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of Cyrtandra.**

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**OLD WORLD GESNERIACEAE VIII:
MISCELLANEOUS BORNEAN SPECIES OF
CYRTANDRA**

B. L. BURTT

Six new species of *Cyrtandra* from Borneo (*C. apaensis*, *C. burleyana*, *C. filisecta*, *C. subsphaerocarpa*, *C. tibangensis*, *C. toreniiflora*) are described. *Cyrtandra albibracteata* is re-described in order to correct gross errors in the original paper. The published diagnosis validating *C. paragibbsiae* from Brunei is supplemented by a full description.

Keywords. Borneo, *Cyrtandra*, *Gesneriaceae*, new species.

INTRODUCTION

The flora of Borneo is extremely rich in species of *Cyrtandra* J.R. & G.Forst. and new species continue to come in as botanists interested in herbaceous plants reach new areas. The names now published have been on the relevant herbarium sheets for a number of years: I am greatly indebted to Dr O.M. Hilliard for unstinting help in clearing this backlog.

Cyrtandra albibracteata B.L.Burt, Edinburgh J. Bot. 47(3): 203 (1990), emend., descriptione originali florum et figura excludenda. *C. dilatatae* C.B.Clarke affinis sed caules folia bracteae pilis grossis brunneis praeditis (nec glabris) differunt; etiam laminis foliorum obovato-ellipticis (nec anguste ellipticis) parte petiolari anguste alata (nec exalata) distinguenda. A *C. spelaea* B.L.Burt parte petiolari anguste alata (nec exalata) bracteis late ovatis inter se liberis (nec in partem petiolarum latam angustatis basi inter se breviter conjunctis) differt.

Type: Sarawak, SE end Hose Mts., 3400ft, Ulu Melinau falls, 2°6'N, 113°42'E, 18 viii 1967, *Burt & Martin* B4952 (holo. E, iso. SAR).

Plant 150–450mm tall, 3–4mm diam., simple or sparingly branched, decumbent at base, producing prop roots when on steep slopes, young parts with coarse crisped brown hairs to c.1mm long, soon glabrescent. *Leaves* opposite, isophyllous or subisophyllous, largest 100–175 × 42–65mm, including short petiolar part, obovate-elliptic, apex acute, base cuneate, narrowly decurrent down petiolar part, margins serrate, lateral veins 7 each side of midrib, tertiary veins coarsely reticulate, upper surface initially with scattered coarse brown hairs 1.5–2mm long, later glabrescent, the basal cells of the hairs sometimes persisting, margins with similar hairs, lower

surface with coarse brown crisped hairs confined to veins making the venation conspicuous. *Inflorescence* a congested axillary cyme, flowers 7–9, peduncle 2–3mm. *Bracts* 12–15 × 6–8mm, white, conspicuous, ovate, margins serrulate, upper surface glabrous, lower with scattered coarse brown hairs to 1mm long; bracteoles c.8 × 2mm then progressively smaller. *Pedicels* c.2mm, pilose. *Calyx* 7–11mm long, initially completely enveloping corolla, lobes valvate, separating as corolla expands, tube 5–8.5mm long, lobes 2–2.5 × 2mm, broadly deltoid, apex distinctly apiculate, inside globular glands, outside and margins of lobes with coarse brown hairs to 1.5mm long. *Corolla* white, yellow at base of lower lip, c.18–20mm long, tube 15mm, narrowly cylindrical in lower two-thirds, abruptly expanded below limb, anticous lip 5 × 10mm, anticous lobe 4 × 3.5mm, posticous lip 3 × 4.5mm, notched for 2mm, all lobes ovate, brown hairs to 3mm long on upper half of corolla outside, inside glabrous. *Stamens* inserted 7–10.5mm above base of tube, filaments c.2.5mm long, thickened about the middle, twisted once, anthers c.1.2–1.5 × 1mm, cohering face to face by a minute ligature; lateral staminodes 1.5mm, posticous staminode 1mm. *Disc* 1.5–1.8 × 1.2–1.3mm, cupular. *Ovary* c.3.5–4 × 1mm tapering imperceptibly into 3–6mm style, ovary glabrous, style glandular-puberulous or not. *Stigmatic lobes* c.0.5 × 0.5mm. *Fruit* 8–9 × 3mm, pericarp verrucose. *Seeds* immature.

Other specimens examined. SARAWAK. Linau–Balui divide near camp on Sungai Dema [c.2°26'N, 114°10'E], c.2000ft, 5 ix 1978, *Burt* B11470 (E). S Hose Mts., W of Bukit Sanpandai, camp IV, c.2°7'30"N, 113°41'30"E, c.4000ft, 1 iv 1980, *Burt* B12765 (E). Linau–Balui divide, Sungai Nawai, c.2600ft, c.2°26'N, 114°10'E, 6 ix 1978, *Burt* 11465 (E). Headwaters of Sungai Sedampa, tributary of the extreme headwaters of the Balleh river, 1°35'N, 114°32'E, c.1000ft, 16 vii 1969, *Anderson* S28854 (E); *ibid.*, 1°34'N, 114°30'E, 1500ft, 2 vii 1969, *Anderson & Paie* S28360 (E).

In the original description of *C. albibracteata*, details of the flower described and figured belong to a different species, which cannot now be identified owing to lack of material. The error came about through my overhasty determination of a plant that was brought back from Sarawak in vegetative condition, flowered once at the Royal Botanic Garden Edinburgh and then died.

The species is currently known only from Sarawak, on the Hose Mts. and the headwaters of the Balleh river near the Kalimantan border. The plants grow in forest, on slopes or the steep banks of streams and gullies, sometimes on sandstone rocks, between c.300 and 1220m above sea level.

The leaves lack sclereids in the hypodermis; astrosclereids sometimes occur in the mesophyll.

***Cyrtandra apaensis* B.L.Burt, sp. nov.** a *C. albibracteata* B.L.Burt emend. (vide supra) foliis majoribus 250–270mm longis 95–135mm latis (nec 100–175 × 42–65mm), bracteis viridibus vel purpurascensibus (nec albis) 16–18 × 16–18mm (nec 12–15 × 6–8mm) pedunculis longioribus 15–20mm (nec 2–4mm) facile distinguitur. Type: Sarawak, Sungai Apa, tributary of S. Sut, in between Bukit Goram [1°54'N, 112°51'E] and Bukit Bakak, Ulu Kapit, c.335m a.s.l., 3 iii 1975, *Chai* S36197 (holo. E; iso. K, L).

Herb; stem 1m tall, c.8mm diam. near apex (base not seen), glabrous except in upper leaf axils and there with crisped brown hairs. *Leaves* opposite, isophyllous, largest c.250–270 × 95–135mm including petiolar part, broadly elliptic, apex acute, base cuneate, gradually narrowly decurrent down petiolar part, margins serrate, lateral veins 9 each side of midrib, tertiary veins coarsely reticulate, upper surface initially clad in coarse brown, strongly crisped hairs, later glabrescent, lower surface with similar hairs nearly confined to veins including a submarginal vein, eventually glabrescent. *Inflorescence* a congested dichasial cyme, flowers c.13, solitary in leaf axils, peduncle 15–20mm, glabrous. *Bracts* c.16–18 × 16–18mm, ‘dark purple below, greenish near tips’, broadly ovate, apex acute, outside nearly glabrous except for minute globular glands, inside coarse brown crimped hairs, also on margins, eventually glabrescent; bracteoles c.14–18 × 8–11mm, progressively smaller upwards. *Pedicels* 3–4mm, glabrous. *Calyx* (in fruit) c.12mm long, initially completely enveloping corolla, lobes valvate, separating as corolla expands, tube 5–6mm long, lobes 6–6.5 × 1.8–2.5mm, deltoid, distinctly apiculate, with minute globular glands inside and out. *Corolla* ‘whitish’, only buds seen, longest 6mm, acute hairs to 1mm long outside, inside glabrous. *Stamens* (in 6mm long bud): filaments c.6mm long, swollen about the middle, anthers 2 × 1.5mm. *Disc* 1.5 × 1mm, cupular. *Ovary* 2.25 × 1mm, glabrous. *Style* 2.8mm, pubescent. *Stigma* 0.5 × 1.5mm, obscurely bilobed. *Fruit* 11–15 × 3.5–4.5mm, pericarp verrucose. *Seeds* 0.25 × 0.2mm, testa very dark red-brown.

Cyrtandra apaensis is known only from the type collection made on a stream bank in forest at c.335m above sea level. It is allied to *C. albibracteata* from which it is easily distinguished by its larger and differently shaped leaves (c.250–270 × 95–135mm, broadly elliptic, not c.100–175 × 42–65mm, obovate-elliptic), peduncles c.15–20mm long (not 2–3mm), and larger and differently coloured bracts (purplish becoming greenish towards the tips, not white). Chai also described the stem as ‘bluish green, petiolar part and basal part of midrib dark purple on lower surface’. Although he described flowers, none are present on the material seen. Nevertheless, its relationships clearly lie in a group of species including not only *C. albibracteata* but also, for example, *C. spelaea* B.L.Burt, *C. dilatata* C.B.Clarke and *C. farinosa* C.B.Clarke.

Both *C. albibracteata* and *C. apaensis* have coarse brown hairs on the vegetative parts, these strongly crisped at least when young, making them appear much shorter than they really are. Their leaves are also similar anatomically, lacking sclereids in the hypodermis but having astrosclereids in the mesophyll, which is the condition throughout the group.

***Cyrtandra burleyana* B.L.Burt, sp. nov.** a *C. urceolata* C.B.Clarke foliis oblanceolatis (nec obovatis) maximis 115–260 × 28–45mm (nec 95–120 × 45–55mm) apice acuto (nec obtuso vel late subacuto) venis lateralibus 13–15 (nec 8–9) pagina superiore maturitate glabra (nec pilis grossis usque ad 3mm longis), pedunculo 3–7mm (nec 20–40mm), bracteis duabus in una margine tantum breviter conjunctis (nec in marginibus ambabus) distincta.

Type: Borneo, W Kalimantan, Gunong Bentuang area 5–10km N of Masa village, 0°52'N, 110°26'E, gently sloping area E of upper Sungai Sembawang, 250m, 21 vi 1989, *Burley et al.* 2747 (holo. E).

Herb, substoloniferous; stems simple or branching once near base, c.100–250 × 2–4mm, base decumbent, rooting, densely appressed-pubescent, hairs brownish, leafy in upper part, nude in lower. *Leaves* opposite, subisophyllous, largest leaves 115–260 × 28–45mm, oblanceolate, apex acute, base narrowly cuneate, margins serrulate, thickly fringed with rufous hairs to 1mm long, lateral veins 13–17 each side of midrib, tertiary veins reticulate, upper surface thinly hairy when young, soon glabrescent, lower surface with blade glabrous, veins and veinlets rufous-hairy and very conspicuous, midrib raised; petiole 5–15mm long, hairy as midrib. *Inflorescences* 1 or 2 in each leaf axil, c.6–13-flowered, partially enveloped by a pair of bracts, peduncle 3–7mm long, very stout. *Bracts* c.15–22 × 10–13mm, broadly ovate, partially fused on abaxial margin only, hairy as leaves, strongly veined; bracteoles wanting. *Pedicels* c.3mm. *Calyx* cylindric, initially enveloping corolla bud, lobes valvate, margins cohering, tube at maturity c.5–8mm long, lobes c.2 × 2mm, broadly deltoid, lightly but conspicuously ribbed, ribs running from sinuses to base, whole calyx rufous-hairy. *Corolla* variously described as 'white', 'white with yellowish tube', 'cream', 'yellow', c.18mm long, tube c.12–13mm, cylindric below, ventricose above on anticous side, anticous lip c.4.5–5 × 7–10mm, anticous lobe 2.5–3 × 4–5mm, posticous lobes 2–3 × 2–4mm, all rounded, outside thickly clad in rufous hairs to 3mm long, inside glabrous. *Stamens* inserted 6.5–8mm above base of tube, glabrous, filaments 3–4mm, twisted once, anthers c.1.5 × 1.2mm, cohering face to face by apical bond, no ligature visible; lateral staminodes c.1.5mm, posticous staminode c.0.5mm. *Disc* 1–1.5 × 1–1.5mm, cupular. *Ovary* 1–2 × 0.8–1.5mm, glabrous. *Style* c.6mm, minutely hairy at apex. *Stigmatic lobes* c.1 × 0.8mm. *Fruit* 8–10 × 4mm. *Seeds* not fully ripe.

Other specimens examined. SARAWAK. Tebakang, Gunong Majar [very roughly 1°N, 110°E], 300m, 28 vi 1983, *Yii & Othman* S46290 (E, K); sine loc., ii–vi 1914, *Native collector* 2574 (A).

KALIMANTAN. W Kalimantan, Gunong Bentuang area, 5–10km N of Masa village, ridge SW of G. Bentuang, 0°56'N, 110°26'E, 1–6 vii 1989, *Burley et al.* 3343 (A, K, L); *ibid.*, Sasi village and environs, 0°56'N, 110°26'E, 430m, 28 vi–6 vii 1989, *Burley et al.* 3020 (A, K, L); *ibid.*, around Sembawang river, 200m, 20 vi 1989, *Burley et al.* 2720 (A, L).

This species is named in honour of Prof. J. Burley CBE, Director of the Forestry Institute, Oxford (1985–2002); he led the Institute's expedition to Kalimantan in 1989 on which this species was discovered.

Cyrtandra burleyana appears to be confined to forests on limestone, in the Sarawak–Kalimantan border area roughly south of Kuching. The conspicuously brown-veined leaves and bracts together with the almost sessile inflorescence of small, hairy flowers and small fruits make this an easily recognizable species. Its affinity lies with *C. urceolata*, which has similarly strongly veined leaves, but these are shorter, broader and blunter than those of *C. burleyana* and have persistent

coarse bristly hairs on the upper surface. The inflorescences have much longer peduncles and the bracts are fused along both (not one) margins to form a cupule surrounding the flowers. *Cyrtandra urceolata* also appears to be a limestone endemic in the Sarawak–Kalimantan border area, from Bau (Sarawak), southeast into Kalimantan.

Cyrtandra filisecta B.L.Burtt, **sp. nov.** affinitatis dubiae sed caulibus robustis, foliis magnis (c.450 × 100mm) oblanceolatis fere glabris versus basin alatam attenuatis et cymis axillaribus multifloris congestis, bracteis bracteolisque tenuiter laciniatis praeditis facile recognoscenda.

Type: Borneo, Kalimantan, Gunong Bentuang, E of upper Sungai Sembawang, 250m, 0°52'N, 110°26'E, 21 vi 1989, *Burley et al.* 2749 (holo. E; iso. K, L).

'Herb'; stem at least 500mm tall, 7–10mm diam., base not seen, glabrous, leafy only at apex. *Leaves* few, tufted, strongly anisophyllous, minor leaves stipule-like, c.20–30 × 6–8mm, narrowly deltoid, major leaves c.400–460 × 80–125mm (including petiolar part), oblanceolate, apex abruptly acute to shortly acuminate, gradually tapering below to a winged base c.8–12mm broad, margins obscurely to distinctly serrulate, lateral veins many (c.25) each side of midrib, tertiary veins coarsely reticulate, glabrous above, blade glabrous below but all veins finely and densely puberulous, hairs crisped. *Inflorescence* a well-branched, many-flowered, highly congested axillary dichasial cyme borne mainly on bare stem below the leafy apex; peduncle very short and stout. *Bracts* c.25 × 15mm in outline, bracteoles similar, only slightly smaller, deeply divided almost or quite to midrib, segments filiform, long-attenuate, glabrous. *Pedicels* 4mm. *Calyx* deeply divided almost to base into 5 subequal lobes, lobes c.2 × 0.5mm, glabrous. *Corolla* 'white' (neither flowers nor buds seen). *Fruit* c.12 × 3mm, pericarp slightly verrucose. *Seeds* c.0.25 × 0.2mm, testa yellow-brown, coarsely reticulate.

Other specimens examined. SARAWAK. Sine loc., ii–vi 1914, *Native collector* 2601 (A).

The filiform, finely attenuate, divisions of the bracts and bracteoles of *C. filisecta* are so distinctive that, despite not having seen any flowers, to name it and thus bring attention to it seems highly desirable.

Despite not seeing critical characters such as size of corolla, form of the disc, and form and indumentum of the gynoecium, the affinity of *C. filisecta* almost certainly lies with *C. lacerata* B.L.Burtt, a rather similar-looking but much more delicate plant with stems only c.40–120mm long and up to 4mm diam. and inflorescences arising in the leaf axils, not on the bare stem below the apical tuft of leaves, major leaves smaller (up to c.220 × 75mm) but with similar venation and indumentum, and deeply lacinate bracts but these not drawn out into the long needle-like points that are so conspicuous a feature of *C. filisecta*. They have similar small, glabrous, deeply divided calyces and similar fruits.

The hypodermis of the leaf in *C. filisecta* is 1–2-layered and astrosclereids with long branches occur in the mesophyll; in *C. lacerata*, Sarawak plants lack a hypodermis, while Brunei ones have a 1-layered interrupted hypodermis; there are astrosclereids in the mesophyll.

Cyrtandra lacerata ranges from Gunong Mulu National Park in Sarawak (type locality, c.4°01'N, 114°49'E) and nearby Brunei (several records, northernmost at 4°20'N, 114°27'E) south through Sarawak at least as far as the Pelagus Rapids on the Rajang (c.2°10'N, 113°E). There are only two records of *C. filisecta* known to me, the type from W Kalimantan not far from the Sarawak border almost due south of Kuching, and another from Sarawak itself without locality, but as it was made by a native collector (based at the Sarawak Museum) on behalf of the Bureau of Science, Manila, it will probably not have been far from Kuching.

Cyrtandra paragibbsiae B.L.Burt in Kirkup et al. eds, A checklist of the flowering plants and gymnosperms of Brunei Darassalam: 436 (1996).

Type: Brunei, Temburong, Amo, Apoi F.R., Temburong river catchment, Apan, tributary of Sg. Tulan, 4°32'N, 115°11'E, 120–130m, 14 vii 1993, *Sands* 5800 (holo. K; iso. BRUN, n.v., E).

Subshrub to 2m high; stems stout (c.10mm diam.), reclinate and pendulous, glabrous. *Leaves* opposite, strongly anisophyllous (but see discussion below), reduced leaves stipule-like, c.12 × 5mm at clasping base rapidly narrowing upwards to c.0.5mm, developed leaves few at top of stem, 180–250 × 58–75mm, elliptic, apex acuminate, base cuneate, margins subentire (veinlets running to margins terminate in a minute black gland); lateral veins c.12 each side of midrib, sharply ascending, terminating in margins, tertiary venation invisible except for linking veinlets near margins, upper surface glabrous, smooth or slightly pustulate, lower surface glabrous except for coarse brown hairs to c.1mm long on midrib, shorter on lateral veins; petioles c.15mm, puberulous. *Inflorescences* 'flowering on stem amongst adventitious roots', technically axillary, pedicels springing in succession from a very short brachyblast. *Bracts* (few seen, 1 pair at base of each pedicel) c.4–5 × 1mm, linear-oblong, with patent acute hairs to c.0.8mm on backs, inside glabrous. *Pedicels* c.15–25mm, thickly clad in patent acute hairs c.1–1.5mm long, brown. *Calyx* 20mm long, almost tubular, subequally 5-lobed, lobes c.4 × 3mm, outside with coarse patent brown hairs to 1–2mm long, inside glabrous. *Corolla* c.55mm long, pale yellow, 2 brown lines in throat, coarse brown hairs to 3mm long outside, tube 38mm, lower part (inside calyx) narrowly cylindrical, abruptly expanded above, two upper lobes c.12 × 8mm, oblong-elliptic, lower lip 3-lobed, c.16 × 22mm, median lobe c.13 × 10mm, oblong-elliptic, lobes and tube glabrous inside (brown lines in throat invisible in dried material). *Stamens* inserted c.20mm above base of tube, 11mm long, glabrous, straight (at least in young flower); anthers 4 × 1.7mm, cohering face to face by a well-developed ligature, glabrous, thecae not confluent; lateral staminodes 5mm, posticous one 3mm. *Disc* 2.5 × 2mm, cupular. *Ovary* 9 × 2mm, minutely papillose, crowned with a coma of hairs c.2mm long. *Style* 12mm long,

hirsute, hairs c.1mm. *Stigma* bilobed, lobes 3×2.2 mm (young, and still pressed together). *Fruit* not seen.

Other specimens examined. BRUNEI. Temburong, Sungai Baki, N side of Temburong, 45m, 16 vii 1993, S. Atkins 497 (E).

Cyrtandra paragibbsiae was diagnosed against *C. gibbsiae* S.Moore, to which it bears a strong resemblance. A glance at the dried upper leaf surface will at once distinguish them: rod-shaped sclereids clearly visible in *C. gibbsiae* while in *C. paragibbsiae* the surface is smooth or pustulate. They differ further in indumentum and in their anthers and gynoecia. The relationship of *C. paragibbsiae* lies with *C. radiciflora* C.B.Clarke and its immediate allies.

Cyrtandra subsphaerocarpa B.L.Burt, **sp. nov.** nulli arcte affinis. Inflorescentia subsessilis, calyx 5-dentatus et valde sulcatus, corolla alba circum faucem fusco-purpureo-notata extra rufo-sericea intus annulo pilorum circa bases filamentorum circumdata, discus cupularis, stylus quam ovarium multo longior apice puberulus, fructus c.5–7 × 4–6mm, pericarpium valde verrucosum simul gregem proprium characterum formant.

Type: Borneo, Sarawak, Balang/Balleh watershed ridge, extreme headwater of Balleh river, foothills of Bukit Batu Tibang, 1°35'N, 114°33'E, just below ridge at 3100ft, 6 vii 1969, Anderson S28452 (holo. SAR; iso. A, E, L).

Shrublet; stems simple from ground level (?), c.150–600mm long, to c.5mm diam., base decumbent, rooting, glabrous, bark dark brown at least when dry, knotted (presumably sclereids, these also present in petiole and midrib), leafy throughout. *Leaves* opposite, isophyllous or slightly anisophyllous, largest 115–180 × 34–47mm, elliptic, apex long-acuminate, base narrowly cuneate, margins entire, revolute, lateral veins immersed, both surfaces glabrous, smooth; petiole 20–37mm long. *Inflorescence*: few-flowered, axillary, very congested cymes, distributed along whole length of stem; peduncle c.1.5–4mm long, very stout. *Bracts* c.11–13 × 4.5–8mm, ovate, leathery, glabrous inside, few hairs on upper margins and back, caducous; bracteoles similar but smaller, c.9–12 × 3.5–5mm. *Pedicels* 2–4mm. *Calyx* c.8mm long, completely enveloping bud, strongly sulcate, outside thinly villous, hairs rufous, 5-toothed at maturity, teeth c.2 × 2mm. *Corolla* 'white with dark purple markings encircling throat', only old withered corollas seen (also buds), tube c.10mm, cylindric below, ventricose above on anticous side, posticous lobes c.5mm long, anticous lobe c.6mm, outside thickly clad in silky rufous hairs to 4mm long, projecting beyond apex of corolla lobes, inside a band of silky hairs encircling tube at point of insertion of stamens. *Stamens* seen only in bud 5mm long, filaments rudimentary, anthers fully developed, 1.8 × 1.8mm, glabrous, cohering apically face to face, staminodes 3. *Disc* 1.8 × 1.2mm cupular. *Ovary* 2 × 1.2mm, glabrous. *Style* 7mm, puberulous at apex and on backs of stigmatic lobes. *Stigma* bilobed, lobes 0.5mm long. *Fruit* 6–8 × 4–5mm, pericarp strongly verrucose, breaking up with age into thick roughly hexagonal flakes. *Seeds* c.0.3 × 0.2mm, dark red-brown.

Other specimens examined. SARAWAK. Western ridge of Bukit Tibang, Indonesian border, extreme headwaters of Balleh river, 1°35'N, 114°34'E, 2 vii 1969, *Anderson* S28714 (E). Bukit Batu Tiban, Ulu Sungai Balleh, 24 iv 1986, *Yii et al.* S52156 (E, K, L).

Cyrtandra subsphaerocarpa is without close allies among described species. It is easily recognized by its short leafy stems rooting at the decumbent base, with sclereids giving the bark a knotty appearance (these sclereids also visible on petioles and midrib of leaves); leaves opposite, elliptic, glabrous, lateral veins immersed; congested subsessile inflorescences each subtended by a pair of rather coriaceous, ovate bracts; strongly 5-ribbed calyx; small (c.15mm) white corolla marked with purple in throat, villous outside, hairs rufous, band of hairs inside at level of insertion of stamens; gynoecium glabrous except for minute hairs on backs of stigmatic lobes and running very briefly down the style; disc cupular; fruit small, broad in relation to length (whence the epithet *subsphaerocarpa*), pericarp strongly verrucose. The leaf-hypodermis is 1-layered and there are astroclereids in the mesophyll (M.H. Bokhari, see Acknowledgements).

The species is so far known only from the extreme headwaters of the Balleh river, on the Sarawak–Kalimantan border, at roughly 1°35'N, 114°33'E, where it is plentiful in submontane forest at an altitude of 950–1200m above sea level. *Anderson* recorded the plant 'on Andesitic derived soils'.

Anderson collected another plant on the headwaters of the Balleh [Ulu Sungei Sedampa, extreme headwaters of Batang Balleh, 1°34'N, 114°30'E, primary forest, small ravine with heavily shaded stream, sandstone outcrops and boulders, unstable soils, 1500ft [c.460m], corolla translucent white, pink markings at back of throat on lower lip, *Anderson & Paie* S28364 (E)]. It is allied to *C. subsphaerocarpa* but differs in its stems, petioles and midrib of leaves lacking sclereids (the stems are finely longitudinally ridged), 4–5 lateral veins clearly visible on each side of midrib, upper surface of leaf finely pitted, hypodermis 2–3-layered (M.H. Bokhari), bracts and bracteoles villous on inner face. The specimen seen bears only fruits and very young buds. The calyx resembles that of *C. subsphaerocarpa*. Half a corolla is present in a pocket on the sheet; this shows tube, anticous limb with lobes missing, two posticus lobes nearly complete. The corolla is silky-rufous as in *C. subsphaerocarpa* and there is a broad band of hairs immediately below the insertion of the stamens. Two thick longitudinal bands that have dried orange run from the sinuses of the lower lip down the floor of the tube almost to the insertion of the stamens. This colour patterning is in marked contrast to *Anderson's* record 'pink markings at back of throat'. It is highly desirable that this plant be re-collected.

Cyrtandra tibangensis B.L.Burt, **sp. nov.** inter species *C. radicyflorae* C.B.Clarke affines ponenda sed ab illa specie caulibus petiolisque villosis (pilis grossis ad 5mm nec pilis tenuibus 1mm longis) paginis foliorum ambabus et marginibus pilis longis grossis (nec pagina superiore et marginibus glabris inferiore subtiliter appresso-pubescente) corolla intus flavescente (nec lobis tribus inferioribus intus macula rubra magna notata) facile distinguitur.

Type: Borneo, Sarawak, Bukit Batu Tibang, Ulu Sungai Balleh [c.1°35'N, 114°33'E], 1300m, 22 iv 1986, *Yü et al.* S52189 (holo. E, iso. SAR [photocopy in E]).

'Herb': stem 200mm to 1m long, c.4mm diam. near apex, base decumbent, villous, hairs coarse, to 5mm long, falling to leave pustules on bare stem, leafy towards apex. *Leaves* opposite, anisophyllous, minor leaf roughly one-half to three-quarters size of major leaf otherwise similar, major leaves c.180–200 × 35–55mm, elliptic, apex abruptly long-acuminate, base cuneate to subcordate, margins obscurely and distantly serrulate, lateral veins c.10 (as few as 7 on minor leaves) on each side of midrib, tertiary veins coarsely reticulate, upper surface with scattered coarse hairs to 5mm long, margins almost villous, lower surface with coarse hairs to 6mm long over veins and veinlets, blade glabrous, pustulate; petioles 20–35mm, hairy as stem. *Inflorescence*: several flowers springing from a brachyblast at nodes near base of stem. *Bracts* not seen. *Pedicels* c.18–20mm long, villous. *Calyx* c.19mm long, tube 11mm, funnel-shaped, lobes 8 × 2–3mm, narrowly deltoid, acute, outside coarse hairs to 3mm long. *Corolla* 'white outside, inside tinged yellow', c.46mm long, tube 31mm, cylindric below, abruptly dilated above, anticous lip 15 × 28mm, anticous lobe 13 × 14mm, posticous lobes 13 × 12mm, all lobes rounded, outside coarse hairs to 2–3mm long scattered among many finer, shorter ones (to 0.5mm), inside papillose all over tube down to point of insertion of filaments. *Stamens* inserted 16mm above base of tube, filaments more or less c.9mm long, strongly twisted post anthesis, papillose near base. *Anthers* 4 × 2mm, more or less triangular in outline, thecae not confluent, cohering face to face by a conspicuous apiculus, few coarse hairs on upper margins of connective; lateral staminodes 5mm, posticous staminode 2mm. *Disc* cupular, 2.5 × 1.8mm. *Ovary* 10 × 2mm, very minutely papillose, apex crowned with a coma of hairs to 2mm long. *Style* pubescent, hairs acute. *Stigmatic lobes* c.4 × 3mm, pubescent on backs. *Fruit* c.24 × 7mm, pericarp verrucose. *Seeds* c.0.3 × 0.2mm.

Other specimens examined. SARAWAK. Extreme headwaters of Balleh river, western ridge of Bukit Tibang, 1°35'N, 114°34'E, 4000ft, igneous (Andesitic) derived soils, 14 vii 1969, *Anderson* S28715 (E, L).

Cyrtandra tibangensis has been recorded only from Bukit Tibang, almost on the border with Kalimantan. It belongs to a group of species including *C. radiceflora* C.B.Clarke (Sarawak), *C. paragibbsiae* B.L.Burt (Brunei) and *C. scutifolia* B.L.Burt (Sarawak) distinguished by the following characters: calyx initially enveloping the young corolla, later splitting into 5 lobes surmounting a conspicuous tube, relatively large corolla (c.45–55mm long), anthers triangular in outline with a prominent apiculus, thecae either not or scarcely confluent, disc cupular, ovary glabrous or very minutely glandular, crowned with a coma of long hairs, style pubescent, stigmatic lobes relatively large, 3–4mm long, spatulate in outline, fruit roughly 20–27 × 4–7mm, pericarp verrucose. *Cyrtandra tibangensis* is easily recognized within the group by the coarse hairs on the vegetative parts; the colouring of the corolla (white and yellow) at once distinguishes it from *C. radiceflora* with cream corollas blotched red on the lower lip.

The material to hand of *C. tibangensis* is not good: only detached flowers on the holotype, and little field information other than 'peduncles and calyx red, petals white outside, inner tinged yellow'. Anderson saw no flowers, but collected good fruits; he also provided the only information on basal parts: 'fruit near base of stem'. He also noted that 'this species occurs in a localised habitat on steep side of ridge between approx. 3500ft and 4000ft'.

***Cyrtandra toreniiflora* B.L.Burt, sp. nov.** a *C. radicyflora* C.B.Clarke inflorescentiis 2–3-floris bracteis duabus c.15 × 6.5mm praeditis (nec inflorescentiis multifloris bracteis et bracteolis usque ad 6 × 0.8mm) calyce pilis minutis ad apices loborum exceptis glabro (nec pilis c.2mm longis villosis) differt. Etiam, praecipue quoad forma calycis, *C. tibangensi* B.L.Burt affinis sed caulibus foliis calycibus glabris (nec villosis) corolla extra pilis minimis praedita (nec pilis grossis 2–3mm longis inter multos alios breviores tenuiores dispersis) facile distinguenda.

Type: Borneo, Kalimantan Timur, Sungai Lunok, near camp Malimau, 2°46'N, 116°43'E, 23 xii 1982, *Axelius* 323 (holo. S).

Herb to 1m tall; stem probably simple, c.4mm diam. near apex, glabrous, drying almost black. *Leaves* opposite, anisophyllous, minor leaf up to roughly half size of major leaf otherwise similar, major leaves c.110–190 × 40–72mm, elliptic, apex abruptly acute, base narrowly cuneate, margins obscurely serrulate, lateral veins 8 each side of midrib, tertiary veins almost immersed, both surfaces glabrous, petioles and veins on lower surface of leaf 'knotted' as if sclereids present (no sclereids in mesophyll of leaf blade). *Inflorescence*: 1–3 flowers springing almost directly from axils of upper leaves, peduncle c.2mm. *Bracts* c.7–15 × 2.5–3.5mm, elliptic, midrib raised on lower surface, 'knotty', upper surface of blade and margins very minutely puberulous, (glabrous on casual inspection), lower surface pubescent, hairs to 0.6mm long, scattered, strongly appressed. *Pedicels* 6–10mm long, glabrous. *Calyx* 16–35mm long, tube c.9–17mm, anticous lobes c.7.5–18 × 2–4mm, posticous lobes c.2.5–16 × 2–3mm, narrowly deltoid in lower half, gradually linear in upper third, glabrous except for minute hairs at tips of lobes. *Corolla* 'white', c.54mm long, tube 40mm, cylindric in lower half, expanded above, anticous lip c.15 × 30mm, anticous lobe 13 × 17mm, posticous lobes 11 × 12mm, all lobes rounded, outside acute hairs to c.0.3mm long on tube, stout 3-celled hairs c.0.1mm long on lobes, inside glabrous. *Stamens* inserted 22–25mm above base of tube, filaments c.13mm long, strongly twisted post anthesis. *Anthers* 5 × 2.8mm, more or less triangular in outline, thecae not confluent, anthers cohering face to face by elongate apiculi terminating in a small disc; lateral staminodes 2–5mm long, posticous staminode 1–1.5mm. *Disc* 2.5–3 × 2–3mm, cupular. *Ovary* c.16 × 2mm, minute globose glands on lower part, scanty long (c.1mm) hairs at apex merging with hairs on style. *Style* pubescent, hairs acute. *Stigmatic lobes* c.4 × 2.5mm, pubescent on backs, stigmatic papillae conspicuous. *Fruit* c.20–40 × 2.5–4mm (young), pericarp pitted, pits c.0.2mm diam., rim thickened. *Seeds* immature.

Other specimens examined. SABAH. Lahad Datu distr., Danum valley [c.5°N, 117°30'E], v 1986, Campbell SAN 117068 (E, SAN). Mt. Tawai Forest Reserve, Karamuak [c.5°30'N, 117°20'E], 29 vii 1978, Dewol & Axelius SAN 88724 (K, L).

A few years ago I found myself looking at the remarkably similar flowers of two quite different plants: one was a *Torenia* L. (*Scrophulariaceae*), the other a *Cyrtandra*, and I had already decided that neither had been described. The situation seemed to call for reciprocal nomenclature. Accordingly, the *Torenia* became *T. cyrtandriflora* B.L.Burt (Burt, 1991), but the description of the *Cyrtandra* has had to wait until now.

Cyrtandra toreniiflora is in the general affinity of *C. tibangensis* (p. 154) from which it is easily distinguished by its very nearly glabrous habit in contrast to the prominent brown hairs on the stem and leaves of *C. tibangensis*. They differ further in the pericarp of the fruit: that of *C. toreniiflora* is pitted, while that of *C. tibangensis* is verrucose. The leaf of *C. toreniiflora* has no hypodermis and no sclereids in the mesophyll, while that of *C. tibangensis* has a 1-layered hypodermis and astrosclereids in the mesophyll (M.H. Bokhari).

While the type of *C. toreniiflora* was collected in NE Kalimantan, the additional specimens cited came from further north, across the border in Sabah, collected in lowland Dipterocarp forest at sites along the Danum and Karamuak rivers.

A third collection from Sabah, made at roughly 5°05'N, 117°30'E, requires special mention: Kinabatangan, Sungai Kuamut, 250m, severely logged mixed dipterocarp forest, Stevens *et al.* 448 (E, L). This plant has stems, leaves, inflorescence, calyx and fruit differing from those of *C. toreniiflora* only in the vegetative parts (excluding upper leaf surface) and calyx being minutely puberulous (patent acute hairs to c.0.2mm long). Flowers were not seen by the collector. The leaves are less markedly anisophyllous than those of the typical plant and there are short-armed astrosclereids in the mesophyll, but neither feature is taxonomically reliable. It is concluded that this plant is a minor variant of *C. toreniiflora*.

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