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the staminate strobilus of *Amentotaxus* (figs. 19, 21 & 26) are probably homologous to the secondary branches (of which the first one is sterile, and the others, fertile), and that these structures are subtended a bract which is homologous to a secondary laminar appendage.

(3) It is further suggested that the open dichotomous vein-systems in the axils of side veins in a segment of *Phylhcladus,* the ultimate units of fertile shoot of *Cordaitwnthus**, and the sporangiophores of *Amentotaxus* (figs. 19, 22, 23, 24, 27 & 28), are probably homologous to the tertiary branches, fertile and sterile, which again are subtended by the tertiary laminar appendages, known as bracts or the like.

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[1] It must be stressed here that in the case of an ovulate strobilus, the terminal structure on the ultimate'units of fertile shoots (figs. 3, 4 & 23) are ovules, *not* sporangia. A. succinct discussion on the telomic concept and the nature of the integument by Andrews (1961, pp. 372-375)'should be consulted.

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THREE NEW MALESIAN SPECIES OF GRAMINEAE

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ABSTRACT

Illustrated descriptions of three new Malesian species *(Racemobambos ceramica* S. Dransfield, *Nastus schmutzii* S. Dransfield and *Cymbopogon minutiflorus* S. Dransfield) are presented. *R. ceramica* is compared with *R. schultzei* (Pilger) Holttum, and *N. schmutzii* with *N. reholttumianus* S. Soenarko. *N. reholttumianus,* so far found only in the island of Sumba, is recorded also as occurring in Flores. *C. minutiflorus* is the first representative of the genus in Sulawesi.

ABSTRAK

Pertelaan bergambar tiga buah jenis baru suku rumput-rumputan dari Malesia disajikan. Jenis-jenis tersebut ialah *Racemobambos ceramica* S. Dransfield, *Nastus schmutzii* S. Dransfield dan *Cymbopogon minutiflorus* S. Dransfield. *R. ceramica* dibandingkan dengan *R. schultzei* (Pilger) Holttum, sedang *N. schmutzii* dengan *N. reholttumianus* S. Soenarko. *N. reholttumianus* yang dilaporkan terdapat di Sumba, ditemukan pula di Flores. *C. minutiflorus* merupakan jenis pertama daripada marga *Cymbopogon* di Sulawesi.

RACEMOBAMBOS Holttum

In the island of Seram, Rutten collected a bamboo characterized by its panicle with multiflorus spikelets and climbing culms. It belongs to *Racemobambos* and can be distinguished from the recognized species of the genus by its long, open and spreading panicle and hairy inflorescence axis. The species, here regarded as new, is very closely related to *R. schultzei* (Pilger) Holttum, which occurs in Japen Isl. (Holttum **1967).** It differs from *R. schultzei* in several respects, compared below

	schultzei	*ceramica*
spikelet	more or less sessile, with swollen base	pedicellate, pedicel 4.5 mm long, base not swollen
lemma	10 mm long	7 — 8.5 mm long
lodicules	minutely puberulous	glabrous
main axis and branches of inflorescence	glabrous	puberulous

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Kacemobambos ceramica S. Dransfield, *sp. nov.* — Fig. 1.

R. schultzei (Pilger) Holttum affinis, sed spiculis non sessilis, lemmatibus 7—8.5 mm longis, lodiculis glabris, axe prinario et ramis inflorescentiae pubescenti, differt.

TYPUS: *Rittten 223U* (BO, holotypus)

Climber; culm not seen, upper part 3 mm diam., hollow, smooth, with thin wall; branches glabrous, 3—4 in each node. Culm-sheath not seen. Flowering branches 12—21 cm long, bearing leaves; leaf-blades 7—13.5 cm long, 5—7 mm wide, glabrous, tapering to a fine tip; auricle very short with long bristles (the longest being 8 mm long). Main axis and lateral branches of panicle puberulous. Spikelets 22—32 mm long, consisting of 4—5 florets, hermaphrodite, the terminal one barren; basal empty glumes 3, hairy when young, glabrous in age; glume I very small, 1.5 mm long, narrow, 1-nerved, pointed; glume II 3.5—4 mm long, 2.5 mm wide, acuminate, 9-nerved; glume III 6.3 mm long, 3 mm wide, rounded on the back, with rounded apex, 10-nerved; rachilla internode 5 mm long, flattened, glabrous; lemmas 7—8.5 mm long, rounded on the back, 3 mm wide, ovate, acuminate, minutely puberulous on the back, 10-nerved; palea 6.5 mm long, membrano-chartaeeous, 2-keeled, hairy along the keels, 2 nerves between the keels, 2 nerves each between the keel and the margin; lodicule 2 mm long, glabrous, hairy along the apex; anthers 3 mm long; ovary minutely puberulous; stigma 3 mm long.

SERAM. Makina, **alt.** 1000 - 110© m, in the forest, 18 May 1919-, *Rutten 228U* (EO).

N A s T u s Nees

Among the bamboo material sent by Father Schmutz of Ruteng (Flores, Indonesia) I found three interesting specimens of *Nastus.* One of them *(E. Schmutz 3866,* Manggarai, West Flores, alt. 800 m, 25.1. 1976) in fact belongs to *N. rehotttumianus* S. Soenarko (1977) which so far is known to occur only in Sumba. It is called "heso" by the native of Manggarai, Flores.

The second specimen *(E. Schmutz 2789)* is slightly different from *N. rehotttumianus,* for it has thinner glumes, lemma and palea. The specimen consists of flowering branches accompanied by very short notes from the collector. The other specimen is a young plant representing the same species as specimen *Schmutz 2789.* Later Father Schmutz sent some valuable information about this plant and *N. rehotttumianus.* People in West Flores recognize two kind of "heso": 1) small "heso", which has culn* about 3 cm in diameter with thin wall, and it is found[1] at lower elevations, 650—800 m, and 2) big "heso", which has culms about 5 cm in diameter with thick wall, and occurs at higher elevations, above 900 m.

FIG. 1. Racemobambos ceramiea. After *Rutten 2234.*

The small "heso" is in fact *N. reholttumianus* and the other "heso" is an undescribed species. This new species can also be differentiated from the former species by having shorter uppermost glume. In *N. reholttumianus* uppermost glume is more or less as long as the lemma and palea, whereas in this new species it is shorter than the lemma and palea. It is a great pleasure to name this species after Father Schmutz who sent with enthusiasm the plant and the valuable information about it.

Nastiis schmulzii S. Dransfield, *sp. nov.* — Fig. 2.

N. reholttumiano S. Soenarko affinis, sed glumis, palea et lemmate tenuioribus et glume superiore lemmate paullo breviore, differt.

TYPUS: *E. Schmutz 2789* (BO, holotypus).

Climber; culm about 6 cm in diam., thick-walled, upper part bearing flowering branches 1.5 cm diam., with annular woody ring in each node. Culm sheath not seen. Flowering branches 9—25 cm long; leaf-blades 2.5—4.5 cm long, 4—8 mm wide, glabrous, lanceolate, tapering to a very fine long tip; ligule very short, less than 1 mm long, fringed (fringes up to 2.5 mm long). Inflorescence open panicle, 3.5—7 cm long, with spreading branches, main axis and branches with minute hairs. Spikelets 5.5—6.5 mm long, glabrous, slightly laterally compressed; glume I not more than 1.5 mm long, mucronate; glumes II 1.5—2 mm long, mucronate; glumes III 2—2.5 mm long, acuminate, ovate, more or less rounded on the back, 7-nerved; glumes IV 3—3.5 mm long, ovate, acuminate, 7-nerved; lemma and palea more or less equal, 5.5—6.5 mm long, glabrous, acuminate, 7-nerved; lodicules 3, 1 mm long, with fringes; ovary slender with 3 long stigma; stamen 6, 2.5 mm long; no rachilla extension.

WEST PLORES. Manggarai, Nunang, Todong Rancang, 18 November 1971, alt. 850 m, *E. Schmutz 2789* (BO); *ibid.*, young plant, 16 January 1976, *E. Schmutz 3853* (BO).

CYMBOPOGON Sprengel

In the revision of the genus *Cymbopogon* (Soenarko 1977) 55 species are recognized and they occur in the Old World tropics and subtropics to Australia. No wild species of the genus has been recorded to occur in Sumatra, Kalimantan and Sulawesi. Among the specimens in the Herbarium Bogoriense there are two incomplete specimens bearing inflorescence only, collected in Donggala in the Central Sulawesi. Therefore they were not included during the preparation of the revision.

, During the International Society of Sugar Cane Technologists germplasm expedition to various parts of Indonesia in 1976 I was able to find

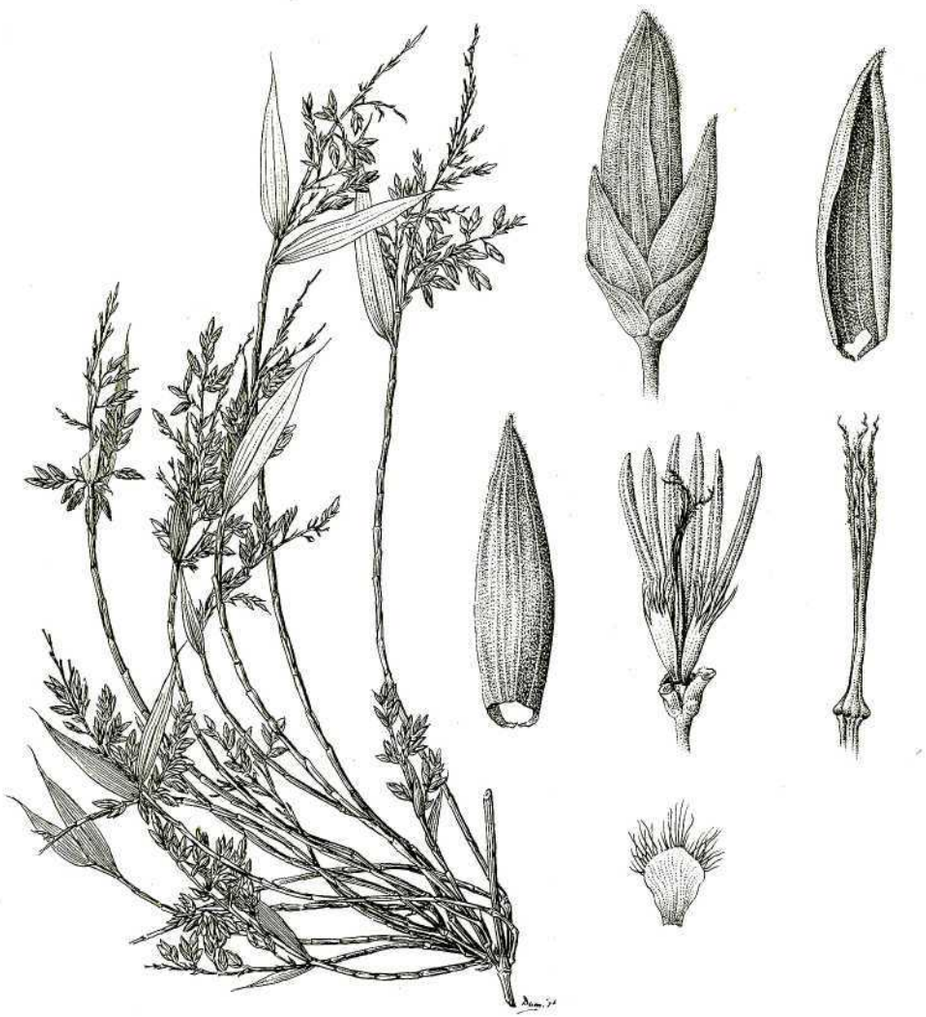

FIG. 2. Nastus schmutzii. After *E. Schmutz 2789.*

this *Cymbopogon* species growing wild in the areas surrounding Palu in Central Sulawesi. This species is so far not found in the other parts of Sulawesi, for during the trips to South and North Sulawesi I did not see it. This species belong to ser. *Citrati* and differs from the other species in this series in the densely pilose pedicels and rachis internodes and much smaller sessile spikelet with relatively broad-winged lower glume.

Cymbopogon minutiflorus S. Dransfield, *sp. nov.* — Fig 3.

Species nova ad series Citrate pertinentes, sed ab aliis speciebus rhachidibus internodiis et pedicellis dense pilosis, et spicula sessili minore, differt.

TYPUS: *S. Soenarko 430* (BO, L, K).

Tufted, perennial grass; flowering culm up to 2 m tall, erect with drooping tip, smooth, polished, glabrous, nodes somewhat swollen, shortly-bearded. Leaf-blades 30—60 cm long, 6—8 mm wide, tapering to a very long tip, narrower to the base, glabrous, slightly rough on both surfaces, light green; basal sheaths persistent at the base of the culm, slipping, often curled, smooth, glabrous except at the lower part with spreading short hairs and at the junction with leaf-blade; ligule membranous, entire, glabrous, 1 mm long. Spathate panicle about 60 cm long, narrow, erect or with drooping branches, internodes of main axis and branches pilose or with spreading hairs, nodes bearded; spatheole 9—16 mm long, glabrous; peduncle 3.5—4 mm long, slender, hairy from the middle upwards. Raceme about 10 mm long, spikelet easily shedding; raceme-bases deflexed at maturity, the upper one much longer than the lower, slender with long hairs; rachis internodes and pedicel slender, 1.5 mm long, lowermost pedicel slender. Sessile spikelet 3.5 mm long, awned; lower glume as long as the spikelet, 0.6—0.7 mm wide, flat on the back or faintly wrinkled, faintly 2-nerved, winged, glabrous, membrano-ehartaceous; upper glume membranous, 1-keeled, shorter than the lower glume; lemma of the lower floret hyaline, acuminate, that of the upper floret hyaline; palea absent; lodicules 2, cuneate, hyaline; awn 9 mm long; anthers 6; ovary very small, 1 mm long, with two stigmas; caryopsis 1.5 mm long.

DISTRIBUTION: Sulawesi, endemic.

HABITAT: On limestone hills or soil, from sea level to 200 m alt.

CENTRAL SULAWESI. Between Tawaeli and Parigi, on limestone hills, 25 April 1976, alt. ca 200 m, locally common, S. *Soenarko 430* (BO, L, K); between Palu and Kulawi, alt. ca 200 m, 26 April 1976, *S. Soenarko 431* (BO); Donggala, near sea, 28 May 1954, *A.H. Alston 15592* (BO, A, B, BRI, L, PNH, SING, US); between Karang and Donggala, 22 August 1937, alt. 20 m, along the road, *P.J. Eyma 1780* (BO).

ACKNOWLEDGEMENTS

I should like to thank Dr. Mien A. Rifai for reading the paper and Dr. John Dransfield for helping with the Latin description. Thanks are also due to Sdr. Damhuri for the drawings.-

FIG. 3. Cymbopogon minutiflorus. After *S. Soenarko 430.*

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COELACHNE GHATICA NAIK, SP. NOV.

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ABSTRACT

Coelachne ghatiea Naik, a new species of grass is described from Western Ghats, India.

ABSTRAK

Suatu jenis baru rumput *Coelachne ghatiea* Naik dipertelakan berdasarkan koleksi dari Ghats Barat di India.

Coelachne ghatiea Naik, *sp. nov.* — Fig. 1.

C. simpliciuscula (Wt. & Arn.) Munro ex Benth. similissime, differt in glumis pubescentibus, minoribus, 0.5—1 mm longis, pedicellis longioribus, 1.5—2 mm longis (terminalibus in ambo plerumque longioribus exceptis), ergo paniculis effusioribus.

HOLOTYPUS: *Naik 1300a* in Herb. MU Aurangabad.

Perennial grass with long creeping stem rooting at nodes. Culms 8—15 cm long, hairy at nodes. Leaves sheaths 5—8 mm long, pubescent with few long hairs; blades lanceolate, 6—30 x 3—4 mm, rounded or sub-cordate at base, many-nerved, hirsute on the nerves above, glabrescent beneath, acute at apex; 'ligule a ring of short hairs. Panicles effuse, 3—8 cm long; rhachis grooved, branches spreading 5—15 mm long. Spikelets globose or broadly ovoid, 1—1.25 mm long on slender pedicels about 1.5—2 mm long. Florets two, the lower sessile and hermaphrodite, the upper pedicelled and hermaphrodite or female. The rhachilla well-developed between the lower and the upper lemma. Lower glume broadly ovate, 0.5 mm long, 3-nerved, pubescent on the back. Upper glume ovate-oblong, about 1 mm long, concave, 5-nerved, pubescent on the back. Lower lemma ovate-oblong,' slightly longer than the upper glume, 5-nerved, pubescent on the back, its palea shorter, nerveless. Callus of the upper floret 0. Upper lemma ovate-oblong, 1.25 mm long, 5-nerved, pubescent on the back, its palea slightly shorter, 2-keeled. Stamens 2 or 3, about 1 mm long. Grain ovoid, filling 2/3 of the lemma.

ECOLOGY: Gregarious on wet rocky soil of open grassland in association with *Utricidaria reticulata* Sin., *Erwcauton* spp. and other grasses.

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