

**The *Cyrtandra* (Gesneriaceae) species of Mount Kerinci,  
Sumatra.**

**Harvard Pap. Bot. 7: 407-421.**

**REFNO: 3384**

**KEYWORDS:**

***Cyrtandra*, Indonesia, Sumatra**

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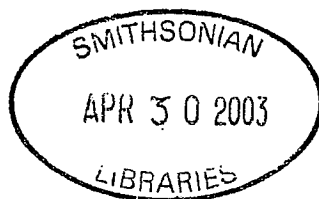
# Harvard Papers in Botany

Volume 7, Number 2

March 2003

A Publication of the Harvard University Herbaria Including  
The Journal of the Arnold Arboretum

Arnold Arboretum  
Botanical Museum  
Farlow Herbarium  
Gray Herbarium  
Oakes Ames Orchid Herbarium



ISSN: 1043-4534

## THE *CYRTANDRA* (GESNERIACEAE) SPECIES OF MOUNT KERINCI, SUMATRA

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**Abstract.** Collections of *Cyrtandra* from Mount Kerinci, Jambi province, Sumatra are reviewed. Thirteen species are known, three of which are new and described here: *C. aureotincta*, *C. pateniserrata*, and *C. stenoptera*. Two species are apparently endemic to Mount Kerinci, four to Kerinci and the immediate surrounding area and four extend to West Sumatra. An additional two species occur also in West Sumatra and apparently also in Java. Only one species, *C. anisophylla*, appears to be widespread in Sumatra.

**Keywords:** Sumatra, Mount Kerinci, Gesneriaceae, *Cyrtandra*, taxonomy.

Mount Kerinci, situated in the west of the Jambi province of Sumatra, forms part of the Barisan mountains (Fig. 1). This range runs the length of Sumatra and was uplifted as a result of thrust associated with the collision of the Indian plate with Asia about 70 million years ago (Whitten et al., 1997). The mountain is still volcanically active and, at 3805 m, is the highest Indonesian mountain outside Irian Jaya. It forms part of the Kerinci-Seblat National Park; which extends for nearly 350 km throughout the Barisan mountains.

Ecological surveys (e.g. Jacobs, 1958; Oshawa et al., 1985) have concluded that there are four distinguishable vegetation zones on Mt Kerinci: a) submontane forest, 1750–2400 m, dominated by *Ficus*, *Lithocarpus* and other large trees, with *Gleichenia* scrub in places; b) a montane forest, 2400–2900 m, dominated by *Symplocos* and *Rapanea* with increasing ericoid elements with altitude; c) a *Rhododendron-Vaccinium* scrub, 2900–3200 m; d) low open vegetation with no more than 30% cover, diminishing to scattered plants of *Histiopteris incisa* (Thunb.) J.Sm. in gulleys only, ending around 3400 m. There is scarce, if any, vegetation above this altitude due to the active state of the volcano. It is in the submontane and montane forest that species of *Cyrtandra* are

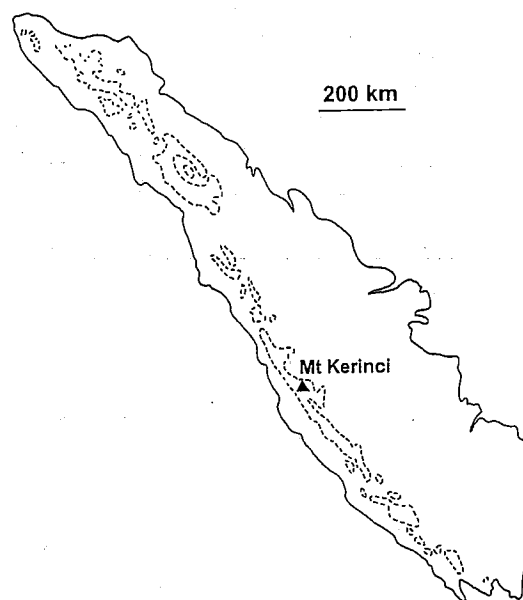


FIGURE 1. A map of Sumatra showing the location of Mount Kerinci. The dashed line represents the 1000 m contour.

common, their upper altitudinal limit being about 2500 m.

*Cyrtandra* J.R. & G.Forst. is the largest genus in the Gesneriaceae, probably consisting

This work was greatly facilitated by the kind encouragement of Sri Tjitrosoedirdjo and Radhiah Zakaria (BIOTROP, Bogor). We thank them particularly for their help in organising the joint RBGE-BIOTROP expedition to West Sumatra and Kerinci, and for many kindnesses in Bogor. For help in the field we thank Radhiah Zakaria and the staff of Andalas University herbarium in Padang, particularly Nurainas and Tamin. We also thank the Kerinci-Seblat National Parks authority in Sungai Penuh for permission to work in the Kerinci-Seblat National Park, and the staff of Herbarium Bogoriense for assistance with the processing of material. In addition we thank the Curators of A, BM, BO, K and L for the loan of material. For helpful comments, useful discussions and advice, we are grateful to H. Atkins, B.L. Burt, M. Mendum and R. Mill. We thank J. Boggan for access to his unpublished nomenclator of the Gesneriaceae. The receipt of a BBSRC studentship award to G.L.C. Bramley is gratefully acknowledged.

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of at least 600 species. The name is derived from the Greek *kyrtos*, meaning curved, and *andros*, meaning male, in reference to the spirally curved fertile staminal filaments. These recoil back into the corolla tube after dehiscence (a mechanism for the avoidance of self-pollination). The range of the genus is from the Nicobar Islands in the west, to southern Thailand, throughout Malesia to the Philippines, Taiwan, southern Ryukyu Islands, south east to Queensland and the Loyalty Islands and east to the high islands of the Pacific to Hawaii. Its main centers of speciation appear to be:

- i) Sundaland (Peninsular Malaysia, Sumatra, Java and Borneo);
- ii) the Philippines;
- iii) New Guinea;
- iv) Hawaiian Archipelago.

Each center has a remarkably high percentage of endemics, and the species or species groups that link them are relatively few (Burt, 1998; Atkins et al., 2001).

*Cyrtandra* species usually grow as an understory element in dense rainforest, often in ravines and gorges characterized by high humidity, very low light intensities and an almost constant moisture supply (Gillett, 1967). Populations are scattered and usually consist of a small assemblage of individuals, which may be subject to evolutionary change through genetic drift. The operation of mutation and selection, together with isolation and drift, provides a reasonable explanation for the large number of *Cyrtandra* species (Gillett, 1973).

The breeding system in *Cyrtandra* was discussed by Gillett (1967) and a study of the reproductive biology of *Cyrtandra grandiflora* Gaud. on Oahu was undertaken by Roelofs (1979). The flowers of *Cyrtandra* are protandrous: the earlier maturity of the anthers and the positioning of the anthers and stigma making a conspicuous provision for outcrossing. Self-incompatibility is not known in *Cyrtandra* or indeed in the Gesneriaceae, but self-pollination in *Cyrtandra* would seem to be minimized by the floral protandry. Studies on the Hawaiian *Cyrtandra* (Smith et al., 1996) have found that interspecific hybridization events have occurred.

It has often been noted that *Cyrtandra* taxonomy is difficult (Wagner et al., 1990; Burt, 1998). Indeed, Gillett (1967) stated that the

great diversity and the large number of species in this genus impose formidable demands on the taxonomist who aspires to interpret its infrageneric taxonomy. The last overall treatment of the genus, describing 167 species, was by C.B. Clarke in 1883 in A. and C. De Candolle's *Monographiae phanerogamarum*. However, Clarke had few collections to study and these were often inadequate. All the sections proposed by Clarke contain a mixture of species that would not now be classified together (Burt, 1990).

The massive size of the genus *Cyrtandra* makes a monograph virtually impossible within any reasonable timeframe. Areas within its range remain undercollected or completely uncollected, and its capability to speciate on a local scale means that the whole range would have to be covered to ensure a treatment was comprehensive. It is for these reasons that taxonomic work on *Cyrtandra* since Clarke (1883) has been on a regional scale.

In 1923, Schlechter published a treatment of the *Cyrtandra* species of New Guinea (96 species). Gillett (1967, 1973) completed accounts of *Cyrtandra* in Fiji (35 species) and the South Pacific (54 species). Sundaland has been the area of focus of B.L. Burt, especially the Bornean species (e.g. Burt, 1990). In addition, Atkins and Cronk (2001) revised the *Cyrtandra* species of Palawan (12 species). However, the main region of study has been the Hawaiian islands. The Hawaiian species have been the subject of five revisions (Clarke, 1883: 34 species; Hillebrand, 1888: 29 species; Rock, 1917, 1918, 1919a, 1919b: 52 species; St John, 1966: 131 species on Oahu; Wagner et al., 1990, 1999: 53 species). In addition, there have been studies on reproductive biology and hybridization (Roelofs, 1979; Smith et al., 1996). There is no comprehensive account of Sumatran *Cyrtandra*.

Although Sumatra is underworked, at present there are 62 published names for *Cyrtandra*, 46 of which are accepted (Boggan, unpubl.). In 1917 H. N. Ridley commented that 'it is somewhat remarkable that the flora of so large and accessible an island as Sumatra should have up to the present date received so little attention'. The situation has not changed much since that time, as Laumonier (1990, 1997) has remarked.

One of the earliest collectors was William Jack, sent to Bengkulu in 1820 as surgeon

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naturalist on the staff of Sir Stamford Raffles. He described about 125 new species, including 11 new *Cyrtandra* species (Merrill, 1952). However he died there in 1822 and his herbarium and manuscripts were destroyed in the burning of the ship "Fame". Species described by Jack have not often been recollected and as his published descriptions were not widely available and his types were destroyed, his names were therefore rarely taken up (Merrill, 1952). The Dutch botanists Miquel, Teysmann, Korthals and de Vriese, amongst others, collected in various parts of the island, chiefly in the lowland districts, the most extensive account being given in Miquel's *Flora Indiae Batavae*, 1855 (Ridley, 1917). The Italian, Odoardo Beccari, was another important collector, chiefly in west Sumatra, especially Mount Singgalang.

In 1877–78 Mount Kerinci was visited by the Dutch Mid-Sumatra expedition and some plants were collected; indeed the collections included *Cyrtandra rhyncanthera* C.B. Clarke. At this time Kerinci was still independent, making some areas difficult to access, but it came under Dutch control in 1903. The first specifically biological explorers of the mountain, in 1914, were H.C. Robinson and C. Boden Kloss, from the Federated Malay States Museum in Kuala Lumpur. They collected a number of *Cyrtandra* specimens from the peak which were subsequently published in an account by H.N. Ridley (1917). In terms of numbers of herbarium collections, the most important botanist was H.A.B. Bunnemeyer, in the employment of the Herbarium Bogoriense, who visited the peak in 1920. Figure 2 presents a graph illustrating his *Cyrtandra* collections. The other notable collectors were A.H.G. Alston in 1954 and W. Meijer in 1956. Jacobs (1958) provides an account of Meijer's expedition to the Kerinci area. In addition, in July 2000, Radhiah Zakaria and Q.C.B. Cronk, on a BIOTROP-RBGE expedition, collected many *Cyrtandra* specimens from the Peak and other locations in west Sumatra.

This paper is the first stage in a study that will attempt to establish the origins and relationships of Sumatran *Cyrtandra*, and the *Cyrtandra* in neighboring areas such as the Malay Peninsula.

What follows are keys and descriptions of the thirteen *Cyrtandra* species known from Mount Kerinci.

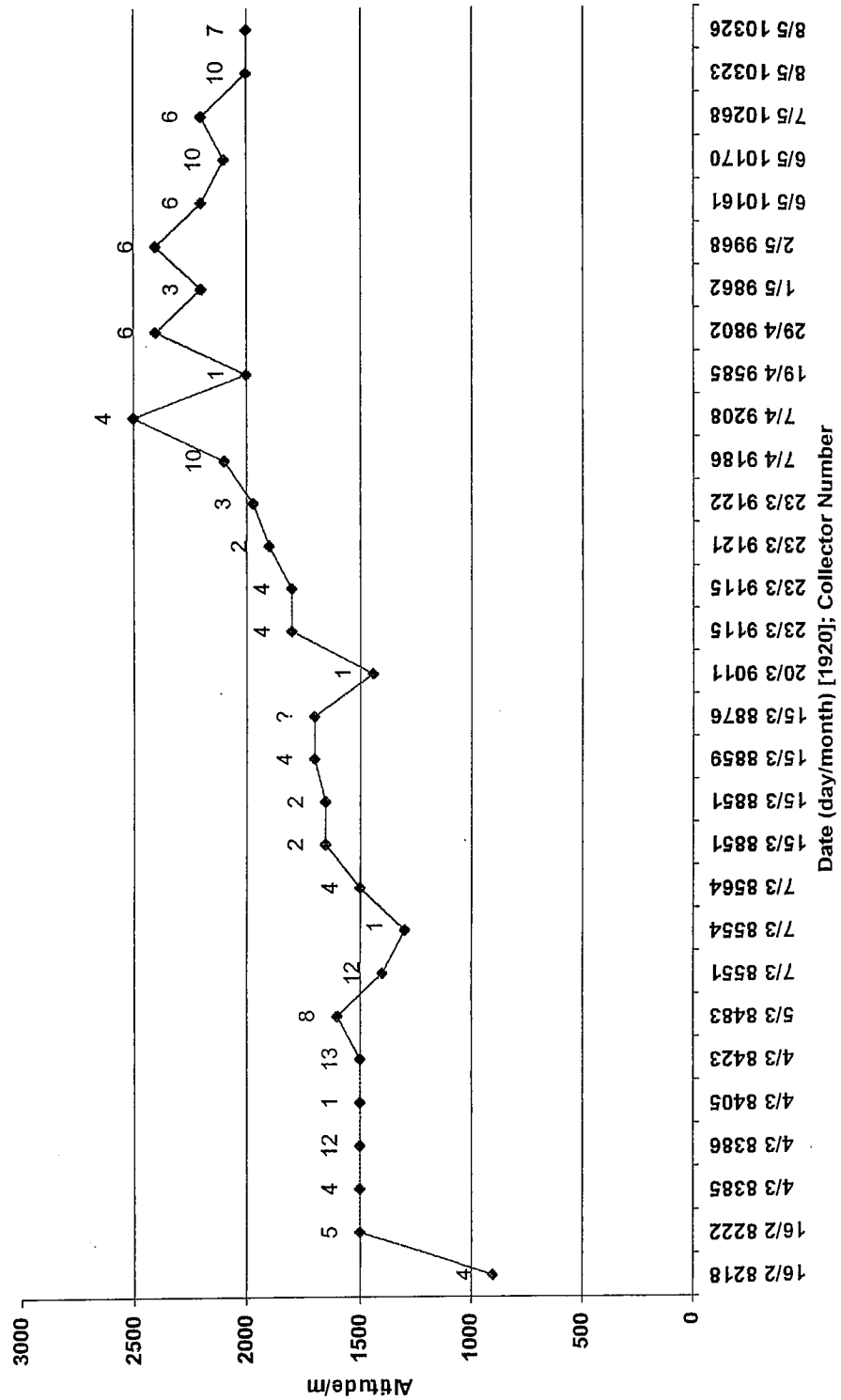
In the keys and descriptions:

- i) Measurements are given for leaves presumed to be mature, and their shape described following Hickey (1979);
- ii) All measurements of floral characters were taken from herbarium material that had been rehydrated and softened in spirit;
- iii) All details of plant heights and colors in the descriptions are taken from the collectors' notes, in most cases the collectors being Radhiah and Cronk;
- iv) All locations follow the American National Imagery and Mapping Agency's (NIMA) GEOnet Names Server (<http://164.214.2.59/gns/html/index.html>);
- v) Descriptions of stigmas: in rehydrated material, stigma characters are very difficult to see, nevertheless, there seem to be some interesting differences between species. The following terms have been used to reflect the basic stigma structure:
  - a) bilobed: when it is only possible to see that there are two lobes present;
  - b) horizontally bilobed: when the two lobes appear to be spread flat, at right angles to the style;
  - c) two short blunt lobes: the lobes are shorter and more rounded than in the other species;
  - d) two triangular lobes: the lobes are distinctly triangular in shape;
  - e) biflabellate: the two lobes are each distinctly fan shaped.
- vi) All measurements refer to length unless stated otherwise.

The first key is designed for use in the herbarium. To this end, the characters chosen are principally vegetative, since many *Cyrtandra* specimens encountered are sterile and of poor quality. However, a second key based on floral characters is also included for interest. Species are arranged in informal groups, I, II & III, according to an unpublished molecular phylogenetic analysis by the authors. Figure 3 presents a leaf spectrum illustrating leaf outlines and margin detail for each of the thirteen species described. Figure 4 shows floral dissections of two of the new species described, *Cyrtandra aureotincta* and *Cyrtandra patenserrata*. The following generic description applies to the Sumatran material encountered in this study only.

FIGURE 2. A graph showing the dates and numbers of Bünne Meyer's *Cyrtandra* collections from Mount Kerinci against the altitudes at which they were collected. The numbers above each specimen are the species numbers, following the account.

Bünne Meyer's Collections



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Date (day/month) [1920]; Collector Number

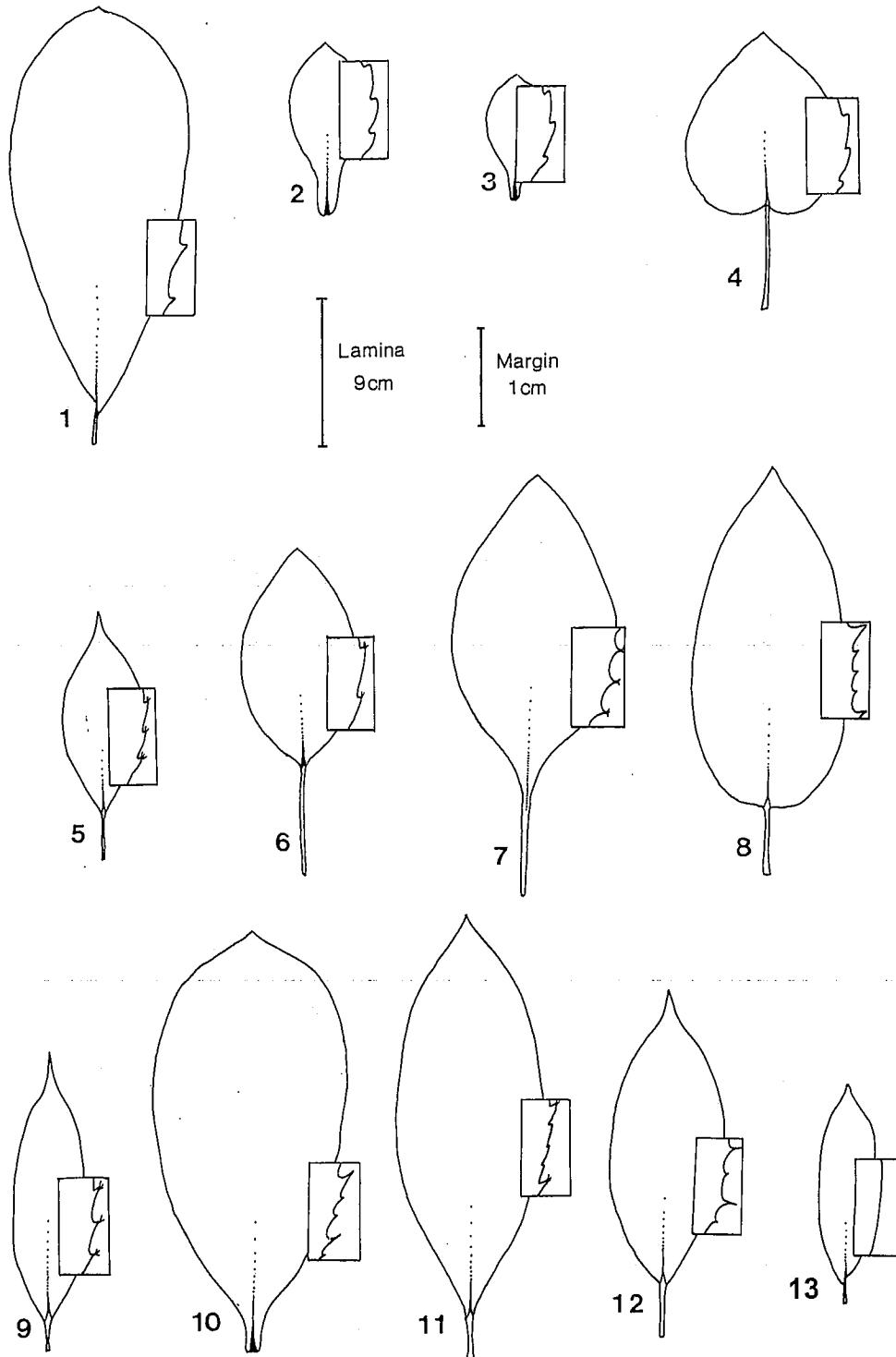


FIGURE 3. 1-13. Leaf spectrum of all thirteen *Cyrtandra* species from Mount Kerinci. Numbering of species follows the account. Note that the trichomes on the leaf margin in species 5, 6, 7 and 9 are enlarged.

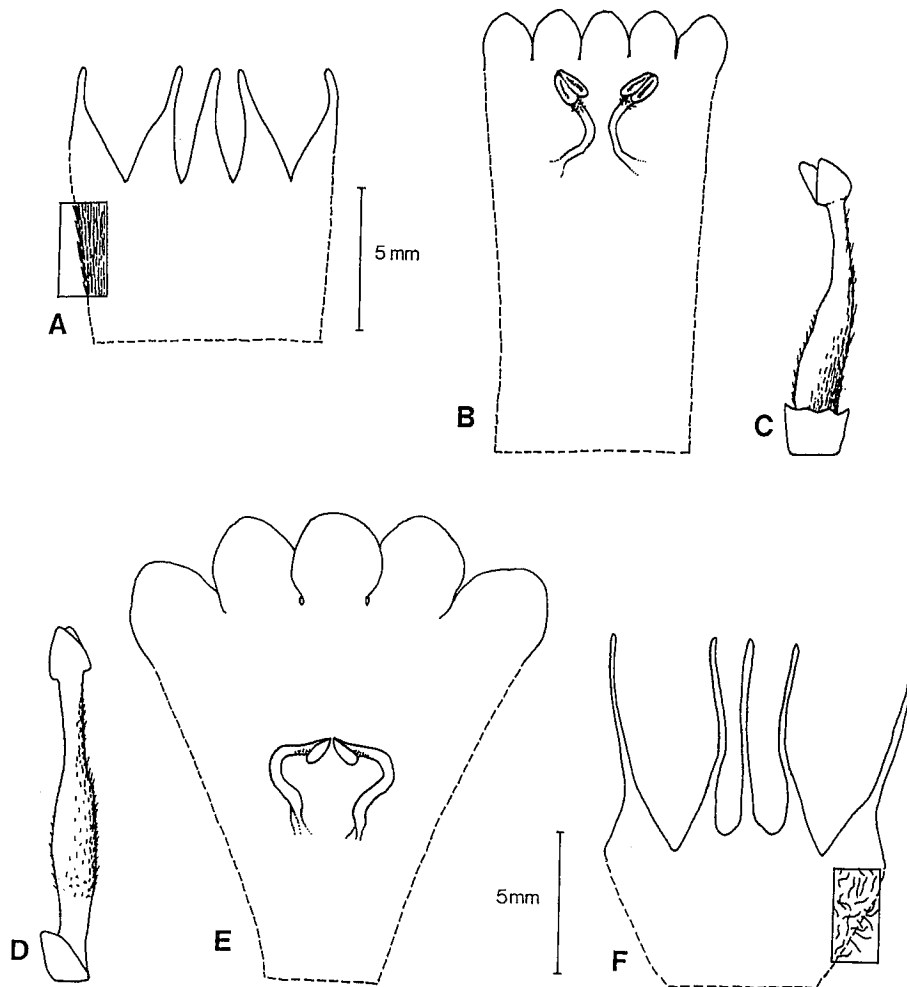


FIGURE 4. A-C. *Cyrtandra aureotincta* Bramley & Cronk: A, calyx, dissected ventrally with indumentum detail; B, corolla, dissected dorsally, showing stamens; C, gynoecium and disk. Drawn from the holotype. D-F. *Cyrtandra patenserrata* Bramley & Cronk: D, gynoecium and disk; E, corolla, dissected dorsally, showing stamens; F, calyx, dissected ventrally with indumentum detail. Drawn from the holotype. It must be noted that the difference in stamen position between species is due to the developmental stage of the flower. The joined anthers in *C. patenserrata* are an earlier stage to the separate anthers in *C. aureotincta*.

*Cyrtandra* J.R. & G.Forst., *Char. gen. pl.* 5 (1776).

Herbs, epiphytes or shrubs. *Leaves* simple, opposite or sometimes pseudoalternate; the leaves in a pair being equal (isophyllous), subequal, or one member being very reduced (anisophyllous), hairy to glabrous above, the venation below often raised and hairy. *Inflorescence* usually in the upper leaf axils but occasionally cauliflorous, sessile, subsessile or pedunculate; *flowers* one to numerous in cymes. Bracts often enclosing or subtending inflores-

cence. *Calyx* 5-lobed, often hairy, persistent or caducous in fruit. *Corolla* tubular, five lobed, lobes subequal to bilabiate, usually white but can be green, red, pink or violet; the lobes sometimes differing in color from the corolla tube. *Stamens* 2. *Staminodes* 3, if present. *Ovary* superior, hairy or glabrous; placentation parietal. *Disk* cupular or unilateral, often persistent around the ovary in fruit. *Fruit* a fleshy or firm berry, often tipped by the persistent styler beak.

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KEY TO SPECIES OF *CYRTANDRA* ON MOUNT KERINCI, SUMATRA

## KEY ONE • (VEGETATIVE CHARACTERS)

- 1a. Leaf arrangement opposite and markedly anisophyllous, sometimes pseudoalternate . . . . . 2  
 1b. Leaf arrangement opposite and equal or slightly unequal in size . . . . . 4  
 2a. Leaf margins entire, lamina narrowly oblong . . . . . 13. *C. flabelligera*  
 2b. Leaf margins serrate, lamina ovate or elliptic to obovate or oblanceolate . . . . . 3  
 3a. Lamina narrowly elliptic to obovate to oblanceolate . . . . . 1. *C. anisophylla*  
 3b. Lamina ovate to broadly ovate, leaf margins serrate . . . . . 4. *C. longepetiolata*  
 4a. Terrestrial herb . . . . . 5  
 4b. Shrub (may be unbranched or branched) . . . . . 7  
 5a. Lamina ovate or broadly ovate with rounded or cordate base, petiole distinct, 8–15 cm . . . . . 4. *C. longepetiolata*  
 5b. Lamina oblanceolate, spatulate or narrowly elliptic to narrowly obovate, decurrent to base of stem . . . . . 6  
 6a. Leaves oblanceolate, bullate . . . . . 2. *C. fenestrata*  
 6b. Leaves, spatulate to narrowly elliptic to narrowly obovate, non-bullate . . . . . 3. *C. rhyncanthera*  
 7a. Inflorescence sessile or on a peduncle less than 1 cm long . . . . . 8  
 7b. Inflorescence on a peduncle greater than 1 cm long . . . . . 13  
 8a. Leaf decurrent or petiole narrowly winged or ridged . . . . . 9  
 8b. Leaf not decurrent, petiole unwinged . . . . . 10  
 9a. Leaf margin serrate, lamina usually less than 20 cm, decurrent with petiole narrowly winged or ridged to the stem . . . . . 7. *C. stenoptera*  
 9b. Leaf margin biserrate, lamina usually greater than 20 cm, decurrent, c.1 cm either side of petiole at base . . . . . 10. *C. rosea*  
 10a. Leaf elliptic to narrowly elliptic, margins serrate . . . . . 5. *C. membranacea*  
 10b. Leaf narrowly ovate, elliptic or narrowly elliptic, margins biserrate . . . . . 11  
 11a. Leaves with all venation below raised and densely hairy (tertiary veins always hairy) . . . . . 11. *C. aureotincta*  
 11b. Leaves with only midrib and lateral nerve pairs below either raised and hairy or subglabrous (tertiary veins always subglabrous) . . . . . 12  
 12a. Lamina elliptic, base acute . . . . . 12. *C. patentiserrata*  
 12b. Lamina narrowly ovate, base obtuse or cordate . . . . . 8. *C. ampla*  
 13a. Lamina narrowly elliptic with a distinct acuminate tip, surface rugose from impressed venation, corolla less than 2 cm long . . . . . 9. *C. impressivenia*  
 13b. Lamina narrowly elliptic to elliptic, tip acute to acuminate, surface smooth, corolla greater than 3 cm long . . . . . 6. *C. trichodon*

## KEY TWO • (FLORAL CHARACTERS)

- 1a. Corolla greater than 3 cm long . . . . . 2  
 1b. Corolla less than 3 cm long . . . . . 3  
 2a. Flowers solitary . . . . . 4  
 2b. Number of flowers greater than one . . . . . 5  
 3a. Corolla 1–3 cm long . . . . . 6  
 3b. Corolla less than 1 cm long . . . . . 13  
 4a. Leaves bullate . . . . . 2. *C. fenestrata*  
 4b. Leaves non-bullate . . . . . 3. *C. rhyncanthera*  
 5a. Calyx divided into five even lobes, inflorescence subsessile . . . . . 4. *C. longepetiolata*  
 5b. Calyx with the three upper lobes more deeply divided than the two lower, inflorescence pedunculate . . . . . 6. *C. trichodon*  
 6a. Calyx divided into five even lobes . . . . . 7  
 6b. Calyx divided into three upper lobes distinct from two lower lobes . . . . . 10  
 7a. Calyx less than 0.5 cm long . . . . . 13. *C. flabelligera*  
 7b. Calyx greater than 0.5 cm long . . . . . 8  
 8a. Inflorescence enclosed in bracts greater than or equal to 2cm long . . . . . 9  
 8b. Inflorescence enclosed in bracts less than 1.5 cm long . . . . . 12  
 9a. Bracts delicate, white, ca. 2.5 cm long . . . . . 5. *C. membranacea*  
 9b. Bracts verrucose, white, ca. 2 cm long . . . . . 7. *C. stenoptera*  
 10a. Corolla white or greenish-white . . . . . 11  
 10b. Corolla red, pink or violet . . . . . 10. *C. rosea*  
 11a. Disk cupular, hairy . . . . . 11. *C. aureotincta*  
 11b. Disk cupular, glabrous . . . . . 7. *C. stenoptera*  
 12a. Calyx ca. 8 mm long, lobes triangular, ca. 2 mm long . . . . . 8. *C. ampla*  
 12b. Calyx ca. 12 mm long, lobes ca. 6 mm long with very fine tips ca. 4 mm long . . . . . 12. *C. patentiserrata*  
 13a. Calyx asymmetric, three lobes fused to form one, the other two divided to the base . . . . . 1. *C. anisophylla*  
 13b. Calyx divided into five even lobes . . . . . 9. *C. impressivenia*

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## GROUP I

1. *Cyrtandra anisophylla* C.B. Clarke in A. & C. DC., *Monogr. phan.* 5: 249. 1883. TYPE: SUMATRA. West Sumatra: Mount Singgalang, 1700 m, June–July 1878, *Beccari s.n.* (holotype: *n.v.*; isotype K).

Erect shrub to 1.5 m. *Leaves* markedly anisophyllous: the larger 15–29 × 6.5–12 cm on a petiole ca. 2 cm, lamina elliptic to narrowly obovate to oblanceolate, apex obtuse to shortly acuminate, base asymmetric, glabrous both above and below, margins serrate, lateral nerve pairs 9–13; the smaller 1.5–3 × 1–1.5 cm, sessile, lamina ovate, apex acuminate, margins entire. *Inflorescence* in axils of leaves, more or less sessile, with many flowers clustered together. *Bracts* overlapping and covering inflorescence, green tinged brownish, somewhat verrucose at base, hairy, broadly ovate, ca. 1 cm, inner bracts smaller. *Calyx* ca. 9 mm, verrucose at base, externally glabrous, internally with glandular and eglandular hairs, asymmetric with 3 lobes fused to form one, obovate with a tridentate apex, otherwise divided to base, the other two lobes slightly shorter with rounded apices. *Corolla* off white, ca. 8 mm, completely enclosed by calyx, outside of lobes with glandular hairs, inside papillose. *Filaments* ca. 4 mm, papillose. *Anthers* ca. 1 mm. *Gynoecium* ca. 6 mm, style with short glandular hairs, stigma horizontally bilobed. *Disk* cupular, ca. 1.5 mm high, margin uneven. *Fruit* more or less globose, 5–10 × 5–12 mm, somewhat fleshy, verrucose, sometimes apiculate from persistent style.

**Mount Kerinci specimens examined.** SUMATRA. Jambi: Mount Kerinci. 1 March 1954, *Alston 13972* (BM); 1500 m, 4 March 1920, *Bünnemeyer 8405* (L); 1300 m, 7 March 1920, *Bünnemeyer 8554* (L); 1440 m, 20 March 1920, *Bünnemeyer 9011* (L); 2000 m, 19 April 1920, *Bünnemeyer 9585* (BO); 1950 m, July 1979, *Ohsawa et al. A-176* (BO); 1800–2000 m, 27 July 2000, *Radhiah & Cronk 109* (E).

**Selected additional specimens examined.** SUMATRA. Aceh: Gunung Leuser Nature Reserve, 1250 m, 26 June 1979, *de Wilde & de Wilde-Duyffjes 18992* (L). North Sumatra: Asahan, Aek Salabat, 450 m, 15–26 July 1936, *Boeea 9591* (A); south of Sidikalang, nr Parbuluan, 28 March 1954, *Alston 14856* (BM).

**Distribution:** SUMATRA. Aceh, Jambi (Kerinci), North Sumatra, West Sumatra; 450–2000 m.

This is a very common and widespread species in Sumatra. It is easily recognizable in the herbarium by the pale underside of the leaves that have very dark venation when dried. However, it must not be confused with *C. beccarii* C.B. Clarke, also from Sumatra, that has the same leaf type but bears a pedunculate rather than sessile inflorescence.

It is the only species to fall into any of the sections that Clarke recognized. This section, *Dissimiles*, is also upheld by B.L. Burtt (Burtt, 1990). It is defined by well-marked characters including anisophyllous leaves and a zygomorphic calyx and contains *C. trisepala* C.B. Clarke and *C. multibracteata* C.B. Clarke of Borneo and *C. stonei* B.L. Burtt of the Malay Peninsula as well as *C. anisophylla* C.B. Clarke and *C. beccarii* C.B. Clarke.

## GROUP II

2. *Cyrtandra fenestrata* C.B. Clarke in A. & C. DC., *Monogr. phan.* 5: 233. 1883. TYPE: SUMATRA. West Sumatra: Mount Singgalang, 1878, *Beccari 65* (syntypes: K, L), 253 (syntypes: BM, K, L).

Terrestrial herb; stem, when mature, somewhat woody and glabrescent, but fleshy and with scabrous hairs when young. *Leaves* opposite and slightly anisophyllous, the larger of the pair 9.5–13.5 × 3–4 cm, the smaller 1–2 cm shorter, lamina oblanceolate, acute, bullate, margin crenate-serrate, decurrent onto stem, up to 1 cm wide at the very base, midrib broadening towards base, scabrous hairy above, all venation below prominent and hairy; lateral nerve pairs 8–9. *Inflorescence* in axils of leaves, single flowered. *Bracts* in a pair at the base of the pedicel; ca. 1 cm long, linear, entire, hairy. *Pedicels* ca. 5 mm. *Calyx* ca. 13 mm, externally with short hairs, internally somewhat verrucose; tube ca. 8 mm; lobes subulate ca. 5 mm. *Corolla* white, ca. 5 cm, narrow within calyx (ca. 5 mm) but then widening to form a broad mouth, ca. 2.5 cm wide; outside, except the parts of lobes covered by the aestivation of the corolla, with long silky hairs, inside papillose. *Filaments* ca. 1 cm, with small area of papillae just below anthers. *Anthers* ca. 2 mm, the connective extending to form hooked tips, ca. 1 mm high, above anthers. *Gynoecium* ca. 2.5 cm, style with eglandular hairs becoming shorter towards ovary, top of ovary with short scattered glands; stigma biflabellate, outer surface hairy, inner face papillose. *Disk* ca. 2.5 mm high, cupular. *Fruit* not seen.

**Mount Kerinci specimens seen.** SUMATRA. Jambi: Mount Kerinci. 1650 m, 15 March 1920, *Bünnemeyer 8851* (K, L); 1900 m, 23 March 1920, *Bünnemeyer 9121* (L).

**Selected additional specimens examined.** SUMATRA. Jambi: Lake Tujuh, 31 July 2000, *Radhiah & Cronk 147*; Mount Tujuh, 1800–2000 m, July 1956, *Meijer 7281* (L). West Sumatra: Mount Singgalang, 1300–1400 m, 26 July 1894, *Schiffner 2563* (A); 1800 m, 25 May 1957 *Meijer 5824* (L).

**Distribution:** SUMATRA. Jambi (Kerinci), West Sumatra; 1300–2000 m.

This species is distinct due to its bullate leaves and large solitary white flower, usually axillary towards the top of the stem. Furthermore, the connective is extended into small hooks above the anthers. It shares this character with *C. rhyncanthera* C.B. Clarke which appears to be very closely related. A lectotype is not suggested because of mixed collections of Beccari 65 and 253.

**3. *Cyrtandra rhyncanthera* C.B. Clarke in A. & C. DC., *Monogr. phan.* 5: 233. 1883. TYPE:** SUMATRA. West Sumatra: Mount Singgalang, *Curtis 77* (lectotype: K).

Terrestrial herb, creeping, putting forth erect stems to ca. 40 cm; stems at first scabrous, becoming glabrescent. *Leaves* opposite and somewhat anisophyllous, the larger of the pair 7–13 × 4–6 cm, the smaller 6–9 × 3–4 cm, both decurrent onto stem, up to 1 cm wide at base; lamina spatulate, or less often narrowly elliptic to narrowly obovate, acute apex formed by terminal serration, margin serrate to crenate serrate, serrations varying in depth and spread, often with tufts of hair at tips; new growth with scabrous hairs above, hairs soon becoming scattered, all venation raised and hairy below; lateral nerve pairs 6–10. *Inflorescence* in axils of leaves, single flowered. *Bracts* in a pair at the base of the pedicel; green, linear, hairy, ca. 10 × 1 mm. *Pedicels* 5–10 mm, hairy. *Calyx* green, 11–15 mm, externally with short angular hairs especially concentrated on ridges, internally glabrous; tube 7–9 mm; lobes 4–6 mm, slightly ridged in the centre, the ridges narrowing to form fine tips ca. 2 mm. *Corolla* white, 4–4.5 cm, narrow within calyx then quickly expanding to 2–2.5 cm wide, lobes with a frilled edge, outside with silky hairs except on parts of lobes covered by the aestivation of the corolla, inside with papillae that follow the edges of corolla lobes down corolla tube.

*Filaments* ca. 8 mm with a small area of papillae just below anthers, the connective extending to form small hooks, ca. 1 mm, beyond the anthers. *Anthers* ca. 2.5 mm. *Gynoecium* ca. 1.8 cm; ovary with scattered short glandular hairs, hairs becoming longer and eglandular on style; stigma 2 mm, bilabellate, inner face papillose. *Disk* cupular, ca. 2 mm high, margin irregularly dentate. *Fruit* ovoid, 15–19 × 6–7 mm, calyx sometimes persisting.

**Mount Kerinci specimens examined.** SUMATRA. Jambi: Mount Kerinci. 2225 m [7300 ft], May 1914, *Robinson & Kloss s.n.* (BM); 1970 m, 23 March 1920, *Bünnemeyer 9122* (L); 2200 m, 1 May 1920, *Bünnemeyer 9862* (BO); 2300 m, 30 July 1921, *Frey-Wyssling 121* (BO); 1800–1900 m, 31 July 1956, *Meijer 6419* (L); 2000 m, 1 August 1956, *Meijer 6462* (L); 2000 m, 27 July 2000, *Radhiah & Cronk 111* (E); 2000–2500 m, 28 July 2000, *Radhiah & Cronk 112* (E); 2000–2500 m, 28 July 2000, *Radhiah & Cronk 118* (E); 1877–78, *Dutch Mid-Sumat. Exped. s.n.* (L).

**Selected additional specimens examined.** SUMATRA. Jambi: Kerinci, Lake Tujuh, 31 July 2000, *Radhiah & Cronk 146* (E). West Sumatra: Mount Merapi, 1600 m, 14 September 1918, *Bünnemeyer 4578* (L); Mount Singgalang, 1878, *Beccari 62* (L); Mount Singgalang nr Bukittinggi, 1800 m, 25 May 1957, *Meijer 5823* (L); Mount Talang, 1900 m, 8 November 1918, *Bünnemeyer 5547* (L).

**Distribution:** SUMATRA: Jambi (Kerinci), West Sumatra; 1600–2500 m.

*Radhiah & Cronk 111* has reddish pigmentation, the leaves are more elliptic and margins very small crenate-serrate, but this probably represents natural variation within this species. *C. rhyncanthera* is closely allied to *C. fenestrata* although the leaves are spatulate or narrowly elliptic to narrowly obovate and smooth rather than oblanceolate and bullate. The large solitary white flower is, however, very similar to that of *C. fenestrata* and the extended connectives are also present.

*Curtis 77* (K) is here lectotypified.

**4. *Cyrtandra longepetiolata* de Vriese, *Pl. Ind. bat. orient.*: 12. 1856. TYPE:** JAVA. Mount Patuha, collector unknown (L).

Terrestrial herb with branching stem. *Leaves* opposite, sometimes subequal or sometimes one member of the pair reduced to a leafy scale, petioles 8–15 cm long, lamina ovate to broadly

ovate, 10–14 cm × 8–10 cm, shortly acuminate at the apex, rounded to cordate at the base, margins serrate, lamina surface glabrous or subglabrous above, venation with short dense hairs below; lateral nerve pairs 5–6. *Inflorescence* in axils of leaves, sessile or subsessile, usually 4–8 clustered flowers. *Bract* purplish-green, enclosing inflorescence. *Pedicels* very short, ca. 3 mm. *Calyx* reddish brown, ca. 1.5 cm, externally with short fine hairs, internally verrucose; tube ca. 9 mm; lobes, ca. 6 mm, triangular, prominently ridged in the centre, the ridges narrowing to form fine tips ca. 3 mm. *Corolla* white, sometimes with a reddish flush and a purple pink speckle in the throat, 3.5–4 cm, broadening towards mouth, outside with silky hairs, inside papillose. *Filaments* ca. 8 mm, glabrous. *Anthers* ca. 2 mm. *Gynoecium* ca. 1.7 cm, style with short hairs, ovary glabrous; stigma with two short blunt lobes, inner face papillose. *Disk* cupular, ca. 2 mm high, margin undulate. *Fruit* ellipsoid, ca. 15 × 5 mm including ca. 5 mm beak, calyx not persistent.

**Mount Kerinci specimens examined.** SUMATRA. Jambi: Mount Kerinci. 900 m, 16 February 1920, *Bünnemeyer* 8218 (BO); 1500 m, 4 March 1920, *Bünnemeyer* 8385 (L); 1500 m, 7 March 1920, *Bünnemeyer* 8564 (BO); 1700 m, 15 March 1920, *Bünnemeyer* 8859 (BO); 1800 m, 23 March 1920, *Bünnemeyer* 9115 (BM, L); 2500 m, 7 April 1920, *Bünnemeyer* 9208 (BO); 1600 m, 30 July 1956, *Meijer* 6358 (L); 1900 m, 27 July 2000, *Radhiah & Cronk* 108 (E).

**Selected additional specimens examined.** SUMATRA. Jambi, Kerinci: Lake Tujuh, 31 July 2000, *Radhiah & Cronk* 140 (E); Mount Tujuh, 1300 m, 4 August 1956, *Meijer* 6590 (L). West Sumatra: Mount Singgalang, 2400 m, 24 May 1918, *Bünnemeyer* 2634 (L); Mount Merapi, 1500 m, 14 October 1918, *Bünnemeyer* 4579 (L); road from Padang to Solok, 900 m, 25 July 2000, *Radhiah and Cronk* 102 (E).

**Distribution:** JAVA. SUMATRA. Jambi (Kerinci), West Sumatra; 900–2500 m.

In Flora of Java (Backer et al., 1965) *C. longepetiolata* de Vriese is given as a synonym of *C. picta* Blume (described from Java). Indeed the type specimen of *C. picta* Blume is actually the original type specimen of *C. longepetiolata* de Vriese. However, according to the International Plant Names Index the name *C. longepetiolata* de Vriese is still upheld, we have therefore chosen to use the name *C. longepetiolata* de Vriese in this account.

It is not clear from the specimens available whether the Kerinci material is truly referable to *C. longepetiolata* of Java. The type specimen of *C. longepetiolata* is vegetatively similar, in that the characteristics of the lamina and the long petioles are not unlike the specimens described here. It also appears to have a subsessile or sessile inflorescence. De Vriese described the flowers as "*rubris*", but the Sumatran specimens examined for this revision have white flowers.

The long petiolate, subglabrous ovate leaves, often cordate at the base, make this species easily recognisable. It must not be confused with *C. pendula* Blume (described from Java), a species that is vegetatively very similar but has an inflorescence that extends to the ground, and in fruit often becomes buried on a long peduncle.

**5. *Cyrtandra membranacea* Ridl.** in J. Fed. Malay States Mus. 8 (4): 71. 1917. TYPE: SUMATRA. Jambi: Kerinci, Siulakderas, 1341 m [4400 ft], 16 Mar. 1914, *Robinson & Kloss* s.n. (holotype: BM; isotype K).

Erect, unbranched shrub. *Leaves* opposite, pairs slightly subequal on petioles 3–3.5 cm long, lamina elliptic to narrowly elliptic, 10–13 × 4–5 cm, apex acuminate, base shortly decurrent, margin with serrations with distinct tufts of hair at tips, surface hairy or sparsely hairy above, venation below raised and hairy; lateral nerve pairs 7–8. *Inflorescence* in axils of leaves, almost sessile, few flowered. *Bracts* enclosing inflorescence, ca. 2.5 cm, white, delicate and hairy with venation prominent on the external surface, margins serrate. *Calyx* ca. 13 mm, externally with long silky hairs, verrucose at base, internally with scattered hairs; tube ca. 8 mm; lobes ca. 5 mm with fine tips, these twisting together to form a point above the corolla when in bud. *Corolla* white, ca. 2.3 cm, ca. 3 mm wide within calyx, broadening to ca. 1 cm at mouth, outside with silky hairs, inside glabrous. *Filaments* ca. 1 cm, glabrous. *Anthers* ca. 2 mm. *Gynoecium* ca. 1.3 cm, style with glandular hairs, stigma bilobed. *Disk* ca. 1.5 mm, cupular, margin undulate. *Fruit* not seen.

**Mount Kerinci specimens examined.** SUMATRA. Jambi: Mount Kerinci. 1500 m, 16 February 1920, *Bünnemeyer* 8222 (BO).

**Selected additional specimens examined.** SUMATRA. Jambi: Kerinci. Mount Tujuh, alt. 1300 m, 4 August 1956, *Meijer* 6588 (L); Sungai Kering, 3 March 1954, *Alston* 14123 (A, BM, L); Sungai Kumbang, 1 May 1914, *Robinson & Kloss* s.n. (BM).

**Distribution:** SUMATRA. Jambi (Kerinci); 1300–1500 m.

In the herbarium, specimens are often notable for their lack of discoloration in leaves and bracts and extensive herbivore damage.

6. *Cyrtandra trichodon* Ridl. J. Fed. Malay States Mus. 8 (4):70. 1917. TYPE: SUMATRA. Jambi: Kerinci, Mount Kerinci, 2225 m [7300 ft], 6 May 1914, *Robinson & Kloss s.n.* (holotype: BM; isotype K).

Erect shrub, stem branched. *Leaves* opposite and isophyllous on petioles 3.5–7 cm, lamina narrowly elliptic to elliptic, 10–15 × 3.5–7.5 cm, acute to acuminate at the apex, base acute, margins usually with shallow serrations, with distinct tufts of hair at tips, surface with scattered hairs above and short coarse hairs on venation below; lateral nerve pairs 6–8. *Inflorescence* in axils of leaves, usually 4–6 flowers. *Bracts* ca. 2 cm, enclosing inflorescence; hairy on both outer and inner surfaces, somewhat verrucose at base. *Peduncles* 1–2.5 cm. *Pedicels* ca. 5 mm. *Calyx* ca. 12 mm, externally with long silky hairs, internally glabrous; tube ca. 6 mm; lobes, the lower two shorter (ca. 4 mm) and upper three longer (ca. 6 mm) both types narrowing to form fine tips ca. 0.5 mm wide for ca. 3 mm. *Corolla* white, ca. 4 cm, narrow within calyx but widening to form a tube ca. 1.2 cm wide that usually does not further broaden at the mouth, outside with silky hairs, inside papillose especially in the upper half, including the lobes, lobes sometimes with an undulate edge. *Filaments* ca. 9 mm, glabrous. *Anthers* ca. 2 mm. *Gynoecium* ca. 2.3 cm, ovary glabrous, style with glandular or sometimes eglandular hairs, stigma ca. 2.5 × 1.5 mm, horizontally bilobed, inner face papillose. *Disk* cupular, ca. 2 mm, margin undulate. *Fruit* ovoid, verrucose, ca. 13 × 6 mm, including 2 mm beak.

**Mount Kerinci specimens examined.** SUMATRA. Jambi: Mount Kerinci. 2400 m, 29 April 1920, *Bünnemeyer 9802* (BO); 2400 m, 2 May 1920, *Bünnemeyer 9968* (BO); 2200 m, 6 May 1920, *Bünnemeyer 10161* (BO); 2200 m, 7 May 1920, *Bünnemeyer 10268* (BO); 1800–1900 m, 31 July 1956, *Meijer 6420* (L); 2000–2500 m, 28 July 2000, *Radhiah & Cronk 124* (E); 2000–2500 m, 28 July 2000, *Radhiah & Cronk 126* (E), 2300 m, *Laumonier TFB 528* (L).

**Distribution:** SUMATRA. Jambi: (Kerinci peak endemic); 2000–2500 m.

Whilst the specimens *Radhiah & Cronk (R&C) 124* and *126* have been included in *C. trichodon*, there are some morphological differences. *R&C 124* was devoid of any particularly informative inflorescence material, but *R&C 126* has bracts that extend into ca. 1.5 cm tips, ca. 4 mm broad. The leaves are slightly larger, 12–16 × 5–7.5 cm and the bases slightly more decurrent. The corolla broadens at the mouth; hairs are not present on the parts of the corolla lobes covered by the aestivation of the corolla; there are less papillae on the actual corolla lobes, and the style has eglandular hairs that become shorter just above the ovary and are more like large papillae. *Laumonier TFB 528* is also an outlying specimen; its leaves are narrowly elliptic, 11–12 × 4–4.5 cm, and the margin has deeper serrations. These differences demonstrate the variation within the species.

7. *Cyrtandra stenoptera* Bramley & Cronk *sp. nov.* TYPE: SUMATRA. Jambi: Mount Kerinci, 1800–2000 m, 27 July 2000, *Radhiah & Cronk 110* (holotype: E; isotypes: BIOT, BO [n.v.]).

*Folia marginibus serratis et petiolis anguste alatis vel ad caules porcatis, inflorescentiae in bracteis albis inclusae. A C. trichodonti inflorescentiis sessilibus vel subsessilibus et foliis decurrentibus differt.*

Shrub to ca. 1.2 m on unbranched stem. *Leaves* opposite and isophyllous, sometimes subequal, main section of lamina 17–20 × 8.5–11 cm, elliptic, decurrent to stem, lamina narrowing to only a few mm wide either side of petiole, or forming a narrower ridge for 5–10 cm, apex acute, margin with serrations with distinct tufts of hair at tips, new growth hairy above, hairs becoming more scattered with age but often original covering remaining on midrib, hairy below, especially on venation, hairs finer than those above; lateral nerve pairs 7–8. *Inflorescence* in axils of leaves and lower on the stem in axils of leaves that have fallen, flowers usually in clusters of 3–12. *Bracts* overlapping and enclosing inflorescence; white, ca. 2 × 2 cm, ovate, hairy, verrucose, margins serrate, the inner bracts becoming more lanceolate, ca. 5 mm wide. *Peduncles* very short, ca. 5–8 mm. *Pedicels* ca. 5 mm. *Calyx* seen only in bud, at this stage ca. 13 mm, externally with stiff angular hairs, internally glabrous; lobes twisting together to form a ca. 3 mm column above the corolla bud. *Corolla* (from bud) white, outside with long silky hairs, papillose inside.

*Gynoecium* (immature) ca. 1 cm, style with eglandular hairs, these shorter near ovary. *Disk* cupular, ca. 3 mm, undulate. *Fruit* ovoid, 10–13 × 6–8 mm, style not persistent.

**Mount Kerinci specimens examined.** SUMATRA. Jambi: Mount Kerinci. 2000 m, 8 May 1920, *Bünnemeyer* 10326 (BO); 4 March 1954, *Alston* 14182 (BM); 2000–2500 m, 28 July 2000, *Radhiah & Cronk* 114 (E).

**Additional specimen examined.** SUMATRA. Jambi: Kerinci, Lake Tujuh, 31 July 2000, *Radhiah & Cronk* 145 (E).

**Distribution:** SUMATRA: Jambi (Kerinci); 1800–2500 m.

*Bünnemeyer* 10326 is labelled as having lurid violet bracts.

### GROUP III

8. *Cyrtandra ampla* C.B. Clarke in A. & C. DC., *Monogr. phan.* 5: 259. 1883. TYPE: SUMATRA. West Sumatra: Mount Singgalang, June–July 1878 *Beccari* 173 (holotype *n.v.*; isotypes: BM, K, L).

Shrub, stem somewhat quadrangular, hairy becoming glabrescent. *Leaves* opposite and isophyllous on petioles ca. 4 cm long, lamina ca. 19–25 × 8.5–15 cm, narrowly ovate, shortly acuminate at apex, base obtuse or cordate, margins biserrate, surface hairy above when young, becoming glabrescent with age although some hairs remain on the slightly impressed midrib near the base, glabrous below but venation raised and hairy; lateral nerve pairs 12–14. *Inflorescence* cauliflorous, sessile, with many clustered flowers. *Bracts* small, ca. 11 × 5 mm, hairy, verrucose, margins serrate. *Pedicels* 1–1.5 cm long. *Calyx* ca. 8 mm, externally hairy, internally verrucose; tube ca. 6 mm; lobes triangular, ca. 2 mm. *Corolla* ca. 15 mm, broadening from ca. 4 mm at base to ca. 9 mm at mouth, with a small pouch present behind where the anthers lie against the lower side of corolla tube; outside silky hairy, inside glabrous. *Filaments* ca. 4 mm, glandular in region below anthers and on connective. *Anthers* ca. 2 mm. *Gynoecium* ca. 1.2 cm, style and ovary hairy, stigma horizontally bilobed ca. 2.5 mm wide. *Disk* ca. 2 mm high, unilateral, undulate. *Fruit* (young) 15 × 5 mm, including the 5 mm style, ovoid, verrucose, hairy; style initially persistent and covered by the decaying corolla; calyx persistent.

**Mount Kerinci specimens examined.** SUMATRA. Jambi: Mount Kerinci. 1600 m, 5 March 1920, *Bünnemeyer* 8483 (BO).

**Selected additional specimens examined.** SUMATRA. Jambi: Kerinci. nr Jl. Djapan, 1300–1400 m, 1 August 1956, *Jacobs* 4431 (A); Kayu Aru, Sungai Tanduk, 6 March 1954, *Alston* 14273 (BM).

**Distribution:** JAVA. SUMATRA. Jambi (Kerinci), West Sumatra; 1300–1600 m.

*Bünnemeyer* 8483 bears a close resemblance to the type of *C. ampla* although the leaves are smaller than the measurements given by C.B. Clarke in his description (25 × 15 cm). It is likely that this specimen is a young plant or shoot.

It is noted under Clarke's description of *C. ampla* that it occurs in Java. If it indeed does also occur in Java, it represents a very interesting disjunct distribution since no collections of this species apparently exist outside Jambi and West Sumatra.

9. *Cyrtandra impressivenia* C.B. Clarke in A. & C. DC., *Monogr. phan.* 5: 212. 1883. TYPE: SUMATRA. West Sumatra: Mount Singgalang, 1700 m, *Beccari* 177 (holotype *n.v.*; isotype K).

Shrub to 1 m. Stems quadrangular, hairy, becoming glabrescent. *Leaves* opposite and isophyllous, petioles hairy, 1.5–3 cm long; lamina 14–18 × 3.5–5 cm, narrowly elliptic, acuminate tip ca. 1.5 cm long, acute at base, margin with shallow serrations with distinct tufts of hair at tips, surface rugose above due to impressed venation, hairy within these impressions, coarsely hairy below, hairs dense on the raised venation; lateral nerve pairs 8–10. *Inflorescence* in axils of leaves, flowers up to 13, in umbels. *Bracts* in a pair, subtending inflorescence; lanceolate, hairy, ca. 10 × 1.5 mm. *Peduncles* 1.5–3 cm, hairy. *Pedicels* 5–10 mm long. *Calyx* green, ca. 9 mm, externally with fine bristly hairs held at all angles, internally verrucose; tube ca. 3 mm; lobes ca. 6 mm, subulate. *Corolla* white with a tawny orange guide mark at the base of the throat, the upper side ca. 8 mm with two brown lobes ca. 2 × 2 mm, the lower side ca. 1 cm, the three lobes white, the centre lobe ca. 3 × 3 mm, the other two ca. 3 × 2 mm; outside with silky hairs except for a glabrous area covered by the calyx tube, inside glabrous. *Filaments* ca. 3 mm, hairy especially in upper half. *Anthers* ca. 1 mm. *Gynoecium* ca. 6 mm, the style and ovary densely hairy, stigma horizontally bilobed, inner face papillose. *Disk* ca. 2 mm high, unilateral with a curved top. *Fruit* hairy, oblong, ca. 17 × 6 mm, style semi-persistent, calyx persistent.

1883, Monogr. phan. 5: 259  
Clarke 1883  
Beccari 173

**Mount Kerinci specimens examined.** SUMATRA. Jambi: Mount Kerinci, 2225 m [7300 ft], 6 May 1914, *Robinson & Kloss s.n.* (BM); 2000–2500 m, 28 July 2000, *Radhiah & Cronk 116* (E).

**Distribution:** SUMATRA. Jambi (Kerinci), West Sumatra; 1700–2500 m.

This species is easily recognisable by the rugose leaves due to impressed venation and the long peduncles bearing umbels of quite small mainly white flowers.

**10. *Cyrtandra rosea*** Ridl. in J. Fed. Malay States Mus. 8(4): 70. 1917. TYPE: SUMATRA. Jambi: Kerinci, Siulakderas, 900 m [3000 ft], 17 Mar. 1914, *Robinson & Kloss s.n.* (holotype BM; isotype K).

Shrub, often branched at base, stem stout, woody. *Leaves* opposite and isophyllous, decurrent onto stem, lamina 20–30 × 7–13 cm, narrowly obovate to oblanceolate, tip obtuse but with a point due to terminal serration, margin biserrate, surface silky hairy above when young, soon becoming subglabrous, venation below raised, somewhat horizontal and covered with hair; lateral nerve pairs, 17–22, at ca. 90° to midrib. *Inflorescence* in axils of leaves and cauliflorous, sessile, flowers 4 to many. *Bracts* small, somewhat verrucose, hairy, serrate. *Pedicels* ca. 15 mm long. *Calyx* ca. 9 mm, externally hairy, internally verrucose, sometimes hairy; tube ca. 5 mm; lobes ca. 4 mm, the lower two almost fused, the upper three free with narrow tips of ca. 1.5 mm. *Corolla* ca. 2 cm, brownish red or purple or dark pink, tubular, not broadening at mouth, lobes ca. 2–3 × 2 mm, outside with silky hairs, inside glabrous. *Filaments* ca. 8 mm, hairy especially in upper half. *Anthers* ca. 2 mm. *Gynoecium* ca. 1.2 cm, style and ovary hairy, stigma horizontally bilobed, ca. 3 mm when lobes fully open, inner face papillose. *Disk* unilateral, with a central section ca. 2 mm high lowering to ca. 1.5 mm either side. *Fruit* obovoid, hairy, ca. 15–18 × 6–10 mm, including beak ca. 1–7 mm, calyx persistent.

**Mount Kerinci specimens examined.** SUMATRA. Jambi: Mount Kerinci, 2225 m [7300 ft], 30 April 1914, *Robinson & Kloss s.n.* (BM); 2100 m, 7 April 1920, *Bünnemeyer 9186* (BO); 2100 m, 6 May 1920, *Bünnemeyer 10170* (BO); 2000 m, 8 May 1920, *Bünnemeyer 10323* (L); 4 March 1954, *Alston 14181* (A, BM); 2000–2500 m, 28 July 2000, *Radhiah & Cronk 115* (E).

**Additional specimen examined.** SUMATRA. Jambi: Lake Tujuh, 31 July 2000, *Radhiah & Cronk, 151* (E).

**Distribution:** SUMATRA. Jambi (Kerinci); (900–)2000–2500 m.

Ridley described *C. rosea* from the Robinson & Kloss collections that were the result of the first expedition to Kerinci in 1914. The type specimen is not particularly informative, and a further Robinson & Kloss specimen from Kerinci Peak is sterile. The listed specimens have been determined to be *C. rosea* but there is variation within this group. It is allied to *C. sandei* de Vriese, described from Java, and it is possible that more than one species exists within the group on Mount Kerinci.

**11. *Cyrtandra aureotincta*** Bramley & Cronk *sp. nov.* TYPE: SUMATRA. Jambi: Mount Kerinci, 2000–2500 m, 28 Jul. 2000, *Radhiah & Cronk 129* (holotype: E; isotypes BIOT, BO [*n.v.*]). Fig. 4A–C.

*Tota planta hirta (disco et ovario inclusis), pilis aureis, corolla angusta cum lobis parvis distincta. A C. rosea foliis minoribus ellipticis, disco cupulato hirta et corolla viridi-alba differt.*

Shrub, unbranched or branched at base only, up to 2.2 m tall. *Leaves* opposite and isophyllous on hairy petioles 3–5 cm long, lamina 19–23 × 7.7–9 cm, elliptic to narrowly elliptic, apex acuminate, base shortly decurrent, margin biserrate, irregularly spaced and hairy, surface golden felted above when young, older leaves with rough hairs, these often breaking off leaving bases giving a rough upper surface, venation raised below with dense, fine, almost matted hairs; lateral nerve pairs 12–15. *Inflorescence* in axils of leaves and of leaves that have fallen, sessile, with up to 20 flowers. *Bracts* enclosing inflorescence; green, ca. 1.5 cm, ovate, hairy on both surfaces, somewhat verrucose, margins irregularly serrate. *Pedicels* ca. 1.5 cm, hairy. *Calyx* ca. 1 cm, externally with straight silky hairs, internally verrucose; tube ca. 6 mm; lobes subulate, the lower two divided for 3 mm, the upper three divided for 4 mm. *Corolla* greenish-white, ca. 1.5 cm, tubular, not broadening at the mouth, with small even lobes, 2 × 1.5 mm, outside with a thick covering of silky hairs, inside with papillae concentrated on area behind anthers. *Filaments* ca. 5 mm, glabrous apart from a small area of hairs at tip, just below anthers. *Anthers* ca. 1.5 mm. *Gynoecium* ca. 1.5 cm, style and ovary densely hairy, stigma with two triangular lobes,

papillose on the inner face. *Disk* cupular, 1.5 mm, margin undulate and hairy. *Fruit* ovoid, hairy, ca. 15 × 5 mm including ca. 3 mm stylar beak, calyx persistent.

**Mount Kerinci specimens seen.** SUMATRA. Jambi: Mount Kerinci. 2400 m, 28 July 2000, *Radhiah & Cronk 122* (E).

**Distribution:** SUMATRA. Jambi: (Kerinci peak endemic); 2000–2500m.

**12. *Cyrtandra patentiserrata*** Bramley & Cronk *sp. nov.* TYPE: SUMATRA. Jambi: Mount Kerinci, 1400 m, 7 Mar. 1920, *Bünnemeyer 8551* (holotype: L). Fig. 4D–F.

*Inflorescentiis sessilibus, bracteis parvis, petiolis brevibus, foliis ellipticis biserratis, serraturis acuminatis patentibus vel subpatentibus distinguitur. A C. rosea foliis ellipticis, calyce lobis quinque aequis perangustis et corolla albida differt.*

Erect shrub. *Leaves* opposite, pairs isophyllous or somewhat subsisophyllous, on petioles 2–4 cm long, lamina 14–17 × 5.8–6.9 cm, elliptic, apex acuminate, the narrow tip 1 cm long, base acute, margin biserrate, serrations with distinctly pointed tips, surface subglabrous to glabrous above, with fine hairs on venation below; lateral nerve pairs 9–10. *Inflorescence* in axils of leaves, sessile, with 2–4 flowers. *Bracts* ca. 12 × 4–6 mm, enclosing inflorescence; elliptic to narrowly elliptic, free, overlapping, hairy on both surfaces and externally verrucose, margins irregularly serrate. *Pedicels* ca. 5 mm long. *Calyx* ca. 12 mm long, externally with short angular hairs, internally verrucose; tube ca. 6 mm long; lobes ca. 6 mm long, narrowing to form very fine tips for ca. 4 mm, these twist together over the top of corolla bud. *Corolla* off-white, ca. 1.5 cm, ca. 1 cm broad at mouth, outside with a dense covering of silky hair, inside with a small area of papillae on the corolla tube where the anthers rest. *Filaments* with small area of papillae under the anthers, otherwise glabrous. *Anthers* ca. 1 mm. *Gynoecium* ca. 1.2 cm, style with eglandular hairs, these becoming shorter on ovary, stigma with two triangular lobes ca. 1 mm long, inner face papillose. *Disk* ca. 1.5 mm high, unilateral, undulate. *Fruit* (immature) ca. 1.2 cm including ca. 5 mm style, narrowly ellipsoid, calyx and style persistent.

**Mount Kerinci specimens examined.** SUMATRA. Jambi: Mount Kerinci. 1500 m, 4 March 1920, *Bünnemeyer 8386* (BO).

**Selected additional specimens examined.** SUMATRA. Jambi: Kerinci, Sungai Kering, 3 March 1954, *Alston 14126* (BM). West Sumatra: Mount Merapi, 1700 m, 14 September 1918, *Bünnemeyer 4562* (L); Mount Sago, ravine of Batang Lakin, 1000 m, 30 September 1956, *Meijer 5329* (L); road from Padang to Solok, 900 m, 25 July 2000, *Radhiah & Cronk 103* (E).

**Distribution:** SUMATRA: Jambi (Kerinci), West Sumatra; 900–1700 m.

**13. *Cyrtandra flabelligera*** Ridl. in J. Fed. Malay States Mus. 8 (4): 69. 1917. TYPE: SUMATRA. Jambi: Kerinci, Sungai Kumbang, 1914, *Robinson & Kloss s.n.* (holotype: BM; isotype K).

Epiphyte. *Leaves* opposite and anisophyllous or sometimes pseudoalternate, the larger of the pair on petiole ca. 1 cm long, lamina 14–16 × 3.5 cm, narrowly oblong, asymmetric (ca. 2 cm wide on one side of midrib, ca. 1 cm wide on the other), apex acute, base asymmetric, the narrower side ending before the wider side, margins entire, surface glabrous above, sparsely hairy on venation below; the smaller of the pair sometimes absent, on petiole ca. 5 mm long, lamina 3.5 × 1.5 cm, asymmetric, ovate, apex acute, base asymmetric, margins entire, surface glabrous above and below. *Inflorescence* in axils of leaves, 2–3 flowers. *Bracts* in a pair, ca. 2 × 1 cm, subtending inflorescence, narrowly obovate, acuminate, glabrous, margins entire. *Peduncles* 1.3–1.5 cm. *Pedicels* ca. 3 mm, hairy. *Calyx* ca. 3 mm, externally hairy, lobes triangular, ca. 1 mm. *Corolla* white, ca. 2 cm, very narrow, ca. 2 mm wide, for ca. 0.8 cm, then widening to ca. 1.2 cm at mouth, outside glabrous. *Gynoecium* ca. 1.5 cm, style hairy, ovary glabrous, stigma bilobed. *Disk* unilateral with a curved top. *Fruit* oblong, ca. 2 × 0.3 cm, the length depending on the varying length of the remaining style, glabrous, calyx persistent.

**Mount Kerinci specimen examined.** SUMATRA. Mount Kerinci. 1500 m, 4 March 1920, *Bünnemeyer 8423* (K).

**Selected additional specimens examined.** SUMATRA. Jambi: Kerinci. Siulakderas, 16 March 1914, *Robinson & Kloss s.n.* (BM); Kayu Aru estate, Sungai Tanduk. 28 February 1954, *Alston 13933* (BM); 6 March 1954, *Alston 14260* (BM).

**Distribution:** SUMATRA. Jambi: (Kerinci); 1500 m (no other altitudes reported).



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