobresia* should be kept apart for phylogenetical and phytogeographical reasons. He considered *Schoenoxiphium* more primitive than *Kobresia*. It may be true that some *Schoenoxiphia* represent the most primitive state known in *Caricoideae*, but in other species, especially in *S. filiforme* Kük. (Fig. 2h), reduction has gone so far that the structure of the inflorescence is pretty much the same as in *Kobresia myosuroides* (Vill.) Fiori & Paol. (= *K. scirpina* Willd.). The degree to which the margins of the prophyll are connected varies in both genera. As, for lack of any other evidence, Kükenthal's phylogenetical reasons can only be founded on the supposition that the African *Schoenoxiphia* must be more related to one another than to the Eurasian *Kobresiae*, they are the same as his phytogeographical ones.

In all probability we may be justified in making the assumption that the open prophyll preceded the complete utricle, and the female flower in *Carex* surrounded by the utricle can only be understood as a strongly reduced state of an androgynaeceous spikelet. Then we may also assume that the prototypes of *Carex* were similar to *Kobresia* and *Schoenoxiphium*. In those protocarices evolution may have led to reduction of the inflorescence from paniculate to spike-like, reduction or total disappearance of the rhachilla, and coalescence of the margins of the prophyll, whereas reduction of the number of carpels—a common feature in *Cyperaceae* and also in *Carex*—is extremely rare. In view of the very different proto-caricoid types still existing, the derivation of *Carex* along different lines from those types, seems in my opinion more plausible than the descent of all *Carices* from a single caricoid type. If we could find permanent correlation in the reduction of inflorescence and rhachilla and the coalescence of the prophyll, we might be able to trace lines across the supposed vertical lines of development, but this is obviously not the case.

Recently NELMES (1951a, b; 1952) pointed out that in his opinion the genera *Schoenoxiphium*, *Kobresia*, *Uncinia*, and *Carex* can not be distinguished in morphological terms. He defended the thesis that the classifying of the existing species on the basis of gross morpho-

logical resemblances and differences had led to unrelated groupings and that the phylogenetic approach to their classification, the tracing of parallel lines of evolution, is the truly scientific one. I am afraid that here phylogenetic speculations are presented as facts. For instance, Nelmes thinks all rhachilla-bearing unispicate *Carices* must be taken out of this genus and derived from *Uncinia*, an antarctic genus with all the characters of a unispicate *Carex* except that the well-developed rhachilla considerably exceeds the utricle and is hooked at the apex (Fig. 1d). In the arctic-alpine *Carex microglochis* Wahlenb. there is a protruding but not hooked rhachilla (Fig. 1b). Nelmes believes that *Carex microglochis* was developed from an *Uncinia* in the Antarctic, which travelled to the northern hemisphere, where it lost its hook but retained a protruding rhachilla, and that after its occupation of a large circumpolar area it gave rise to *Carex pauciflora* Lightf., also uncinoid, though it lost the rhachilla completely (Fig. 1c). It is obvious that here the systematic place of the unispicate *Carices*, certainly an incoherent group, is determined by the supposed evolution of a single organ. It also means that, if its ancestor (*Carex microglochis*) no longer existed, *Carex pauciflora* would be left in the "wrong genus" *Carex*. And we never know how many ancestors have become extinct. Moreover, it is very unlikely that the rhachilla, which became hooked in *Uncinia*, reverted to its original condition in *Carex microglochis*. In the case of *Carex pauciflora* comparative morphology has even entirely been given up as a means to classification, as there is no morphological character whatever by which it can be distinguished generically from unispicate "true *Carices*". At least in the present case I agree with DANSER (1940) that for the time being we can only employ the typological method. To maintain two protocaricoid genera for phytogeographical reasons alone, as was done by Kükenthal, must also be declined. There is a possibility of distinguishing between *Carex* and its prototypes on morphological grounds, although there will remain some species which may be placed in either.

I do not take all nomenclatural consequences of the foregoing remarks, as my only purpose is the re-examination of the question whether the Sumatran *Schoenoxiphium kobresioideum* is really generically distinct from the Himalayan *Kobresiae*. Kükenthal's description needs some minor corrections. "Spiculae partiales androgynae, flos imus foemineus, flores 3 superiores masculini" is certainly incorrect as for the inflorescences I examined (Fig. 2e). In the upper branches of the panicle (spiculae propriae of Kükenthal's) the male flowers prevail, in the lower branches they are less numerous. At the base of a lower branch a female flower surrounded by the cladoprophyll is found, the apex bears several male flowers. Between the basal female flower and the apical male ones there are several spikelets ("spiculae partiales"), the upper ones of which are much more reduced than the lower ones. Whereas the rhachilla of each lower spikelet bears up to 4 well developed male flowers besides a single female one, the upper spikelets are female, the male part being reduced to a vestigial, sometimes hardly discernable glume at the

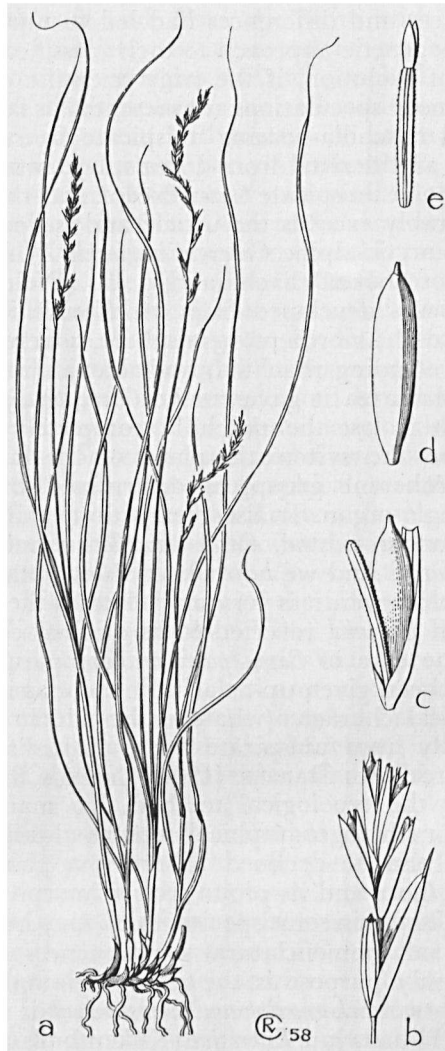


Fig. 3. *Kobresia kobresioidea* (Kük.) Kern—*a*: habit, $\times \frac{2}{5}$; *b*: spike, $\times 4$; *c*: female spikelet, $\times 8$; *d*: nut, $\times 8$; *e*: rhachilla with vestigial male flower at top, $\times 12$.—
From Van Steenis 8542 (L).

top of the rhachilla. Kükenthal says that the margins of the prophyll are connected at the base only, but I always find them quite free. The rhachilla is flattened and ciliate, especially in the unisexual spikelets, but I doubt whether it may be called subauricled at the top.

Whereas in 1909 Kükenthal distinguished between *Schoenoxiphium* and *Kobresia* for phytogeographical reasons, this principle is now abandoned and the Sumatran plant referred to the former genus on morphological grounds, *viz* the length and shape of the rhachilla between the female and male part (shorter or longer than the nut!).

In my mind this is a matter of too slight importance upon which to establish a genus, even if it would hold good in all cases. Flattened, ciliate rhachillas are frequently found in Himalayan *Kobresiae* (see e.g. KÜKENTHAL 1909, Fig. 12 G!), and even in *Kobresia laxa*, with which Kükenthal compares his new species, the rhachilla can not be called setaceous. In *Schoenoxiphium* not all spikelets are androgynaeceous; even in those species with decompound inflorescences the uppermost spikelets of each spike are female. In *Schoenoxiphium gracile* Cherm. from Madagascar usually all spikelets are female (specimens with complete spikelets occur).

Kükenthal arranges some of the species connecting *Schoenoxiphium* and *Kobresia* in this order:

1. *Schoenoxiphium kobresioideum* Kük., still belonging in *Schoenoxiphium*, but with the habit of *Eu-Kobresia*;

2. *Kobresia kükenthaliana* Hand.-Mazz., with all spikelets androgynaeceous and a shortened rhachilla;

3. *Kobresia laxa* Nees, with mostly unisexual, rarely androgynaeceous spikelets and the rhachilla usually sterile, exceeding the prophyll.

I fail to see why and in what way the generic boundary-line between 1 and 2 was drawn. *Schoenoxiphium kobresioideum* is closely allied to some species of *Kobresia*, especially to *K. laxa*, from which it differs by several distinct though not generic characters. Its transfer to *Kobresia* appears to be necessary, not least to prevent unjustified genetic-geographical conclusions.

Kobresia kobresioidea (Kük.) Kern, comb. nov.—*Schoenoxiphium kobresioideum* Kük., Bull. Jard. Bot. Btzg III, 16, 1940, 312.—Fig. 3.

II. REMIREA OR CYPERUS?

The homology of the peculiar corky organ tightly clasping the nut of *Remirea maritima* Aubl. has often been discussed and up to the present there is no unanimous agreement on its interpretation. ROBERT BROWN (1810) took it for the incrassate flower-bearing glume. He was followed by nearly all subsequent authors, e.g. NEES (1835, p. 286; 1854), BOECKLER (1868), BENTHAM (1883, p. 1058), CLARKE (1883–1884, p. 677), KÜKENTHAL (1935), and OHWI (1944).

However, KUNTH (1837) disagreed with Brown in assuming it to represent the thickened upper internode of the rhachilla. Kunth's interpretation found no support until 1922, when CHERMEZON (1922) pointed out that

1. the stamens in *Remirea* are placed between a normal glume and the ovary, not between the corky organ and the ovary; as a rule stamens in *Cyperaceae* are anterior, i.e. placed between the flower-bearing glume and the ovary; consequently the corky organ can not be the flower-bearing glume;

2. the corky organ is distinctly shorter than the glume below it; in *Cyperaceae* the fertile glumes are always the largest ones;

3. the glumes in *Remirea* are all many-nerved; the corky organ is

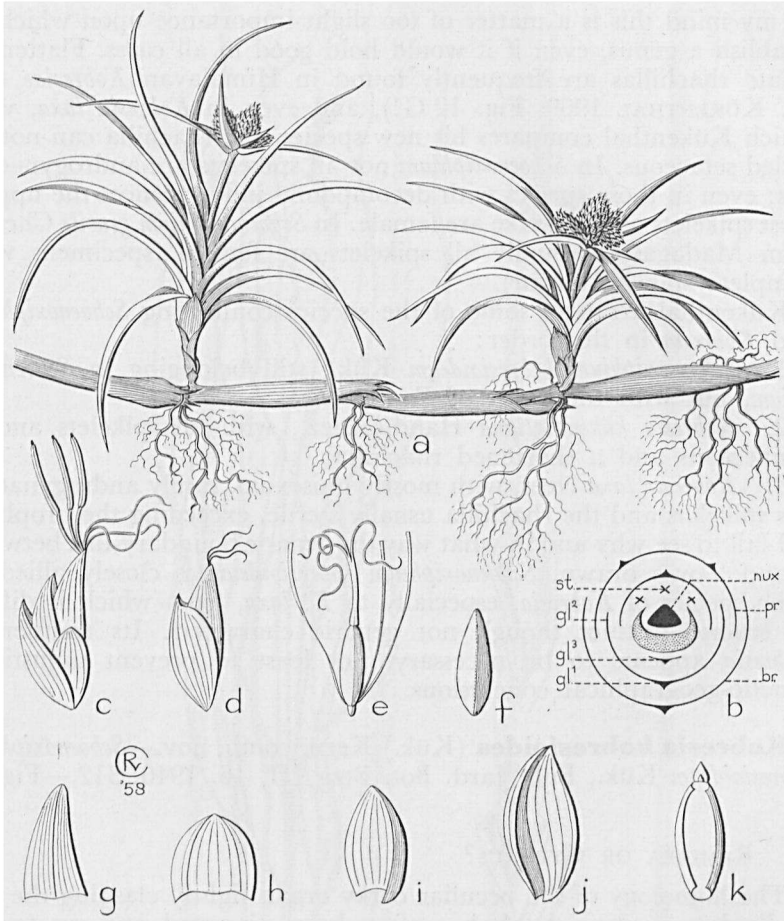


Fig. 4. *Cyperus pedunculatus* (R.Br.) Kern—*a*: habit, $\times \frac{1}{2}$; *b*: diagram of spikelet (*br*: bractea; *pr*: prophyllum; *gl*: gluma; *st*: stamen); *c*: flowering spikelet, $\times 5$; *d*: nut enclosed by upper glumes; *e*: flower, $\times 5$; *f*: nut, $\times 5$; *g*: bract, $\times 5$; *h*: prophyll, $\times 5$; *i-j*: glumes, $\times 5$; *k*: rhachilla, with vestigial upper internode and vestigial upper glume, $\times 5$.—From Coert 1646 (L).

nerveless with only a single vascular strand embedded in the aerenchyma;

4. the corky organ bears a small cucullate appendage at its apex, which is undoubtedly the vestigial uppermost glume; such a strongly reduced glume is found in numerous *Cyperaceae*, and in *Cyperus subgen. Mariscus* it has the same aspect as in *Remireia*.

To these facts I might add as further evidence:

5. the nut in *Remireia* is flattened against the corky organ; trigonous nuts in *Cyperaceae* are always flattened against the rhachilla, having an edge next the subtending glume;

6. the appendage of the corky organ is not exactly terminal, for

beyond it a short but distinct continuation of the axis can easily be observed.

It is incomprehensible that, in spite of Chermezon's irrefutable argumentation, KÜENTHAL (1944, p. 201) stuck to his opinion already put forward in the 'Pflanzenreich', that the organ in question is nothing else than a slightly transformed glume hardly different from the other glumes. From the facts mentioned above it can in my opinion only be concluded that it is the upper (or rather the penultimate) rhachilla internode, which was transformed into a floating organ. Flattened, broadly winged rhachilla internodes embracing the nuts, and bearing a much reduced glume with a short continuation of the rhachilla beyond it, are found throughout *Cyperus subgen. Mariscus*. In *Cyperus odoratus* L. the rhachilla internodes function as a floating organ in exactly the same way as in *Remirea*.

Mainly on account of the distichous arrangement of the glumes, Nees, Kunth, and Boeckeler placed *Remirea* in *Cypereae*. For various reasons nearly all subsequent authors thought relationships were rather with "rhynchosporoid" genera, such as *Schoenus*, *Rhynchospora*, *Oreobolus*, etc. There are two exceptions:

1. PALLA (1913) did not recognize *Remirea* as a separate, monotypic genus. As the leaf-anatomy perfectly corresponds with that of his genus *Duval-Jouvea*, he transferred *Remirea maritima* to this genus [*Duval-Jouvea maritima* (Aubl.) Palla]. *Duval-Jouvea* is now generally merged into *Cyperus*.

2. Chermezon, who accepted the subdivision of *Cyperus* into several smaller genera, kept *Remirea* apart, but placed it next to *Kyllinga* and *Mariscus*.

Although KÜENTHAL (1944, p. 204) admitted that the shape of inflorescence, spikelet, and nut, the strong nervation of the glumes, and the anatomy of the leaf point to its relations with *Cyperus subgen. Mariscus*, he left *Remirea* in subfam. *Rhynchosporoideae*, and thus remote from *Cyperus*, on the following grounds:

1. the presence of several empty glumes at the base of the spikelet;
2. the spiral arrangement of the glumes;
3. the lateral position of the flower;
4. the disarticulation of the rhachilla below the lowermost glume.

I can not agree with him for the following reasons:

1. In *Cyperus* there are usually two "empty glumes" at the base of the spikelet. The lowermost one is the bract inserted on the axis from which the rhachilla arises, the next one the prophyll, as a rule borne at the base of every lateral branch in *Cyperaceae*, and usually recognizable as such by two more or less prominent keels. Besides bract and prophyll there are 1 or 2 more sterile glumes in *Remirea*. However, this is also the case in several *Cyperus* species (e.g. *C. cinereobrunneus* Kük. with 4 and *C. filipes* Benth. with 4 or even more "empty glumes"), and does not prevent *Remirea* from being placed next to or even in *Cyperus*.

2. I always find the glumes in *Remirea* distichously arranged.

Kükenthal may have been misled by the fact that some spikelets in the very dense inflorescence are somewhat contorted.

3. The position of the flower is exactly the same as in *Cyperus*. Moreover, I fail to see why lateral position of the flower would be a reason for placing *Remirea* in subfam. *Rhynchosporoideae* as understood by Kükenthal. The tribe *Rhynchosporae* was raised to the rank of a subfamily by ASCHERSON and GRAEBNER (1902–1904) on account of the supposed basic differences in spikelet structure (sympodial in *Rhynchosporoideae*, monopodial in *Scirpoideae*), a view also held by Kükenthal. Only in true, monopodial spikelets flowers are really placed laterally. Here it may be remarked that I do not share Ascher-son and Graebner's view. Basic differences in the spikelet structure between *Rhynchosporoideae* and *Scirpoideae* do not exist; in both the so-called spikelets are in fact monochasia. I agree with HOLTUM (1948), in whose opinion "*Rhynchosporae* probably represent a series of developments on different lines from the condition of *Scirpus*, rather than a coherent tribe".

4. Unlike Kükenthal (and Chermezon) I always found in the numerous ripe spikelets of *Remirea* examined the rhachilla disarticulating above the prophyll or sometimes above the bract, in the same way as in *Cyperus* subgen. *Mariscus* (see also URTTIEN, 1949).

Summarizing the foregoing account of the spikelet structure, we may conclude that there is no reason whatever to treat *Remirea* as a separate, monotypic genus, especially as the "peculiar corky glume" is nothing more than an incrassate rhachilla internode. As the shape of spikelet, nut, glume, and involucre are all as in *Cyperus* subgen. *Mariscus*, I think the natural place of *Remirea maritima* is in that subgenus, in which already several other species with 1-flowered spikelets are included.

Cyperus pedunculatus (R.Br.) Kern, comb.nov.—*Remirea maritima* Aubl., Hist. Pl. Guian. Franç. 1, 1775, 45, t. 16, non *Cyperus maritimus* Poir.—*Remirea pedunculata* R. Br., Prodr., 1810, 236.—Fig. 4.

III. TYLOCARYA OR FIMBRISTYLIS?

On one of the *Cyperaceae* collected by Kostermans and Den Hoed on the Netherlands Kwae Noi River Basin Expedition in 1946, NELMES (1949) based the new genus *Tylocarya*. After having carefully studied the type in the Rijksherbarium, Leyden, I can not agree with him that this collection would represent a separate genus, and I am convinced that it is a species of *Fimbristylis*. Nelmes is of the opinion that the persistent style-base puts it out of *Fimbristylis* and moreover that no species of this genus has anything like such long and such linear-cylindric spikelets. However, the style-base is certainly not persistent on all fruits or even on the majority of them. In every spikelet many nuts are found not crowned by the "bulb" characteristic of *Bulbostylis*, *Eleocharis*, and *Rhynchospora*. In several *Fimbristylis* species the basal part of the style occasionally remains on the fruit. This is especially the case in *Fimbristylis thomsonii* Boeck., the nut of which

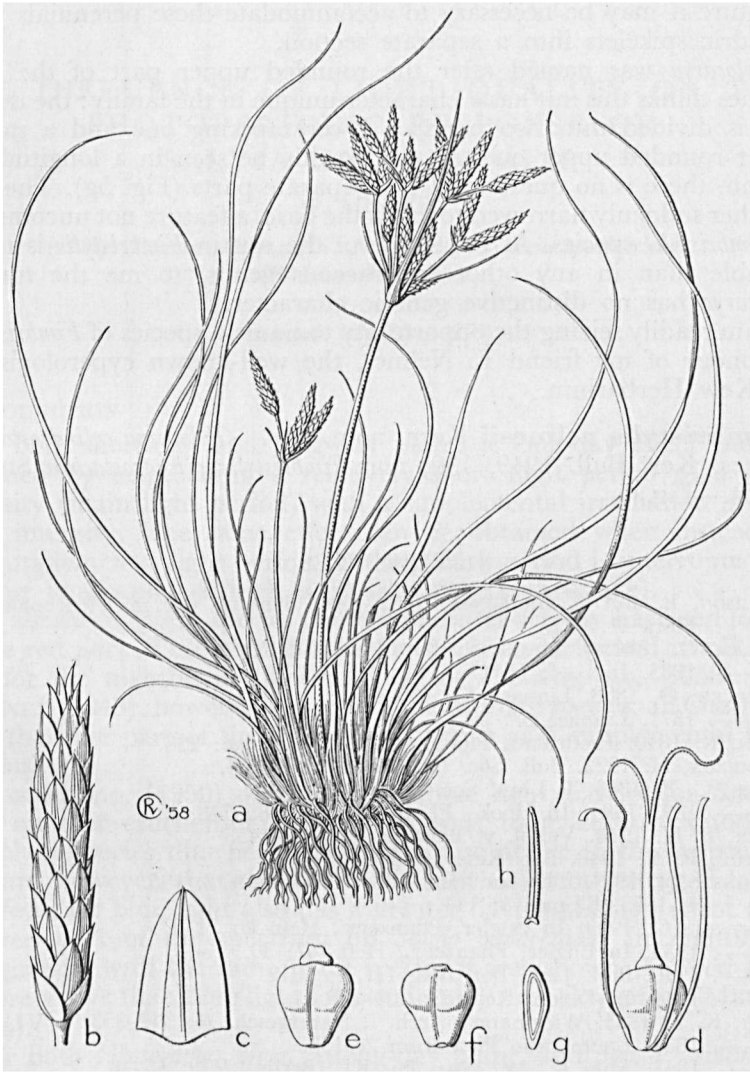


Fig. 5. *Fimbristylis nelmesii* Kern—*a*: habit, $\times \frac{1}{2}$; *b*: spikelet, $\times 2\frac{1}{2}$; *c*: glume, $\times 5$; *d*: defflorate flower, $\times 10$; *e-f*: nuts, $\times 10$; *g*: longitudinal section of nut, $\times 10$; *h*: anther, $\times 10$.—From Den Hoed & Kostermans 968 (L).

was described by BOECKELER (1871) as follows: “caryopsis . . . styli basi subsistente majuscula conico-pyramidata triangulari brunnea coronata”. The articulation between nut and style obviously does not always function perfectly, and then the upper part of the style breaks off along an irregular line (see fig. 5e). Linear-cylindric spikelets are found in several S.E. Asian species of *Fimbristylis*, e.g. in *F. brunnea* Clarke ex Camus, *F. brunneoidea* Kern, *F. spicigera* Kern, and *F. psammophila* Kern. In a previous paper (KERN, 1955) I pointed out that

in future it may be necessary to accommodate these perennials with cylindrical spikelets into a separate section.

Tylocarya was named after the rounded upper part of the nut. Nelmes thinks this nut has a character unique in the family: the dorsal face is divided into two parts, a lower tapering one and a rather larger rounded upper one. As can readily be seen in a longitudinal section, there is no question of two separate parts (Fig. 5g). The nut is rather suddenly narrowed towards the base, a feature not uncommon in *Fimbristylis* species. As the shape of the nut in *Fimbristylis* is more variable than in any other cyperaceous genus, to me the nut of *Tylocarya* has no distinctive generic character.

I am readily seizing the opportunity to name a species of *Fimbristylis* in honour of my friend E. Nelmes, the well-known cyperologist of the Kew Herbarium.

***Fimbristylis nelmesii* Kern, nom. nov.**—*Tylocarya cylindrostachya* Nelmes, Kew Bull. 1949, 139, non *Fimbristylis cylindrostachya* Steud. (1855).—Fig. 5.

REFERENCES

- ASCHERSON, P. and P. GRAEBNER. 1902–1904. Synopsis der mitteleuropäischen Flora 2²: 339.
- BENTHAM, G. 1881. J. Linn. Soc. Bot. 18: 360–367.
- . 1883. In B. & H. Gen. Pl.: 1037–1073.
- BOECKELER, O. 1868. Linnæa 35: 435–436.
- . 1871. Linnæa 37: 37.
- BROWN, R. 1810. Prodrömus Floræ Novæ Hollandiæ: 236.
- CHERMEZON, H. 1922. Bull. Soc. Bot. Fr. 69: 809–814.
- CLARKE, C. B. 1883. J. Linn. Soc. Bot. 20: 374–403.
- . 1893–1894. In Hook., Fl. Br. Ind. 6: 585–748.
- DANSER, B. H. 1940. Vakbl. v. Biologen 21: 137–145.
- HOLTUM, R. E. 1948. Bot. Rev. 14: 536.
- HUTCHINSON, J. 1934. The families of flowering plants 2: 195.
- KERN, J. H. 1955. Blumea 8: 144.
- KÜKENTHAL, G. 1909. In Engler, Pflanzenr., Heft 38: 21–27.
- . 1935. In Engler, Pflanzenr., Heft 101: 30.
- . 1940. Bull. Jard. Bot. Btzg III, 16: 312.
- . 1944. In Fedde, Rep. 53: 200–209.
- KUNTH, K. S. 1835. Wiegmann's Arch. f. Naturgesch. 1^a: 349–353, t. VI.
- . 1837. Enumeratio Plantarum 2: 138.
- . 1841. Abh. K. Ak. Wiss. Ph. Kl. (Berlin) 1839: 46–48.
- NEES VON ESENBECK, C. G. 1832. Linnæa 7: 531.
- . 1835. Linnæa 9: 273–306.
- . 1854. Hook. J. Bot. Kew Misc. 6: 29.
- NELMES, E. 1949. Kew Bull. 1949: 139–140.
- . 1951, a. Reinwardtia 1: 222–225.
- . 1951, b. In Lousley, The study of the distribution of British plants: 108–109.
- . 1952. Kew Bull. 1951: 427–436.
- OHWI, J. 1944. Mem. Coll. Sc. Kyoto Imp. Un. B 18: 24.
- PALLA, E. 1913. Denkschr. Ak. Wiss. Wien 89: 500.
- PAX, F. 1886. Bot. Jahrb. 7: 287–318.
- . 1887. In E. & P., Pfl. Fam. 2²: 98–126.
- SCHRADER, H. A. 1806. Flora Germanica 1: 155.
- UJTIIEN, H. 1949. In Backer, Bekn. Fl. Java (em.ed.) 10, fam. 246: 48.
- WILDENOW, K. L. 1805. Species Plantarum 4: 205.