

## *Cyrtandra* (Gesneriaceae) from Kauai and Maui Hawaiian Plant Studies 96<sup>1</sup>

HAROLD ST. JOHN<sup>2</sup>

THE GENUS *Cyrtandra* is by far the largest genus of the higher plants in the native flora of the Hawaiian Islands. Extensive exploration for it and intensive taxonomic study of it have been made only on the island of Oahu (St. John 1966). Subsequent collections of it from the other islands are continually revealing novelties in this genus which is so characteristic of the rain forests and the deep, shaded gulches near streams and waterfalls. Here are presented descriptions of two new species from Kauai and one from Maui.

*Cyrtandra congesta* sp. nov. (sect. *Cylindrocalyces*)

Figure 1

DIAGNOSIS HOLOTYPE: Frutex 1–1.6 m altus est, novellis adpresse adscendente badi-sericeo-pilosis, ramulis foliosis ad basim subglabratis, cicatricibus foliorum 4–5 mm altis scutelliformatis, cicatricibus fascicularum 7, internodis 12–18 mm longis, *foliis* oppositis congregatis in 6 nodis superis positus eis in jugo quoque subaequalibus, petiolis 5–6 cm longis sed ad punctum 1 cm ex basi alatis badi-pilosulis tum subglabratis, *laminis* 23–26 cm longis 7.8–9 cm latis chartaceis ellipticis et concinnis vel minime angustioribus in apice vel in basi acutis basi cuneata longe decurrenti dimidiis ambis minime inaequalibus supra obscure viridibus et mox glabratis sed midnervo adpresse badi-pilosulo et nervis principalibus paulo pilosulis infra subalbi-viridibus et adpresse badi-pilosis tum glabratis nervis minus pubescentibus marginibus grosse crenati-serratis excepta in basi nervis secundariis 9–10 in

dimidio quoque adscendentibus tum sursum curvatis et interconnectentibus et in serris salientibus, *cymis* axillaribus 5–7-floriferis adpresse adscendente badi-pilosis cum bractea 15 mm longa bifida, pedunculis 2–3 mm longis, bracteolis 8–12 mm longis oblancoelatis, pedicellis 4–14 mm longis adpresse adscendente badi-pilosulis, *alabastris* cum *calyce* 12–15 mm longo subfusiformi adpresse badi-pilosulis corpore ellipsoideo cum rostro 3–4 mm longo clauso, in flore tubo 10 mm longo ellipsoideo cum 2 labiis, labia supera 9 mm longa in 3 mm in 3 lobis anguste lanceolatis partita, labia infera cum 2 lobis 6 mm longis dimidio infero late deltoideo dimidio supero lineari-lanceolato obtuso, *corollis* albis in vivo extra glabris tubo 14 mm longo 7 mm diametro in medio in 40° deflexo, 2 lobis superis 6 mm longis 5 mm latis oblongi-ellipticis, labia infera trilobata, lobis lateralibus 7 mm longis 5 mm latis oblongi-ellipticis, loba infera 7 mm longa 6 mm lata oblongi-elliptica, 2 staminibus inferis perfectis cum filamentis ad tubum ad 4 mm ex fauce adnatis, parte libera 3 mm longa crassa fere recta tereti, 2 antheris fertilibus 3.3 mm longis late ellipticis in apicibus connatis, connectivo 1.7 mm longo ovato, ovario 4 mm longo subgloboso, *stylo* 7 mm longo tereti crasso glabro, stigmati cum 2 lobis 2 mm longis suborbicularibus, ovario cum disco cupulato 2 mm alto cincto, bacca 14 mm longa alba laevi ellipsoidea cum rostro brevi, seminibus 0.2–0.25 mm longis 0.17–0.18 mm diametro ellipsoideo mellicoloratis cum apicibus badiis.

DIAGNOSIS OF HOLOTYPE: Shrub 1–1.6 m tall; young shoots appressed ascending, brown silky pilose; the leafy shoots subglabrate toward the base; leaf scars 4–5 mm high, shield-shaped; bundle scars 7; internodes 12–18 mm long; *leaves* opposite, close together, borne at the 6 upper nodes, those

<sup>1</sup> Manuscript received 1 October 1976.

<sup>2</sup> Bernice P. Bishop Museum, P.O. Box 19000-A, Honolulu, Hawaii 96819.



FIGURE 1. *Cyrtandra congesta* St. John, from holotype. *a*, habit,  $\times \frac{1}{2}$ ; *b*, *c*, bud,  $\times 1$ ; *d*, *e*, flower,  $\times 1$ ; *f*, pistil,  $\times 2$ ; *g*, berry,  $\times 1$ .

of a pair subequal; petioles 5–6 cm long, but winged to within 1 cm of the base, brown pilosulous to subglabrate; *blades* 23–26 cm long, 7.8–9 cm wide, chartaceous, truly elliptic or slightly narrowed to one or the other end, acute, the base cuneate and long decurrent, the two halves slightly unequal, above dark green, early glabrate, except for the appressed brown puberulous midrib, and slightly so on the principal veins, below whitish green and more densely appressed brown pilose, but soon glabrate, and even on the veins less hairy than on those above, the margins coarsely crenate serrate, except at base, the secondary veins 9–10 on a side, ascending, then upcurved and interconnected and salient in the serrae; *cymes* axillary, 5–7-flowered, appressed ascending brown pilose, subtended by a bifid bract 15 mm long; peduncles 2–3 mm long; bracteoles 8–12 mm long, oblanceolate; pedicels 4–14 mm long, appressed ascending brown pilosulous; *buds* with *calyx* 12–15 mm long, subfusiform, appressed brown pilosulous, the body ellipsoid, ending in a 3–4 mm closed beak; in anthesis the ellipsoid tube 10 mm long, 2-lipped, the upper lip 9 mm long, parted for 3 mm into 3 narrowly lanceolate lobes, the lower lip of 2 lobes 6 mm long, the lower half broadly deltoid, the upper half linear-lanceolate, obtuse; *corolla* white, when fresh glabrous without, the tube 14 mm long, 7 mm in diameter, at the middle deflexed at 40°, the 2 upper lobes 6 mm long, 5 mm wide, oblong-elliptic; lower lip 3-lobed, the lateral lobes 7 mm long, 5 mm wide, oblong-elliptic; lower lobe 7 mm long, 6 mm wide, oblong-elliptic; the 2 lower stamens perfect, their filaments adnate to the corolla tube to within 4 mm of the throat, the free portion 3 mm long, stout, almost straight, terete, the 2 perfect anthers 3.3 mm long, broadly elliptic, the tips connate, the connective 1.7 mm wide, ovate; ovary 4 mm long, subglobose; *style* 7 mm long, terete, stout, glabrous; stigma lobes 2 and 2 mm long, suborbicular; ovary surrounded at base by a cupulate disk 2 mm high; berry 14 mm long, white, smooth, ellipsoid and with a short beak; seeds 0.2–0.25 mm long, 0.17–

0.18 mm in diameter, ellipsoid, honey-colored with brown ends.

HOLOTYPE: Hawaiian Islands, Kauai Island, Kalalau Trail,  $\frac{1}{4}$  mile above Ke'e to Hanakapiai Trail, inside last valley before Hanakapiai, 14 March 1976, *Charles Christensen* 4 (BISH).

SPECIMENS EXAMINED: Hawaiian Islands, Kauai Island, Waiauakua Valley, 8 May 1976, *Christensen* 5 (BISH).

DISCUSSION: *Cyrtandra congesta* is a member of the section *Cylindrocalyces*. The most similar species is a member of the section *Verticillatae*. It is *C. perstaminodica* St. John, of the central Koolau Range, Oahu, a species with the pedicels 1–2 mm long; calyx opening by 1 distal slit; corolla when fresh with the tube 19 mm long, and at the upper third decurved at 65°, the lower lobe 8 mm long, 5.5 mm wide; style sparsely pilose at apex; berry when dried 21–24 mm long; leaves in whorls of 3; blades elliptic-oblanceolate, the margin depressed callous serrulate, the secondary veins 17–25 in each half. *Cyrtandra congesta* has the pedicels 4–14 mm long; calyx opening into 3 lanceolate lobes; corolla when fresh with the tube 14 mm long, and at the middle decurved at 40°, the lower lobe 7 mm long, 6 mm wide; style glabrous; berry when fresh 14 mm long; leaves opposite; blades elliptic, or elliptic and slightly narrowed at one or the other end, the margin coarsely crenate serrate, the secondary veins 9–10 in each half.

The new epithet is the Latin adjective *congesta*, crowded, and it is given with reference to the crowded inflorescences.

*Cyrtandra elliptica* sp. nov. (sect. *Cylindrocalyces*)

Figure 2

DIAGNOSIS HOLOTYPE: Planta 1 m alta erecta cum caule simplici est, novellis adpresse adscendente badi-hirsutis, caule folioso 5–11 mm diametro obscure purpureo carnosio badi-hirsuto, cicatricibus foliorum

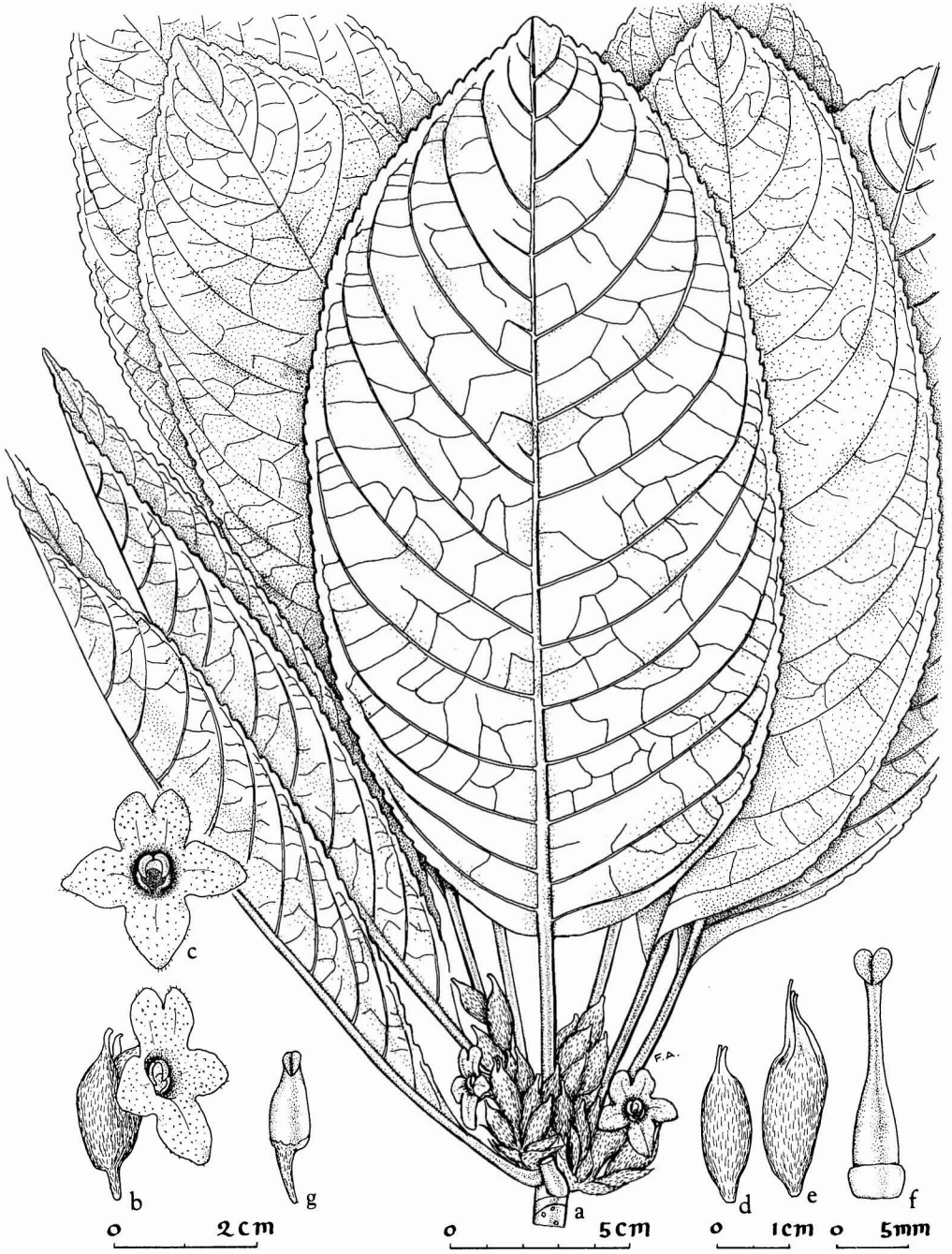


FIGURE 2. *Cyrtandra elliptica* St. John, from holotype, a, habit,  $\times \frac{1}{2}$ ; b, c, flower,  $\times 1$ ; d, e, bud,  $\times 1$ ; f, pistil,  $\times 2$ ; g, berry,  $\times 2$ .

7 mm latis obovate scutelliformis pallidis, cicatricibus fascicularum 5, *foliis* oppositis multis in acervo terminali adscendentibus, petiolis 3–4.5 cm longis 7–8 mm diametro adpresso basi-pilosulis et cum 2 alis erectis fere ad basem descendentibus, *laminis* 22–29 cm longis 8–13 cm latis mollibus carnosis late ellipticis obtusis basi rotundata vel breve cuneata marginibus grosse serratis supra glabris viridibus lucidis infra subviridi-albis glabris excepta midnervo elevato adpresso basi-pilosulo nervis secundariis 12–13 in dimidio quoque arcuatis adscendentibus, *cymis* multis axillaribus 5–7-floriferis, bracteis 12–20 mm longis lanceolatis, pedunculis 5 mm longis hirsutulis, pedicellis 7–12 mm longis hirsutis, *alabastris* 18–28 mm longis fusiformibus adpresso basi-pilosulis in toto connatis et cum rostro terminali 7 mm longo, *calycibus* in flore cum 3 lobis 7–8 mm longis deltoidei-lanceolatis, *corollis* albis, tubo 18 mm longo in basi et medio 5 mm diametro in fauce 11 mm diametro subcylindrico dimidio infero fere recto sed dimidio supero in 40° decurvato extra glabro intra glabro excepta fauce glandulose atomifera, 2 lobis superis 7 mm longis et latis et in 5 mm partitis suborbicularibus extra glabris intra capitate glandulose puberulis, labia infera 3-lobata, lobis lateralibus 10 mm longis 8 mm latis late ellipticis intra capitate glandulose puberulis, loba infera 12 mm longa 9 mm lata elliptica intra capitate glandulose atomifera excepta proxima margines, 2 staminibus inferis perfectis cum antheris 3 mm longis 2.2 mm latis cordati-ovatis, staminodiis lateralibus 0.3 mm longis subulatis in tubo corollae usque ad 6 mm ex fauce adnatis, *ovario* 5 mm longo lanceoloideo basi cum collari 1.8 mm alto cincta, stylo 5 mm longo tereti glabro, 2 stigmatibus 2 mm longis oblongi-ellipticis in basi distali partitis, fructibus incognitis.

DIAGNOSIS OF HOLOTYPE: Plant 1 m tall, erect, single-stemmed; young shoots appressed ascending brown hirsute; leafy stem 5–11 mm in diameter, dark purple, fleshy, and brown hirsute; leaf scars 7 mm wide, obovate shield-shaped, pale; bundle scars 5; *leaves* opposite, numerous, ascending in a

terminal plume; petioles 3–4.5 cm long, 7–8 mm in diameter, appressed brown pilosulous, and with 2 erect decurrent wings almost its full length; *blades* 22–29 cm long, 8–13 cm wide, soft and fleshy, broadly elliptic, obtuse, the base rounded or shortly cuneate, the margins coarsely serrate, above glabrous, green and shiny, below greenish white, glabrous except for the brown appressed pilosulous elevated midrib, secondary veins 12–13 in each half, arched ascending; inflorescences numerous, axillary; *cymes* 5–7-flowered; bracts 12–20 mm long, lanceolate; peduncles 5 mm long, hirsutulous; pedicels 7–12 mm long, hirsute; *buds* 18–28 mm long, appressed brown pilosulous, fusiform, entirely connate, and ending in a 7 mm beak; *calyx* at anthesis with 3 lobes 7–8 mm long, deltoidei-lanceolate; *corolla* white, the tube 18 mm long, 5 mm in diameter at base and middle, 11 mm in diameter at the throat, subcylindric, the lower half nearly straight, but the upper half decurved at 40°, glabrous without and within except that the throat within is glandular atomiferous; upper lobes 2 and 7 mm long and wide, parted for 5 mm, suborbicular, without glabrous, within capitate glandular puberulous; lower lip 3-lobed, the lateral lobes 10 mm long, 8 mm wide, broadly elliptic, within capitate glandular puberulous; the lower lobe 12 mm long, 9 mm wide, elliptic, within capitate glandular puberulous except near the margins; 2 lower stamens perfect, their anthers 3 mm long, 2.2 mm wide, cordate-ovate; lateral staminodia 0.3 mm long, subulate, adnate to the corolla tube to within 6 mm of the throat; *ovary* 5 mm long, lanceoloid, the base surrounded by a cupulate base 1.8 mm high; style 5 mm long, terete, glabrous; 2 stigmas 2 mm long, oblong-elliptic, parted to the base on the distal side; fruit unknown.

HOLOTYPE: Hawaiian Islands, Kauai Island, Na Pali coast, above Ke'e to Kalalau Trail, south side of third gulch southwest of Ke'e, in deep shade near springs and seeps, with *Aleurites*, *Pipturus*, *Touchardia*, *Boehmeria*, *Hedyotis acuminata*, 800–1000 ft alt., 27 May 1976, Charles Christensen 14 (BISH).

SPECIMENS EXAMINED: Hawaiian Islands, Kauai Island, Na Pali coast, between Ke'e and Hanakapiai, last valley northeast of Hanakapiai, in and near seeps on side of valley, 600 ft alt., this valley has the largest population and finest plants of the species, 25 July 1976, *Christensen 37* (BISH).

DISCUSSION: *Cyrtandra elliptica* is a member of the section *Cylindrocalyces*, as is its closest relative, *C. congesta* St. John, also of the Na Pali coast, Kauai, a species with the young shoots appressed ascending brown silky pilose; petioles 5–6 cm long, but winged to within 1 cm of the base; blades 23–26 cm long, 7.8–9 cm wide, narrowly elliptic, acute, the base cuneate, above early glabrate except for the appressed puberulous midrib; buds 12–15 mm long, the beak 3–4 mm long, in anthesis 5-lobed; corolla tube 14 mm long; lateral lobes 7 mm long, 5 mm wide; lower lobe 7 mm long, 6 mm wide; style 7 mm long. *Cyrtandra elliptica* has the young shoots appressed brown hirsute; petioles 3–4.5 cm long, and with 2 erect decurrent wings almost to the base; blades 22–29 cm long, 8–13 cm wide, broadly elliptic, obtuse, the base rounded or shortly cuneate, above glabrous; buds 18–28 mm long, the beak 7 mm long, in anthesis 3-lobed; corolla tube 18 mm long; lateral lobes 10 mm long, 8 mm wide; lower lobes 12 mm long, 9 mm wide; style 5 mm long.

The new epithet is the Latin adjective *elliptica*, elliptic, and it is chosen with reference to the shape of the blades.

*Cyrtandra waihoiensis* sp. nov. (sect. *Crotonocalyces*)

Figure 3

DIAGNOSIS HOLOTYPE: Frutex 2 m altus est, ramulis foliosis 4–5 mm diametro dense ferruginose pilosis, ramis vetustioribus 5–7 mm diametro sparse pilosis, cicatricibus foliorum 5 mm altis oblate scutelliformatis et a circulo 2 mm lato conjunctis, cicatricibus fascicularum 7; internodis 7–10 mm longis, *foliis* oppositis moderate separatis et in 3 nodis superis positis, eis jugi subaequalibus,

petiolis in basi perfoliatis 6.2–7.7 cm longis dense ferruginose pilosis, *laminis* 10–12.5 cm longis 5.5–7 cm latis firme chartaceis ovatis ad obovatis apice acuminato basi rotundato sed dimidiis inaequalibus supra obscure viridibus et catenulate subbadi-hirsutis pilis separatis infra subbadi-pilosis et in midnervo salebrose pilosis marginibus fere ad basim denticulatis nervis secundariis 6–7 in dimidio quoque adscendentibus et in vicino margini incurvatis interconnectentibus nervis tertiis in dentibus pilosis salientibus, *cymis* axillaribus 2-floriferis dense ferruginose pilosis, *pedunculo* 20 mm longo, *pedicellis* 26–27 mm longis, *bracteis* 12 mm longis foliaceis, *alabastris* anguste campanulatis lobis liberis calycis adscendentibus, *calycibus* 14 mm longis (quando bullitis) intra per 2 mm ex basi glabris alibi tubo adscendente albi-puberulo, lobis intra ad basim puberulis ad apicem hirsutulis, tubo calycis et lobis extra dense saliente hirsutulis, *calycibus* 2-labiatis intra labiis 6 mm partitis, labia supera 3-lobata et inter lobas 4.5 mm partitis, lobis in basi 3 mm latis late lanceolatis, labia infera 2-lobata lobis 8 mm longis 3.8 mm latis oblongi-ellipticis, *corollis* 21 mm longis (quando bullitis) exsertis albis tubo 15 mm longo extra in parte inclusa glabro sed in parte supera libera saliente albi-hirsutulo subcurvato in basi 4 mm diametro in fauce 6.5 mm diametro tubo intra glabro, lamina 2-labiata 5-lobata lobis intra glabris, 2 lobis superis 2.5 mm longis 2.8 mm latis rhombici-suborbicularibus, labia infera 3-lobata lobis lateralibus 3.5 mm longis 4.5 mm latis oblique rhombici-suborbicularibus, loba infera 3.2 mm longa 4 mm lata ovati-suborbiculari, 2 staminibus inferis cum filamentis in tubo corollae usque ad 5 mm ex fauce adnatis parte libera 5 mm longa subulata in spira adscendenti, antheris 2 mm longis 1.8 mm latis oblique cordati-deltaeideis, staminodiis lateralibus in tubo corollae usque ad 5.5 mm ex fauce adnatis parte libera 0.5 mm longa apice antheroideo 0.4 mm longo deltaeideo, *stylo* 7 mm longo glabro, 2 lobis stigmatis 1.5 mm longis ovatis in latere proximo  $\frac{1}{3}$  connatis, *ovario* 5 mm longo anguste ellipsoideo glabro in basi a disco cupulato fere 1 mm alto cincto, fructibus incognitis.

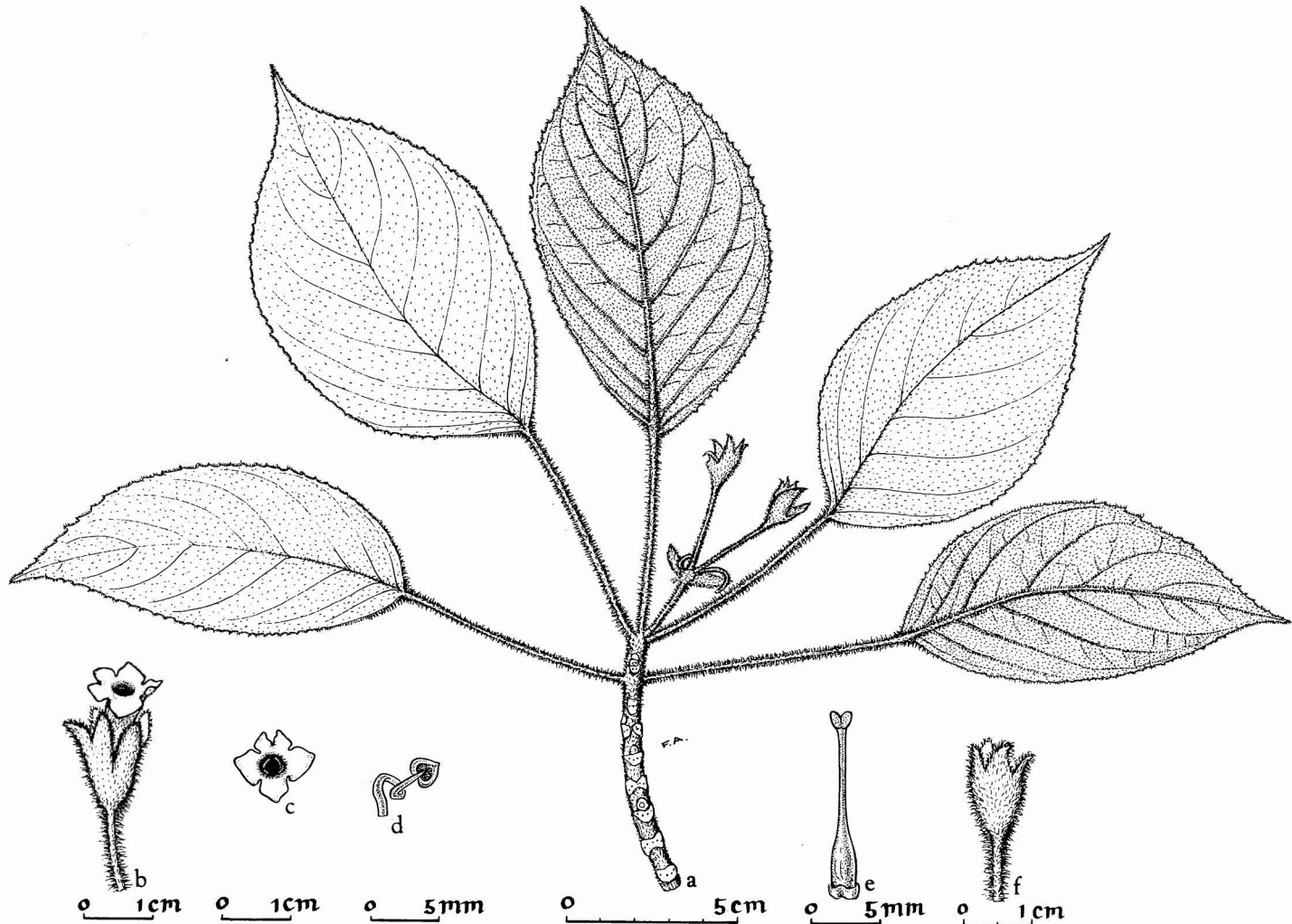


FIGURE 3. *Cyrtandra waihoiensis* St. John, from holotype. *a*, habit,  $\times \frac{1}{2}$ ; *b*, *c*, flower,  $\times 1$ ; *d*, stamen,  $\times 2$ ; *e*, pistil,  $\times 2$ ; *f*, bud,  $\times 1$ .

DIAGNOSIS OF HOLOTYPE: Shrub 2 m tall; leafy branchlets 4–5 mm in diameter, densely rusty pilose; older branchlets 5–7 mm in diameter, more sparsely pilose; leaf scars 5 mm high, oblate shield-shaped and connected by a ring 2 mm wide; bundle scars 7; internodes 7–10 mm long; *leaves* opposite, well-spaced, borne at the 3 upper nodes, those of a pair subequal; petioles at base perfoliate, 6.2–7.7 cm long, densely rusty pilose; *blades* 10–12.5 cm long, 5.5–7 cm wide, firm chartaceous, ovate to obovate, the apex acuminate, the base rounded but unequal, above dark-green and spaced catenulate brownish hirsute, below brownish pilose and shaggily so on the midrib, the margins denticulate almost to the base, the secondary veins 6–7 in each half, ascending, and near the margin incurved and interconnected, the tertiary veins salient in the hairy teeth; *cyme* axillary, 2-flowered, densely rusty pilose; *peduncle* 20 mm long; pedicels 26–27 mm long; bracts 12 mm long, foliaceous; *buds* narrowly campanulate, having the free calyx lobes ascending; *calyx* 14 mm long when boiled, glabrous within for 2 mm of the base, the rest of the tube ascending white puberulous, the lobes within puberulent below, hirsutulous toward the tip, the calyx tube and lobes on the outside densely spreading hirsutulous; calyx 2-lipped, cleft 6 mm between the lips, the upper lip 3-lobed, cleft 4.5 mm between the lobes, the lobes 3 mm wide at the base, broadly lanceolate, the lower lip 2-lobed, the lobes 8 mm long, 3.8 mm wide, oblong-elliptic; *corolla* when boiled 21 mm long, exerted, white, the tube 15 mm long, the outside glabrous where covered, but the upper free part spreading white hirsutulous, only slightly curved, at base 4 mm in diameter, at the throat 6.5 mm in diameter, the tube glabrous within, limb 2-lipped, 5-lobed, the lobes glabrous within, the 2 upper lobes 2.5 mm long, 2.8 mm wide, rhombic-suborbicular, the lower lip 3-lobed, the lateral lobes 3.5 mm long, 4.5 mm wide, obliquely rhombic-suborbicular, the lower lobe 3.2 mm long, 4 mm wide, ovate-suborbicular; the 2 lower stamens with their filaments adnate to the corolla tube to within 5 mm of the throat, the free part 5 mm long,

subulate, compactly spiraling upward; the anthers 2 mm long, 1.8 mm wide, obliquely cordate-deltoid; the lateral staminodia adnate to the corolla tube to within 5.5 mm of the throat, the free part 0.5 mm long, the pale antheroid tips 0.4 mm long, deltoid; *style* 7 mm long, glabrous; 2 stigmatic lobes 1.5 mm long, ovate, connate  $\frac{1}{3}$  way up the proximal side; *ovary* 5 mm long, narrowly ellipsoid, glabrous, surrounded at base by a cupulate disk nearly 1 mm high; fruit unknown.

EXPANDED DESCRIPTION: Petioles 4–8 cm long; blades 5.5–12.5 cm long, 4–7 cm wide, elliptic; cymes 2–4-flowered; peduncle 20–30 mm long; pedicels 18–27 mm long, calyx densely pilose.

HOLOTYPE: Hawaiian Islands, east Maui, Waihoi Valley, on north side along unnamed stream, under dark shaded bank of *Dicranopteris linearis*, 943 m alt., 13 July 1972, *Betsy Harrison* 63 (BISH).

SPECIMENS EXAMINED: Hawaiian Islands, east Maui, Waihoi Valley, along south fork of Waiohonu Stream, under well-shaded ledge, near *Dicranopteris*, *Sadleria*, *Broussaisia*, *Hedyotis*, 966 m alt., 15 June 1972, *Harrison* 33 (BISH); Hana Forest Reserve, in vicinity of crater at back of Waihoi Valley, under *Metrosideros*, 5000 ft alt., 14 August 1973, *Heather Fortner* 447 (BISH).

DISCUSSION: *C. waihoiensis* is a member of the section *Crotonocalyces*, as is its closest relative, *C. begoniaefolia* Hbd., of Ulupalakua, Maui, a species with the petioles 3.5 cm long, pilose velvety; blades 17.5–20 cm long, 8.5–10 cm wide, lance-ovate, very asymmetric at base, subcordate, the larger teeth 2 mm long, the apex gradually acuminate; pedicels 20 mm long; bracts 24 mm long, ovate lanceolate; corolla 24 mm long. *Cyrtandra waihoiensis* has the petioles 4–8 cm long, pilose; blades 5.5–12.5 cm long, 4–7 cm wide, ovate to obovate or elliptic, symmetrical or nearly so, the base rounded, the larger teeth 1–1.5 mm long, the apex abruptly acuminate; pedicels 18–27



mm long; bracts 12 mm long, lanceolate; corolla 21 mm long.

The new epithet is formed from the name of the type locality, Waihoi, and *-ensis*, the Latin adjectival geographic suffix.

#### LITERATURE CITED

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