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BULBOPHYLLUM ALSIOSUM (ORCHIDACEAE): A NEW RECORD FROM SULAWESI, INDONESIA

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WENDY ACHMMAD MUSTAQIM
Program Studi Biologi, Fakultas Sains dan Teknologi, Universitas Samudra, Jln. Prof. Dr. Syarief Thayeb, Meurandeh, Langsa Lama, Langsa 24416, Indonesia.
Email: wendyachmmadm@gmail.com; https://orcid.org/0000-0001-9902-830X

PRIMA WAHYU KUSUMA HUTABARAT
Research Center for Biosystematic and Evolution, National Research and Innovation Agency (BRIN), Jln. Raya Jakarta Bogor Km. 46, Cibinong, Bogor 16911, Indonesia.
Email: hutabaratpwk@gmail.com; https://orcid.org/0000-0002-5571-7899

ALEXANDER KURNIAWAN SARIYANTO PUTERA
Program Studi Pendidikan Biologi, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Sulawesi Barat, Jln. Prof. Dr. Baharuddin Lopa, S.H, Talumung, Majene 91412, Indonesia.
Email: alexander_ksp@unsulbar.ac.id; https://orcid.org/0000-0002-1823-0504

KURNIAWAN PALINDONDAYA BANDJOLU
Perkumpulan Konservasi Membumi, Jln. Arimbi 1 No. 2, Bantarjati, Bogor16153, Indonesia.
Email: kurniawanbandjolu@gmail.com; https://orcid.org/0000-0002-1878-6473

ROLAND PUTRA PRIBADI AHMAD
Departemen Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Indonesia, Pondok Cina, Beji, Depok 16424, Indonesia & Tumbuhan Asli Nusantara Foundation, BTN Korpri Blok C1 No 96, Kawatuna, Mantikulore, Palu 94233, Indonesia.
Email: rolandputra3@gmail.com; https://orcid.org/0000-0003-1615-471X

YUDA REHATA YUDISTIRA
Tumbuhan Asli Nusantara Foundation, BTN Korpri Blok C1 No. 96, Kawatuna, Mantikulore, Palu 94233, Indonesia. & Yayasan Konservasi Biota Lahan Basah, Jln. Raya Sawo 17–19, Surabaya 60218, Indonesia.
Email: yudarehata@gmail.com; https://orcid.org/0000-0003-1354-486X

ABSTRACT
MUSTAQIM, W. A., HUTABARAT, P. W. K., PUTERA, A. K. S., BANDJOLU, K. P., AHMAD, R. P. P. & YUDISTIRA, Y. R. 2026. *Bulbophyllum alsiosum* (Orchidaceae): a new record from Sulawesi, Indonesia. *Reinwardtia* 25(1): 41–47. — *Bulbophyllum alsiosum* Ames, a previously Philippines endemic, is reported for the first time in Sulawesi and also represents the first country record for Indonesia. The species was collected from three localities in the montane forest of central and the upper montane forest of the southwestern part of the island. The finding increases the number of *Bulbophyllum* sect. *Beccariana* in Sulawesi to nine species. Description, note, preliminary conservation status, and photographs are given.

Key words: Epiphyte, monocots, montane, taxonomy, Wallacea.

ABSTRAK
MUSTAQIM, W. A., HUTABARAT, P. W. K., PUTERA, A. K. S., BANDJOLU, K. P., AHMAD, R. P. P. & YUDISTIRA, Y. R. 2026. *Bulbophyllum alsiosum* (Orchidaceae): sebuah rekaman baru dari Sulawesi, Indonesia. *Reinwardtia* 25(1): 41–47. — *Bulbophyllum alsiosum* Ames, jenis yang sebelumnya dianggap endemik Filipina, dilaporkan untuk pertama kalinya dari Sulawesi dan juga merupakan rekaman pertama untuk Indonesia. Jenis ini dikoleksi dari tiga lokasi di hutan pegunungan bagian tengah dan hutan pegunungan atas barat daya pulau. Penemuan ini menambah jumlah jumlah *Bulbophyllum* seksi *Beccariana* di Sulawesi menjadi sembilan jenis. Pertelaan, catatan, status konservasi awal, dan foto-foto disajikan.

Kata kunci: Epifit, monokotiledon, pegunungan, taksonomi, Wallacea.

INTRODUCTION

Sulawesi is the largest island in the Wallacea bioregion. The island has a complex geological history, formed by Laurasian, Australasian, and oceanic elements (Hall, 2002). There are an estimated 5,972 species of plants that occur in the island, with around 2,225 species of them endemic (Middleton *et al.*, 2019). This island has a strong similarity in floristic composition with the Philippines, Java, the Lesser Sunda Islands, and the Maluku Archipelago, but not with neighbouring Borneo (van Welzen & Raes, 2011).

Bulbophyllum Thouars is among the most species-rich genera in Sulawesi. The latest monographic work on Sulawesi species was published by Vermeulen & O'Byrne (2011), where 123 species were recorded for the island. Despite being already revised, the genus in Sulawesi is considered poorly known. Several new species were described or records published after the revision, bringing the total number of known species to 132 (POWO, 2024). The latest new species include *Bulbophyllum mamasaense* Wibowo, Juswara & J.Champ. (Wibowo *et al.*, 2022).

Continuous exploration of the orchids of Sulawesi yielded further noteworthy findings. In mid-2023, an exploration in the mountainous regions of Mamasa, Sulawesi Barat Province, yielded the discovery of plants that do not match species previously recorded in Sulawesi (Thomas & Schuiteman, 2002; Vermeulen & O'Byrne, 2011). One year later, a similar plant was found in the montane forest of Tentena, Poso Regency, Central Sulawesi Province. Further identification showed that this species belongs to *B. alsiosum* Ames, a species previously known only from the Philippines. Therefore, the findings represent the first record for Sulawesi and the first country record for Indonesia.

MATERIALS AND METHODS

The materials used in this study were collected during a sequential exploration in two areas in Sulawesi by the authors. The first exploration was conducted in Mamasa, Sulawesi Barat in 2023, and in Poso, Sulawesi Tengah in 2024. Plants were collected and preserved in dried herbarium supplemented with flowers in 70% ethanol following guidelines from Davies *et al.* (2023). Identification was done using type examinations in JSTOR Global Plants (https://plants.jstor.org), specimen and photographs comparison, and relevant literature (Ames, 1912; Comber, 1990, 2001; Seidenfaden & Wood, 1992; Thomas & Schuiteman, 2002; Vermeulen & O'Byrne, 2008, 2011; Pelser *et al.*, 2011; de Vogel *et al.*, 2014-onwards; Vermeulen *et al.*, 2015). Morphological descriptions were prepared primarily from fresh specimens combined with protologue in Ames (1912). The IUCN Red List conservation status assessment was carried out following guidelines (IUCN Standards and Petitions Committee 2024). Area of Occupancy (AOO) and Extent of Occurrence (EOO) were calculated using GeoCAT (Bachman *et al.*, 2011). The results, combined with threat data either directly observed and inferred from Google Satellite Images were checked against the criteria in IUCN (2012).

TAXONOMIC TREATMENT

Bulbophyllum alsiosum Ames, Leafl. Philipp. Bot. v. 1583 (1912). — Type: PHILIPPINES, Negros: Negros Oriental, Cuernos Mtns, Apr 1908, Elmer 9817 (holotype: AMES; isotypes: AMES-image! [00000382], BM-image! [000516997], F-image! [V0046257F], GH-image! [02385724], L, MO-image! [100257642], NY, US, Z-image! [Z-000062297]). Figs. 1−2.

Long creeping or ascending *epiphyte*, often on the base of tree trunk, rhizome to *ca.* 3 m. Rhizome slightly flexuous, covered by marcescent, light brown sheaths, sparsely rooted along. *Pseudobulb* cylindric, 2.0–3.5 cm long, covered by marcescent sheaths; section between pseudobulb up to 13.5 cm. *Leaf* lamina green, paler beneath, elliptic, 11.0–13.2 × 4.0–7.5 cm, base cuneate, apex acute, midrib sunken above, raised beneath; petiole 2.0–3.0 cm long. *Inflorescence* 1(–2)-flowered, from the rhizome, peduncular bracts 6, greenish yellow, marcescent, sheathing, up to 1.1 cm long, apex apiculate, longitudinally ribbed, uppermost bracts *ca.* 1.0 cm long, connate at ¼ basal, longitudinally ribbed outside, all glabrous. *Flowers ca.* 2.7 cm long, not opening widely. *Pedicels* and ovary 1.3 cm long, ovary greenish-yellow, purple mottled, sulcate, with rounded ribs. *Dorsal sepals* greenish cream outside, inside red, with creamy margin, ovate, 2.8 × 1.3 cm, apex acute to subobtuse, glabrous. *Lateral sepals* with the same color as dorsal sepals, asymmetric, narrowly ovate-triangulate, 2.6 × 1.1 cm, lower margin recurved, forming an acute angle in the lower third, indistinctly 7-veined, apex acute. *Petals* outside white with upper half pale red, inside red, margin white, oval, 1.1 × 0.6 cm, 5-veined, apex rounded or obtuse, glabrous. *Labellum* thick, upper surface red or bright yellow, lower surface white, pinkish or yellowish at the margin, lanceolate in outline, 1.7 × 0.6 cm, margin upcurved, apex acute, upper surface with 3 longitudinal calli from near the base and running close to the apex, callus sometimes not prominent, slightly wavy, especially toward the apex, glabrous. *Column* including stelidia 4.5 mm long, cream above, lower margin red, stelidia triangular, *ca.* 1.2 mm long, lower margin with a broadly deltoid 0.5 mm long wing; stigma obdeltoid in outline. *Anther* cucullate, yellow-orange, front part tinged with red, obovate, *ca.* 3 × 2.5 mm, drawn out, containing 4 pollinia, pollinia yellow.

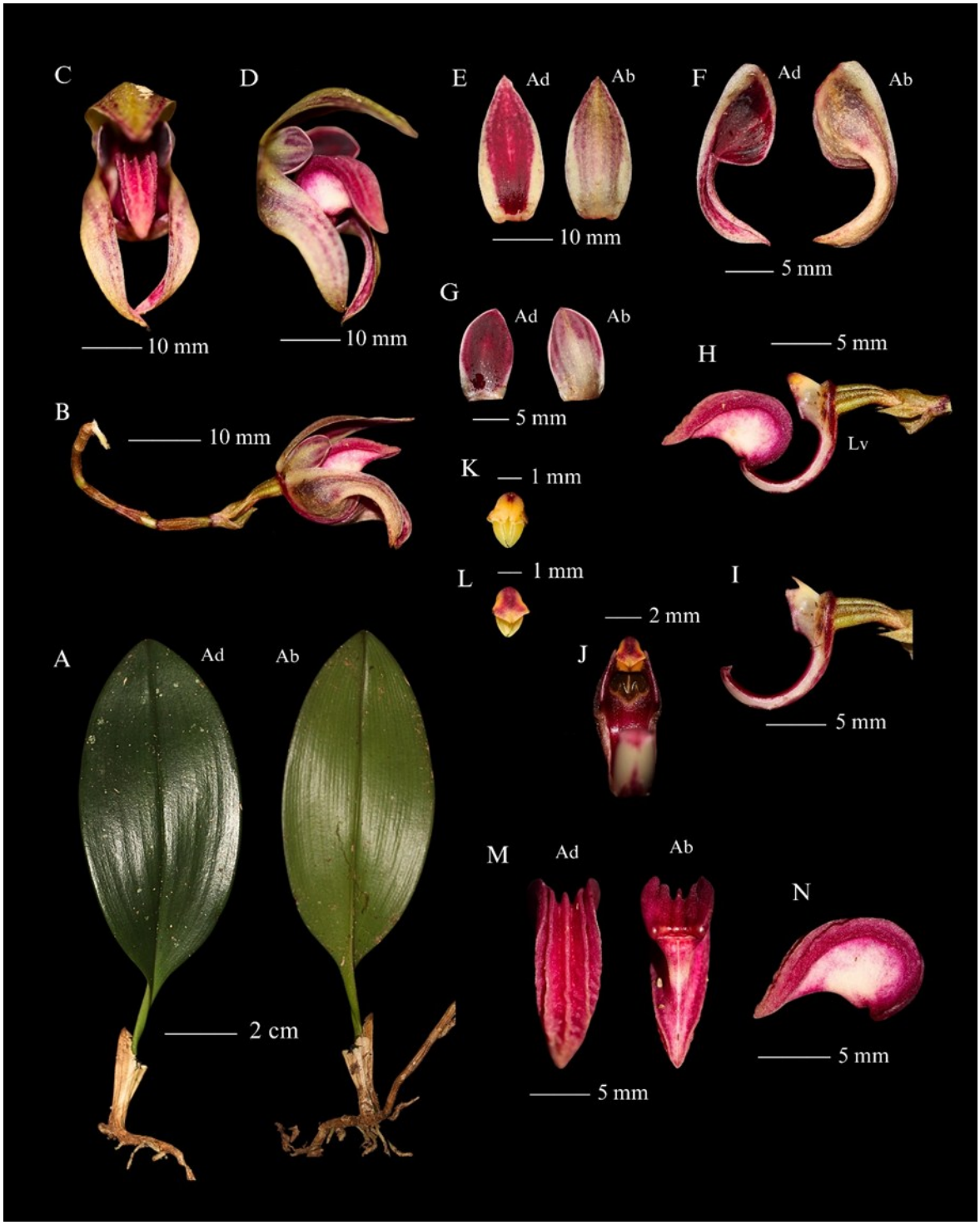

Fig. 1. Detailed morphology of *Bulbophyllum alsiosum* Ames. A. Rhizome and leaves. B. Inflorescence. C. Front-view of flower. D. Lateral view of flower. E. Dorsal sepal. F. Lateral sepals. G. Petals. H. Flowers with perianth removed. I. Ovary, column, and column foot. J. Ventral view of column and stigma. K–L. Anther. M. Labellum. N. Labellum, lateral view. Ad = adaxial, Ab = abaxial. Photos by Wendy A. Mustaqim & Yuda R. Yudistira.

Fig. 2. In-situ photographs of *Bulbophyllum alsiosum*. A. Living plant. B. The 2-flowered inflorescence in Mamasa. C. Lateral view of flower. D. Front-view of flower. Photos A–B by Wendy A. Mustaqim, C–D by Prima W.K. Hutabarat.

Specimens examined. INDONESIA. Sulawesi Barat. Mamasa regency, Nosu subdistrict, Batu Papan (3°09'05.8"S 119°27'21.2"E), 1,980 m asl, 2 Aug. 2023, *Mustaqim et al. 2768* (CEB); Mamasa regency, Lambanan, near Pasapa' Lombonan (2° 55'05.2"S 119°28'56.1"E), 1,930 m asl, 4 Aug. 2023, *Mustaqim et al. 1784* (CEB). Sulawesi Tengah. Poso regency, Bomba subdistrict, before Petirorano (1°47'35.8"S 120°28'39.7"E), 1,523 m asl, 24 Nov. 2024, *Hutabarat et al. 1645* (UIDEP).

Distribution. Philippines (Luzon, Leyte, Negros, and Mindanao) (Ames, 1912; Pelser *et al.*, 2011) and Sulawesi (Sulawesi Barat and Sulawesi Tengah Province) (Fig. 3).

Habitat and Ecology. In the Philippines, this species was found on moss-covered trees at elevations from 600 to 1,300 m asl (Ames, 1912; Pelser *et al*., 2011). In Sulawesi, this species was recorded from undisturbed montane to upper montane forests at 1,523 m and 1,980 m asl, all in shaded habitats.

Phenology. Flowering in June (Ames, 1912), August, and November.

Preliminary IUCN Red List conservation status. The species was recorded from at least seven locations, four in the Philippines and three in Indonesia, with an EOO of 575,927 km^2 (Least Concern) and an AOO of 36 km^2 (Endangered). The population

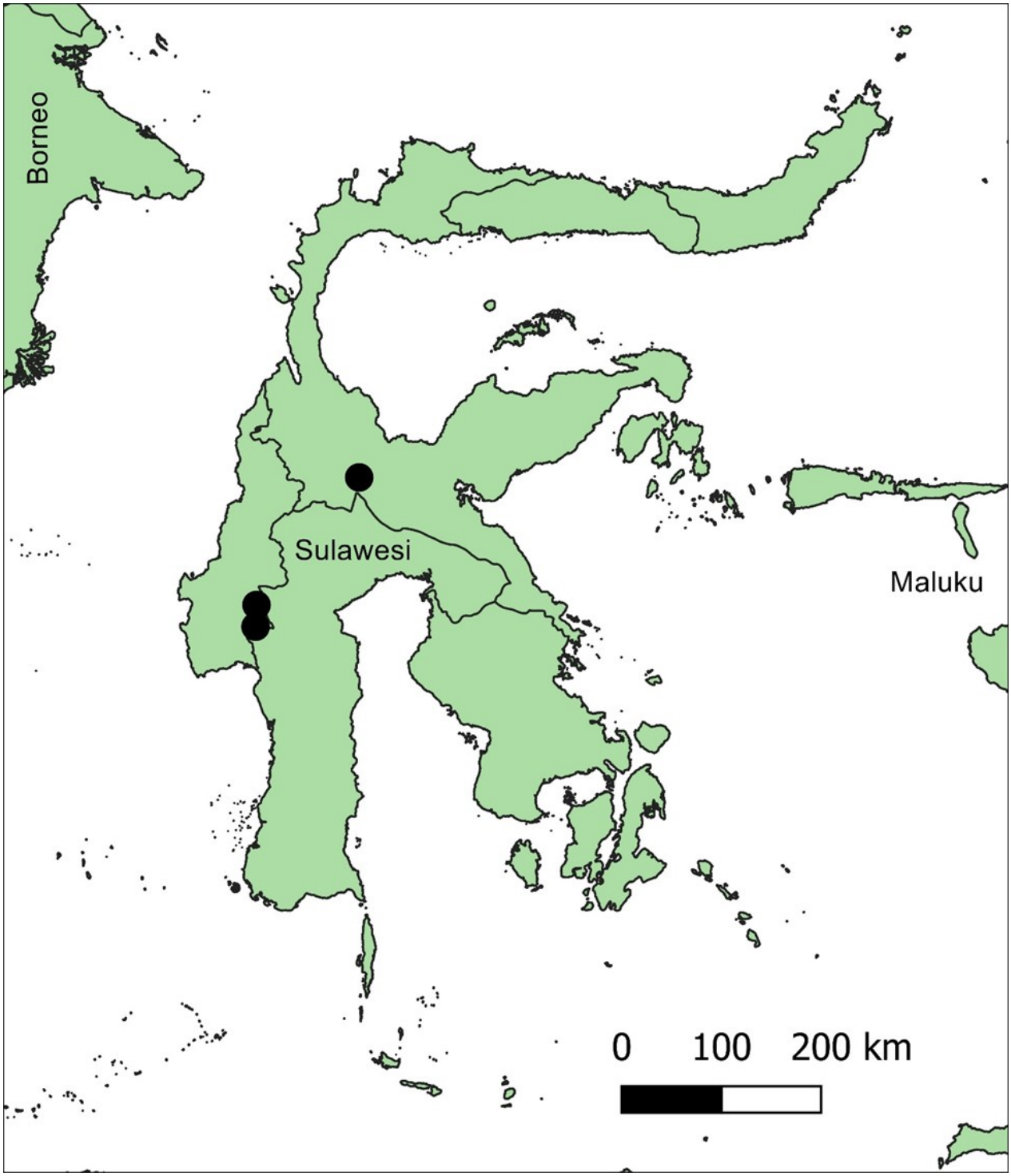

Fig. 3. Geographical distribution of *Bulbophyllum alsiosum* in Sulawesi (●).

on Luzon Island is located near rapidly developing city of Antipolo, and the potential habitat is likely threatened by rapid conversion, especially in lower elevations. Meanwhile, the other populations are relatively safe. Despite the AOO reaching the EN threshold, the level of threats is considered insufficient to warrant a threatened status. Besides that, despite its large flowers, this species is not a priority for poachers in orchid collecting, as we have seen in Sulawesi. Therefore, the species is best assigned as Near Threatened (NT).

Note. This species belongs to section *Beccariana,* which is characterized by leaves that have visible reticulate venations and flowers with free lateral sepals with the upper margin twisted proxi-

mally, 5–7-veined petals, and the base of pedicels level with the bract attachment (Vermeulen *et al.*, 2014). The most similar species in Sulawesi is *B. uniflorum* due to their 1(–2)-flowered inflorescence and ovary with rounded ridges. While *B. alsiosum* is strictly Wallacean species, *B. uniflorum* has a wider geographic range, from Sumatra, Peninsular Malaysia, Java, Borneo, and Sulawesi (Vermeulen *et al.*, 2011; 2015), but this species differs in having much shorter inflorescence (8 cm *vs* 10 to 30 cm long), flowers with rounded (*vs* acuminate) tepals, and labellum lanceolate (*vs* subtriangular ovate). This finding added the number of *Bulbophyllum* section *Beccariana* in Sulawesi to nine species.

The discovery of Sulawesi's material improves the current morphological scope of *B. alsiosum*. Previously, this species was reported to have only 1-flowered inflorescences (Ames, 1912), whereas the plant from Mamasa has 2-flowered inflorescences. Such variation, *i.e.* the occurrence of both one to two flowers in a single species, has also been found in other species within section *Beccariana*, like *B. uniflorum*, the Bornean endemics like *B. sububellatum* Ridl. and *B. nabawanense* J.J.Wood & A.Lamb, and several more (Comber, 2001; Vermeulen *et al*., 2015).

Besides that, most known *B. alsiosum* have red labellum, but plants from Tentena, Poso, Sulawesi Tengah have yellow labellum. The current findings also add ecological information. This species was previously recorded from elevations of 600–1,300 m asl in the Philippines (Pelser *et al.*, 2011). Meanwhile, the records in Sulawesi span a higher elevation range, from 1,523 to 1,980 m asl. This means that this species can be found in lowland to upper montane ecosystems according to elevational zonation in Southeast Asia (van Steenis, 1972; Kartawinata, 2016). This new elevation range (from 600 to 1,980 m) is considered for the section Beccariana, but it is rather considered normal situation. Some species within this section also have a broad range of elevational distribution, like *B. membranifolium* Hook.f. subsp. *inunctum* (J.J.Sm.) J.J.Verm., P.O'Byrne & Lamb (100 to 1,800 m), *B. sanguineomaculatum* Ridl. (100 to 1,300 m), and *B. uniflorum* (600 to 2,000 m) (Vermeulen *et al*., 2015).

The discovery of *B. alsiosum* in Sulawesi adds to the records of phytogeographical continuity between the Philippines and Sulawesi. Both areas belong to a biogeographical unit called Wallacea, and their floristic similarity is high (van Welzen & Raes, 2011). Some of the latest records of the Philippines flora newly recorded for Sulawesi, or geographically extending to the southern part of Sulawesi, have been published (*e.g. Calanthe stenocentron* (Schltr.) M.W.Chase, Christenh. & Schuit. (Mustaqim *et al.*, 2022)). New records of flora for Sulawesi previously known from surrounding areas are likely a result of the low scientific plant collecting in this area, as indicated by the low density of scientific plant collections (Middleton *et al.*, 2019). Another possible reason could be the regional collecting gaps since the finding localities, especially in Sulawesi, are all botanically under-explored as evidenced by the finding of many new endemic plant species, *i.e.*, Poso (*e.g.* Ardiyani *et al.*, 2021; Hutabarat *et al.*, 2022; Saleh *et al.*, 2023) and Mamasa (*e.g.* Ardiyani & Poulsen, 2019; Ardi & Thomas, 2020; Wibowo *et al.,* 2022; Hutabarat *et al.,* 2022).

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