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NEW TAXA IN MALESIAN CUCURBITACEAE

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ABSTRACT

In the wide-spread cucurbitaceous SE Asian genus *Trichosanthes* 5 new Malesian taxa are described by Rugayah, viz *Trichosanthes auriculata* Rugayah, *T. beccariana* Cogn. subsp. *pusilla* Rugayah, *T. montana* Rugayah, *T. pendula* Rugayah, and *T. rotundifolia* Rugayah. The new monotypic genus *Borneosicyos*, with the sole species *B. simplex* de Wilde, endemic of Sabah, is described by de Wilde.

ABSTRAK

Anggota suku cucurbitaceae yang tersebar luas di kawasan Asia Tenggara, telah dipelajari kembali dan hasilnya dipertelakan lima taksa baru marga *Trichosanthes* yaitu *T. auriculata* Rugayah, *T. beccariana* Cogn. subsp. *pusilla* Rugayah, *T. montana* Rugayah, *T. pendula* Rugayah, dan *T. rotundifolia* Rugayah. Selain itu dipertelakan pula marga baru *Borneosicyos* yang monotipik dengan jenisnya yang endemik di Sabah yaitu *B. simplex* de Wilde.

INTRODUCTION

The on-going research in Malesian Cucurbitaceae, notably on *Trichosanthes*, including its taxonomy, by the first author, and on the taxonomy of the remaining genera, for Flora Malesiana, requires the publication of names for new taxa. Since the commencement of revising the family in 1992, the Malesian material of Cucurbitaceae in various international herbaria has been checked, supplemented with intensified field investigations directed to the family. Provisionally, in this publication it concerns the description of 4 new species and 1 new subspecies in *Trichosanthes* by Rugayah, and 1 new monotypic genus by De Wilde.

**Trichosanthes auriculata** Rugayah, *spec. nov.*

Scandens dioecia. Folia basis auriculis binis. Racemi masculi 10-20 cm longi, bracteis lanceolatis 1-2 cm longis pedicello insertis, floribus c. 3 cm longis, calycis lobis linearibus c. 5 mm longis. Fructus c. 10 cm longus 7 cm latus, seminibus numerosis planis margine late radiatim costatis. —Typus, *Paul Choi S 36193* (L; iso K, KL), Sarawak.

Climber to 15 m, sometimes creeping and rooting on the nodes, at first with minute hairs, glabrescent, drying greenish; dioecious (?). Leaf blade ovate-oblong, base cordate, apex acute-acuminate, not lobed, margin entire or towards the base shallowly sinuate, with remote minute dents c. 0.5 mm; glands small, several, scattered, and 3-7 inside conspicuous concave auricles c. 5 mm across at the base of the blade at both sides at apex of the petiole. Probract absent. Tendrils 2-fid. Male raceme slender, 10-20 cm long, including peduncle 1-5 cm; bracts subpersistent, lanceolate, 10-20 mm long, inserted high on the pedicels, with few glands and distinct midnerve; female raceme similar to male but stouter, to 25 cm, with larger bracts, 2-3 cm long. Male flower: puberulous, pedicel slender, 1-2.5 cm, the bracteole inserted  $\pm$  half-way; receptacle tube 2-2.7 cm, widened towards the throat to c. 5 mm, calyx lobes linear, 4-7 mm, petals (excluding threads of fringe) c. 2 cm long; synandrium 6-7 mm, at apex with pale appendages c. 0.5 mm, filaments short, inserted at c. 1/3 from the throat within the tube. Female flower resembling male; pedicel stouter, with larger bract (to 3 cm long); ovary ellipsoid-fusiform, c. 8 mm long, puberulous. Fruit 1-4 in the basal part of stout racemes, broadly ellipsoid, c. 10 x 7 cm, green with paler or yellowish stripes; seeds numerous, flat, elliptic, with broad radiately ribbed margin, 8-10 mm long.

**DISTRIBUTION:** Borneo (W, C, and E Kalimantan, Sarawak, Sabah).

**HABITAT & ECOLOGY:** Scrambling in forest edges and at riversides; up to 600 m altitude; fl. & fr. throughout the year.

**NOTES:** It is not sure whether this plant is monoecious or dioecious. The limited material available shows completely male flowering collections, one with male racemes and detached fruit, and one with strong fruiting racemes with fruit in the basal portion and towards the apex a damaged female flower, with numerous stout persistent pedicels in between.

The male flower buds and flowers, particularly the elongated shape in which the petals are folded before anthesis, show much resemblance to *Gymnopetalum* (but in that genus the petals are not fringed). It also has the habit of creeping and rooting on the nodes in common with that genus.

The present species occupies an isolated position within the genus *Trichosanthes*, and possibly deserves the status of a related separate

genus. Rare or unique features are e.g. the separate male and female racemes, the position of several fruits in one inflorescence, the long slender racemes with pedicels with the bracts conspicuously shifted upwards, the seeds with radiately ribbed margin, and the conspicuous, unique auricles at the blade base, with several glands inside.

SPECIMENS SEEN: SARAWAK: *Clemens* 21707, 21708; *Haviland* 2944; *S* 36193 —SABAH: *Clemens* 27529 (BO, for the fruit only) —KALIMANTAN: *Afriaslini* 958; *Amdjah* 416; *Church* cs. 702; *Endert* 3014; *Ruiten* 112.

***Trichosanthes beccariana* Cogn. subsp. *pusilla* Rugayah, subsp. nov.**

Scandens monoecia. Folia integra vel 3(-5)-lobata vel margine sinuate. Flos masculus receptaculi tubo c. 1.5 cm longo. Fructus ovoideus 2.5-4 cm longus, seminibus 7-10 mm diam. —Typus: *Mogea* (with *De Wilde*) 4372, male fl. (BO; iso K, L), Central Kalimantan.

Subherbaceous perennial climber to 15 m long, drying greenish, grey puberulent; monoecious. Leaves: petiole 1-2 cm; blade ovate(-oblong), membranous, 4-11 cm long, entire or 3(-5)-lobed, or margin sinuate; basal nerves 3 or 5, main lateral ones highly arching up, reticulation prominent below, base cordate, apex blunt or acute(-acuminate); glands small, few to many, scattered. Probract absent. Tendrils simple or 2 or 3-fid. Racemes male or mixed with a few female flowers towards base,  $\pm$  slender, 2-6 cm long, including peduncle 0.5-3 cm long, few to many-flowered, bracts elliptic, 2-3 mm, to 0.5 cm up the pedicel, with several minute glands on upper surface. Male flower: pedicel 5-10 mm (with bracts below half-way), receptacle tube slender, c. 15 mm long, at throat 3-4 mm wide, calyx lobes linear, c. 2 mm long; petals (excluding slender threads) c. 1 cm long, white. Female flowers solitary at the nodes, with pedicel c. 2 cm long, or a few mixed with male flowers towards the base in the raceme, with pedicel 0.5-1 cm long; perianth as in male; ovary ellipsoid-fusiform, puberulent, incompletely known. Fruit ovoid-ellipsoid, green paler flamed, maturing orange-red, when dry 2.5-4 x 2-3 cm; pulp of endocarp leaving coarse fibres, fruiting pedicel slender, 2-3 cm on the nodes, 0.5-1 cm long in the raceme; seeds several to many, flat, with two lateral inflated parts, 7-10 mm diam., bright brown, not ornamented.

DISTRIBUTION: Whole of Borneo.

HABITAT & ECOLOGY: Lowland forest edges, roadside scrub, at low altitudes; 0-350 m; fl. & fr. throughout the year.

NOTES: 1. This subspecies is generally a mini-replica of the type-subspecies, which differs by stouter habit, larger subcoriaceous, not or but rarely lobed leaves up to 21 x 11 cm, larger flowers (receptacle-tube c. 20 mm long), and larger fruit, 5-8.5 x 3-6 cm, with larger seed, 10-12

cm across. Peculiarly the subsp. *beccariana* is known only from Sumatra by the type collection (West Central Sumatra, at c. 360 m) and from a restricted area (Crocker Range & Kinabalu) in Sabah, at altitudes between 1000 and 1500 m.

2. *Trichosanthes beccariana* subsp. *pusilla* very much resembles *T. nervifolia* L. (1753) from Sri Lanka and India, in general appearance, but this has different fruit and seed, the latter devoid of the inflated lateral parts.

3. Cogniaux in A. DC, Mon. Phan. Prod. 3 (1881) 380, says that this species is dioecious, but we think this is erroneous.

SPECIMENS SEEN: SARAWAK: *S* 19341, 43748, 48874 —SABAH: *SAN* 31691, 87357, 88171, 88428, 95877, 113306, 113922, 120388—W. KALIMANTAN: *Laman* (with *Ismail*) *TL* 492; *Ruspani K* 165 —C. KALIMANTAN: *Church c.s.* 852; *Mogea* (with *De Wilde*) 4372 —E. KALIMANTAN: *Kessler et al.* PK2030.

### *Trichosanthes montana* Rugayah, *spec. nov.*

Scandens monoecia. Racemi masculi crassi c. 25 cm longi, pedunculo 2–3 cm longo, rhachide c. 5 mm diam, bracteis distaliter grosse dentatis. Fructus globosus pyriformisve. —Type: *De Wilde & Duyffes 21841*, West Java (BO; iso L), West Java.

Climber, to 12 m, monoecious, brown puberulous. Leaf blade circular in outline, 15–25 cm diam., 5-lobed to 2/3–3/4, margin entire; glands absent. Probract ellipsoid-oblong, 10–15 mm. Tendril 2–4-fid. Male raceme drying dark brown, stout, to 25 cm long, peduncle 2–3 cm, rachis stout, c. 5 mm diam., bracts largely persistent, with thickened bases, 2–4.5 cm long, coarsely dentate up to 1/5 in apical portion, brown puberulous, without glands. Male flower: pedicel 1–15 cm, receptacle tube c. 3.5 cm, calyx lobes narrowly triangular, subentire, c. 1 cm, petals white. Female flower: either solitary on the node, or beside a male raceme, or a few mixed with male flowers in the raceme; pedicel c. 3 cm long in solitary flowers, c. 1 cm in the raceme. Fruit 12–14 cm long, globose when solitary on the nodes, pear-shaped in the raceme, bright orange-red; seed flat, glossy, ± oblong, 17–2 cm long.

DISTRIBUTION: Sumatra, W. Java, Borneo (Sabah), N. Sulawesi, and Halmahaira; doubtful in the Philippines.

HABITAT & ECOLOGY: A montane species of forest edges at (900-) 1000–1500 m altitude.

NOTES: The type (*De Wilde 21841*) is depicted in *Blumea* 42 (1997) 480, f. 4, erroneously under the name *Trichosanthes sumatrana* Cogn. Re-examination of the type of *T. sumatrana*, *Beccari FI 4427 a acutiloba*, has now shown that this belongs to what at present is **known** as *T.*

*borneensis* Cogn., s.l. and to which also belong the specimens known under the name *T. wallichiana* in Peninsular Malaysia.

It is noteworthy that the fruit on the nodes is different of shape (globose) from those in the raceme (pear-shaped).

Fruit in the field was frequently eaten by rodents or birds.

SPECIMENS SEEN: SUMATRA: *Bünnemeyer* 4299; *Jacobs* 8106. —W. JAVA: *Van Steenis* 11693; *De Wilde & Duyffjes* 21703B, 21841, 21865; (with *Rugayah*) 21888 —SABAH: *Clemens* 34152; —SULAWESI: ? *Koorders* 13613Q, 16611/3, 16613§; (possibly) *De Vogel & Vermeulen* 6989 —HALMAHERA: *Idjan & Mochtar* 229; *Sidiyasa & Whilmore* 6989.

***Trichosanthes pendula* Rugayah, spec. nov. — Fig. 1, 2, 3.**

Liana, caule 5-costato; dioecia. Racemi pendentes 5-12 cm longi atrofusci pilosi (i.s.). Flores pendentes, receptaculi tubo curvato, calycis lobis gracilibus 10-15 mm longis. Semina lata c. 10 mm longa 20 mm lata 5 mm crassa partibus lateralibus 2 inflatis. —Type: *Joseph B et al.* SAN 120771 (male fl.) (KEP; iso L), Sabah.

Climber to 15 m high, drying greenish, with hairs drying rusty, late-glabrescent, stem conspicuously angular or ribbed; dioecious. Leaf blade ovate-cordate or sub-5-angular in outline, 10-20 cm diam, scabrous; glands scattered, and 1 at each side near the insertion of the petiole, probract absent. Tendrils 2 or 3-fid. Male raceme 1 to several in a kindle on a short shoot, pendent, together with persistent pedicels and (immature) flowers forming a tassel 5-12 long, when dry rusty hairy (hairs c. 1 mm) all over, including most of flowers; bracts ± linear, c. 5 mm, on the pedicel, caducous; flowers pendent, but tube curved horizontally at anthesis. Male flower: pedicel slender, 2-4 cm; receptacle tube 5-6 cm, calyx lobes ± linear, 10-15 mm, petals (excl. threads of the fringe) oblong, c. 2 cm long, white. Female racemes and flowers as in male; ovary oblong-fusiform, pubescent, 10-12 mm long, stigma (4-)5-lobed. Fruit ovoid-oblong, c. 10 x 6-7 cm, green paler flamed, glabrous, fruiting pedicel 3-5 cm; seeds many, much broader than long, with two laterally inflated parts, c. 10 x 20 x 5 mm, not ornamented.

DISTRIBUTION: E Sabah.

HABITAT & ECOLOGY: In lowland forest, on ridges, in roadsides; 0-400 m altitude; fl. Feb. -Aug.; fr. Feb., April.

NOTES: 1. This species is isolated within *Trichosanthes* and possibly deserves the status of a new genus. It is outstanding by e.g. the dioecious flowers, in both male and female in compound, pendulous racemes grouped into tassels, the possibly absent probract, the prominently 5-ribbed stem, the synandrium with many whitish appendages in between the thecae, the (4-)5-lobed stigma, the presence

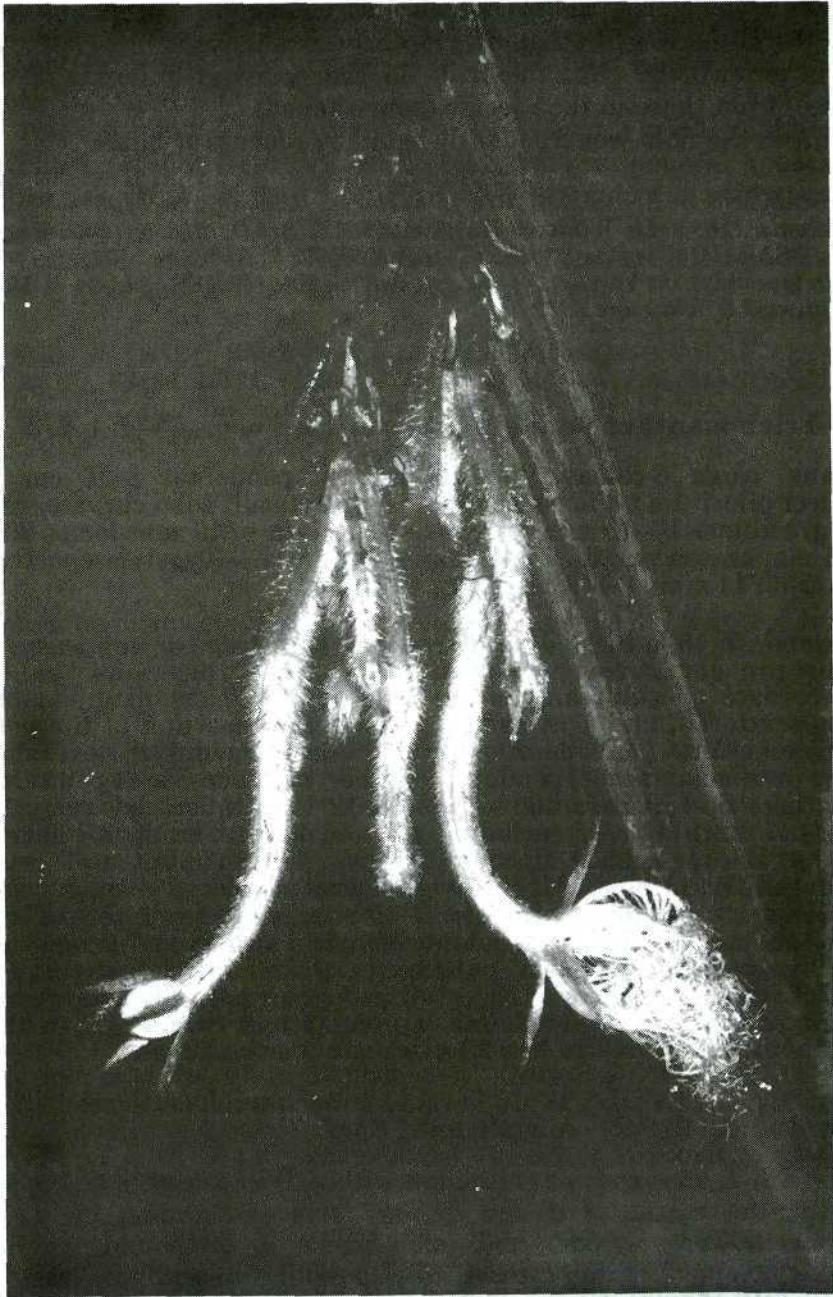


Fig. 1. Habit of the pendent female inflorescences in early morning, when the flowers are closing; note the curved receptacle tubes; x 1.

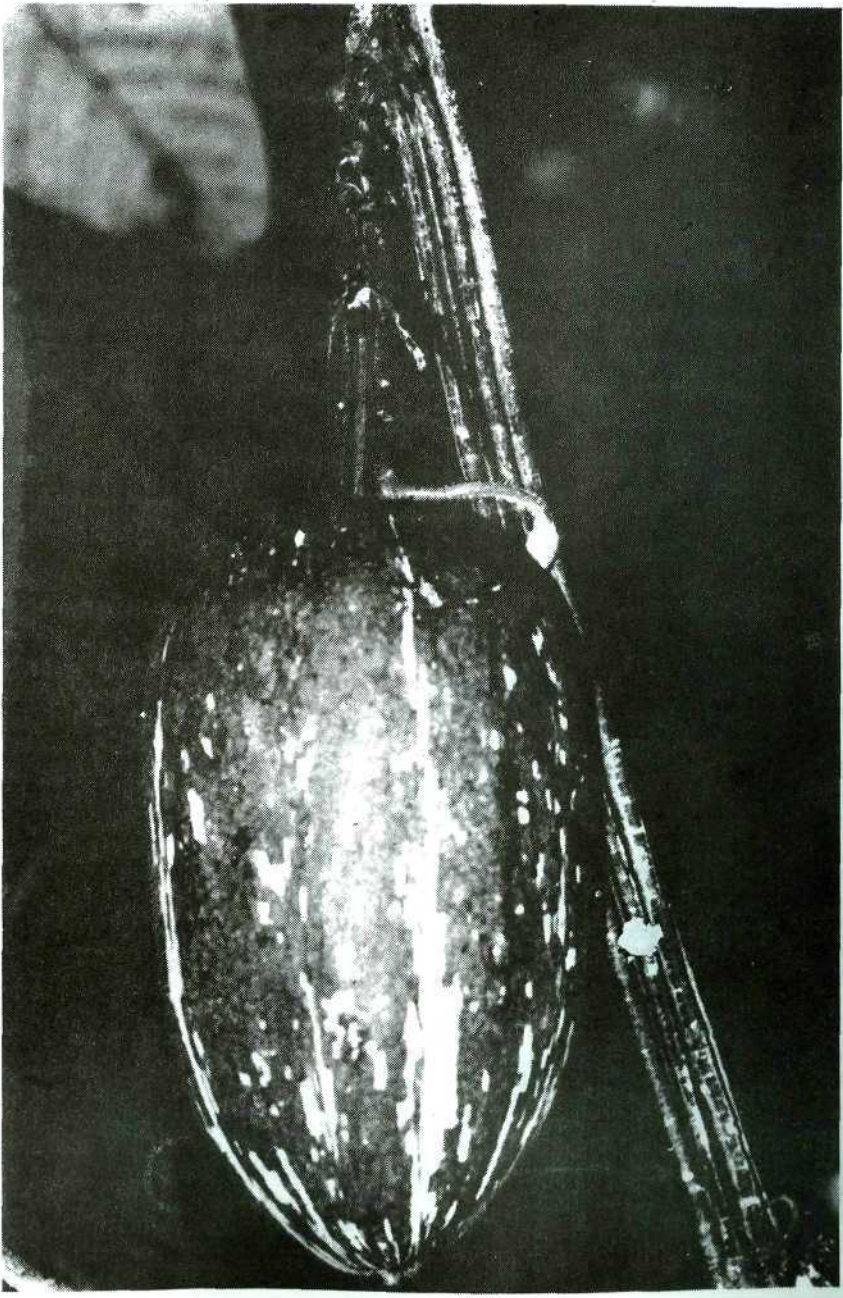


Fig. 2. Habit of mature fruit; x 1.



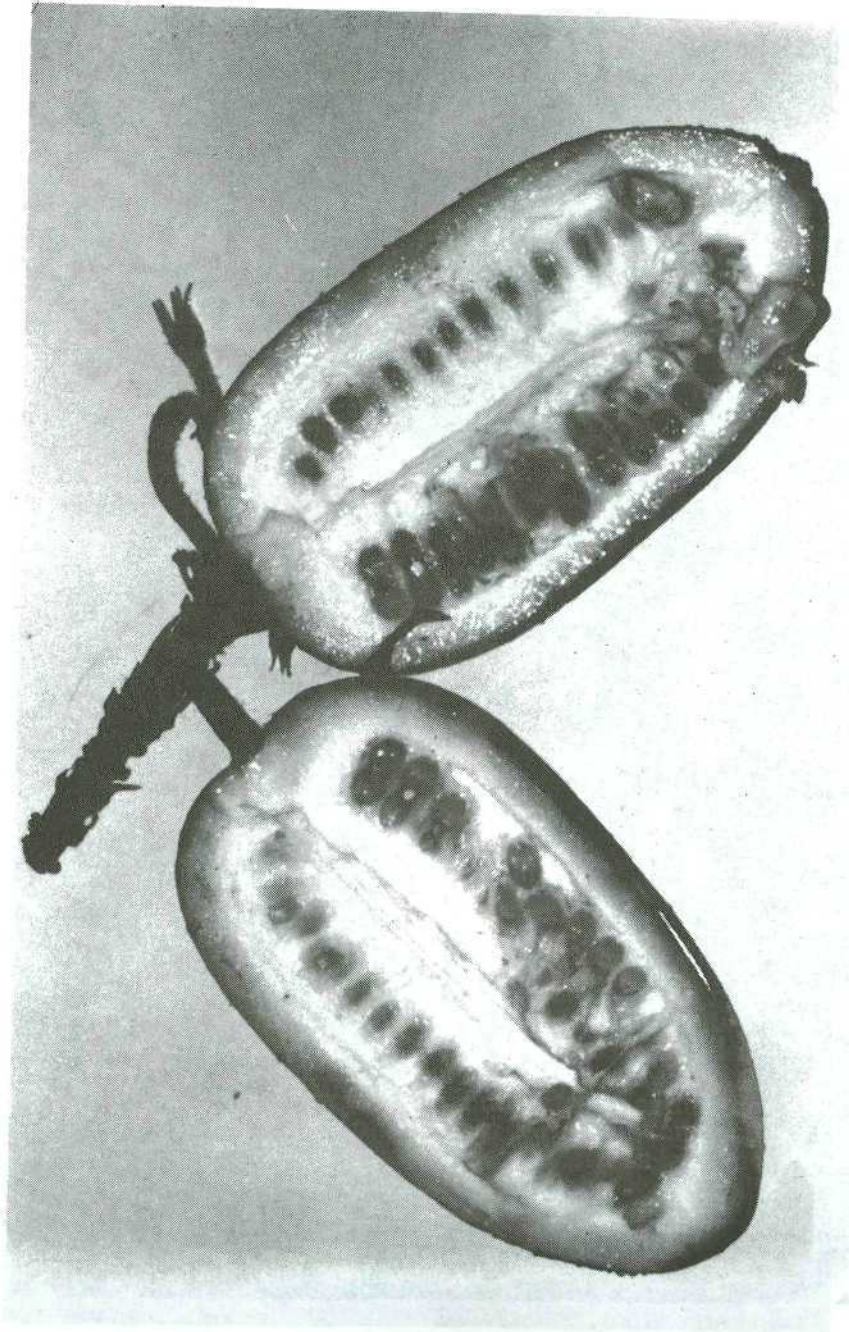


Fig. 3. Mature fruit, opened to show creamy-white pulp containing whitish seeds; x 1.

of a disc consisting of 3 line-shaped thickenings adnate to the base of the receptacle tube, and the (compound ?) broad seeds with peculiar inflated lateral parts.

2. The whole inflorescence, including flowers, dries dark rusty in the herbarium, but in the living state all parts including the hairs (are whitish, and the petals are pure white).

SPECIMENS SEEN: (*Kodoh Tarodop*) SAN 87769; (*Aban G. & Dewol S.*) SAN 91628; (*Joseph B. et al.*) SAN 120771; (*De Wilde & Duyffjes*) SAN 139041; (*Meijer c.s. for NCI*) SAN 141744.

### ***Trichosanthes rotundifolia* Rugayah, spec. nov.**

Scandens dioecia. Lamina late cordata 10-20 cm lata, margine integro denticulis minutis dispersis. Racemus masculus gracilis 4-10 cm longus pauciflorus, bracteis integris vel vadoselqbatis 7-10 mm longis. Fructus solitarius oblongus 8-10 cm longus, seminibus planis c. 20 mm longis 15 mm latis 4 mm crassis, margine lato. —Type: *Lörzing 5284* (BO; iso L), Sibolangit, N Sumatra.

Climber to 10 m, dioecious, glabrescent, at first with minute indumentum. Leaf blade broadly cordate, 6-20 cm diam., membranous, unlobed, margin with remote minute dents c. 0.5 mm.; glands small, predominantly close to the insertion of the petiole. Petiole slender, with systoliths. Probract elliptic, acute, 5-7 mm. Tendrils 2-fid. Male raceme slender, 4-10 cm (peduncle 3-7 cm included), 5-10 flowered, bracts subsistent, subtire or shallowly few-lobed, 7-10 mm, with minute glands; flowers minutely pubescent. Male flower: pedicel 0.5-1.5 cm, receptacle tube 1.5-2 cm, calyx lobes narrow, acute, entire, c. 4 mm, petals white, excl. fringe c. 1 cm. Female flower: solitary at the nodes; pedicel 1-2 cm, resembling male flower; ovary c. 1 cm, at first minutely pubescent. Fruit ± ellipsoid or oblong, 8-10 cm long, smooth, green with yellowish stripes; seed flat, subcircular or subellipsoid, with thin, broad margin, c. 20 x 15 x 4 mm, dull yellow-brown.

DISTRIBUTION: S, C, and Northern Sumatra.

HABITAT AND ECOLOGY: River sides, scrub, foothill and lower montane forest, 150-1200 m altitude; fl. throughout the year, fr. Jul.—Dec. .

SPECIMENS SEEN: *Ajoeb 323*; *Bunnemeijer 3772, 8220*; *Dayar Arbain DA-468*; *Lörzing 5146, 5284, 5783, 11291*; *Robinson & Kloss 15, 20-031914*; *Rijksen 20-12-1973*; *de Wilde & de Wilde-Duyffjes 12412, 21793*.

BORNEOSICYOS W. J. de Wilde, *gen. nov.*

Graciliter scandens, dioecia. Lamina integra ovato-oblonga petiolo comparative brevi, probractea minuta. Cirrhi simplices. Fructus solitarius ad nodos oblongus c. 10 cm longus pedicello longo gracili, seminibus numerosis horizontalibus compresso-globosis c. 10 mm diam. albidis. — Type species: *Borneosicyos simplex* W. J. de Wilde.

Climber, dioecious. Leaves herbaceous; petiole proportionally short, 1-1.5 cm long; blade ovate-oblong, unlobed, 8-13 cm long, base rounded, apex acute-acuminate, margin entire, without dents; glands minute, numerous. Tendrils simple, probract small, c. 3 mm. Male inflorescences and flowers not known; female flowers solitary at the nodes. Fruit solitary at the nodes, oblong, c. 10 cm long, fruiting pedicel long and slender, 3.5-5 cm long; seeds c. 30, horizontal, rounded, c. 10 mm diam., not ornamented.

*Borneosicyos simplex* W. J. de Wilde, *spec. nov.*

Ad 10 m scandens dioecia. Petiolus brevis 1-15 cm longus, lamina 8-13 cm longo 3.6-6 cm lata basi rotundata, glandulis minutis numerosis dispersis. Probractea c. 3 mm longa. Cirrhi 6-15 cm longi. Fructus 8-10 cm longus 4-4.5 cm latus rostro 2-3 mm longo, seminibus c. 30 compresso-globosis c. 10 mm diam. obscure albidis. — Type: *Chow & Aban SAN 65050* (KL; iso K, SAN), Sabah.

Subglabrous climber to 10 m, stem slender, 1-3 mm diam.; dioecious. Petiole 1-1.5 cm long, leaf blade membranous, ovate-oblong, entire, 8-13 x 3.5-6 cm, base rounded, apex acute-acuminate, margin entire, not dented; basal nerves 3(-5)-palmate, arching upwards to half-way the blade, lateral nerves 2-4 per side; glands numerous, less than 0.5 mm diam., scattered; cystoliths absent. Tendrils simple, 6-15 cm. Probract cartilaginous, oblong, acute, c. 3 mm. Male inflorescences and flowers not known. Female flower (according to fruit) solitary at the node, pedicel slender, c. 3 cm; ovary and perianth not seen. Fruit solitary at the nodes, red, smooth, glabrous, oblong, 8-10 x 4-4.5 cm, base rounded, apex acute, 2-3 mm beaked; exocarp drying thin, endocarp juicy, on drying leaving thin membranes around the seeds; fruiting pedicel slender, 3.5-5 cm long, c. 1 mm thick; seeds c. 30, compressed globose, subcircular in outline, somewhat flattened, c. 10 x 8-9 x 4 mm, with narrow margin (c. 0.5 mm), whitish, smooth, not ornamented.

DISTRIBUTION: Endemic of the montane forest of the Kinabalu-Crocker Range area, Sabah.

HABITAT & ECOLOGY: Climber on forest trees, at 1500-1600 m altitude; fr. in Oct.

NOTES: This new genus with one species is only known in fruit, from two collections from Sabah, collected at wide intervals, in 1931 and 1969. They were named as Cucurbitaceae indet. and as possibly *Trichosanthes*. Closer examination made it clear that they cannot go satisfactorily in any known Malesian genus. They differ from *Trichosanthes* in many details, of which the comparatively short petiole, the entire, elongated leaf blades with rounded base, the simple tendrils (rare in *Trichosanthes*), the slenderly pedicelled fruit containing many compressed-globose whitish seeds (resembling cherry stones) are the most apparent. There may be relationship with *Zehneria*, which are smaller plants, with smaller fruit and seed. The comparatively short petiole reminds of *Solena*.

Flowering material is needed to establish its position among the other Malesian genera.

SPECIMENS SEEN: SABAH: Mt. Kinabalu, *J. & M. S. Clemens* 26751; mile 28 Crocker Range Road, *Chow & Aban* SAN 65050.

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CONTENTS

	Page
RATNA WIDURI & PETER VAN WELZEN. A revision of the genus <i>Cephalomappa</i> (Euphorbiaceae) in Malesia .....	153
ALAKA PANDE & V.G. RAO. TWO new species of <i>Sphaerulina</i> from India .....	185
KUSWATA KARTAWINATA. Additional notes on <i>Planckonia brevistipitata</i> Kusw. (Lecythidaceae).....	191
A.J.G.H. KOSTERMANS. The Burmese <i>Cimiamomum</i> (Lauracee) .....	195
RUGAYAH & W.J.J.O. DE WILDE. New taxa in Malesian Cucurbitaceae..	215

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