**Abstract.** *Cyrtandra argentii* Olivar, H.J. Atkins & Muellner sp. nov., endemic to the Philippines and named after George Argent, is herein described and illustrated. Collections associated with this new species are often confused with three other species, namely *C. ferruginea* Merr., *C. villosissima* Merr., and *C. hirtigera* H.J. Atkins & Cronk. Distinguishing characters including keys, updated descriptions, distribution maps, and photos of live specimens are provided to aid identification of the four species. Following the International Union for the Conservation of Nature (IUCN) criteria, *C. argentii* sp. nov. is considered to be Near Threatened (NT) due to its distribution in a zone susceptible to anthropogenic pressure and the lack of any formal protection.

**Keywords.** Cyrtandra, *C. argentii* sp. nov., George Argent, IUCN, Philippines.

**Introduction**

_Cyrtandra_ J.R. Forst. & G. Forst. (Forster & Forster 1775) is the largest genus of ca 800 spp. in the family Gesneriaceae Rich. & Juss. (de Candolle 1816). The genus is recognized by possessing two fertile stamens and fruits that are indehiscent, either hard capsules or fleshy berries (Cronk _et al._ 2005; Atkins _et al._ 2013). Members of the genus exhibit diverse growth forms, ranging from herbs and shrubs, to climbers and small trees distributed throughout the Malesian region and across the Pacific (Johnson _et al._ 2017; Kartonegoro _et al._ 2018). Species of *Cyrtandra* are important rainforest elements, thriving in habitats with high humidity, low light intensity, and constant moisture supply (Gillett 1967). Despite a
continuous distributional range, the genus shows high levels of local endemism exhibiting high degrees of ecological specialization, making it an ideal candidate to address hypotheses on speciation, patterns of diversification, and community assembly (Atkins et al. 2001; Bramley et al. 2004; Clark et al. 2009; Johnson et al. 2019).

In recent years, several studies (Wagner et al. 2001; Bramley et al. 2003; Atkins 2004; Bramley 2005; Lorence & Perlman 2007; Bone & Atkins 2013; Johnson 2017; Kartonegoro et al. 2018; Atkins et al. 2019; Nishii et al. 2019) have led to an increase in numbers of species of Cyrtandra. These studies emphasized the urgency to document and understand the biodiversity of cyrtandras before they succumb to anthropogenic pressures. However, little is still known about the taxonomy of members in areas which are considered centers of biodiversity for the genus. Atkins et al. (2013) estimated a high species richness on Borneo, in the Philippines and on New Guinea. Understanding species boundaries of members from these areas is becoming increasingly important for examining biological trends of adaptation and speciation, and facilitating ecosystem and species conservation assessments.

For the Philippines, a comprehensive account of Cyrtandra spp. was published by Merrill (1922) in his An Enumeration of Philippine Flowering Plants noting 83 species, of which only C. oblongifolia C.B.Clarke (de Candolle & de Candolle 1883) was listed as not endemic. Atkins & Cronk (2001) revised Philippine cyrtandras from the island of Palawan, describing seven new species and indicating that C. elatostemoides Elmer (Elmer 1913) is also found on Borneo. Both accounts were considered in an updated checklist of Philippine cyrtandras available through ‘Co’s Digital Flora of the Philippines’ (Pelser et al. 2011 onwards). A taxonomic revision of Philippine cyrtandras, however, addressing species boundaries, distributions, and descriptions is yet to be achieved.

Atkins & Cronk (2001) noted the striking vegetative similarities between C. villosissima Merr. (Merrill 1906) from the island of Mindanao and a 1922 collection by Merrill from the island of Palawan which he labeled C. woodii Merr. ind. with no accompanying publication. Similarities include an erect suffrutescent habit, and large leaves that are slightly falcate and densely hirsute. However, in Merrill’s 1922 Enumeration of Philippine Plants the name C. woodii did not appear, and the distribution of C. villosissima was extended to Palawan, which according to Atkins & Cronk (2001) seems to provide evidence for Merrill’s decision to ‘sink’ his C. woodii into C. villosissima. Increased sampling in the locality of C. woodii led to collections with reproductive structures that show the species’ distinctness from C. villosissima. This ultimately led to the description of C. hirtigera H.J.Atkins & Cronk (Atkins & Cronk 2001), favoring a new name to prevent confusion with the Bornean C. woodsii B.L.Burtt (Burtt 1970). In the course of an ongoing research project, aimed at the taxonomic revision of Philippine cyrtandras, it was found that C. ferruginea Merr. (Merrill 1915) and a series of collections from Mindoro and the Aurora Province housed at the Royal Botanic Garden Edinburgh (RBGE) share similar vegetative characters with C. villosissima. As a result, identification of several herbarium specimens was found to be intermediate between C. villosissima and C. ferruginea, without a clear distinction being possible between the two when no additional reproductive characters were present. In this paper, species sharing the character combination of an erect suffrutescent habit and large leaves that are slightly falcate and densely hirsute, are referred to as the C. villosissima group. Members of this group are C. ferruginea, C. hirtigera, C. villosissima, and C. argentii sp. nov. Our study aims at clarifying the differences between these species through keys and photographs, and provides a description and diagnosis for a new species often misidentified as either C. ferruginea, C. villosissima, or C. hirtigera.

Material and methods

Data for this study were derived from herbarium specimens including their corresponding field notes, photographs, and field observations. Whenever available, living collections housed at the Royal Botanic Garden Edinburgh (RBGE) were consulted and reproductive characters and measurements were
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Table 1. Diagnostic characters separating the four studied species.

|                          | *C. argentii* sp. nov. | *C. ferruginea* | *C. hirtigera* | *C. villosissima* |
|--------------------------|------------------------|-----------------|----------------|------------------|
| Distribution             | Sierra Madre Mountain Range to Mindoro Island | Catanduanes, Mt Bulusan, Mt Isarog, Mt Mayon | Palawan | Negros Island to Mindanao Island |
| Indumentum color         | White all throughout   | Ferruginous      | Crimson or pale white | Ferruginous |
| Leaf symmetry            | Subequal               | Anisophyllous   | Subequal       | Subequal         |
| Inflorescence type       | Compound cyme          | Cyme            | Cyme           | Cyme             |
| Inflorescence attachment | Pedunculate            | Pedunculate     | Subsessile     | Subsessile       |
| No. of flowers per inflorescence | 10–15              | 1–3             | 4–many-flowered | 4–many-flowered |
| Calyx hirsuteness        | Densely hirsute externally, glabrous internally | Densely hirsute externally, with glandular hairs internally at base of lobes | Densely hirsute externally, with scattered glandular hairs internally and prominent tufts of hairs at the base | Densely hirsute |
| Calyx lobes shape        | Acuminate              | Acuminate       | Acute or narrowly acuminate | Linear |
| Corolla color            | White                  | White           | Dull reddish orange or yellowish green | Red |
| Corolla hirsuteness      | Glabrous externally and internally | Densely hirsute, with glandular hairs internally | Glandular orange externally and internally | Densely hirsute |
| Calyx persistence        | Persistent entirely enclosing the fruit | Persistent entirely enclosing the fruit | Not persistent | Persistent |
| Style persistence        | Persistent             | Persistent      | Not persistent | Persistent |

recorded from material preserved in alcohol. All Philippine *Cyrtandra* deposited at AAH, BM, BO, E, GH, K, L, NY, P, PNH, and US were consulted through visits to these herbaria and access to digital images. Herbaria acronyms follow *Index Herbariorum* (Thiers, continuously updated). Descriptions follow schemes of recently published accounts of new species (Atkins & Cronk 2001; Johnson 2017; Kartonegoro et al. 2018; Atkins et al. 2019). Assessment of Conservation Status was implemented using GeoCAT (Bachman et al. 2011), following the IUCN Red List Category criteria (IUCN Standards and Petitions Subcommittee 2017).

**Results**

*Cyrtandra ferruginea*, *C. villosissima*, *C. hirtigera*, and the new species described here share the following characteristics: erect suffrutescent habit and large slightly falcate and densely hirsute opposite leaves. There exist minute differences in their vegetative characters and they are presented in the key. Table 1 details more differences between the studied species. The studied species primarily differ, vegetatively, in color of indumentum and leaf symmetry. *Cyrtandra argenti* sp. nov. is distinct among the three species by having a white indumentum, and *C. ferruginea* is distinct by having pronouncedly anisophyllous leaves. Ultimately, the species are distinguishable by calyx and inflorescence type, corolla color and, to some degree, by geographic distribution (Fig. 1). *Cyrtandra hirtigera* is restricted
to the island of Palawan and *C. villosissima* is found in Mindanao extending to Negros Island. Only *C. ferruginea* and *C. argenti** sp. nov. occur on Luzon island.

Class Magnoliopsida Brongn. (Brongniart 1843)
Order Lamiales Bromhead (Bromhead 1838)
Family Gesneriaceae Rich. & Juss. (de Candolle 1816)

Genus *Cyrtandra* J.R.Forst. & G.Forst. (Forster & Forster 1775)

**Key to the studied species**

1. Mature leaves anisophyllous (i.e., smaller leaves less than half the length of the larger leaves in a pair) .................................................................................................................... *C. ferruginea* Merr.
   – Mature leaves subequal ..................................................................................................................... 2

2. Indumentum white; inflorescences pendulous and pedunculate ................................................................. *C. argenti** Olivar, H.J. Atkins & Muellner sp. nov.
   – Indumentum ferruginous; inflorescences erect and subsessile ............................................................... 3

3. Calyx divided almost to the base; corolla red ....................................................... *C. villosissima* Merr.
   – Calyx fused for half or more of its length; corolla yellowish green or dull reddish orange ............................ *C. hirtigera* H.J.Atkins & Cronk

**Cyrtandra argenti** Olivar, H.J.Atkins & Muellner sp. nov.
[urn:lsid:ipni.org:names:77209562-1](urn:lsid:ipni.org:names:77209562-1)
Figs 1, 2, 3A, 4A

**Diagnosis**
The species’ pendulous compound cymose inflorescences (10–15 flowers) distinguish it from all other members of the genus in the Philippines. The combination of subequal leaves, white woolly indumentum, glabrous corolla, and ovoid fruit separates this species from the rest of the *C. villosissima* group.

**Etymology**
This species is named after George Argent who was part of the team that collected specimens at the type locality. George’s contribution to our knowledge of the Philippine flora is undisputed. His extensive fieldwork in the country has led to the discovery of several new species, recognition of important conservation areas, and promotion of biodiversity studies.

**Material examined**

**Type**
PHILIPPINES • Mindoro Island, Oriental Province, Mt Halcon; 600 m; 13 Mar. 1997; *Mendum, M.*, *Argent, C.G.C.*, *Pennington, R.T.*, *Wilkie, P.*, *Reynoso, E.J.*, *Gaerlan, F.* 29053 (holotype: E!; isotype: PNH).

**Additional material**
PHILIPPINES • Mt Halcon, Mindoro; 12 May 1986; *C.E. Ridsdale* 1762 (K000223279, L.2822762) • ibid.; 1 Apr. 1991; *Stone, Reynoso, Sagcal* 504 (K000223280, L.2822797, US00737625) • ibid.; 13 Mar. 1997; *Argent, Gaerlan, Reynoso* 20053 (L.3805692) • Sierra Madre Mountains, Baler Aurora; 25 Mar. 1968; *Jacobs, M.* 8002 (L.2822694) • Aurora National Park; 8 Mar. 1993; *Barbon, Garcia, Fernando*
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9121 (K000223281, L.3794225) • Llavae, Infanta, Quezon Province; 25 Jun. 1955; Lagrimas, M. 521 (L.2822646).

Description

An erect suffrutescent plant up to 3 m in height. Stems terete or slightly grooved, with white woolly hairs throughout. Leaves opposite, subequal; petioles 4–7 cm long, densely hirsute; blades 13–30 × 7–15 cm, oblong to oblong-elliptic, slightly falcate, apex attenuate, base rounded to oblique, pronouncedly asymmetrical, not decurrent, margins denticulate, 10–12 pairs of lateral veins, curving and uniting at the margins, densely hirsute on both sides. Inflorescences compound cymes, axillary, pendulous, pedunculate, with 10–15 flowers; peduncle 5–6 cm, densely hirsute; bracts green, ca 9 × 2 mm, lanceolate, densely hirsute on both surfaces, persistent; bracteoles on every point of branching, lanceolate, green, ca 5 × 2 mm, densely hirsute on both surfaces; pedicels 3–5 cm long, densely hirsute. Calyx tubular, pale green, ca 15 mm long, upper lobes ca 4 mm long, lower lobes ca 6 mm long, acuminate, densely hirsute externally, glabrous internally. Corolla white, ca 30 mm long, funnel-shaped, lobes suborbicular, upper lobes 10–12 × 5 mm, lower lobes 7 × 7 mm, lower lobes 8 × 8 mm, 3–4 × 1–2 mm; glabrous externally and internally, lobes slightly recurved. Stamens 2; filaments ca 12 mm long, attached ca 17 mm from base of corolla, glabrous; anthers ca 2.5 mm long, thecae parallel, coherent at apices; staminodes 3, lateral staminodes ca 3 mm long, central staminode ca 0.5 mm long. Gynoecium ca 20 mm long overall; disc cupular with entire margin, ca 1.5 mm long, glabrous; ovary ca 6 mm long, glabrous, with some eglandular hairs towards base of style; style ca 14 mm long, with eglandular hairs throughout; stigma

Fig. 1. Map of the Philippines showing known distributions of Cyrtandra argentii Olivar, H.J. Atkins & Muellner sp. nov. (★), C. ferruginea Merr. (■), C. hirtigera H.J. Atkins & Cronk (◆), and C. villosissima Merr. (●) based on collection localities. A single point may represent more than one collection.
Fig. 2. *Cyrtandra argentii* Olivar, H.J. Atkins & Muellner sp. nov. A. Flower, lateral view. B. Detail of upper leaf surface. C. Habit. D. Inflorescence. E. Calyx, longitudinal section. F. Corolla, longitudinal section. G. Gynoecium. H. Fruit enclosed by the persistent calyx. Drawn from *Mendum et al. 29053* deposited at E. Habit, inflorescence, fruit and leaf indumentum drawn from dried material. Flower parts all from material preserved in alcohol. Drawing by Claire Banks.
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bilobed, ca 2.5 mm across. *Fruits* ovoid, green, glabrous, verrucose, ca 12 × 5 mm, excluding the style; calyx persistent and entirely enclosing the fruit, style persistent.

**Distribution and habitat**

*Cyrtandra argentii* sp. nov. is found growing on slopes near streams in primary forests. This species is distributed from the north of Luzon to the island of Mindoro.

**Conservation status**

*Cyrtandra argentii* sp. nov. occurs at an elevation of 600–800 m a.s.l. which corresponds to the forest land use zone (Villanueva & Buot Jr 2018). Using the online GeoCAT conservation assessment tool (http://geocat.kew.org/), the proposed conservation category based on Extent of Occurrence (EOO) is Near Threatened (NT), and the category based on the estimated Area of Occupancy (AOO) calculated using the default 2 × 2 km grid is Endangered (EN). Here, we consider this species’ status as NT due to: i) its occurrence in close proximity to the agroforest land use zone, the latter at approximately 100–400 m a.s.l. (Villanueva & Buot Jr 2018); and ii) the fact that the forest areas wherein the species occurs are not declared protected by law (Biodiversity Management Bureau 2015), making it highly susceptible to population decline through deforestation and other anthropogenic activities.

**Notes**

Like many species of *Cyrtandra*, filaments of *C. argentii* sp. nov. recoil into the corolla tube after anther dehiscence. This is hypothesized as constituting a mechanism against self-pollination (Bramley et al. 2003). The length of the style also varies developmentally, the style can be either exserted or inserted depending on the stage of maturity of the flower.

*Cyrtandra ferruginea* Merr. (Merrill 1915)

Figs 1, 3B, 4B

**Material examined**

**Type**

PHILIPPINES • Luzon, Camarines, Mt Cauayan; 9 Dec. 1913; *Phil. Pl. Ramos 1548* (syntypes: BM!, GH!, NY!, P!, US!).

**Additional material**

PHILIPPINES • Mt Isarog, Camarines Sur; Aug. 1915; *Ramos 23554* (US00081328) • ibid.; 22 Mar. 1997; *Mendum et al. 29182* (E00057041) • ibid.; 23 Mar. 1997; *Argent et al. 20182* (L.3805694) • Mt Bulusan, Sorsogon; Dec. 1915; *Elmer 16074* (L.2818244, US00081329, U.1341267, P03884333) • ibid.; 19 Jun. 1958; *Sinclair 9624* (E00631523) • Mt Mayon, Albay; 15 Nov. 1991; *Reynoso, Romero & Fuentes 3384* (E00316099) • Catanduanes; 11 Dec. 1917; *Ramos 30288* (US00081330, P03884332) • Mt Malinao, Albay; 29 Oct. 1995; *Reynoso, Sageal & Fernando 21406* (L.3805666).

**Description**

An erect suffrutescent plant up to 1 m in height. *Stems* terete with ferruginous hairs all throughout. *Leaves* opposite, anisophyllous; petioles 4–7 cm long, densely hirsute; blades ca 20 × 12 cm, oblong to obl-long-elliptic slightly falcate, apex acute or slightly acuminate, base acute or rounded, pronouncedly asymmetrical, not decurrent, margins denticulate, 10 pairs of lateral veins, curving and uniting at the margin, densely hirsute on both sides; blades of smaller leaves of a pair 6.5–9 × 2–2.5 cm, resembling the major leaves in all other respects. *Inflorescences* cymose, axillary, erect, pedunculate, with 1–3 flowers; peduncle 2–3 cm long, densely hirsute; bracts green, ca 10 × 1 mm, linear lanceolate, densely hirsute.
Fig. 3. Leaf similarities. A. *C. argentii* Olivar, H.J.Atkins & Muellner sp. nov. B. *C. ferruginea* Merr. C. *C. hirtigera* H.J.Atkins & Cronk. D. *C. vilosissima* Merr. Photos taken from Co’s Digital Flora with permission (Pelser *et al.* 2011 onwards).
on both surfaces, persistent. *Calyx* tubular, pale green, 20–30 mm long, upper lobes ca 3 mm long, lower lobes ca 7 mm long, acuminate, densely hirsute externally, with glandular hairs internally at base of lobes. *Corolla* white, 50–65 mm long, funnel-shaped, upper lobes rounded, ca $8 \times 9$ mm, lower and lateral lobes rounded, ca $5 \times 6$ mm, densely hirsute, with glandular hairs internally, lobes slightly recurved. *Stamens* 2; filaments ca 10 mm long, attached ca 18 mm from base of corolla, sparsely covered with glandular hairs; anthers ca 1.5 mm long, thecae parallel, coherent at apices; staminodes 3, lateral staminodes ca 4 mm long, central staminode ca 1 mm long. *Gynoecium* ca 25 mm long overall; disc cupular with undulate margin, ca 2 mm long, glabrous; ovary 8–9 mm long, with glandular hairs throughout; style ca 12 mm long, with glandular hairs throughout; stigma bilobed, ca 1 mm across. *Fruits* lanceolate, green, hirsute, verrucose, 30–40 $\times$ 6 mm; calyx persistent and entirely enclosing the fruit, style persistent.

**Distribution and habitat**

*Crytandra ferruginea* is found growing in damp forests at approximately 500–800 m a.s.l. and can be found on Catanduanes, Mt Isarog, Mt Mayon, Mt Malinao and Mt Bulusan (Fig. 1).

**Notes**

*Crytandra ferruginea* is morphologically most similar to *C. argentii* sp. nov., but can be separated by the following characters: ferruginous anisophyllous leaves, 1–3 flowered simple cymes, and hirsute corolla.

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**Fig. 4.** Inflorescence types. A. *C. argentii* Olivar, H.J. Atkins & Muellner sp. nov. B. *C. ferruginea* Merr. C. *C. hirtigera* H.J. Atkins & Cronk. D. *C. villosissima* Merr. A, B & D from Co’s Digital Flora with permission (Pelser et al. 2011 onwards). C from a living collection in RBGE.
Cyrtandra hirtigera H.J. Atkins & Cronk (Atkins & Cronk 2001)  
Figs 1, 3C, 4C

Material examined

Type
PHILIPPINES • Palawan, Cleopatra’s Needle; 29 Jan. 1998; Cronk et al. 25433 (holotype: PNH!; isotypes: E!, K!, L!).

Additional material
PHILIPPINES • San Vicente, Palawan; 4 Aug. 1988; Soejarto & Madulid 6353 (L.2818049) • Mt Beaufort, Palawan; 12 Mar. 1984; Ridsdale SMHI 23 (L.2818051) • Pagdanan Range, Palawan; 22 Apr. 1984; Podzorski SMHI 934 (L.2818049) • Mt Mantalingahan, Palawan; 5 May 1948; Edaño 122 (L.2818048) • ibid.; 4 Mar. 1992; Argent & Romero 9666 (L.3805814) • Malampaya Bay, Palawan; Oct. 1922; Merrill 11573 (US00081506) • Mt Capoas, Palawan; Apr. 1913; Merrill 9500 (US00081487) • Palawan; Apr. 1906; Foxworthy 581 (US00081485, P03899657) • Taytay, Palawan; 31 Jan. 1991; Stone 327 (L.2822680).

Description
An erect suffrutescent plant, up to 2–2.5 m in height. Stems terete, with crimson or white hairs throughout. Leaves opposite, subequal; petioles 5–8 cm long, densely hirsute; blades 22–30 × 15–18 cm, broadly elliptic, slightly falcate, apex acuminate, base cuneate, not decurrent, margins denticulate, 12–14 pairs of lateral veins, curving and uniting at the margins, densely hirsute on both sides. Inflorescences cymous, axillary, erect, subsessile, with 4–many flowers; peduncle 4–5 mm, densely hirsute; bracts green, ca 1 cm × 5 mm, lanceolate, densely hirsute on both surfaces, persistent; bracteoles up to 5 mm long, densely hirsute on both surfaces; pedicels ca 5 mm long, densely hirsute. Calyx tubular, red or green, ca 1–1.5 cm long, lobes ca 5 mm long, lower lobes ca 6 mm long, acute or narrowly acuminate, densely hirsute externally, with scattered glandular hairs internally and has prominent tufts of hairs at the base. Corolla dull reddish orange or yellowish green, ca 2 cm long, funnel-shaped, lobes slightly bilabiate or subequal, upper lobes, 1–1.5 × 2 mm, lateral lobes 1 × 1.5 mm, lower lobes 2 × 1.5 mm; glandular hairs externally and internally. Stamens 2; filaments ca 1–1.5 cm long, attached ca 12–13 mm from base of corolla, glabrous; anthers ca 2 mm long, thecae parallel, coherent at apices; staminodes 2, 5–8 mm long. Gynoecium ca 20 mm long overall; disc cupular with undulate margin, ca 1.5 mm long, glabrous; ovary ca 4–5 mm long, glabrous; style ca 10 mm long, with eglandular hairs throughout; stigma bilobed, ca 2.5 mm across. Fruits ovoid, green, glabrous, ca 1 cm × 5 mm; inflorescence bracts persistent, calyx and style not persistent.

Distribution and habitat
Cyrtandra hirtigera is distributed throughout the island of Palawan and is usually found on slopes near gullies at 30–900 m a.s.l.

Notes
Atkins & Cronk (2001) described two varieties of this species, C. hirtigera var. hirtigera and C. hirtigera var. chlorina, distinguishable by color and shape of their calyces and corolla limbs. Cyrtandra hirtigera var. hirtigera has a crimson indumentum, red calyces with acute lobe apices, and reddish orange corollas with slightly bilabiate limbs. Cyrtandra hirtigera var. chlorina has pale indumentum, green calyces with acuminate lobe apices, and yellowish green corollas with subequal lobes.
Cyrtandra villosissima Merr. (Merrill 1906)
Figs 1, 3D, 4D

Material examined

Type
PHILIPPINES • Mindanao, Camp Keithley, Lake Lanao; Jan. 1906; Mrs Clemens 51 (holotype: AAH!; isotypes: F!, US!).

Additional material
PHILIPPINES • Mt Malindang, Misamis Occidental; 16 Mar. 2004; Opiso et al. 2088 (L.3794253)
• ibid.; May 1993; Gaerlan et al. 10925 (K000184579, L.3794112) • Mt Hibok-Hibok, Camiguin; 1999; RBGE & PNH 48 (E00743749) • Lake Balunsasayao, Negros Oriental; 11 Sep. 1953; Britton 357 (L.2826671) • Cuernos Mountains, Negros Oriental; 13 May 1948; Edaño 7393 (AAH00092001)
• ibid.; Mar. 1908; Elmer 9511 (L.2826672, US00081486) • Mahilucot River, Bukidnon; Jul. 1920; Ramos & Edaño 38649 (L.2826670, US00081488) • Mt Daho, Jolo; Sep. 1924; Ramos & Edaño 43913 (P03899658).

Description

An erect suffrutescent plant up to 7 m in height. Stems terete or slightly grooved, with ferruginous woolly hairs throughout. Leaves opposite, subequal; petioles 3–5 cm long, densely hirsute; blades 11–20 × 3.5–8 cm, oblong-ovate to ovate-lanceolate, slightly falcate, apex acuminate, base acute or acuminate, pronouncedly asymmetrical, not decurrent, margins denticulate, 12–14 pairs of lateral veins, curving and uniting at the margins, densely hirsute on both sides. Inflorescences cymous, axillary, erect, subsessile, with 4–many flowers; peduncle 4–5 mm, densely hirsute; bracts green, ca 1 cm, linear, densely hirsute on both surfaces, persistent; bracteoles up to 5 mm long, densely hirsute on both surfaces; pedicels ca 5 mm long, densely hirsute. Calyx tubular, pale green, lobes linear ca 1.5 cm × 1 mm, densely hirsute. Corolla red, ca 18 mm long, funnel-shaped, lobes orbicular-ovate ca 4 mm long, densely hirsute. Stamens 2; filaments ca 2 mm long; anthers ca 2.5 mm long, thecae parallel, coherent at apices. Gynoecium ca 20 mm long overall, densely hirsute; disc cupular, glabrous; style densely hirsute. Fruits oblong, green, densely hirsute, ca 1 cm × 4.5 mm; calyx and style persistent.

Distribution and habitat

Cyrtandra villosissima is distributed throughout the island of Mindanao and extends to the island of Negros in the Visayas and is usually found in well-shaded areas near ravines.

Notes

Cyrtandra villosissima is vegetatively similar to C. hirtigera. It is distinguishable by its red corolla and green calyces with distinctly linear lobes. Based on available distribution data, C. hirtigera appears to be restricted to the island of Palawan while C. villosissima can be found from Negros Island to the island of Mindanao.

Discussion

The recognition of C. argentii sp. nov. as a new species was here aided by increased availability of collections with reproductive parts and continued alpha-taxonomic work. This highlights the importance of reproductive characters in establishing species boundaries among Cyrtandra species. In phylogenetic analyses of the Southeast Asian Cyrtandra (Atkins et al. 2020), the C. villosissima group was not resolved as monophyletic; only C. villosissima and C. hirtigera belonged to the same subclade, but were not resolved as exclusive sister taxa. The character combination of erect suffrutescent habit with large leaves that are slightly falcate and densely hirsute has evolved at least three times independently (Atkins
et al. 2020). Figure 3 shows this shared character combination and Fig. 4 shows the inflorescence type that ultimately distinguishes the species from each other.

The genus *Cyrtandra* is the most taxonomically challenging in the Gesneriaceae due to its large number and high proportion of poorly known and undescribed species (Burtt 2001; Atkins et al. 2013; Clark et al. 2013). Atkins et al. (2013) estimated 800 species of *Cyrtandra*. Since then, several authors (Bone & Atkins 2013; Johnson 2017; Kartonegoro et al. 2018; Atkins et al. 2019) have described additional species. The number of species is expected to increase further as more alpha-taxonomic work and field collection are carried out.

Large genera can be systematically addressed by following a phylogenetically informed taxonomic approach on a region-by-region basis (Atkins et al. 2013; Clark et al. 2013). This has been applied effectively by Bramley (2005) in a revision of *Cyrtandra* section *Dissimiles* in Borneo. The approach involves a robustly sampled phylogenetic tree wherein monophyletic clades can be characterized morphologically by one or more salient characters (Atkins et al. 2013; Clark et al. 2013). Taxa with molecular data can be assigned to the clades while taxa lacking molecular data can be tentatively assigned based on morphological similarities. Upon assignment to a clade, taxonomic assessment can be streamlined by focusing on related taxa identified through both morphological and molecular data, therefore limiting the number of potential conspecifics for comparison. Areas, particularly archipelagos, with high diversity can benefit from this approach since it provides a systematic way of prioritizing areas where additional fieldwork and alpha-taxonomic work are most needed. Clark et al. (2013) suggest that phylogenetically defined areas can be addressed taxonomically first, followed by increased sampling in lesser-resolved areas. This strategy is currently being applied to study the genus in the Philippines with the aim of producing a complete revision of *Cyrtandra* in the archipelago (Olivar et al., in preparation).

**Acknowledgements**

This research received support from the SYNTHESYS Project http://www.syntheses.info/ which is financed by European Community Research Infrastructure Action under the FP7 ‘Capacities’ Program. Financial support for this study was also provided by the Deutscher Akademischer Austauschdienst (DAAD project no. 91690870) to JECO and ANM-R, and the Federal Ministry of Education and Research (BMBF project no. 16GW0120K) to ANM-R. Mr Danilo Tandang from PNH is acknowledged for his help with the types. Curators of AAH, BM, BO, E, GH, K, L, NY, P, PNH, and US are acknowledged for their assistance during visits, loans, and digital images. Nathan Kelso, Sadie Barber and Stephen Willis are thanked for their excellent care of the Gesneriaceae living collections at RBGE and Claire Banks is thanked for the detailed botanical illustration of the new species.

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Manuscript received: 2 September 2019
Manuscript accepted: 6 January 2020
Published on: 30 June 2020
Topic editor: Frederik Leliaert
Desk editor: Connie Baak

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