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12-15-2025

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Clerodendrum kelli* (Lamiaceae), a new species from Carranglan, Nueva Ecija, Philippines, and lectotypification of *Clerodendrum mindorensis

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ABSTRACT. *Clerodendrum kelli* R.Bustam., A.B.Tobias & Ples—a new species of the genus *Clerodendrum* L. (Lamiaceae) from the montane forests of Carranglan, Nueva Ecija, Luzon Island, Philippines—is described and illustrated. The species shares morphological features that are uncommon for the genus with both *Clerodendrum quadriloculare* (Blanco) Merr. (purple abaxial leaf surfaces) and *C. mindorensis* Merr. (reduced fruiting calyx lobes), but differs from both in having lax (vs dense/compact) inflorescences bearing flowers with shorter corolla tubes and reddish-pink (vs green or purple) calyces with ovate (vs triangular or lanceolate) lobes. Additionally, a lectotype for *C. mindorensis* is assigned. Preliminary assessment of its conservation status following IUCN guidelines places *Clerodendrum kelli* in the category of Critically Endangered (CR B1ab(iii)+2ab(iii)).

Keywords. Lamiales, Luzon Island, Pantabangan-Carranglan Watershed Forest Reserve, understorey shrub

Introduction

The genus of glorybowers, *Clerodendrum* L., belongs to the subfamily Ajugoideae of the mint family, Lamiaceae (Li et al., 2016; Zhao et al., 2021). Various taxonomic studies and databases have included around 150 to 250 species, distributed across Africa, Asia, and Australia (Wearn & Mabberley, 2011; Wearn et al., 2019; Zhao et al., 2021; POWO, 2025; WFO, 2025). Most members of the genus can be recognised by brightly-coloured, accrescent fruiting calyces and 4-lobed drupaceous fruits (Bramley et al., 2011; Wearn et al., 2019; Sattaphorn et al., 2024).

In the Philippines, *Clerodendrum* species are often called some variation of the Tagalog name “*bagawak*”. Eighteen native species have thus far been recorded, six of which are endemic (Wearn et al., 2019; Olimpos & Ples, 2023). These species can be distinguished from one another based on characters such as leaf shape (e.g., cordate, elliptic); corolla length (from less than 1 cm to more than 10 cm) and colour (e.g., white, red/orange, yellow); and calyx forms (e.g., campanulate, tubular; reflexed or else cup-like when fruiting), among others (Wearn et al., 2019). Infrageneric classifications of *Clerodendrum* were recently updated and discussed in Sathaphorn et al. (2024).

The Philippine Taxonomic Initiative, Inc. (PTI) encountered populations of shrubby *Clerodendrum* with pale purple abaxial leaf surfaces and short white corolla tubes in the Pantabangan-Carranglan Watershed Forest Reserve (PCWFR). Upon closer morphological examination and after comparison of collections with protologues, other taxonomic treatments, and digitised type specimens, the plants were determined to belong to a currently undescribed species. Descriptions, photographs, and illustrations are thus presented here, together with a comparison to other species (one of which, *Clerodendrum mindorense* Merr., has a lectotype designated in the process).

Methodology

Two collections (*P4-25*, *PCWFR7-032*), collected under Wildlife Gratuitous Permit Nos. III-2022-002 (Extension) and III-2023-012 (Extension), with Local Transport Permit Nos. CMÑZ 2022-008 and CMÑZ 2023-008, were used for the morphological description. These were supplemented by in situ observations, photographs, and spirit collections preserved in Copenhagen solution. Geographic coordinates of collection sites were recorded with GaiaGPS, which also served to generate reference maps for the study.

Specimens were compared against measurements and characters for similar Malesian species listed in the recent *Flora Malesiana* treatment for *Clerodendrum* (Wearn et al., 2019), photographs from online digital flora (Nickrent et al., 2006 onwards), as well as digitised type specimens from various online herbaria and databases, including A, FEUH, GH, HNUL, K, L, NY, PUH, and US (acronyms following Thiers, continuously updated). Botanical terms were applied as defined by the Kew Plant Glossary (Beentje, 2016).

Type specimens were deposited in the Philippine National Herbarium (PNH) at the National Museum of the Philippines, Manila as well as the Jose Vera Santos Memorial Herbarium (PUH) at the Institute of Biology, University of the Philippines Diliman. Conservation status was assessed following the Guidelines for Using the IUCN Red List Categories and Criteria (IUCN Standards and Petitions Committee, 2024).

Taxonomic treatment

Clerodendrum kelli R. Bustam., A. B. Tobias & Ples, **sp. nov.**

This species shares characters that are uncommon for the genus with both *Clerodendrum quadriloculare* (Blanco) Merr. (purple abaxial leaf surfaces) and *Clerodendrum mindorense* Merr. (reduced fruiting calyx lobes). However, it differs from both in having lax (vs dense/compact) inflorescences bearing flowers with shorter (1.2–1.5 vs 2–3 and 4.5–11 cm long) corollas and reddish-pink (vs green or purple) calyces with ovate (vs triangular or lanceolate) lobes. – TYPE: Philippines, Nueva Ecija, Pantabangan-Carranglan Watershed Forest Reserve, Mt Meddengen, 1200–1362 m, 8 August 2023, PCWFR7-032 (holotype PNH [PNH259150]; isotype PUH [PUH021859]). (Figs 1, 2)

Shrub, c. 1 m tall. **Stems** lenticellate, light brown, puberulent-glabrescent. **Leaves** simple, decussate; petiole with or without groove, 0.5–4.4(–6.3) cm long, purplish-red for younger leaves, minutely puberulent; *lamina* lanceolate, 4.5–15.9 × 1.6–7 cm, 2.1–3.6 times as long as wide, adaxially green, abaxially pale purple, glabrous on both sides, papery, base cuneate, margin coarsely dentate, apex attenuate; *venation* semi-craspedodromous, adaxially sunken and abaxially prominent, midrib purplish red and minutely pubescent, lateral veins 4–6 pairs and purple, tertiary veins greenish. **Inflorescences** erect, somewhat lax, terminal thyrses typically containing 12–18 flowers, 3.6–5.3 × 1.9–5.9(–7.4) cm, minutely puberulent; *peduncle* with or without groove, 10–19 cm long, purplish red, axes trichotomous; *primary branches* from main axis to lower cymes 0.7–1.1(–2.2) cm long, subtended by leaf-like bracts up to 6 cm long. **Flowers** with pedicels 4–11(–20) mm long, minutely puberulent, bearing caducous linear bracteoles 3–5 × c. 1 mm. **Calyx** cupuliform, reddish-pink, puberulent, 2–2.5 × 2–2.5 mm; *lobes* 5, ovate, connate for about 2/3 of cup length, then 0.5–1 × 1–1.5 mm; *fruiting calyx* accrescent, enclosing the proximal third of the young fruit and turning red, cup expanding to c. 3 × 4–5.5 mm, lobes becoming incorporated such that calyx cup rim becomes entire. **Corolla** white; tube 1.2–1.5 cm long, puberulent; *lobes* elliptic-ovate, 4–8 × 2–4 mm, puberulent. **Stamens** 4, filaments white, 14–16 mm long, exerted to 10–11 mm from corolla tube; *anthers* basifixed, elliptic, c. 1.5 × 1 mm, pale purple. **Style** 1, 23–25 mm long, white to reddish-pink. **Fruit** (immature) globose to subglobose, 2–6.5(–8) × 2.5–5 mm, bright green, glabrous when young.

Distribution. The species is endemic to the Philippines, so far only known from two localities (Mt Meddengen and Sitio Binbin) in the Caraballo Mountain Range, within the Pantabangan-Carranglan Watershed Forest Reserve (PCWFR) in the province of Nueva Ecija on the island of Luzon (Fig. 3).

Ecology. *Clerodendrum kelli* was recorded as a small shrub growing in humid montane rainforest between 1170 and 1362 m above sea level, under partial to full shade. The species did not appear to be locally abundant or common. In both sites where it was observed, the soil was generally loam or clay topped with thick leaf litter; the Sitio Binbin site was slightly brighter and drier, with less moss cover than the Meddengen

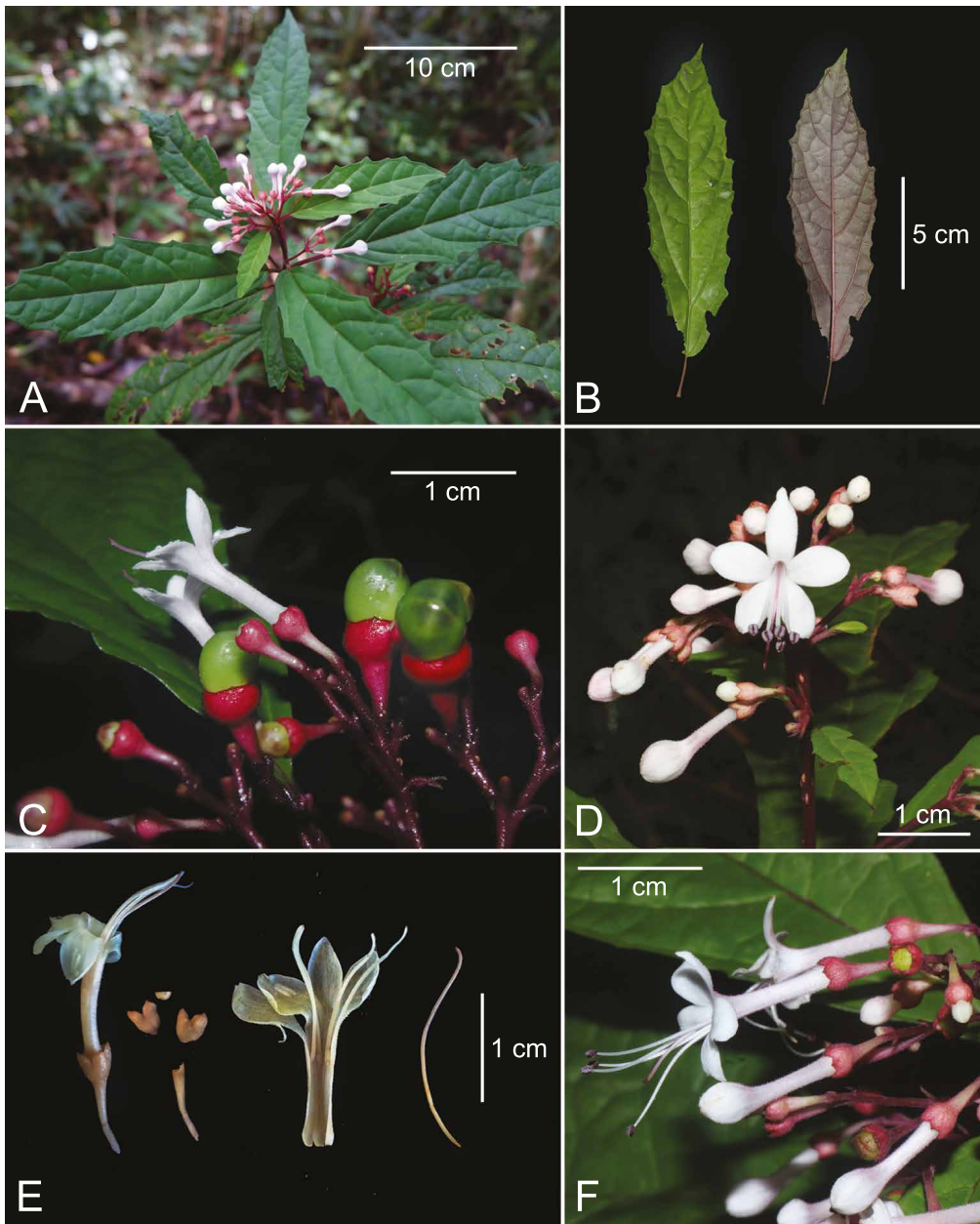


Fig. 1. *Clerodendrum kelli* R.Bustam., A.B.Tobias & Ples. **A.** Habit. **B.** Leaves, adaxial and abaxial surface. **C.** Flowers and immature fruits. **D.** Inflorescence and flowers (front view). **E.** Longitudinal section of flower. **F.** Inflorescence and flowers (side view). (Photos: A, E, A.B. Tobias; B, D, J.P. Collantes; C, J.A. Mansibang; F, J.M. Agcaoili)

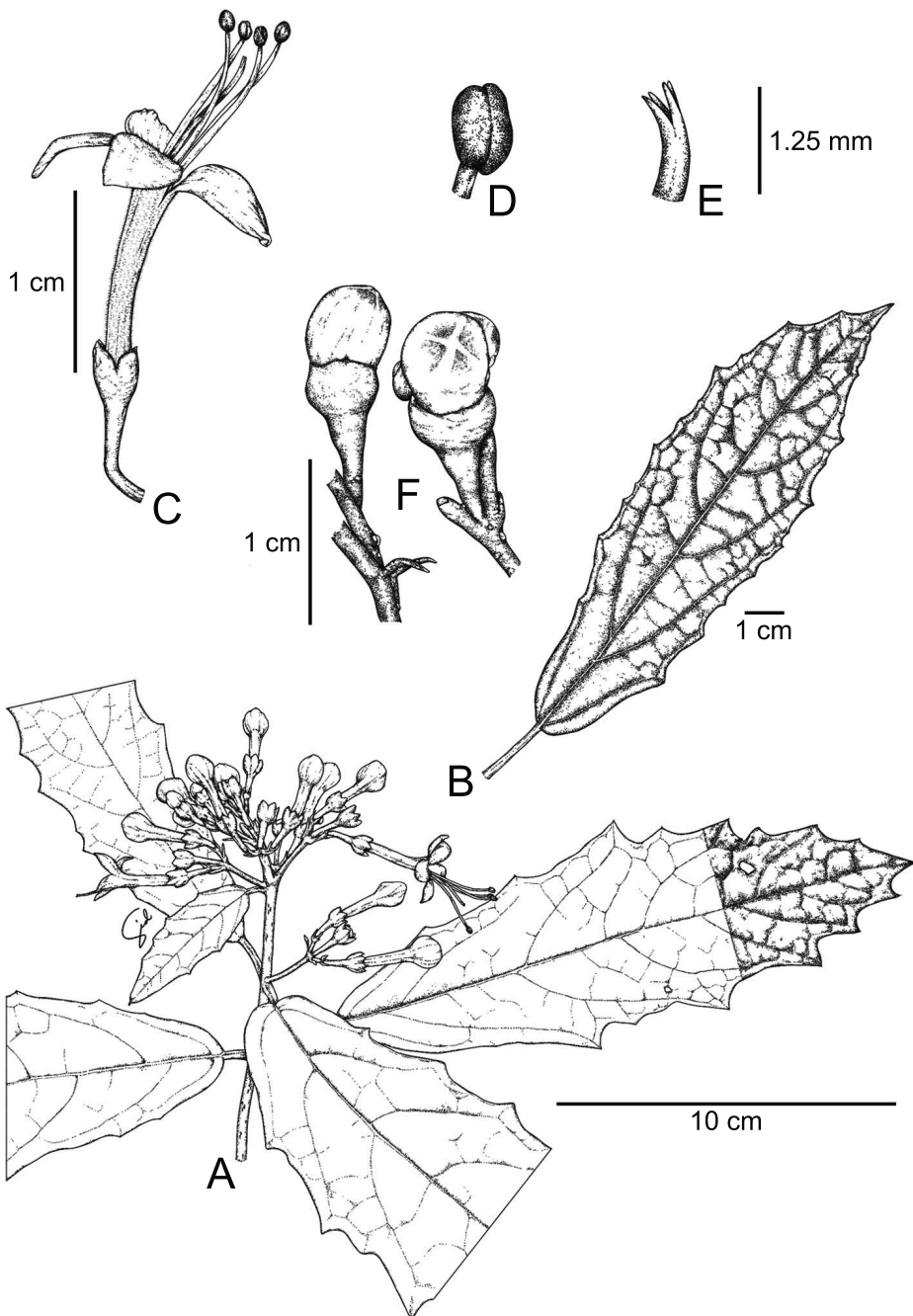


Fig. 2. *Clerodendrum kelli* R.Bustam., A.B.Tobias & Ples. **A.** Flowering twig. **B.** Leaf. **C.** Flower. **D.** Anther. **E.** Stigma. **F.** Developing fruit and fruiting calyx without lobes. Illustrated by Julieferd Torres.

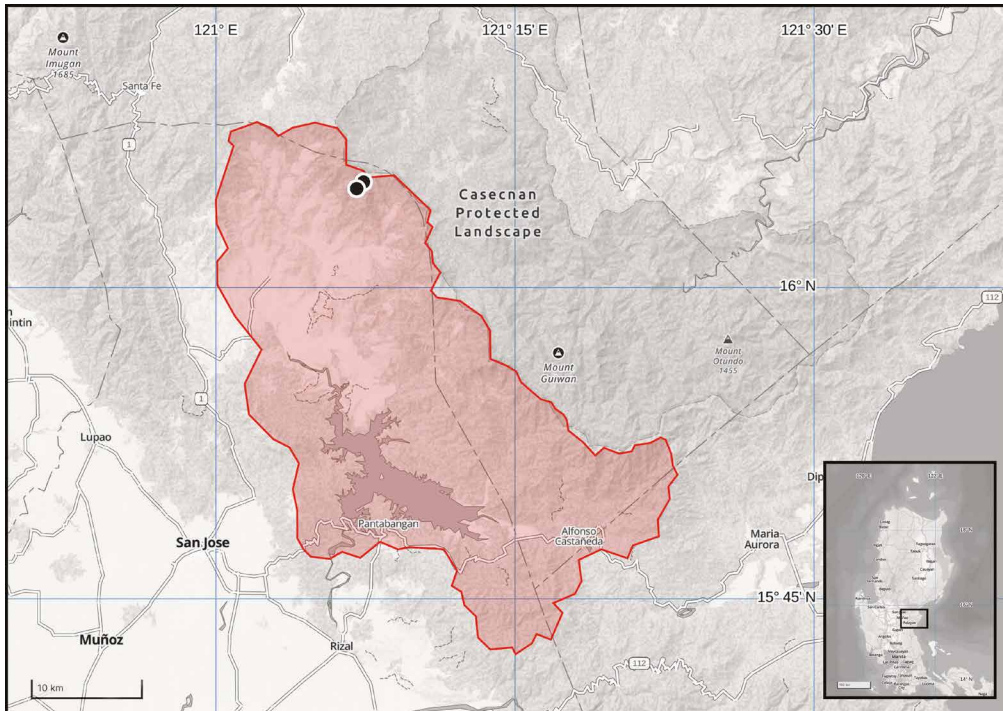


Fig. 3. Distribution map for *Clerodendrum kelli* R.Bustam., A.B.Tobias & Ples. The red bounded area represents the Pantabangan-Carranglan Watershed Forest Reserve (PCWFR), and the black dots represent the two occurrences of *Clerodendrum kelli*.

site. *Syzygium bataanense* (Merr.) Merr. and species belonging to the genera *Agathis* Salisb., *Nageia* Gaertn., and *Lithocarpus* Blume were dominant in the Sitio Binbin area, while *Clethra canescens* Reinw. ex Blume and species belonging to the genera *Saurauia* Willd., *Calophyllum* L., and *Syzygium* Gaertn. were dominant in Meddengen. Ground cover in Meddengen included *Begonia* cf. *palemlemensis* Calaramo, C.W.Lin & Rubite, *Scutellaria javanica* Jungh., and species in *Coleus* Lour. and *Strobilanthes* Blume. Other understorey vegetation included species of *Medinilla* Gaudich. ex DC. and *Vaccinium* L. *Clerodendrum kelli* was observed flowering in March and August, and fruiting from August to October.

Etymology and uses. The specific epithet *kelli* is the Bugkalot name for this species. The Bugkalot recognise *Clerodendrum kelli* as a species that occurs in the colder areas of the mountain; they traditionally mix extracts from the mashed leaves of this plant with food preparations for sick dogs to restore their health (Udasco, pers. comm.).

Provisional IUCN conservation assessment. This species has been collected from two localities in the Caraballo Mountain Range within the Pantabangan-Carranglan Watershed Forest Reserve (PCWFR). Both records can be considered a single

location (area of threat), with an area of occupancy (AOO) of approximately 8 km². Although this area is formally protected, land conversion for small-scale agriculture and residential/recreational use, among other threats, has resulted in the decline of the extent and quality of its natural habitat. There have also been large landslides near the ridge where the species grows. *Clerodendrum kelli* is therefore assessed as Critically Endangered (CR B1ab(iii)+2ab(iii)).

Additional specimens examined. PHILIPPINES: **Nueva Ecija:** Pantabangan-Carranglan Watershed Forest Reserve, Sitio Binbin, c. 1170 m, 25 Oct. 2022, P4-25 (PUH [PUH021860]).

Notes. In addition to the uncommon characters that *Clerodendrum kelli* shares individually with *C. quadriloculare* and *C. mindorensis* (see diagnosis), the three species also all produce white corolla tubes and calyces that form cups around the developing fruit. However, leaf margins differ among the three species, and leaf venation for *Clerodendrum kelli* is semi-craspedodromous (vs brochidodromous). In addition, the measurements for various characters (leaf/calyx/corolla tube length and inflorescence size) are consistently smaller/shorter for *Clerodendrum kelli* when compared to *C. mindorensis* or *C. quadriloculare*. The similarities and differences between the three species are summarised in Table 1.

Molecular phylogenetic work could confirm the infrageneric placement of *Clerodendrum kelli*, although it is unlikely to be a member of sections *Densiflora* (with its condensed cymes and narrowly triangular calyx lobes), *Fortunata* (with its axillary inflorescences and long calyx lobes), *Siphonanthus* (with its elongated corolla tubes), and *Tridens* (with its red/orange calyces and corollas). Following the key to section provided by Sattaphorn et al. (2024), *Clerodendrum kelli* most likely falls under sect. *Albiflora*, having white corollas on an upright inflorescence, and lacking the distinctly “broad” ovate calyces and villose stems of sect. *Clerodendrum*.

Lectotypification of *Clerodendrum mindorensis* Merr.

The *Clerodendrum* treatment in the recent *Flora Malesiana* (Wearn et al., 2019) stated that the holotype for *C. mindorensis* (Merrill 1192) deposited at the PNH has been lost, but did not designate a lectotype. We selected the isotype at NY for this purpose, as it has the least obstructed view of the flowering structures, particularly the calyces. We have also taken the opportunity to cite a previously unlisted isotype from K.

Clerodendrum mindorensis Merr., Philipp. J. Sci., C 7: 342 (1912); Lam, Verbenaceae Malayan Archipel. 309 (1919); Merrill, Enum. Philipp. Fl. Pl. 3: 404 (1923); Moldenke, Phytologia 62: 314 (1987). – *Clerodendrum simile* Merr., Publ. Bur. Sci. Gov. Lab. 35: 64 (1905), nom. illeg. (non H. Pearson, Fl. Cap. 5: 224 (1901)). – TYPE: Philippines, Mindoro, Baco, January 1903, *E.D. Merrill 1192* (lectotype NY [NY00137464], designated here; isolectotypes K [K000804603], L [L.2759304], US [US00119352]).

Table 1. Comparison between *C. kelli*, *C. mindorensis*, and *C. quadriloculare*. Data for the latter two species were obtained from Wearn et al. (2019). Asterisks indicate characters not listed in that treatment, but observed by the authors in living plants (*) or photographs thereof (**; Nickrent et al., 2006 onwards).

Characters	<i>C. kelli</i>	<i>C. mindorensis</i>	<i>C. quadriloculare</i>
Shared by all three species			
Corolla tube colour	White	White	Pinkish mauve to white
Fruiting calyx form	Accrescent cup	Accrescent cup	Accrescent cup
Shared by <i>C. kelli</i> and <i>C. quadriloculare</i>			
Leaf abaxial colour	Pale purple	Pale green	Purplish
Shared by <i>C. kelli</i> and <i>C. mindorensis</i>			
Fruiting calyx lobes	Absent	Absent	Present
Different in <i>C. kelli</i>			
Inflorescence form	Lax	Dense	Dense
Leaf venation	Semi-craspedodromous	Brochidodromous	Brochidodromous
Calyx colour	Reddish-pink	Green**	Green or purple*
Different among all three species			
Leaf margins	Coarsely dentate	Entire-repand	Sinuate to slightly dentate
Leaf length	4.5–15.9 cm	9–20 cm	7–26 cm
Inflorescence length	3.6–5.3 cm	6–11 cm	-
Inflorescence width	1.9–5.9(–7.4) cm	6–11 cm	14–23 cm
Calyx lobe shape	Ovate	Triangular**	Lanceolate
Calyx length	2–2.5 mm	4–5 mm	5–6 mm
Calyx accrescent length	3 mm	6–12 mm	14–18 mm
Corolla tube length	1.2–1.5 cm	2–3 cm	(4.5–)6–9(–11) cm

ACKNOWLEDGEMENTS. The authors would like to thank John Michael M. Agcaoili for his photos and for first bringing the species to our attention. We are also grateful to the following individuals and organisations for their invaluable help with the study: Joselito M. Blanco and Gerundio C. Fernandez (former and current PENR Officers, PENRO-Nueva Ecija, and Protected Area Superintendents-PCWFR), Florencio J. Lalu and Merlito A. Villar (former and current CENR Officers, CENRO-Muñoz), Engr. Paquito T. Moreno and Engr. Ralph C. Pablo (former and current Regional Executive Director-DENR Region 3), and members of the Protected Area Management Board (PAMB) of PCWFR for their issuance of a Gratuitous Permit to conduct research in the area. We would like to thank Mr Marlon Bagiw, Maverick Tamayo, Jayson Mansibang, Liezel Magtoto, and John Paul Collantes for the technical and field support during PCWFR-1 and PCWFR-7 fieldwork and in the writing of this paper, as well as Pieter B. Pelser for reviewing the paper before submission and providing comprehensive and crucial feedback. Finally, the authors thank the Jose Vera Santos Memorial Herbarium (PUH) for use of its facilities in the early processing and temporary storage of the specimens, as well as Ateneo de Manila University for the funding support through the University Research Council Big Project Grant.

References

- Beentje, H. (2016). *The Kew Plant Glossary: An Illustrated Dictionary of Plant Terms*, 2nd ed. UK: Royal Botanic Gardens, Kew.
- Bramley, G.L.C., Go, R. & de Kok, R.P.J. (2011). Lamiaceae. In: Soepadmo, E., Saw, L.G., Chung, R.C.K. & Kiew, R. (eds), *Tree Flora of Sabah and Sarawak*, vol. 7. Malaysia: Sabah Forestry Department, Forest Research Institute Malaysia, Sarawak Forestry Department.
- IUCN Standards and Petitions Committee (2024). *Guidelines for Using the IUCN Red List Categories and Criteria*, ver. 16. Prepared by the Standards and Petitions Committee. Available from: <https://www.iucnredlist.org/documents/RedListGuidelines.pdf>.
- Li, B., Cantino, P.D., Olmstead, R.G., Bramley, G.L.C., Xiang, C., Ma, Z., Tan, Y. & Zhang, D. (2016). A large-scale chloroplast phylogeny of the Lamiaceae sheds new light on its subfamilial classification. *Sci. Rep.* 6: Article 34343.
- Nickrent, D.L., Costea, M., Barcelona, J.F., Pelser, P.B. & Nixon, K. (2006 onwards). *PhytoImages*. Available from: <http://www.phytoimages.siu.edu>. Accessed 21 Mar. 2025. (*Clerodendrum mindorense*: CUBIC 121944, CUBIC 130956)
- Olimpos, S.M.B. & Ples, D.J.R. (2023). *Begonia dimorpha* (Begoniaceae) and *Clerodendrum pygmaeum* (Lamiaceae), new records for the Philippines from Tawi-Tawi Island. *Gard. Bull. Singapore* 75(1): 119–128.
- POWO (2025). *Plants of the World Online*. Facilitated by the Royal Botanic Gardens, Kew. <https://powo.science.kew.org/>. Accessed 8 Sep. 2025.
- Sathaphorn, J., Paton, A.J., Zuntini, A.R., Cowan, R.S. & Leeratiwong, C. (2024). Phylogeny and infrageneric classification of *Clerodendrum* (Lamiaceae). *Bot. J. Linn. Soc.* 204(2): 103–136.
- Thiers, B. (continuously updated). *Index Herbariorum: A global directory of public herbaria and associated staff*. New York Botanical Garden. <http://sweetgum.nybg.org/science/ih/>. Accessed 29 Apr. 2024.
- Wearn, J.A. & Mabberley, D.J. (2011). *Clerodendrum* confusion – redefinition of, and new perspectives for, a large Labiate genus. *Gard. Bull. Singapore* 63(1&2): 119–124.

- Wearn, J.A., Mabberley, D.J. & Bramley, G.L.C. (2019). *Clerodendrum*. In: Bramley, G.L.C. (ed.), Lamiaceae, *Flora Malesiana*, ser. 1, Seed Plants, vol. 23, pp. 90–157. Singapore: National Parks Board.
- WFO (2025). *World Flora Online*. *Clerodendrum* L. <http://www.worldfloraonline.org/taxon/wfo-4000008593>. Accessed 8 Sep. 2025.
- Zhao, F., Chen, Y., Salmaki, Y., Drew, B.T., Wilson, T.C., Scheen, A., Celep, F., Bräuchler, C., Bendiksby, M., Wang, Q. et al. (2021). An updated tribal classification of Lamiaceae based on plastome phylogenomics. *BMC Biol.* 19: Article 2.