Journal of Tropical Biology and Conservation 18: 285–289, 2021 ISSN 1823-3902
E-ISSN 2550-1909

**Short Communication**

# *Burmannia sphagnoides* (Burmanniaceae): A New Record for Kalimantan, Indonesia

**Wendy A. Mustaqim[1*], Yasper M. Mambrasar[2]**

*[1]Program Studi Biologi, Fakultas Teknik, Universitas Samudra, Jl. Prof. Dr. Syarief Thayeb, Meurandeh, Langsa Lama, Langsa, Aceh 24416, Indonesia*
*[2]Botany Division, Research Center for Biology – Indonesia Institute of Sciences, Cibinong Science Center, Jl. Raya Jakarta Bogor km. 46, Cibinong, Bogor, Indonesia*

***Corresponding author:** wamustaqim@unsam.ac.id

## Abstract

This paper reports the first occurrence for a rare mycoheterotrophic *Burmannia sphagnoides* Becc. (Burmanniaceae) in Kalimantan (Indonesian Borneo) based on a specimen collected from Gunung Mas Regency, Kalimantan Tengah Province. A morphological description, distribution map, brief notes, and photographs are presented.

**Keywords**: Borneo, herbs, mycoheterotroph, new record, taxonomy

## Introduction

The family Burmanniaceae consists of eight genera with perhaps as many as 96 species accepted so far (Merckx et al., 2013). The comprehensive taxonomic study of this genus in Malesia was published over half a century ago (Jonker, 1948). According to Jonker, there are at least five genera and 39 species that have been reported from this phytogeographical region. Some new findings were also published in the recent years (e.g. Tsukaya et al., 2016; Tsuetsugu et al., 2018).

*Burmannia sphagnoides* Becc. was described for the first time by the Italian botanist Odoardo Beccarii (1877). The type specimens was collected from Kuching, Sarawak in 1865. The species is now known from Sumatra, Peninsular Malaysia, and Sarawak (Jonker, 1948; POWO, 2021). Though if collected from Malaysian Borneo, there was no record from Indonesian Borneo until this study. In 2020, a specimens was collected from Gunung Mas Regency, Kalimantan Tengah Province, in Kalimantan, Indonesian Borneo. There is no previous report of this species in Indonesian Borneo and is therefore considered a new record for the area.

Received 23 August 2021
Reviewed 02 September 2021
Accepted 14 September 2021
Published 15 October 2021

## Materials and Methods

The specimen was collected during extensive High Conservation Value assessment for plants from 2019 to 2020. It was found in a remaining forest patch near an oil palm plantation and settlements. This forest is located outside of protected areas. Identification was done using comparison to published literature on mycoheterotrophic plants in Borneo (Jonker, 1948; Dancak et al., 2015; Ling et al., 2019; Tsukaya et al., 2016) and herbarium study in BO and digital specimens in FI and L (abbreviations follow Thiers, 2021-continuously updated). The morphological description of the species was prepared from the recently collected specimen.

## Results and Discussion

### Species Description

***Burmannia sphagnoides*** Becc., Malesia 1: 246 (1877). Type: Malaysia, Ragiato di Sarawak, Kuching, June 1865, *Beccari* 86 (FI-image! [FI013461]) (type illustration: Beccari (1877, tab. XV, f. 8–11)). Figure 1.


**Figure 1**. *Burmannia sphagnoides* from Gunung Mas Regency, Kalimantan Tengah Province, Indonesia: A. plants, B. close-up of roots, C. stem and scales, D. close up of flowers showing bracts, E. close up of flowers.

Mycoheterotrophic plants, 4–5.5cm; glabrous. Stem unbranched, 1.5–2mm across, densely covered with scale-like leaves, imbricate in the lower portion of stem, ovate-lanceolate, up to 8mm long and × 2mm wide, narrowing to pointed, rather filiform apex, margin entire, glabrous, midrib 1. Flowers 3-5 at the apex of stem. Bracts lanceolate, c. 7.5-8.5 × 1.5–4mm, acute or subobtuse. Flowers with 6 costae, 8.5–9mm. Perianth tube cylindrical, c. 4mm long, white. Outer perianth broadly ovate-triangulate, c. 2 × 2mm, thick, apex acute. Inner perianth c. 1mm long. Style filiform, slightly angled, bearing 3 stigmas. Ovary broadly ellipsoid to subglobose, 3 × 3mm. Mature fruit unknown.

**Distribution**: This species has been recorded from Sumatra, Peninsular Malaysia, and Sarawak. The distribution in Sumatra is so far only known from the East Coast Residence, now called Sumatra Utara Province (Jonker, 1948). Distribution in Borneo including the new record is listed in Figure 2. The new record is located around 472km southeast of Kuching, Sarawak, where most Bornean specimens were collected.

**Habitat**: *Burmannia sphagnoides* was found at the lowland area around 43m asl. The habitat is a dipterocarp forest. The common species include several species from the genus *Dipterocarpus* and *Shorea* (Dipterocarpaceae), *Knema* (Myristicaceae), and *Syzygium* (Myrtaceae). Some species in this forest fragment are potentially threatened with extinction according to the IUCN Red List (2021) like *Dipterocarpus lowii* Hook.f. (NT). Endemic species like the climbing epiphyte *Bulbophyllum beccarii* Rchb.f. (Orchidaceae) also occur in the same area.

Very limited ecological data is available for this species. In the Flora Malesiana, Jonker (1948) mentions this species occurs in the forest on decaying matter. Our recent observation also shows a similar situation. The plants were found growing on an empty forest floor with a lot of organic materials like dead leaves and fallen branches or trunk. It seems this species has a very narrow type of habitat. The vegetation is of mixed forest with a small number of dipterocarp trees. More than 100 individuals were seen during the field exploration at a single site on a single occasion. In Sarawak, according to our examination of specimens, this species was collected from the forest floor on dead leaves (*Brooke 9544* [L.1487316]) or ‘wet leaves’ (*Brooke 9764* [L.1487317]). The only recorded type of forest is primary dipterocarp forests on sandstone substratum, with low stature and considerably thin-stemmed forest (*Jacobs 5554* [L.1487318]).

**Notes**: In Borneo, as well as Malesia, this species can be recognized from other members of the genus by the mycoheterotrophic life-style with reduced leaves, usually in the form of scales, densely covering the stem (appearing imbricate), the wingless flowers, and ovary that is equal to or longer than the perianth (Jonker, 1948).

**Specimen examined**: INDONESIA. Kalimantan: Kalimantan Tengah Province, Gunung Mas Regency, forest near Agrolestari Santosa oil palm plantation (1°20'53.52"S 113°31'14.88" E), c. 43m asl, Mustaqim RA2020-01 (BO!). MALAYSIA. Borneo: Sarawak, 1st div., c. 25km West of Kuching, Mt Matang, 750-900m, 21 Sep 1958, *Jacobs 5554* (K, L!-image [L.1487318]); Sarawak Division 1, 13th mile Matang, 1 Dec 1954, 1000 ft, *Brooke 9544* [L!-image [L.1487316]); Sarawak Division 1, Kuching, 23 Mar 1955, *Brooke 9764* (L!-image [L.1487317]); Sarawak, Mattang, Apr 1866, *Beccari 1502* (L!-image [L.1483719]); Sarawak Division I, Perungen, 11 May 1954, *Brooke 8511* (L!-image [L.1487320]).

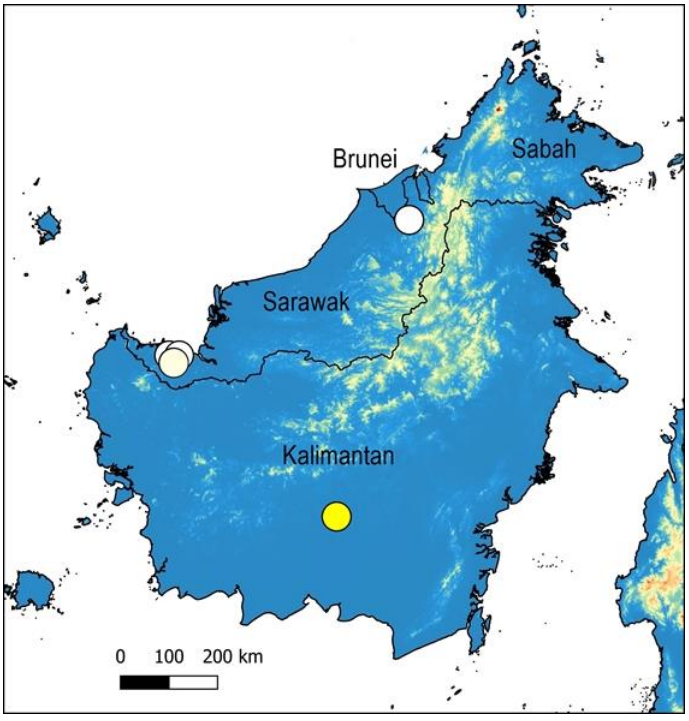


**Figure 2.** Geographic distribution of *Burmannia sphagnoides* in Borneo with new record in Kalimantan (○ = previous records; ● new record).

## Acknowledgements

The first author thanks PT. Agrolestari Santosa for allowing us to do field work in and around their concession area; Remark Asia for support with field exploration to the sites in 2019 and 2020; and also the whole team of Remark Asia and staff from PT. Agrolestari Santosa, Gunung Mas Regency, for us helps during the field trip.

## References

**Beccari O. 1877.** *Malesia; raccolta di osservazioni botaniche intorno alle piante dell'arcipelago Indo-Malese e Papuano pubblicata da Odoardo Beccari, destinata principalmente a descrivere ed illustrare le piante da esso raccolte in quelle regioni durante i viaggi eseguiti dall'anno 1865 all'anno 1876.* Volume primo. Genova: Tipografia del R. Istituto Sordo-Muti.

**Dancak M, Hrones M, Sukri RS, Metali F, Joffre AA. 2017.** Novitates Bruneienses, 9. A synopsis of *Epirixanthes* (Polygalaceae) in Brunei Darussalam and notes on species elsewhere. *Gardens' Bulletin Singapore,* **69(2)**:179–187.

**GBIF.org. 2021.** GBIF Occurrence Download https://doi.org/10.15468/dl.r9xncx. Retrieved 4 July 2021.

**IUCN. 2021.** IUCN Red List. http://www.iucnredlist.org. Retrieved 12 March 2021.

**Jonker FP. 1948.** Burmanniaceae. *Flora Malesiana ser. 1,* **4(1)**:13–26.

**Ling CY, Tsukaya H, Mustapeng AMA. 2019.** Mycoheterotrophic plants of Tama Abu Protected Forest, Ulu Baram, Sarawak. *Transactions on Science and Technology,* **6(1-2)**:119–126.

**Merckx VSFT, Freudenstein JV, Kissling J, Christenhusz MJM, Stotler RE, Crandall-Stotler B, Wickett N, Rudall PJ, Maas-Van De Kamer H, Maas PJM. 2013.** Taxonomy and classification. In: Merckx VSFT. (ed). *Mycoheterotrophy: The Biology of Plants Living in Fungi*. New York/Heidelberg/Dordrecht/London: Springer.

**POWO. 2021.** Plants of the World Online: *Burmannia sphagnoides* Becc. Retrieved from http://plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:126649-1 on Mar 6 2021.

**Thiers B. 2021**-continuosly updated. Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Retrieved from http://sweetgum.nybg.org/ih/ on 1 July 2021.

**Tsuetsugu K, Tsukaya H, Nurainas N, Okada H. 2018.** *Thismia sumatrana* (Thismiaceae), a new species from West Sumatra, Indonesia, with discussions on the taxonomic identity of *Thismia clavigera*. *Phytokeys* **113**:59–67. doi: 10.3897/phytokeys.113.29103

**Tsukaya H, Suleiman M, Okada H. 2016.** A new species of *Epirixanthes* (Polygalaceaeae) from Imbak Canyon, Sabah, Borneo. *Phytotaxa,* **266(2)**:146–150. doi: https://doi.org/10.11646/phytotaxa.266.2.9