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RESEARCH ARTICLE

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A new species of *Vanoverberghia* (*Zingiberaceae*) from the Philippines

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Key words

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Philippines
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Abstract A new species from the Philippines, *Vanoverberghia rubrobracteata*, is described and illustrated here. The new species is most similar to *Vanoverberghia sepulchrei* from which it differs in its leaves with oblong to narrowly elliptic lamina, unevenly truncate ligule apex, glabrous and red floral bracts, red calyx, white or pink corolla tube and lobes, and absence of spots on the style.

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INTRODUCTION

Vanoverberghia Merr. is currently comprised of only two species namely *V. sepulchrei* Merr. from the Philippines and *V. sasakiana* Funak. & H.Ohashi from Taiwan (Zingiberaceae Resource Centre 2018). The type species of the genus, *V. sepulchrei,* is known to be restricted within Northern Luzon to the provinces of Mountain Province (type locality), Benguet, and Ifugao (Funakoshi & Ohashi 2000). Herbarium specimens and photographs posted online (e.g., Co's Digital Flora of the Philippines: www.philippineplants.org), however, document that *V. sepulchrei* also occurs in the provinces of Antique, Capiz, Quezon, Negros Occidental, Rizal, and Sorsogon. Recent examination of herbarium material and photographs identified as *V. sepulchrei* revealed that populations from the latter provinces and some populations from Ifugao and Mountain Province may represent a separate taxon. To investigate further whether these populations are distinct from *V. sepulchrei*, new vegetative and flowering material was collected from some of the above mentioned provinces. After comparing these to the protologue of *V. sepulchrei* and specimens including types, this study confirms the presence of a separate species which is described and illustrated below.

Specimens seen only as digital image available online (e.g., plants.jstor.org) are denoted with an asterisk (*). For the conservation status of the new species, the extent of occurrence (EOO) and area of occupancy (AOO) were calculated using the Geospatial Conservation Assessment Tool (GeoCAT) (Bachman et al. 2011; http://.geocat.kew.org). These data were then compiled to determine the conservation status of the new species using the International Union for Conservation of Nature (IUCN) criteria (IUCN 2016). The assessment is under review and will be available at http://www.iucnredlist.org/ after April 2019. A key to the species as well as a distribution map of *Vanoverberghia* are provided.

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TAXONOMIC TREATMENT

Key to Vanoverberghia species

1. Pseudostem 2–3 m long; peduncle yellowish green; apices of labellum lobes bifid; mature fruits mid-green. — Taiwan . . . . . *V. sasakiana*
1. Pseudostem 4–8 m long; peduncle red; apices of labellum lobes entire; mature fruits deep red. — Philippines 2
2. Lamina oblong; ligule apex rounded; bracts pubescent and pinkish white; calyx pinkish white; corolla tube and lobes white; style with spots . . . . . *V. sepulchrei*
2. Lamina oblong to narrowly elliptic; ligule apex unevenly truncate; bracts glabrous and red; calyx red; corolla tube and lobes white to pink; style spotless. . *V. rubrobracteata*

Vanoverberghia rubrobracteata Docot & Ambida, *sp. nov*. — Fig. 1–3; Map 1

Similar to *Vanoverberghia sepulchrei* Merr. but differs in the shape of the lamina (oblong to narrowly elliptic not oblong only), shape of the ligule apex (unevenly truncate not rounded), surface and colour of the floral bracts (glabrous and red not pubescent and white), colour of the calyx (red not pinkish white), colour of the corolla tube and lobes (white or pink not white only), and absence of spots on the style. — Type: *R.V.A. Docot 0123* (holo PNH no. 256337; iso E, NY, SING, USTH), Philippines, Luzon, Quezon, Tayabas, Barangay Lalo, Mount Banahaw, N14°03.561' E121°31.157', 1432 m, 12 Nov. 2018.

Etymology. The specific epithet refers to the red floral bracts.

Terrestrial herb in loose or dense clump. *Rhizome* 25–50 mm across, red, strongly aromatic when cut, scales thick, brown. *Leafy shoot* arching at various degrees, *pseudostem* 4–6 m long, base bulbous, 3–5 cm across, red; *sheaths* glabrous, green; *ligule* ovate, 20–30 mm long, coriaceous, glabrous, red, apex unevenly truncate and entire; *petiole* terete, 10–13 mm long; *lamina* oblong to narrowly elliptic, 50–51 by 11–15 cm, veins obscure, dark green above, lighter beneath, glabrous on both sides, base rounded, margin entire, apex caudate with a 20–30 mm long flagellate tip. *Inflorescence* a terminal raceme, pendulous, 25–35 cm long; *peduncle* terete, 10–20 cm long, glabrous, deep red, subtended by 2–3 persistent bracts; *rachis* 7–15 cm long, glabrous, deep red; *pedicel* terete, 3–5 mm

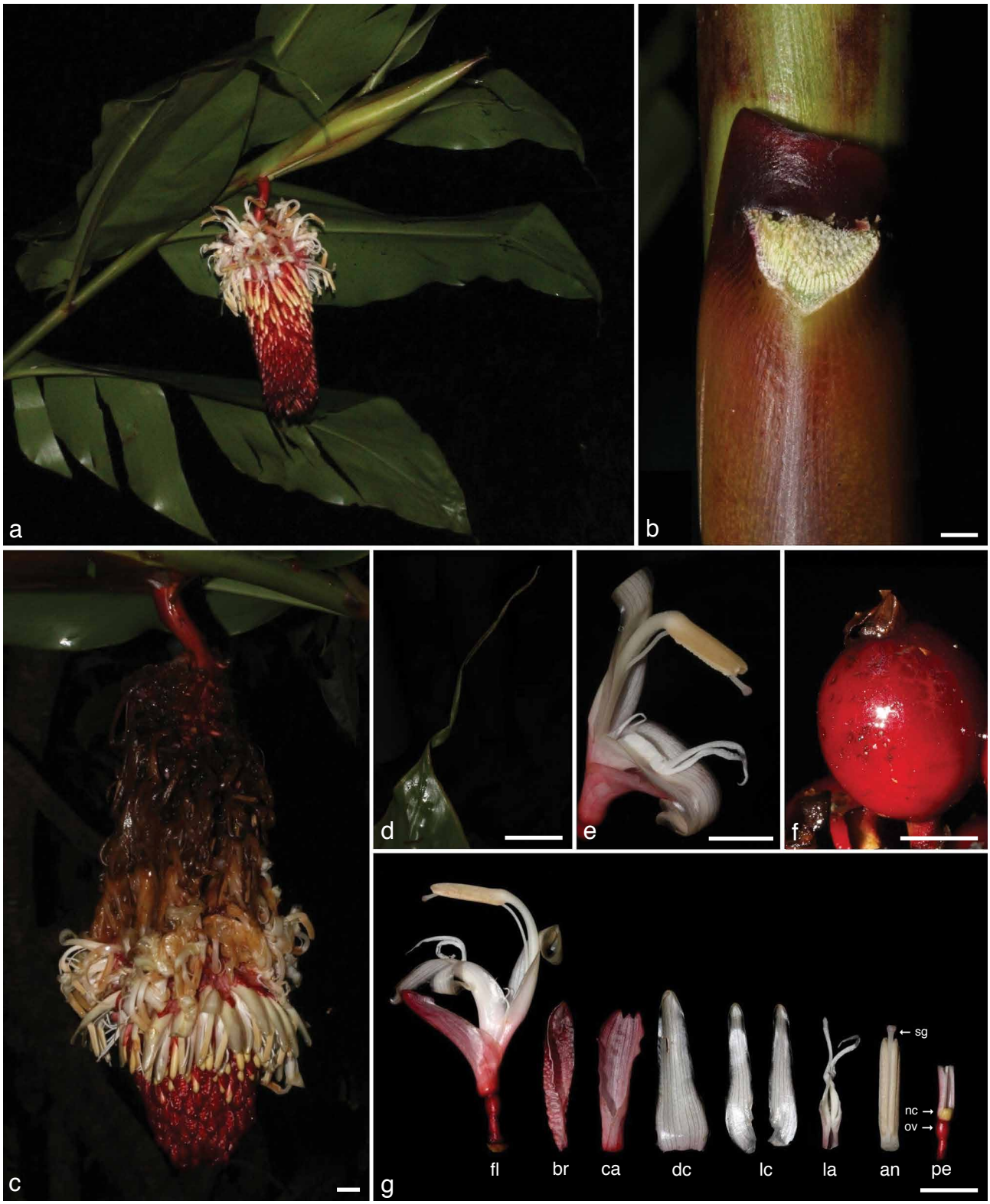


Fig. 1 *Vanoverberghia rubrobracteata* Docot & Ambida. a. Habit; b. ligule; c. inflorescence; d. leaf apex; e. flower at anthesis; f. mature fruit; g. flower (all from type locality). — Scale bars = 1 cm. — Photos by R.V.A. Docot.
Abbreviations: an: anther; br: bracts; ca: calyx; dc: dorsal corolla lobes; fl: flower; lc: lateral corolla lobes; la: labellum; nc: nectaries (epigynous glands); ov: ovary; pe: pedicel; sg: stigma.

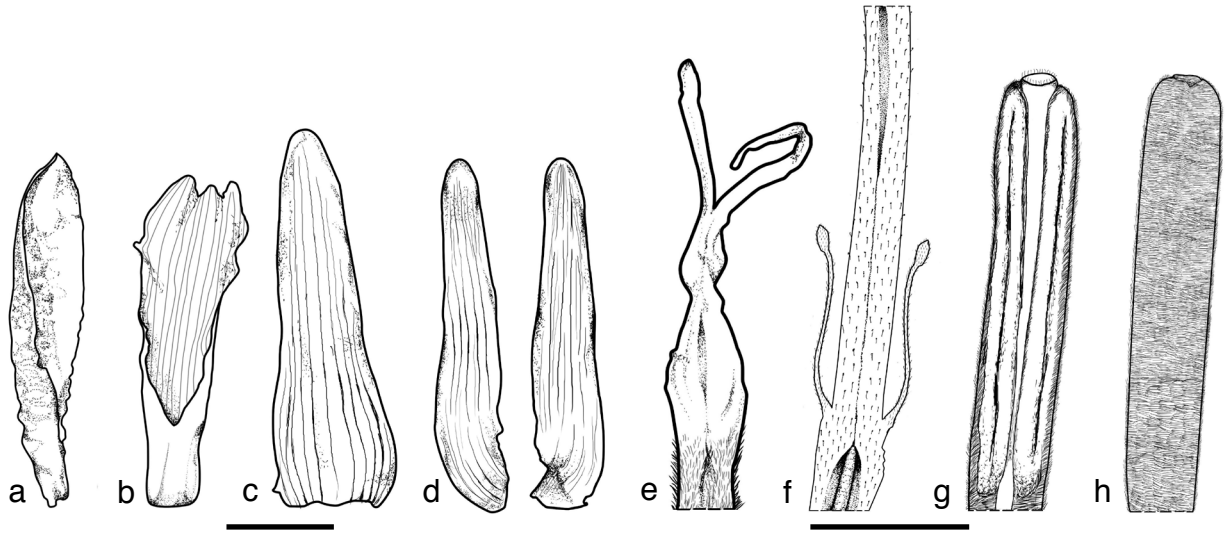
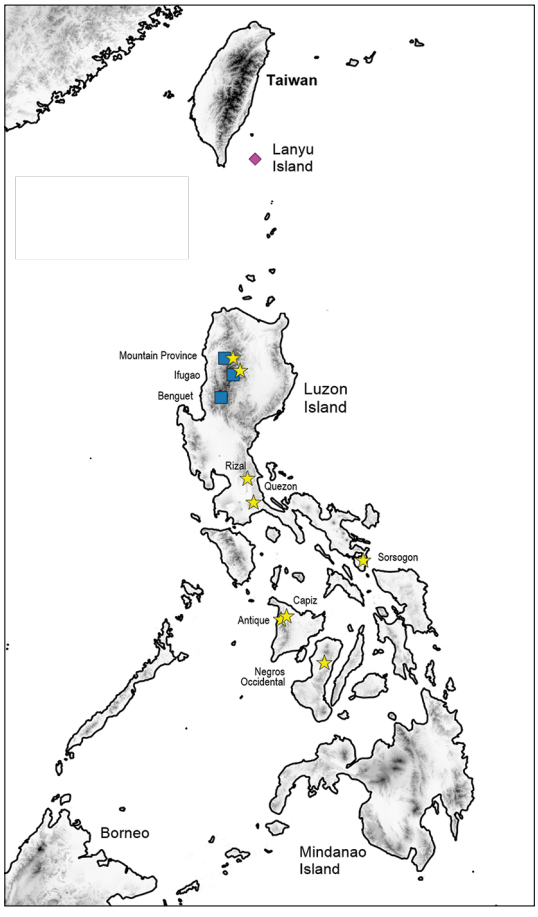


Fig. 2 *Vanoverberghia rubrobracteata* Docot & Ambida. a. Floral bract; b. calyx; c. dorsal corolla lobe; d. lateral corolla lobes; e. labellum; f. filament and lateral staminodes; g. anther (front view), notice also the style and stigma; h. anther (back view). — Scale bars = 1 cm. — Drawing by G. Campos.

long, slightly puberulous, red; *floral bract* spathaceous, tubular at the base, glabrous, 35–40 by 5–10 mm when flattened, red, apex pubescent; *bracteole* absent; *flower buds* cylindric; *flowers* congested along the rachis, one per floral bract; *calyx* funnel-shaped, 15–18 mm long, glabrous, coriaceous, red, apex 3-dentate; *corolla tube* 10–15 mm long, glabrous, coriaceous, white or pink; *dorsal corolla lobe* linear-oblong, 55–60 by 6–8 mm, glabrous, white to pink, apex rounded and cucullate; *lateral corolla lobes* linear-oblong, 55–60 by 3–5 mm, glabrous, white or pink, apex rounded and cucullate; *labellum* connate to the base of lateral corolla lobes, free part bifid, the lobes subulate, 30–40 by 3–5 mm, white, base pubescent, apices of lobes entire; *lateral staminodes* filiform, 2–3 mm long, slightly pubescent, white; *stamen* 68–71 mm long, curved at anthesis; *filament* canaliculate and enclosing the style for almost half its length above the labellum, 53–55 by 2–3 mm, slightly glandular, cream-white; *anther* oblong, 15–16 by 2–3 mm, sericeous, crestless, thecae pubescent; *style* 4–6 cm long, glabrous, white; *stigma* cupular, 1–2 mm wide, white, ostiole elliptic, margin hispid; *epigynous glands* compressed, subglobose, 1.5–2 mm long; *ovary* subglobose, 4–7 by 2–3 mm, coriaceous, glabrous, deep red. *Fruit* ellipsoid to subglobose, 20–25 by 15–20 mm, coriaceous, glabrous, deep red when mature, calyx persistent. *Seed* subglobose, 1–2 mm across, brown with white aril.



Map 1 Distribution of *Vanoverberghia rubrobracteata* Docot & Ambida (★), *V. sasakiana* Funak. & H.Ohashi (◆) and *V. sepulchrei* Merr. (■).

Vernacular names — Akbab (Igorot language), Bagombong (Tagalog), and Tagbak (Bisaya).

Uses — The fruits are eaten by the locals and were reported to have a sweet and sour flavour like *V. sepulchrei* (Docot et al. 2016).

Phenology — Flowering: between October and January; fruiting: between February and May.

Distribution & Habitat — *Vanoverberghia rubrobracteata* is endemic to the Philippines and occurs in the provinces of Antique, Capiz, Ifugao, Quezon, Mountain Province, Negros Occidental, Rizal, and Sorsogon (Map 1). It inhabits montane forests along streams and ravines from 1 000–1 600 m.

Conservation status — *Vanoverberghia rubrobracteata* is abundant within the montane forest of the eight localities, three of which are protected areas in the Philippines (e.g., Mount Banahaw-San Cristobal Protected Landscape). The population of the species, however, may decline if expansion of agricultural (e.g., vegetable plantations) and residential areas within the forests of each locality is continuously practiced. Therefore, *V. rubrobracteata* is preliminary assessed here under the Least Concern (LC) category.

Additional specimens examined.

Vanoverberghia rubrobracteata. Philippines, Luzon, **A. Loher 7028* (K), Rizal, 1906; **A.D.E. Elmer 17095* (BO, P, S, US), Sorsogon, Irosin, Mount Bulusan, Aug. 1916; **A.D.E. Elmer 17383* (BO, P, US), Sorsogon, Irosin, Mount Bulusan, Sept. 1916; *D.N. Tandang & R.T. Angeles s.n.* (PNH), Ifugao, Banaue, 22 Jan. 2013; *R.V.A. Docot 0049* (USTH [2 sheets] incl. spirit), Quezon, Tayabas, Barangay Lalo, Mount Banahaw, 25 Apr. 2016. – Visayas, **M. Ramos & G. Edaño 30734* (BO, P), Capiz, Mount Madjaas, Apr.–May 1918; *R.V.A. Docot 0118* (NY, USTH incl. spirit), Antique, Culasi, Barangay Flores, Mount Madjaas, 17 Oct. 2017.

Fig. 3 *Vanoverberghia rubrobracteata* Docot & Ambida. a. Mountain Province; b. Ifugao ; c. Negros Occidental; d. Antique (a, c: without voucher; b: *D.N. Tandang* & *R.T. Angeles s.n.*; d: *R.V.A. Docot 0118*). — Photos by: a. H. Funakoshi; b. D.N. Tandang; c. P.B. Pelser; d. R.V.A. Docot.

Vanoverberghia sepulchrei. Philippines, Luzon, *P.T. Barnes 947* (SING), Benguet, Baguio, May–June 1904; **A.D.E. Elmer 8560* (BO, SING, US), Benguet, Baguio, Mar. 1907; **M. Vanoverbergh 956* (BM, US), Bontoc, Mountain Province, 19 Oct. 1910; **M. Ramos & G. Edaño 45045* (BO, P, SING), Benguet, Baguio, Mar. 1925; *H.C. Conklin & Buwaya I-984* (L [2 sheets], PNH), Bayninan, Banaue, Ifugao, 6 Mar. 1963; *R.V.A. Docot 0001* (USTH [2 sheets]), N17°03.293' E120°57.372', Mount Data, Barangay Alab-Oriente, Bontoc, Mountain Province, 1 Nov. 2013; *R.V.A. Docot 0027* (USTH! [3 sheets] incl. spirit), Mount Data, Barangay Alab-Oriente, Bontoc, Mountain Province, 9 Jan. 2016; *R.V.A. Docot 0122* (PNH, USTH incl. spirit), Mount Data, Barangay Alab-Oriente, Bontoc, Mountain Province, 5 Nov. 2017. – Cultivated material from Lyon Arboretum, Honolulu, Hawaii: **Anon L-87.0651* (E [4 sheets], US) 1995; **J. Mood 46* (E), 15 June 1998; **J. Mood 47* (E), 16 July 1995.

Notes — *Vanoverberghia rubrobracteata* and *V. sepulchrei* both occur in the provinces of Ifugao and Mountain Province. The population of the new species in these two provinces which are located more northerly, however, are quite distinct from the populations distributed more southerly by having pink corolla tube and lobes (vs white) (Fig. 3a, b). Since only the colour of the corolla tube and lobes was found to be different, this study cannot warrant the populations from Ifugao and Mountain Province to be recognized as a separate species nor a variety.

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