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CORYBAS GEMINIGIBBUS, A NEW ADDITION TO THE ORCHID FLORA OF SUMATRA

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Abstract. *Corybas* is an orchid genus of 154 species distributed from India to South China, the Western Pacific, and New Zealand. Sumatra is home to eight species, five of which are endemic. However, the true diversity is likely underestimated due to limited exploration in some parts of the island. During a recent exploration in the northern Gayo Plateau near the northern tip of the island, a *Corybas* species was discovered that did not match any previously known species. Further identification through specimen comparison and literature review confirmed that the species is *Corybas geminigibbus*. It was found growing in montane bogs. This discovery marks the second bioregion in Indonesia where this species has been recorded and the ninth *Corybas* species on the island. The finding also provides additional evidence of floristic similarities, suggesting past geological connections between northern Sumatra and mainland Asia. A detailed description, discussion, and photographs are provided.

Abstrak. *Corybas* adalah genus anggrek dengan anggota berjumlah 154 spesies yang tersebar dari India ke bagian selatan China hingga ke Pasifik bagian barat dan Selandia Baru. Sumatra memiliki delapan spesies yang mana lima diantaranya merupakan spesies endemik, akan tetapi jumlah ini sangat mungkin lebih rendah dari keragaman aslinya karena kurangnya eksplorasi botani di beberapa kawasan di pulau ini. Saat eksplorasi botani di Dataran Tinggi Gayo bagian utara, satu spesies *Corybas* berhasil ditemukan dan tidak cocok dengan spesies yang ditemukan di Sumatra sebelumnya. Identifikasi lebih lanjut melalui perbandingan spesimen dan ulasan literatur mennjukkan bahwa spesies yang diambil adalah *Corybas geminigibbus*. Spesies ini ditemukan tumbuh pada rawa gambut pegunungan. Penemuan ini menandai catatan bioregion kedua di Indonesia dan merupakan spesies *Corybas* ke-9 di Sumatra. Penemuan ini juga menambah bukti kemiripan floristik, menunjukkan koneksi geologi masa lampau antara Sumatra bagian utara dan daratan utama Asia. Deskripsi detail, diskusi, dan foto-foto disajikan.

Keywords/Kata kunci: monocots, monokotiledon, montane bogs, gambut pegunungan, taxonomy, taksonomi, West Malesia, Malesia Barat

Introduction. *Corybas* Salisb. (Orchidoideae: Diurideae: Acianthinae) is one of the most distinctive orchid genera, characterized by a single well-developed leaf and one comparatively large flower relative to the plant's size (Dransfield *et al*., 1986). The genus ranges from India and South China to the Western Pacific and New Zealand, comprising approximately 154 species (POWO, 2024).

Sumatra is home to eight species of this genus, five of which are endemic. Some of these species are only known from specimens collected long ago, such as *Corybas bancanus* (J.J.Sm.) Schltr. from Bangka [=Banka] before 1920, and *C. roseus* (Janch.) Janch. ex J.J.Sm. before 1930 from Payakumbuh, Sumatera Barat Province (Comber, 2001). The most recent descriptions of new taxa from Sumatra date back

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nearly three decades, when three endemic species were described: *Corybas karoensis* J.B.Comber & J.Dransf., *C. scutellifer* J.B.Comber & J.Dransf., and *C. stenotribonos* J.B.Comber & J.Dransf. (Comber & Dransfield, 1995).

The number of species known is likely an underestimate. Overall, Sumatra requires more intensive botanical research to uncover new species or other noteworthy findings (Middleton *et al*., 2019). Areas that need further exploration include the northern part of the island (De Wilde & Duyfjes, 1994). So far, only one record of the genus was found from the northern part (i.e., mountainous regions of the Gayo Plateau). The specimen was collected from Mount Ketambe in the southern part of the Gayo Plateau (Dransfield *et al*., 1986).

Recent botanical surveys on the northern Gayo Plateau in North Sumatra have yielded numerous specimens of Orchidaceae, including species of *Corybas*. The collected *Corybas* specimens did not match with any previously known species from Sumatra (Comber, 2001), prompting further identification efforts through specimen comparisons and literature review (Chantanaorrapint & Chantanaorrapint, 2016; Comber, 1990; Dransfield *et al*., 1986; Seidenfaden & Wood, 1992; Truong *et al*., 2020). The results showed that the collected specimens belong to *C. geminigibbus,* which is reported from Sumatra for the first time.

Materials and methods. Fieldwork was conducted in the northern part of the Gayo Plateau, Aceh, Sumatra, Indonesia, in June and September 2023 and August 2024 to explore orchids and other plants in several montane bogs in northern Gayo Plateau, Aceh, Sumatra, Indonesia. Plants in flowers were collected using guidelines from Davies *et al*. (2023). To prepare the morphological descriptions, direct observation and measurement of fresh plants were made in the field, complemented by materials preserved in 70% ethanol stored in LGS and UIDEP. Morphological terminology in the description follows Beentje (2016) and Dransfield *et al*. (1986). The identification was performed using literature (Chantanaorrapint & Chantanaorrapint, 2016; Comber, 1990, 2001; Dransfield *et al*., 1986; Seidenfaden & Wood, 1992; Truong *et al*., 2020) and type specimens accessed from JSTOR Global Plants (2024).

Taxonomic treatment

Corybas geminigibbus J.J.Sm., Mitt. Inst. Bot. Hamburg 7: 13. 1927.

TYPE: Indonesia. Borneo: West Kalimantan, Mt Mulu, *Winkler 496* (HBG500940) (HBG-Holotype n.v.).

Small terrestrial *herb* with underground tuberoids. *Tuberoid* globose, fleshy, 4–5 mm diam. *Stem* erect, whitish-green, *ca*. 8 mm long, *ca*. 1.1 mm diam., with a basal sheath, *ca*. 5.5 mm long, apex filiform; stolons whitish, hairy, 2.0–3.1 cm long, 0.8–1.0 mm diam. *Leaves* sessile, broadly cordate, apex obtuse with short *ca*. 1.25 mm long mucro, glabrous, 13 mm long, 14–15 mm wide at the widest point, slightly undulate especially at the apical margin, light green with paler veins, the veins scarcely conspicuous. , Q Á R U H V F H Q one-flowered, terminal; bract pale green, narrowly triangular, *ca*. 4.5 mm long, filiform toward the apex, recurved at the base. *Flower* with dorsal sepal pale green, streaked with red from the middle and becoming fully red upwards, with the tip green; lateral sepals pale green at the base, upwards red, and white at the upper 1/3; petals red, whitish at the base and apex; labellum with the lower half mostly transparent white, inside white at the base, white upwards until the apex of the erect part, the reflexed part purple-red with a white apical part. *Dorsal sepal* strongly curved, hood-like, oblanceolate, *ca*. 14 × 3 mm, mucronate at the apex; glabrous. *Lateral sepals* free, narrowly triangular-linear, *ca*. 21.0 × 0.8 mm; glabrous. *Petals* similar to lateral sepals, *ca*. 13–14 mm long, glabrous. *Labellum* 9 mm long, differentiated into two parts, basal half erect, upward strongly reflexed, basal half strongly inrolled, upper half slightly expanded, *ca*. 4.5 × 7.0 mm, spur 2, short, blunt, *ca*. 1 mm long. *Column ca*. 2 mm long, slightly curved; anthers erect, pollinia 2, coarse granulate. *Capsule* and *seed* not seen. (Fig. 1).

Ecology: Terrestrial in montane bogs under trees or shrubs, at elevations from 1410 to 1700 m. The species roots in the acidic organic matter of bogs and grows among mosses. The vegetation is characterized by the presence of several plants from the Ericaceae.

Flowering: June, August and September.

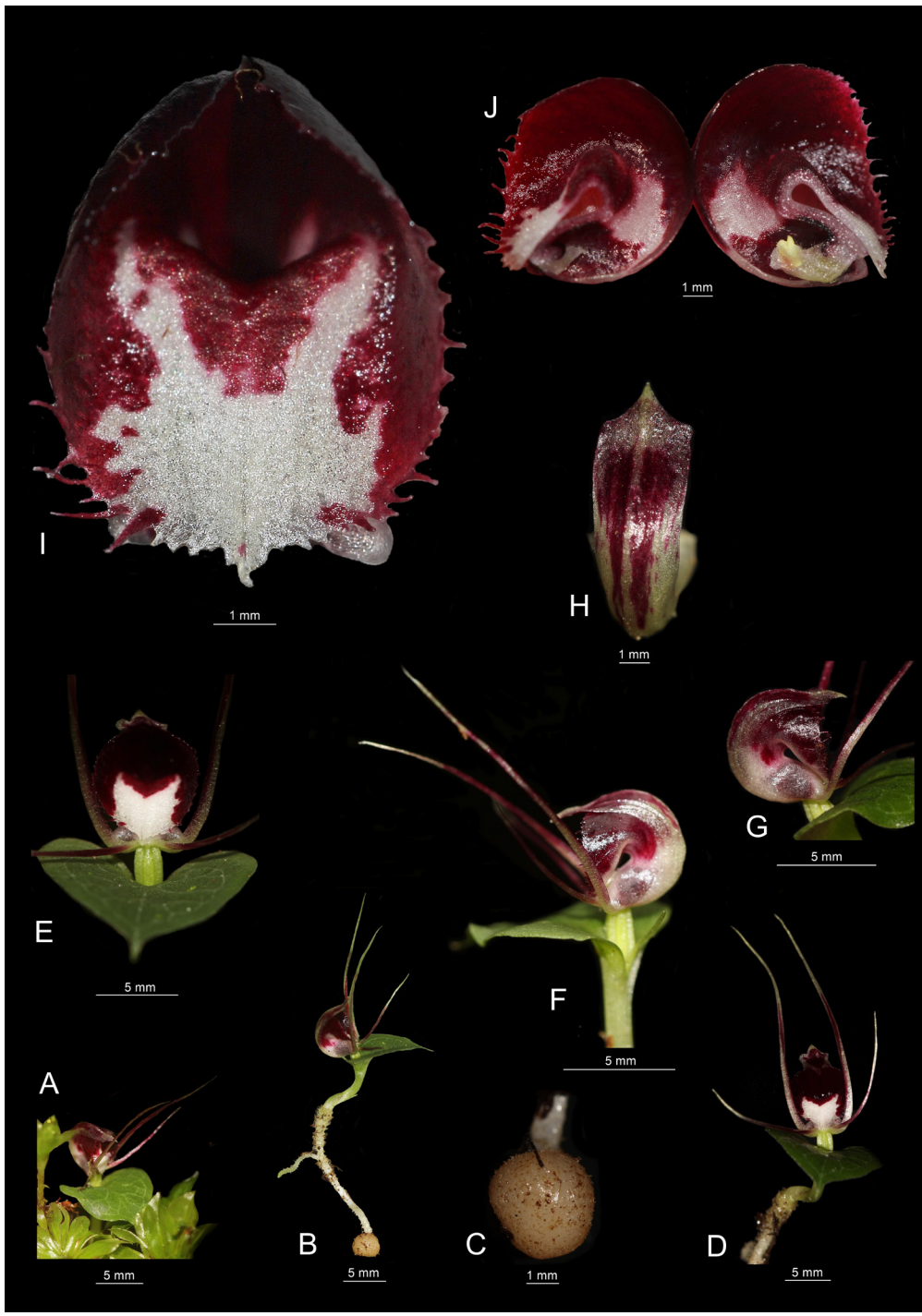


FIGURE 1. *Corybas geminigibbus* from northern Gayo Plateau, Sumatra. **A**. Plant in habitat. **B**. Habit. **C**. Tuber. **D**. Plant with flower. **E**. Flower, frontal view. **F**. Flower, lateral view. **G**. Close up of the flower, lateral view. **H**. Dorsal sepal. **I**. Labellum, frontal view. **J**. Labellum, longitudinal dissection also showing the column. Based on *Mustaqim et al. 3292*. Photos by W. A. Mustaqim.

FIGURE 2. Geographic distribution of *Corybas geminigibbus* in the northern Gayo Plateau, Sumatra, Indonesia (●). Map by W.A. Mustaqim.

GENERAL DISTRIBUTION: Thailand (Chantanaorrapint & Chantanaorrapint, 2016), Vietnam (Truong *et al*., 2020), Peninsular Malaysia, Borneo (Dransfield *et al*., 1986), and Sumatra (here recorded, Fig. 1–2). In Sumatra, this species is restricted to the northern Gayo Plateau, with all known locations limited to two sites in Aceh Tengah Regency.

SPECIMENS EXAMINED. **Aceh Province**: Aceh Tengah Regency, Pegasing Subdistrict, *precise location withheld for conservation purposes*, *Mustaqim et al. 2717*, 14 June 2023 (LGS, MEDA); *ibid*. Bebesen Subdistrict, *precise location withheld for conservation purposes*, *Mustaqim et al. 3292*, 17 September 2023 (LGS, MEDA) (Fig. 1); *ibid*. Bebesen Subdistrict, *precise location withheld for conservation purposes*, *Mustaqim 3443*, 4 August 2024 (LGS).

Discussion. *Corybas geminigibbus* is a relatively widespread species in the genus. The species was first collected in Sarawak, Mt. Mulu. Until 1986, it was known only from Peninsular Malaysia and Borneo (Dransfield *et al*., 1986), but more recent records indicate a broader distribution extending to Thailand (Chantanaorrapint & Chantanaorrapint, 2016) and Vietnam (Truong *et al*., 2020). The morphological range of this species is now understood to be considerable, especially in size, as evidenced by the smaller dimensions of plants documented in Thailand (Chantanaorrapint & Chantanaorrapint, 2016).

According to Dransfield *et al*. (1986) and Truong *et al*. (2020), *C. geminigibbus* is characterized by the following combination of floral traits: (1) dorsal sepal that is non-hooded and only slightly longer (nearly subequal) than the lip, with acuminate apex and smooth (not keeled) abaxial side; (2) sepals and petals free at the base; and (3) labellum with straight base, V-shaped throat, a slightly inrolled margin and smooth surface. The specimens collected from the northern Gayo Plateau exhibit a unique color pattern, with a labellum that is predominantly purple with a white apical part. In Sumatra, this species is similar to *C. pictus* but easily distinguished by the acuminate (*vs*. truncate) dorsal sepal (Comber, 2001).

The populations of *C. geminigibbus* in the northern Gayo Plateau are confined to montane bogs (Fig. 3) The first population was found growing on shaded, mossy floors of bogs dominated by Myrtaceae and –Ericaceae vegetation (*Mustaqim et al. 2717*). The second population was found among ericaceous scrub and mixed montane vegetation on boggy ground (*Mustaqim 3292*). The population size in this area is estimated to be more than 250 plants at each site, but many plants have been lost due to illegal collecting by poachers, as happened in other orchid species in this area (Metusala, 2017).

For geographic ranges in Indonesia, this finding expand the distribution of this species to two regions, up from the previously known seven (Midleton *et al*., 2019). Sumatra is the third largest island in Indonesia, as well as the insular Southeast Asia, surpassing the size of neighboring countries like Malaysia or the Philippines. This is the second recorded locality for the species in Indonesia, with the first being in Bukit Mulu, West Kalimantan Province (Dransfield *et al*., 1986).

Conclusions. The record of *C. geminigibbus* in Sumatra is important evidence of past geological connections between mainland Asia and Sumatra. It strengthens the linkage between the two areas based on floristic similarities. The record is also a significant contribution to the future planning of research and conservation activities for Indonesia, e.g., national red-listing with the final aim of a conservation action plan.

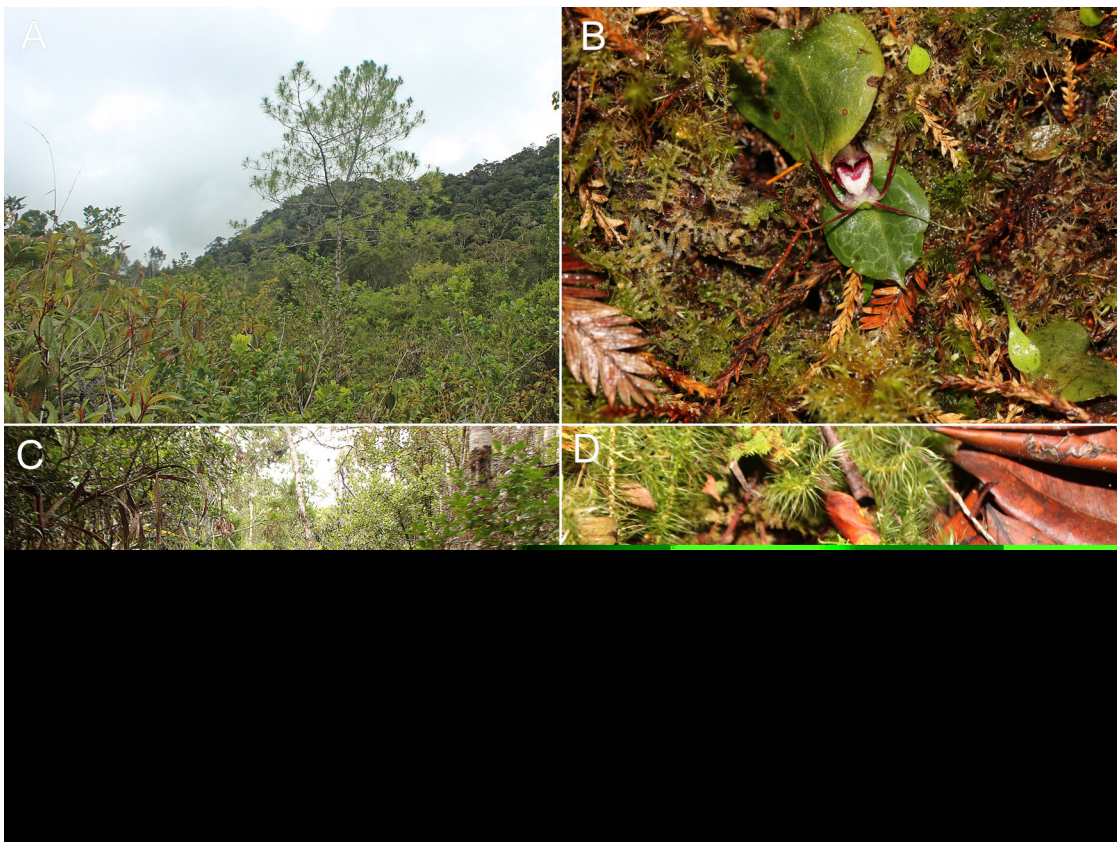


Figure 3. Habitat of *Corybas geminigibbus* in the northern Gayo Plateau. **A**. Ericaceae shrubland. **B, D**. *Corybas geminigibbus* in its habitat. **C**. Forest stand with logging trail. Photos by W. A. Mustaqim.

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Author contributions. WAM: Conceptualization (equal); Investigation (equal); Writing – original draft preparation (equal); ZA: Supervision (equal); Writing – reviewing and editing (equal); Investigation (equal); RBG: Data curation (equal); Investigation (equal); TR: Data curation (equal); Investigation (equal); YRY: Supervision (equal); Investigation (equal); Writing – reviewing and editing (equal).

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Conflict of interest. No conflict of interest to declare.

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