

STUDIES IN CYPERACEAE 10. *CYPERUS MACROPACHYCEPHALUS*, A REMARKABLE NEW SPECIES FROM NEW GUINEA

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SUMMARY

The new species *Cyperus macropachycephalus*, known only from Chambri Lake in the Lower Sepik area (Papua New Guinea) is described and illustrated. Its ovary is dimerous and dorsiventrally compressed, much flattened, or more rarely trimerous, and then compressed subtrigonal. A close relative could be *Cyperus pachycephalus* Kern, but the wider affinities are rather obscure.

During a recent collecting trip in Papua New Guinea* in the lower Sepik area a strikingly beautiful *Cyperus* was found and collected and appears to represent a new species, probably a more or less close relative of *Cyperus pachycephalus* Kern.

Cyperus macropachycephalus Goetghebeur – Figs. 1, 2.

Probabiliter *Cypero pachycephalo* Kern affinis, sed praecipue inflorescentia laxiore, spiculis valde majoribus discretisque differt. Herba annua, radicibus fibrosis. Culmi 10–40 cm alti, 1–2 mm crassi, plerumque plures, aggregati, erecti, subtriquetri, laeves, glabri, basi paucifoliati. Folia usque ad 20 cm longa et 2 mm lata, culmo breviora vel aequilonga, linearia, plana vel canaliculata, inferne carinata, marginibus antrorse scabra, vaginis rubro-violaceis. Anatomia typi chlorocyperoidei, fasciculis vascularibus parvis vaginis chlorophyllosis circumdatis. Inflorescentia in capitulum depresso subglobosum contracta, 1,5–4 cm diametro, subdense, multispiculata spiculis (20–80) discretis. Bractae involucales inflorescentiam superantes, foliis consimiles, usque ad 20 cm longae et 3 mm latae, patentes, basi flavescentes. Spiculae 10–20 mm longae et 2,5–3 mm latae, saepe leviter incurvatae aut tortae, valde compressae, pallidae, flavescentes, ca. 12–24-florae. Rhachilla recta, tenuis, quasi exalata, ca. 0,4 mm lata, internodiis ca. 0,6 mm longis. Glumae 3,5–4 mm longae (incl. mucrone ca. 0,5 mm longo), 1,5–1,7 mm latae, > 1/2 parte imbricatae, bifariam dispositae, carinato-subnaviculares, distincte 9–11-nerviae, lateribus pallide stramineae vel flavescentes, nervis percursae, e carina laevi viridi in mucronem rectum validum laevem sed apice spinula unica minuta productae. Stamina 3, filamenta denique ca. 3 mm longa, anguste ligulata, subhyalino-rufescentia, antherae ca. 0,5 mm longae, connectivo in appendicem minutam depresso globosam subverruculosam producto. Stylus ca. 1 mm longus, epapillosus, stigmatibus 2 (interdum 3), ca. 1 mm lon-

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Fig. 1. *Cyperus macropachycephalus* Goetghebeur. a. Habit; b, c. spikelets (scale a: 5 cm; b, c: 2 mm).

gis exsertis. Achenium ca. 1.5 mm longum et 0.9 mm latum, subellipticum ad subovatum, valde compressum, sectione transversa anguste ellipticum (G2) vel anguste trigonum (G3), pallide griseo-brunneum. — *T y p u s*: *P. Goetghebeur & W. Vyverman 6712* (GENT, holotypus, isotypi ad distribuendi).

Probably related to *Cyperus pachycephalus* Kern, but quite different by its more lax inflorescence with spreading, much larger and distinct spikelets.

Annual herb, with fibrous roots. *Culm* 10–40 cm high, 1–2 mm wide, often with several in a tuft, erect, subtriquetrous, smooth and glabrous, with rather few leaves, all basal. *Leaves* up to 20 cm long and 2 mm wide, shorter than to as long as the culm, linear, flat to canaliculate, keeled on the lower surface, antrorsely scabrid along the margin, with red-purplish sheaths. Anatomy of the chlorocyperoid type, the smaller vascular bundles surrounded by a green Kranz sheath. *Inflorescence* contracted into a subglobular head, 1.5–4 cm in diameter, rather dense, with 20–80 distinct spikelets. Involucral bracts longer than the inflorescence, similar to the leaves, up to 20 cm long and 3 mm wide, spreading, yellowish at the base. Spikelets 10–20 mm long and 2.5–3 mm wide, often slightly twisted, conspicuously laterally flattened, rather pale and yellowish, c. 12–24-flowered. *Rachilla* straight, slender, almost wingless, c. 0.4 mm wide, the internodes c. 0.6 mm long. *Glumes* 3.5–4 mm long (including the c. 0.5 mm long mucro), 1.5–1.7 mm wide, imbricate for less than half their length, exactly distichous, keeled and \pm boat-shaped, conspicuously 9–11-nerved, pale stramineous to yellowish, with a smooth, greenish keel excurrent into a solid, nearly straight, and smooth mucro, topped by a single small spinule. *Stamens* 3, their filaments elongating during anthesis, and then up to c. 3 mm long, narrowly ligulate, subhyaline to becoming rufous, anthers c. 0.5 mm long, the connective with a small depressed globose slightly verruculose outgrowth. *Style* c. 1 mm long, epapillose, style branches 2 (rarely 3), c. 1 mm long, exserted. *Achene* c. 1.5 mm long and 0.9 mm wide, subelliptical to subovate, conspicuously compressed, on cross section narrowly elliptical (G2) or narrowly trigonous (G3), pale grey-brownish.

Distribution. Papua New Guinea, East Sepik Province, Lower Sepik alluvial plain, Chambri Lake, in dried-up mud at the edge of a barat, on the opposite side of Chambri Mission, 143° 09' E, 4° 16' S, *P. Goetghebeur & W. Vyverman 5712* (GENT, holotype), and from there halfway towards the village Timbunmeri, 143° 07' E, 4° 19' S, *P. Goetghebeur & W. Vyverman 6717bis* (GENT), 7-10-1987. Locally common, but only seen here. In both localities growing with *Cyperus pachycephalus* Kern, and almost indiscernible from the latter when the involucral bracts and the top of the spikelets are eaten by waterfowl (*6717bis*).

The most striking – and in *Cyperus* rather exceptional – character of this new species is of course the combined presence of dorsiventrally compressed-dimerous and subtrigynous-trimerous gynoecea in a single inflorescence. In our specimens the dimerous gynoecea are by far prevailing. The shape of the fruit and the texture of the fruit wall also point to a more or less close relationship with *Cyperus pachycephalus* Kern, a much more common species in the Sepik alluvial plain.

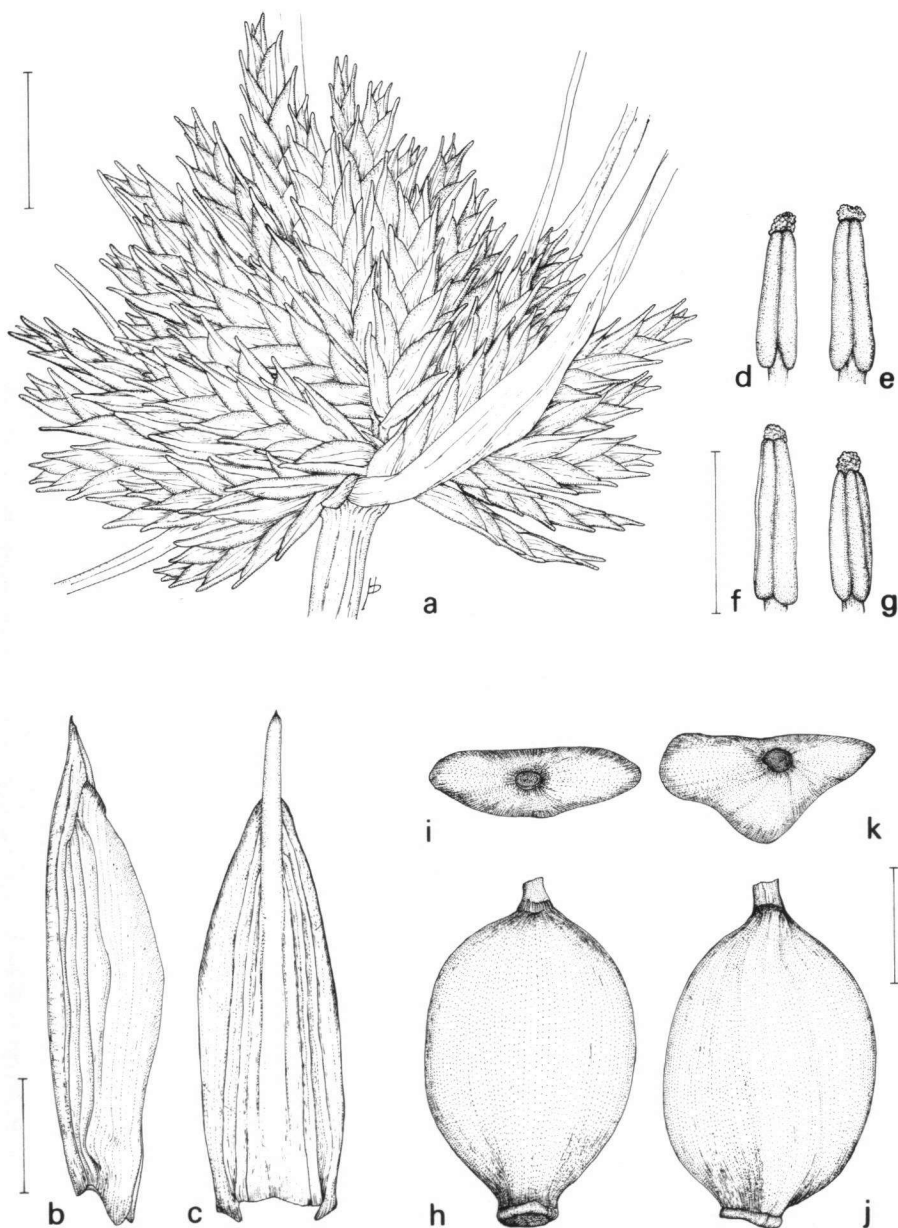


Fig. 2. *Cyperus macropachycephalus* Goetghebeur. a. Inflorescence; b. glume, lateral; c. glume, abaxial; d-g. anthers; h. dimerous fruit, abaxial; i. idem, apical; j. trimerous fruit, abaxial; k. idem, apical (scale a: 5 mm; b, c: 1 mm; d-k: 0.5 mm).

The vascular bundles – in particular the minor bundles – in the stem, the leaves and the involucre bracts are surrounded by three sheathing layers:

- 1) the innermost layer is composed of large green cells, the Kranz-sheath;
- 2) the middle layer is composed of small sclerified cells, the sclerenchyma sheath;
- 3) the outermost layer is composed of large, radiating green cells, the mesophyll sheath.

This configuration corresponds exactly to what is known as the chlorocyperoid anatomy type.

In the Flora Malesiana key to the species of *Cyperus* (Kern, 1974: 597), this new species would enter under couplet 5 (second lead), as a new dichotomy 5A:

Spikelets 4–8 mm long, 1.5–2(–3) mm wide, 6–12-flowered

45. *C. pachycephalus*

Spikelets 10–20 mm long, 2.5–3 mm wide, 12–24-flowered

45A. *C. macropachycephalus*

SYSTEMATIC POSITION WITHIN CYPERUS

I have tried to compare the new species with those of the several sections exhibiting some similarities in the inflorescence, glumes, fruit, vegetative anatomy, etc.

It should be noted that the sections in Kükenthal (1935/1936) are in need of revision from both the taxonomic and nomenclatural point of view.

1. Section *Juncellus* Grisebach

The combination of annual plant, compact inflorescence and conspicuously many-nerved glumes does not fit; furthermore the presence of G2 and G3 on one plant is here very rare.

2. Section *Incurvi* Kükenthal

Annual plants with narrow leaves, chlorocyperoid anatomy, elongate spikelets, mucronate glumes, and G2 are unknown here.

3. Section *Platystachyi* Kunth

Annals with long mucronate glumes and G2 are excluded.

4. Section *Graciles* Benth

Flat leaves, chlorocyperoid anatomy, multispiculate inflorescences, closely set glumes, and G2 prevent our species from entering this section.

5. Section *Ruprestres* C.B. Clarke

The combination of medium-sized annual plants, with large involucre bracts and again G2 is not present here.

6. Section '*Dichostylis*' (P. Beauvois) Baillon

Cyperus pachycephalus was described in this section by Kern (1952: 119) and compared with *C. pygmaeus* Rottbøll, apparently mainly because of the non-fixed number of carpels, and further the dense, head-like, but lobed inflorescence with many small, slightly twisted spikelets.

Our species is even more deviating from *C. pygmaeus* and relatives in having much larger heads and spikelets and a less dense inflorescence with quite discrete spikelets. Structurally, however, no striking differences can be shown; inflorescence, spikelets, glumes and fruits of these species do resemble each other, save for the dimension.

In Kükenthal's (1935/1936: 308–315) circumscription the section *Dichostylis* is clearly heterogeneous, as already shown by Raynal (1966: 306 & 1967: 588). Furthermore this section cannot bear the name *Dichostylis*, which is a superfluous (and hence illegitimate) name for *Echinolytrum* Desvaux, typified by *E. dipsaceum* (Rottbøll) Desvaux, now known as *Fimbristylis dipsacea* (Rottbøll) Benth.

Raynal (1967: 588) proposed a grouping of *C. pygmaeus* and relatives with a few other ephemeral annuals (*C. squarrosus* L., *C. hamulosus* M. Bieberstein) as a section *Aristati* Kunth. I am not convinced of the close relationship between the latter two and the former species; on the contrary, they are probably not so close as to form a section on their own.

For the time being I prefer to leave the new species at the side of *C. pachycephalus* Kern without pronouncing myself on the taxonomic and nomenclatural problems, awaiting further studies, which will require much more time than can be spent now.

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