

**OLD WORLD GESNERIACEAE X: BORNEAN
SPECIES OF *CYRTANDRA* ALLIED TO
*C. PHOENICOLASIA***

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Cyrtandra phoenicolasia, *C. hottae* and five new species constitute a group distinguished by a suite of characters including setose vegetative parts, deeply divided calyx, small white corolla marked on the lower lip with yellow to brown, unilateral disc, ovary constricted at base, and fruit small. All species are fully described and an identification key provided.

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

INTRODUCTION

The group of species closely allied to *Cyrtandra phoenicolasia* Lauterb. and *C. hottae* B.L.Burtt share the following characteristics: stem simple above the base, leafy towards the apex (lower leaves shed), often floriferous well below the leaves, *conspicuous brown bristles (setae) on all vegetative parts*, inflorescence an axillary *tightly congested, dichasial cyme, peduncle not exceeding c.35mm*, mostly much shorter (3–10mm), *calyx deeply divided* (roughly halfway in *C. phoenicolasia*, otherwise nearly to the base), *corolla small* (c.12–20mm), *white marked with yellow to brown on the lower lip*, *ovary glabrous, constricted at base on ventral side to accommodate the fleshy unilateral disc, style puberulous or minutely gland-dotted, fruit small* (c.5–15mm long), *pericarp verrucose*.

In the shortly pedunculate, very congested inflorescence, deeply divided calyx, small white corolla, ovary constricted at the base to accommodate the unilateral disc, and in their small fruits, *C. phoenicolasia* and its allies resemble *C. chrysea* and its allies (Hilliard & Burtt, 2004). The latter group, although variously hairy, differs in its lack of brown bristles and also in the pink to purple (not yellow to brown) markings on the corolla.

Key to species

- 1a. Leaves with two conspicuous balloon-like pouches c.7–8mm in diam. at each node formed by the united bases of the petiolar wings — **1. *C. phoenicolasia***
 1b. Leaves without such pouches _____ **2**

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- 2a. Hairs on stems closely appressed; largest major leaves c.37–45mm broad, minor leaf roughly one-tenth to one-third length of major leaf _____ **7. C. hottae**
- 2b. Hairs on stems spreading; largest major leaves 50–150mm broad; if leaves anisophyllous, then minor leaf one-third to two-thirds length of major leaf — 3
- 3a. Peduncles 15–35mm long _____ **2. C. megaphylla**
- 3b. Peduncles c.3–7mm long _____ 4
- 4a. Bristles on stem 1.5–2mm long _____ **6. C. brevisetosa**
- 4b. Bristles on stem 5–8mm long _____ 5
- 5a. Outermost bracts 20–30 × 5–11mm, both midrib and lateral veins clearly visible on lower surface, calyx lobes 3–5mm long _____ **4. C. latibracteata**
- 5b. Outermost bracts c.12–20 × 1.5–3mm, veins invisible, calyx lobes c.2–3mm long _____ 6
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- 6a. Bracts 12–16 × 2–3mm, lanceolate, acuminate _____ **3. C. phoenicoides**
- 6b. Bracts 15–20 × 1.5–2mm at base, rapidly and abruptly narrowing to less than 1mm _____ **5. C. dorytricha**

1. *Cyrtandra phoenicolasia* Lauterb., Bot. Jahrb. 44: 541 (1910).

Lectotype (chosen here): Borneo, Kalimantan, zwischen Semurung und Sungai Tarik [10°50'S, 115°50'E], Urwald, Bachrand, 18 vii 1908, *Winkler* 3026 (lecto. WRS�; photocopy E; isolecto. BM, K, L).

Herb, stem to c.600mm long, 4–5mm diam., simple, decumbent at base and rooting there, thickly clad in brown bristles c.3–5mm long. *Leaves* opposite, anisophyllous, minor leaf roughly a third as long to half as long as major leaf, largest major leaves 120–200 × 55–85mm, obovate, apex abruptly acute, base cuneate, decurrent, margins serrate to serrulate, each tooth a vein-ending, lateral veins 10–12 each side of midrib, tertiary veins coarsely reticulate, all veins strongly raised on lower surface, upper surface clad in scattered brown bristles 3–5mm long, c.2mm on margins, a small 'shield' (outgrowth of blade) c.6–7.5 × 5–7.5mm at base of midrib, apical half free of midrib, lower surface glabrous between the veins, all veins and veinlets densely appressed-pubescent, bristly as well, bristles to 3–4mm long; petiole c.10–15mm long, winged by decurrent blade, wings broadening at base and united with wings of opposing leaf to form a deep pouch c.7–8 × 7–8mm. *Inflorescence* a dichasial cyme, solitary in leaf axils, flowers c.10, tightly clustered; peduncle c.8–10mm, densely bristly. *Bracts* c.13–17 × 2–8mm, sublinear to elliptic, acuminate, venation clearly visible particularly on lower surface, brown bristles to c.4mm on margins, fewer on inner and outer surfaces, bracteoles similar but narrower. *Pedicels* 2–4mm long, bristly. *Calyx* 2–3mm long, campanulate, tube 1–2mm, lobes 5, 1–1.5 × 0.8–1mm, bristly to glabrous. *Corolla* white with 2 raised yellow keels on lower lip running down into throat, c.14–17mm long, tube 9.5–12mm, cylindrical at base, then abruptly expanded and ventricose on lower side, bilabiate, lower lip 4.5–5 × 7–9mm, median lobe 2.2–2.5 × 4mm, upper lip 3–4 × 4.4–5mm, notched,

outside with plentiful hairs to c.1.5mm long, inside very minutely hairy on keels and sometimes on upper lip and median lobe of lower lip. *Stamens* inserted c.5–7mm above base of tube, filaments 4–5mm long, slightly swollen near apex and there very minutely hairy, eventually twisted once near base, anthers 1–1.2 × 0.8–1.1mm, cohering apically by a very small apiculus; lateral staminodes 1–1.3mm, posticous staminode wanting. *Disc* 1.2–1.5 × 0.7–0.8mm, unilateral. *Ovary* c.3.5mm, glabrous (not shortly pilose as originally described), constricted at base to accommodate disc. *Style* 4.5–5.5mm, appressed-pubescent. *Stigmatic lobes* c.0.8 × 0.5mm. *Fruit* 6–7 × 3–3.5mm, pericarp verrucose. *Seeds* c.0.3 × 0.2mm, testa red-brown.

Other specimens examined. KALIMANTAN. Zwischen Batu babi und Lumowia [c.1°45'S, 115°45'E], 10 vii 1908, *Winkler* 2860 (syntype WRS�, BM; photo. E). Around Jelini, along Sungai Belayan, NW of Tabang [0°34'N, 116°02'E], 100–150m, 12 i 1979, *Murata et al.* B-1185 (L), B-1172 (L). W. Koetai, no. 36, near Long Petah, 450m, 16 ix 1925, *Endert* 3378 (L).

SARAWAK. Ulu Sungai Sedampa, extreme headwaters of Batang Balleh, 1°34'N, 114°30'E, 1500ft, 2 vii 1969, *Anderson & Paie* S28354 (E). Nanga Balang, extreme headwaters of Batang Balleh, 1°35'N, 114°30'E, 950ft, 29 vi 1970, *Anderson* S28312 (E, L). Balang/Balleh watershed ridge, extreme headwaters of Balleh river, foothills of Bukit Batu Tibang, 1°35'N, 114°33'E, 2800ft, 6 vii 1969, *Anderson* S28460 (E, L).

A remarkable feature of *C. phoenicolasia* is the two deep pouches at each node formed by the union of the winged bases of the petioles of each pair of leaves. In addition, there is a shield-shaped structure on the upper surface of the leaf astride the midrib near its base. This appears to be an outgrowth of the blade, attached to the midrib only in its lower half. What purpose it serves is unknown; the pouches are possibly 'compost pits', though in one specimen seen (*Anderson* S28640) they were filled with small seeds, perhaps cached there by ants. Union of winged petioles to form 'pockets' has been recorded in several other, unrelated, species of *Cyrtandra*, but, so far as is known, never in the form recorded here.

Specimens from Kalimantan appear to have bracts broader than in those from Sarawak, but this needs confirmation on more plentiful material.

A broad concept of *C. phoenicolasia* has hitherto included a number of allied species newly described below as *C. brevisetosa*, *C. dorytricha*, *C. latibracteata*, *C. megaphylla* and *C. phoenicoides*. All lack the leaf pouches of *C. phoenicolasia* and differ further in several respects, including a more deeply divided calyx.

Plants of *C. phoenicolasia* favour outcrops, boulders and cliffs in forest along streams, from SE Sarawak eastwards across Kalimantan, between 300 and 850m above sea level.

The leaves lack a hypodermis and there are no sclereids in the mesophyll.

2. *Cyrtandra megaphylla* Hilliard & B.L.Burtt, **sp. nov.** a *C. phoenicolasia* Lauterb. foliis multo majoribus (c.270–370 × 88–150mm nec 120–200 × 55–85mm), petiolis alatis haud saccum altum ad nodos formantibus (nec petiolis alatis saccum altum formantibus), venis lateralibus foliorum maximorum 13–20 (nec 10–12), pedunculis 15–35mm longis (nec 8–10mm), calyce fere ad basim lobato (nec plus minusve ad medium) distinguenda.

Type: Borneo, Sarawak, Sungai Bena, tributary of Sungai Sut, c.1°55'N, 113°5'E, 23 vii 1962, *Burt* B2603 (holo. E).

Herb, stem to 1m tall, probably decumbent at base (adventitious roots present), c.7–10mm diam., thickly clad in brown bristles 7–12mm long, leafy only towards apex. Leaves opposite, anisophyllous, minor leaf roughly one-half to two-thirds as long as major leaf, largest major leaves 270–370 × 88–150mm, including petiolar part, obovate, apex rather abruptly acute, base cuneate, decurrent down very short petiole in wings c.8–10mm broad, wings of leaf pairs briefly united at base, margins serrulate, each tooth a vein-ending, lateral veins 13–20 each side of midrib, tertiary veins coarsely reticulate, often scalariform towards margins and apex, upper surface clad in scattered bristles 3–4mm long, lower surface glabrous between the veins, all veins and veinlets densely appressed-pubescent, spreading brown bristles 8–10mm long as well, longest on midrib. *Inflorescence* a many-flowered very congested, axillary, dichasial cyme; peduncles 15–34mm long, clad in brown bristles c.4mm long. *Bracts* c.18–30 × 3–5mm, lanceolate, acuminate, venation obscure, brown bristles to c.5mm long on both surfaces, bracteoles similar but narrower and slightly shorter. *Pedicels* c.2–5mm long, bristly. *Calyx* 5-lobed nearly to base, tube c.0.25–0.5mm long, lobes 2–2.5 × 0.8–1.2mm, narrowly triangular, bristles 1–2mm long outside. *Corolla* white with 2 yellow bars on palate darkening to brown in throat, c.19mm long, tube 13mm, cylindrical at base, then abruptly expanded and ventricose on lower side, bilabiate, lower lip c.6 × 11mm, median lobe 3 × 4.5–5.5mm, upper lip 3 × 7–8mm, lobes 3 × 4mm, outside brown appressed hairs to 1mm long, inside minute hairs on lower lip, particularly on the yellow bars. *Stamens* inserted 8mm above base of tube, filaments 5.5mm long, twisted once, anthers 1.5 × 1.25mm, cohering face to face by a very small apiculus; lateral staminodes 1mm long, posticous staminode 0.5mm. *Disc* 1.2 × 2mm, unilateral. *Ovary* 6.5 × 1.25mm, constricted at base to accommodate the disc, glabrous. *Style* 6mm, very minutely gland-dotted. *Stigmatic lobes* c.1 × 0.8mm. *Fruit* 8–15 × 3–4.5mm, pericarp verrucose. *Seeds* c.0.3 × 0.2mm, testa red-brown.

Other specimens examined. SARAWAK. Batu Laga Plateau, Ulu Sungai Kebhor, Batang Balui [c.2°42'N, 113°47'E], 600m, 6 iii 1989, *Yii* S56515 (K). Sungai Bena area, 1°56'N, 113°8'E, 23 iv 1980, *Burt* B12945 (E). Sungai Merating, Bena Sut, Kapit, 23 iv 1980, *Paie* S41000 (E, L). Sungai Kerangan Limo, Mengiong, Kapit, [c.1°30'N, 113°30'E], 500m, 9 xi 1979, *Othman et al.* S41331 (E, L).

Cyrtandra megaphylla (*megaphylla* = large leaves), like the rest of the species in this group, differs sharply from *C. phoenicolasia* by the lack of pouches at the nodes derived from the united petiolar wings of the leaf-pairs and in having the calyx divided nearly to the base (not roughly halfway). It differs from all other species included here in its much longer peduncles, 15–35mm versus 3–10mm.

The distribution of *C. megaphylla* as currently known is confined to Sarawak between 1°30' and 2°42'N and 113°5'S to 47'E, while that of *C. phoenicolasia* is further south and east, between 1°35'N to 1°50'S, 114°30'E to 116°2'E, from

E Sarawak east across Kalimantan. *Cyrtandra megaphylla* is a plant of the forest floor along rocky streambanks and on hill slopes, c.500–700m above sea level.

Burt recorded 'young foliage copper-purple underneath, gradually fading'; Yii 'stems and petioles purplish'. Others commented on the brown or blackish hairs on mature stems and leaves, a feature of this group (they also occur in other groups). The leaves have a one-layered hypodermis and small astrosclereids in the spongy mesophyll.

3. *Cyrtandra phoenicoides* Hilliard & B.L.Burt, sp. nov. a *C. megaphylla* Hilliard & B.L.Burt foliis majoribus cujusque paris c.150–250mm longis (nec 270–370mm), setis in caulibus et in pagina foliorum inferiore ad 5mm longis (nec 7–12mm), pedunculis 3–5mm longis (nec 15–35mm) distinguenda.

Type: Borneo, Sarawak, Gunong Mulu National Park [c.4°01'N, 114°52'E], between Sungai Melinau and Sungai Trekan, c.400ft, 15 vi 1975, *Burt* B8282 (holo. E).

Herb, stem c.250–500mm long, 4–5mm diam., decumbent and rooting at base, sometimes with a minor branch near base, thickly clad in brown bristles to 5mm long. *Leaves* opposite, more or less isophyllous to anisophyllous and then minor leaf roughly half length of major leaf, largest major leaves 150–250 × 55–100mm long including petiolar part, elliptic to obovate-elliptic, apex acute, base cuneate, decurrent down short petiole in wings c.3–4mm broad, wings of leaf-pairs briefly united at base, margins serrate, lateral veins 11–14 each side of midrib, tertiary veins coarsely reticulate tending to scalariform towards margins, upper surface with scattered brown bristles 2.5–5.5mm long, lower surface glabrous between the veins, all veins and veinlets densely appressed-pubescent, brown bristles 4–5.5mm as well mainly on midrib and lateral veins. *Inflorescence* a very congested axillary, dichasial cyme, flowers 10 to many; peduncles 3–5mm long, bristly. *Bracts* 12–16 × 2–3mm, lanceolate, acuminate, venation invisible, brown bristles to 3mm long mainly on backs and margins, bracteoles similar but narrower. *Pedicels* 2–7mm long, bristly. *Calyx* 5-lobed nearly to base, tube c.0.3mm, lobes 2.25–2.5 × 0.8mm, narrowly triangular, few small bristles outside. *Corolla* white with 2 yellow bars on palate turning brownish in throat, c.15mm long, tube 10mm, cylindric at base then abruptly expanded and ventricose on lower side, bilabiate, lower lip 5 × 10mm, median lobe 2.5 × 4mm, upper lip 2 × 4mm, notched, outside brown bristles 1.5mm long, inside minutely glandular below sinus of upper lip. *Stamens* inserted c.6mm above base of tube, filaments 4mm, twisted once, anthers 1 × 1mm, cohering face to face by a very small apiculus; staminodes not seen. *Disc* 1 × 1mm, unilateral. *Ovary* 3 × 0.8mm, constricted at base to accommodate disc, glabrous. *Style* 4mm, very minutely gland-dotted. *Stigmatic lobes* 0.6 × 0.4mm. *Fruit* 5–6 × 3–3.5mm, pericarp verrucose. *Seeds* c.0.25 × 0.2mm.

Other specimens examined. SARAWAK. Mulu National Park, Bukit Binaret, 28 iv 1985, *Abg. Motar et al.* S49469 (E).

BRUNEI. Temburong, 4°4'N, 115°6'E, Bukit Biang, 20m, 17 x 1989, *Forman* 916 (E, K). Temburong, 4°32'N, 115°11'E, Amo, Temburong river, Sungai Bakit N side of Temburong, 45m, 16 vii 1993, *S. Atkins* 489 (E, K). Temburong, 4°30'N, 115°11'E, Amo, Bukit Belalong, 500m, 26 ii 1992, *Dransfield* JD7231 (E). Temburong, 4°30'N, 115°10'E, E of Kuala Belalong Field Studies Centre, c.70m, 21 ii 1992, *Argent & Mitchell* 9182 (E).

Cyrtandra phoenicoides is in the general affinity of *C. phoenicolasia*; the epithet draws attention to this. Its closest ally appears to be *C. megaphylla*, from which it is distinguished by its smaller major leaves (c.150–250mm versus 270–370mm long), shorter bristles on stem and undersurfaces of leaves (up to 5mm versus 7–12mm) and shorter peduncles (c.3–5mm versus 15–35mm). Also the bracts are shorter and narrower, and the flowers are possibly smaller, but too few corollas have been seen to be certain.

The two species are well separated geographically, *C. megaphylla* apparently confined to Sarawak south of 3°N latitude, while *C. phoenicoides* is currently known from Brunei and just across the border in Mulu National Park, c.4–5°N latitude.

Cyrtandra phoenicoides occurs between 20 and 500m above sea level, on banks and along streams in the forest. The leaves have small astrosclereids in the spongy mesophyll; a one-layered hypodermis may be present or absent.

4. *Cyrtandra latibracteata* Hilliard & B.L.Burt, sp. nov. a *C. dorytricha* Hilliard & B.L.Burt bracteis extimis 20–30 × 5–11mm et costa et venis lateralibus clare visibilibus (nec 15–20 × 1.5–2mm venatione invisibili) calycis lobis 3–5mm (nec 2–3mm) longis differt.

Type: Borneo, Sabah, Mt. Kinabalu, eastern shoulder, 6°5'N, 116°36'–40'E, 3500ft, 18 vi 1961, *Chew et al.* 643 (holo. E; iso. K, L).

Herb, stem c.300–650mm long, 6–8mm diam. near apex, at least sometimes decumbent (a few stems seen curved at base and rooting there), thickly clad in brown bristles 5–7mm long, leafy mainly towards apex, floriferous well down bare stem. *Leaves* opposite, subsisophyllous, largest leaves 220–330 × 60–110mm, including short petiole, elliptic to obovate-elliptic, apex acute, base cuneate, decurrent down short petiole in wings 3–4mm broad, wings of leaf pairs briefly united at nodes, margins serrate, each tooth a vein-ending, lateral veins 8–10 each side of midrib, tertiary veins coarsely reticulate becoming scalariform towards margins, upper surface with scattered bristles 2.5–4mm long, lower surface (at maturity) glabrous between veins, midrib with brown bristles 5–7mm long, lateral veins and veinlets with much shorter, finer, paler hairs. *Inflorescence* a many-flowered, tightly congested, axillary dichasial cyme; peduncles to 7mm long, bristly. *Bracts* (outermost pair) 20–30 × 5–11mm, elliptic, acute, venation prominent, bracteoles similar but gradually smaller, bristles to 4mm long on both surfaces and margins. *Pedicels* 4–8mm, bristly. *Calyx* 5-lobed nearly to base, lobes 3–5 × 0.8–1mm, narrowly triangular, bristles to c.4mm long on backs and margins. *Corolla* white with 2 yellow bars on palate darkening to brown in throat, no corollas present on herbarium sheets though mentioned by collectors. *Stamens* not seen. *Disc* 1 × 1mm, unilateral. *Ovary*

4 × 1mm, constricted at base to accommodate disc, glabrous. *Style* c.4mm, very minutely gland-dotted. *Stigma* bilobed (young). *Fruit* c.10 × 3–3.5mm, pericarp verrucose. *Seeds* c.0.2 × 0.15mm, testa dark red-brown.

Other specimens examined. SABAH. Mt. Kinabalu, eastern shoulder, 6°05'N, 116°36–40'E, Singh's Plateau, 3000ft, 13 vi 1961, *Chew et al.* 1024 (E, K). Dallas [Dallas, 6°2'N, 116°28'E], Bridle trail falls, 3000ft, 17 viii 1931, *Clemens* 26105 (BM, GH, K).

SARAWAK. Along valley of Ulu Sungai Bejangung, eastern part of Bukit Kana [2°42'N, 112°54'E], 700–850m, 21 xi 1963, *Hotta* 15418 (E, KYO), but see discussion below.

Cyrtandra latibracteata resembles *C. phoenicolasia* in its conspicuously veined bracts, but lacks petiolar pouches at the nodes, which are a conspicuous feature of that species. It differs further in its larger leaves, bigger bracts, and in the calyx being lobed nearly to the base. Its closest ally is possibly *C. dorytricha*, from which it is distinguished by its much bigger, strongly veined, bracts, longer calyx lobes, and possibly longer fruits. That we have seen no corollas of this species is of little importance; it is features of calyx and gynoecium that are of diagnostic value in this group.

Cyrtandra latibracteata occurs on Mt. Kinabalu, between c.900 and 1000m above sea level, in forest. Then there appears to be a record from 3° further south in Sarawak (*Hotta* 15418, cited above). This specimen differs from the Kinabalu plant by the presence of long bristles on both the midrib and lateral veins on the lower leaf surface. There is an urgent need for collecting before these forests are completely destroyed by logging.

The leaves of *C. latibracteata* lack sclereids in the spongy mesophyll and a hypodermis may be present or absent; *Hotta* 15418 has not been checked for sclereids.

5. *Cyrtandra dorytricha* Hilliard & B.L.Burt, **sp. nov.** a *C. megaphylla* Hilliard & B.L.Burt folio majore paris 150–260 × 56–110mm (nec 270–370 × 88–150mm), venis lateralibus paucioribus (5–10 utrinque costae nec 13–20), pedunculis brevioribus (3–7mm nec 15–35mm) distinguenda.

Type: Borneo, Sarawak, SE end Hose Mts., 2°6'N, 113°42'E, near Bukit Semako, c.2200ft, 17 viii 1967, *Burt & Martin* 4948 (holo. E).

Herb, stems to c.600mm tall, c.4–6mm diam. near apex, thickly clad in brown bristles (4–)6–8mm long, leafy mainly towards apex, floriferous to well down the stem. *Leaves* opposite, isophyllous or almost so, largest major leaves 150–210 (–260) × 56–90 (–100)mm, including petiolar part, obovate to elliptic, apex rather abruptly acute, base cuneate, decurrent down short petiole to form wings c.3–5mm broad, wings of leaf pairs briefly united at nodes, margins serrate, each tooth a vein-ending, lateral veins 5–10, tertiary veins coarsely reticulate tending to scalariform towards margins, upper surface clad in scattered bristles, c.3–7mm long on midrib, 2–5mm on blade, lower surface glabrous between the veins, all veins and veinlets densely appressed-pubescent, spreading brown bristles as well 3–7mm long (longest on midrib). *Inflorescence* a many-flowered very congested, axillary, dichasial cyme;

peduncles 3–7mm long, bristly. *Bracts* (outermost pair) 15–20 × 1.5–2mm at base rapidly and abruptly narrowing to less than 1mm, venation invisible, bracteoles similar but gradually smaller, bristles 3–5mm long. *Pedicels* 3–4mm long, bristly. *Calyx* 5-lobed nearly to base, lobes c.2–3 × 0.5–0.8mm, narrowly triangular, bristles to 2.5mm long outside and on margins, caducous. *Corolla* white with 2 yellow bars on palate darkening to brown or purplish in throat, c.12–14mm long, tube 9–10mm long, cylindric below then abruptly expanded and ventricose on lower side, bilabiate, lower lip 3–5 × 5–8mm, median lobe 2 × 2–2.5mm, upper lip 1.5–2 × 4–5mm, deeply notched into 2 lobes, outside brown bristles 1–3mm long, inside glabrous. *Stamens* inserted 5–6mm above base of tube, filaments 2–3mm long, twisted once, anthers c.1 × 0.8mm, cohering face to face by a very small apiculus; lateral staminodes 0.4–0.8mm long, posticous staminode not seen. *Disc* 1 × 1mm, unilateral. *Ovary* 4 × 1mm, glabrous, constricted at base to accommodate disc. *Style* 3.5–5mm, very minutely gland-dotted. *Stigmatic lobes* 0.5 × 0.3mm. *Fruit* 5.5–8 × 3–4mm, pericarp verrucose. *Seeds* c.0.2 × 0.15mm, testa red-brown.

Other specimens examined. SARAWAK. [2°56'N, 112°44'E], Tatau, path to Bukit Buan, 100ft, 10 vi 1956, *Purseglove* P5468 (E, K, SING). NE of Bukit Kana [2°42'N, 12°54'E], 50–150m, 22 xi 1963, *Hotta* 15531 (E, KYO). Bukit Raya [c.2°10'N, 113°E], 31 iii 1969, *Smith* S28141 (E). Pelagus Rapids on Sungai Rajang, c.2°10'N, 113°E, 19 vii 1962, *Burt & Woods* B2543 (E). SE end Hose Mts., Bukit Mabong and Ulu Melinau falls area, c.2°6'N, 113°42'E, 5–20 viii 1967, *Burt & Martin* B4807 (E).

Cyrtandra dorytricha is allied to *C. megaphylla* from which it is distinguished by its mostly smaller major leaves (c.150–260 × 56–100mm not 270–370 × 88–150mm) with fewer lateral veins (5–10 each side of midrib, not 13–20) and shorter peduncles (3–7mm not 15–35mm). Like *C. megaphylla*, *C. dorytricha* is confined to Sarawak but their distribution areas, as we know them, scarcely overlap, that of *C. dorytricha* being slightly more northern than that of *C. megaphylla*, but still in the southern half of Sarawak, below the 3°N parallel of latitude.

The epithet *dorytricha* (meaning spear hair) draws attention to the coarse brown bristles that are a characteristic of all the species in this group. Astrosclereids occur in the spongy mesophyll of the leaves; a hypodermis may be present or absent.

Little ecological information is available, but the plants seem to favour stream-sides in forest between c.50 and 600m above sea level.

6. *Cyrtandra brevisetosa* Hilliard & B.L.Burt, sp. nov. ab *C. phoenicolasia* Lauterb. saccis transnodalibus absentibus, setis caulinis 1.5–2mm longis (nec 3–5mm), calycibus fere ad basin lobatis (nec plus minusve ad medium); ab omnibus speciebus proxime affinibus inter alia setis caulinis 1.5–2mm longis (nec 5–12mm) et pilis minutis valde appressis in venis paginae inferioris absentibus differt.

Type: Borneo, Sarawak, Gunong Bunga range from Seropak village, 1°16'N, 110°09'E, c.350m, 6 iii 1982, *Argent & Sinclair* 8230 (holo. E; iso. L, K, KL).

Herb, stem at least 450mm tall, 3–5mm diam., very slender but woody, simple, bark longitudinally finely ridged, leafy only at apex and there clad in brown bristles

1.5–2mm long, quickly caducous. *Leaves* opposite, anisophyllous, minor leaf roughly one-third to one-half as long as major leaf, largest major leaves 140–180 × 50–80mm, obovate, apex acute, base cuneate, very narrowly decurrent down petiole, margins serrate, lateral veins 14–15 each side of midrib, tertiary veins coarsely reticulate, upper surface clad in scattered brown bristles to 2mm long, lower surface glabrous between the veins, midrib and lateral veins in particular with scattered brown bristles 1–3mm long, longest on midrib, otherwise glabrous; petioles 8–15mm long. *Inflorescence* a many-flowered, very congested, dichasial cyme, not plentiful, borne on the bare stem at the nodes well below the leafy stem-apex; peduncles 3–6mm long. *Bracts* c.15–17 × 4–7mm, elliptic-lanceolate, long-acuminate, triplinerved, upper surface glabrous, lower surface and margins with bristles up to 3mm long, bracteoles similar but progressively narrower and slightly shorter (10–13mm). *Pedicels* 2–3mm long, bristly. *Calyx* 5-lobed nearly to base, lobes c.3 × 0.5mm (in fruit and flower), few bristles c.2mm long near tips of lobes. *Corolla* white with 2 yellow bars on lower lip darkening to brown in throat, c.15mm long, tube 12mm, cylindrical at base then abruptly expanded and ventricose on lower side, bilabiate, lower lip badly damaged in both flowers seen, upper lip c.2 × 4mm, notched, outside with brown bristles to c.2mm long, inside minutely glandular below sinus on upper lip and on coloured base of lower lip. *Stamens* inserted c.7mm above base of tube, filaments 5mm, anthers 1.2 × 1mm, cohering face to face by a very small apiculus; lateral staminodes 2mm, posticous staminode not seen. *Disc* c.1 × 1mm, unilateral. *Ovary* 4.5 × 0.8mm, constricted at base to accommodate disc, glabrous. *Style* 4.5mm, very minutely gland-dotted. *Stigmatic lobes* c.1 × 0.6mm. *Fruit* 6–8 × 2.5–3mm, pericarp verrucose. *Seeds* c.0.25 × 0.2mm, not fully ripe, testa bright red-brown.

Cyrtandra brevisetosa is known to us only from the type collection. The plants were growing in shade among sandstone rocks by a river in the Gunong Bunga Range southwest of Kuching. The species has a distinct facies: long slender stems glabrous except at the apex and leafy there, with few inflorescences scattered down the stem well below the leaves.

The bristles on the stems are distinctly shorter than those of any other species in the group, which character suggested the specific epithet.

7. *Cyrtandra hottae* B.L.Burt, Edinburgh J. Bot. 47: 217 (1990).

Type: Borneo, Sarawak, Bintulu distr., eastern part of Bukit Kana [2°42'N, 112°54'E], along valley of Ulu Sungai Bejangung, 700–850m, 21 xi 1963, *Hirano & Hotta* 15377 (holo. KYO, iso. E).

Herb, stem up to c.500mm tall, 4mm diam., woody, simple, erect, leafy towards apex, often floriferous well down leafless part, thickly clad in strongly appressed brown bristles. *Leaves* opposite, strongly anisophyllous, minor leaf c.13–40 × 4–12mm, roughly one-tenth to one-third size of major leaf, largest major leaves 130–190 × 37–45mm including petiolar part, narrowly obovate, abruptly acuminate, base cuneate, decurrent down very short petiolar part, margins crenate-serrate, both

surfaces clad in red-brown bristles to c.3–5mm long. *Inflorescence* a 12- to many-flowered, very congested, axillary, dichasial cyme; peduncles c.5–8mm long, bristly. *Bracts* 12–18 × 6–9mm, ovate, bristles to 3mm on both surfaces mainly towards margins and on prominent midrib on lower surface; bracteoles similar, scarcely smaller. *Pedicels* 2–3mm long, setose. *Calyx* 5-lobed almost to base, lobes c.1.8–2 × 0.7mm, narrowly triangular, very few bristles on back of each lobe. *Corolla* white with a small patch of dark blotches (seen in dried material: no notes on colour by collectors) below the two sinuses of the lower lip, c.13mm long, tube 11mm, cylindrical below then abruptly expanded and ventricose on lower side, bilabiate, lower lip c.2 × 6mm, median lobe 2 × 2.2mm, upper lobes 1.5 × 2.6mm, outside a few bristly hairs, inside glabrous. *Stamens* inserted 7mm above base of tube, filaments c.5mm long, slightly twisted, anthers 1 × 0.8mm, face to face and united at extreme tips, staminodes not seen. *Disc* c.1 × 1mm, unilateral. *Ovary* 2.5 × 1mm, constricted at base to accommodate style, glabrous. *Style* c.2mm, few minute glandular hairs towards base. *Stigmatic lobes* c.0.25mm long. *Fruit* 5 × 2mm, pericarp verrucose. *Seeds* not fully ripe.

Other specimens examined. SARAWAK. Bintulu distr., Mubong to Sungai Latai [2°50'N, 114°12'E], along Ulu Sungai Kakus [2°48'N, 112°59'E], 12 xi 1963, *Hirano & Hotta* 1137 (E, KYO); Ulu Belaga, Sungai Semawat, 3°N, 113°54'E, *Hansen* 610 (C).

Cyrtandra hottae is rendered distinctive by the strongly appressed bristles on the stem in contrast to the spreading bristles in the other species of this group. Also, the leaves are often remarkably anisophyllous, and the bracteoles are scarcely smaller than the bracts, giving the inflorescence a very leafy look. Hansen described the stems and undersurface of the leaves as dark purple; the colour is often detectable in dried leaves. The leaves lack sclereids and a hypodermis.

Dr Mitsuru Hotta, Research Associate in the Herbarium, Department of Botany, Kyoto University, collected Bornean plants in the 1960s and donated many duplicates to E.

No further collections have been made since the species was first described in 1990. The plant may have a narrow distribution within Sarawak, between roughly 2°40' and 3°N, 112°50' to 113°E.

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REFERENCE

- HILLIARD, O. M. & BURTT, B. L. (2004). Bornean species of *Cyrtandra* (Gesneriaceae) closely allied to *C. chrysea* and *C. eximia*. *Kew Bull.* 59: 251–259.

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