

A NEW VARIETY OF *Paphiopedilum barbatum* (ORCHIDACEAE: CYPRIPEDIOIDEAE) FROM SUMATRA, INDONESIA

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Abstrak

Paphiopedilum merupakan salah satu genus anggrek yang memiliki nilai penting dalam bidang hortikultura sekaligus dunia konservasi. Genus *Paphiopedilum* memiliki pusat keragaman spesies di kawasan Asia Tenggara, khususnya di kepulauan Indonesia. Berbagai upaya penelitian terus dilakukan untuk mengobservasi keragaman genus *Paphiopedilum* di Indonesia. Pada tahun 2017, spesimen anggrek genus *Paphiopedilum* sp. (Orchidaceae: Cypripedioideae) telah dikoleksi oleh penduduk lokal dari hutan di Aceh, Pulau Sumatra, Indonesia. Observasi morfologi dilakukan terhadap tumbuhan hidup, material awetan basah, spesimen herbarium, serta foto-foto berwarna dari individu yang hidup di habitat aslinya. Perbandingan morfologi dengan spesies *Paphiopedilum* terkait dilakukan berdasarkan data-data dari protolog, literatur, tumbuhan hidup, spesimen herbarium dan foto-foto. Hasil observasi menunjukkan bahwa data-data morfologi bunga dan habitus masih termasuk ke dalam rentang variasi dari *Paphiopedilum barbatum*, namun terdapat perbedaan pada karakter petal-nya. Oleh karena itu, spesimen *Paphiopedilum* sp. dari Aceh tersebut dideskripsikan sebagai varietas baru dengan nama *Paphiopedilum barbatum* var. *acehense*. Selain memaparkan deskripsi varietas baru *Paphiopedilum barbatum* var. *acehense*, penelitian ini juga menyajikan deskripsi morfologi dari *Paphiopedilum barbatum* var. *barbatum* yang disusun dari beberapa literatur.

Keywords: *Paphiopedilum*, Sumatra, Orchidaceae

INTRODUCTION

Paphiopedilum Pfitzer (Orchidaceae: Cypripedioideae) is widely distributed from India across southern China to Southeast Asia, including New Guinea and the Solomon Islands. The genus is well represented in Southeast Asia which is its centre of diversity. *Paphiopedilum* section *Barbata* (Kraenzl.) V.A. Albert & B. Pettersen is the largest in the genus, most species being found on the islands of the Malay Archipelago and the Philippines. This section is characterised by the elliptic leaves tessellated with darker green on the adaxial surface and inflorescences that bear single

flower (Albert & Pettersen, 1994; Cribb, 1998). To date, eight species of *Paphiopedilum* section *Barbata* have been recorded from Sumatra: *P. barbatum* (Lindl.) Pfitzer, *P. braemii* H.Mohr, *P. bullenianum* (Rchb.f.) Pfitzer, *P. javanicum* (Reinw. ex Lindl.) Pfitzer, *P. superbiens* (Rchb.f.) Stein, *P. tonsum* (Rchb.f.) Stein, *P. lunatum* Metusala and *P. bungebelangi* Metusala (Govaerts *et al.*, 2017; Metusala, 2017).

Paphiopedilum barbatum is one of the little known *Paphiopedilum* species in Sumatra Island. This species was described in 1842 from type specimen collected in

1838 on Mount Ophir (now known as Gunung Ledang) in Johor, Peninsular Malaysia. It has been recorded from Peninsular Malaysia and Sumatra, growing in leaf litter, or moss on granite boulders in the shaded forest between 200 to 1300 m elevation (Cribb, 1998). Recent taxonomical work has shown a wide range of colour form and morphological variation in *P. barbatum* in Peninsular Malaysia (Leong, 2014). However, there is limited information about the extent and variation of *P. barbatum* in Sumatra. Comber (2001) mentioned that there is a single specimen at Leiden, collected by W. Meijer from West Sumatra at 1700–2400 m.

Some flowered specimens of *Paphiopedilum* section *Barbata* were collected from Aceh in 2017. Observation on their morphology suggested these specimens belong to *P. barbatum*, but there were differences in the petal's characteristics from those of the typical *P. barbatum*. Therefore the specimens from Aceh have been treated here as a new variety.

MATERIALS AND METHODS

Morphological description of the new variety was based on examination of living plants, spirit material, and a dried herbarium specimen, and was supplemented by colour photographs of several plants in their natural habitat. Dried flowers were studied after softening in boiling water. Details of the flowers were examined under a stereomicroscope. The comparison with other *Paphiopedilum* species involved the study of their protologues, literatures, living plants, herbarium specimens, and photographs.

RESULT AND DISCUSSION

Paphiopedilum barbatum (Lindl.) Pfitzer var. *acehense* Metusala, var. *nov.* (Figs. 1,2)

Type:—INDONESIA. Sumatra Island: Aceh Province, 1300–1800 m, *RIO* 9007 (holotype: BO!).

Diagnosis:— This new variety differs from the typical variety in having strongly undulate greenish petals and lack of pink or purple tinge.

Terrestrial herb with short stem. **Roots** hairy, light brown. **Rhizome** cylindrical, 4 mm wide, short to elongate (more than 20 cm long) **Leaves** 5–7 per shoot, distichous, spreading, to 14–16 × 1.8–2.7 cm, oblong-elliptic to oblong-linear, coriaceous, glabrous, light green to dark green; adaxial surface matte to slightly velvety, mottled with darker green and longitudinal venation dark green; abaxial surface waxy and rather shiny/glossy, whitish to light greyish green; leaf base usually tinged purple beneath—especially on older leaves; apex obtuse to acute, minutely tridenticulate at tip. **Inflorescence** one-flowered, erect, to 39 cm; peduncle cylindrical, 25–30 cm long, greenish brown to purplish brown, pubescent, indumentum white to yellowish white; floral bract tightly encircling ovary at base, 2.0–2.5 × 1.3–1.6 cm, triangular to ovate, light green, pubescent on outer surface, margin ciliate, dorsal midrib prominent, apex obtuse to acute. **Pedicel and ovary** 7.0–7.5 cm long, green, pubescent, indumentum white to yellowish white. **Flower** to 7.5 cm high × 3–8 cm wide. **Dorsal sepal** erect, 3.0–3.8 × 3.2–3.7

cm, broadly ovate to sub-orbicular, slightly glossy, white with purple and green longitudinal venation, ventral/inner surface glabrous, pubescent on outer surface, margin ciliate, sometimes slightly undulate, apex obtuse to acute. **Synsepal** descending, 2.7–3.1 × 1.4–1.7 cm, oblong-ovate, white with light green venation, ventral/inner surface glabrous, pubescent on outer surface, margin ciliate, apex obtuse or shortly bifid. **Petals** spreading to pendent, occasionally twisted in apical half, usually reflexed or recurved near apex, 4.3–5.1 × 0.8–1.1 cm, oblong to linear-oblong, sometimes slightly falcate, yellowish green to whitish green with darker green longitudinal stripes, margin undulate, minutely ciliate with some irregular long cilia, warts blackish brown to black on both upper and lower margins and on blade; apex obtuse to acute. **Lip** descending, deeply saccate, 3.8–4.5 × 2.0–2.8 cm, glossy to matte, sac greenish brown, yellowish brown, to purplish maroon with darker venation, glabrous on outer surface; side lobes incurved, glossy, yellowish brown to purplish green, bearing many raised small warts. **Column** c. 1 cm long. **Staminode** 9–10 × 10–13 mm, lunate, light green or pale purple or green suffused purple with darker green reticulate pattern on the front surface, base shortly bilobed, surface minutely pubescent, incised at apex; apical lateral lobes falcate, usually incurved, acute; apical central lobe very much reduced, occasionally with a marginal lobule on each side.

Distribution:— Indonesia, Sumatra, Aceh Province.

Etymology:— Named after Aceh Province, where the type material originated.

Habitat and ecology:— Usually growing as terrestrial herb, occasionally lithophytic, with roots in leaf litter or sphagnum moss on hill slopes from 1300–1800 m altitude. Some plants produce long and creeping rhizomes to reach brighter areas, so in deep shady areas, plants usually appear etiolated with longer internodes.

Paphiopedilum barbatum in Peninsular Malaysia is very variable, especially between different localities. Within a population, variation in leaf size, degree of leaf mottling, flower colour and form all occur, even in plants within a 50 m² patch. The appearance of warts on the petals is also a variable character. The warts can occur on the upper margin only, both margins, as well as on the adaxial surface (Figure 3). The distribution and number of warts should no longer be considered diagnostic characters that can be used to distinguish between *P. barbatum* and its allies. The petal colour is also very variable, but specimens from Peninsular Malaysia are always with a distinct pink-purple tinge (Leong, 2014).

Except for some petal characters, specimens from Aceh exhibit a plant habit and flower characters which fall within the variation of *P. barbatum* stated in Leong (2014) and Cribb (1998). The specimens from Aceh also had a similar staminode shape to specimens from Peninsular Malaysia (Figure 4). However, the specimens from Aceh have greenish petals with strongly undulate margins and lack a

pink or purple tinge. The typical variety of *P. barbatum* has relatively flat to less

undulate and always with a distinct pink-purple tinge, especially around the apex.



Figure 1. *Paphiopedilum barbatum* var. *acehense*. **A-D**, variations in flower morphology and coloration (all shown in their natural habitat). Photographs by Ahmad Nurohman.

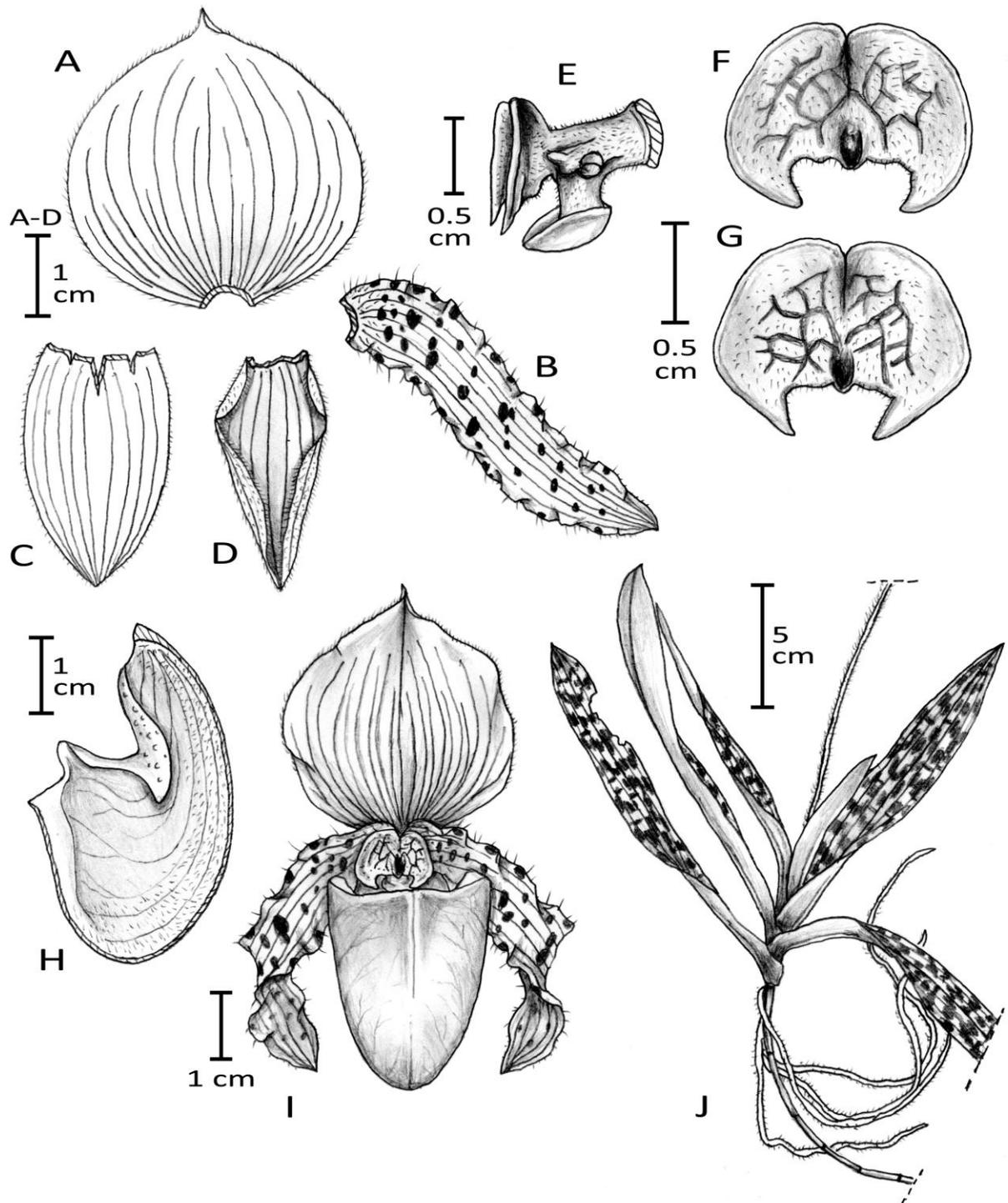


Figure 2. *Paphiopedilum barbatum* var. *acehense*. A, dorsal sepal. B, petal. C, synsepal, flattened. D, synsepal, natural shape. E, column, side view. F-G, staminode. H, lip, longitudinal section. I, flower, front view. J, habit. A-F and H-J taken from type specimen. All drawn by Destario Metusala.



Figure 3. **A-B**, variation in *Paphiopedilum barbatum* var. *barbatum* in Peninsular Malaysia, showing non-undulating petals tinged pink to purple. The distribution of warts on the petals is far more variable than shown in these two plants. Photographs by Ong Poh Teck.

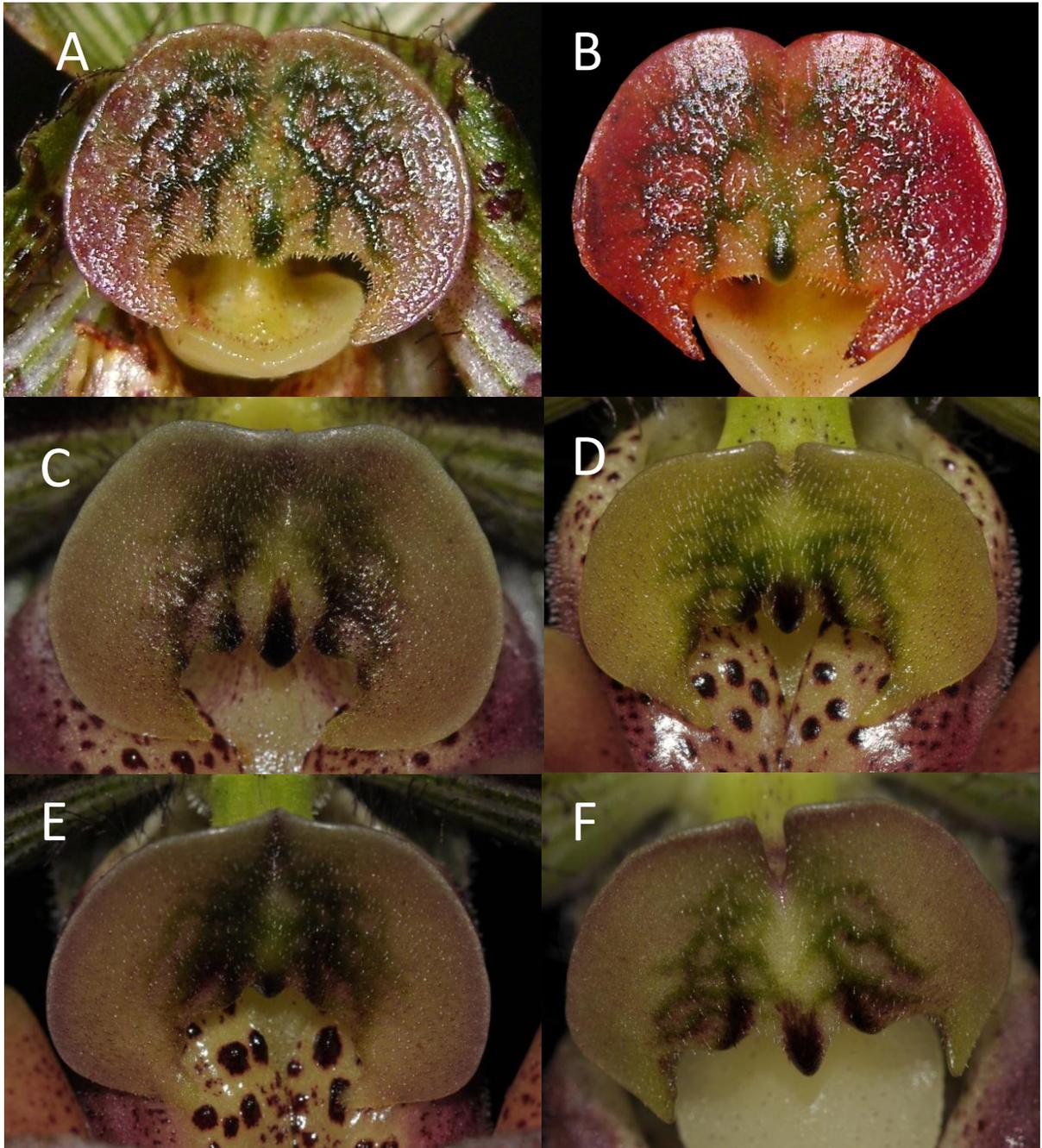


Figure 4. Variations in staminode shape. **A-B**, *P. barbatum* var. *acehense* in Aceh. **C-F**, *P. barbatum* var. *barbatum* in Peninsular Malaysia. Photographs: A-B by Destario Metusala; C-F by Ong Poh Teck.

Paphiopedilum barbatum* var. *barbatum

Type:—MALAYSIA. Peninsular Malaysia: Gunung Ledang (Mount Ophir), *Cuming s.n.* (holotype: K!).

Terrestrial herb with short stem. **Roots** hairy, light brown. **Rhizome** cylindrical, short to elongate (to more than 40 cm long) **Leaves** 3–8 per shoot, distichous, spreading, to 5.0–22.5 × 2.1–5.4 cm, narrowly oblong to broadly elliptic, coriaceous, glabrous, yellowish or bluish green; adaxial surface glossy or matte, obscurely to distinctly mottled with darker green, longitudinal venation green to dark green; abaxial surface whitish to greyish green; leaf base sometimes slightly tinged purple beneath—especially on older leaves, margins entire to slightly undulating; minutely tridenticulate at tip, apex acute. **Inflorescence** one-(rarely two) flowered, erect to arcuate; peduncle cylindrical, 20–61.5 cm long, purple to brownish purple, pubescent, indumentum white and purple; floral bract tightly encircling ovary at base, 2.3 × 1.0–1.4 cm, narrowly ovate, light green, suffused purple at the fold and towards the base, pubescent on outer surface, indumentum white and purple, margin ciliate, dorsal midrib prominent, apex acute. **Pedicel and ovary** 4.5–6.7 cm long, pale green to purplish green, pubescent, indumentum purple. **Flower** to 7.5–9 cm high × 8–10 cm wide. **Dorsal sepal** erect, 3.2–5 × 3.5–5.5 cm, ovate to broadly ovate, white with purple and green longitudinal venation, ventral/inner surface glabrous, pubescent on outer surface, margin ciliate, sometimes slightly undulate or reflexed, apex

occasionally recurved and slightly folded, obtuse to acute or sometimes cuspidate. **Synsepal** descending, 2.4–3.5 × 1.5–2.5 cm, narrowly to broadly ovate, dorsally convex, greenish at base and suffused purple towards the margin, longitudinal venation bold purple, ventral/inner surface glabrous, pubescent on outer surface, indumentum white and purple, margin ciliate, apex acute. **Petals** spreading, held almost horizontal to about 45° downwards, rarely more than that, apical third may be reflexed and slightly twisted upward, 4.5–6 × 0.7–1.6 cm, linear-oblong, colour very variable, usually a combination of green, pink, brown and purple, or sometimes almost completely purple, longitudinal venation darker, margin ciliate; warts blackish purple to black, usually on upper margin only, sometimes on both upper and lower margins and also on the blade as well; apex obtuse to acute. **Lip** descending, deeply saccate, 3.3–4.7 × 2.0–2.7 cm, glossy to matte, sac pale brown or maroon-purple to maroon, often suffused greenish, with darker venation, glabrous on outer surface; side lobes incurved, glossy, purple suffused with green, bearing many raised small warts. **Column** c. 1 cm long. **Staminode** 8–11 × 10–15 mm, lunate, light green or pale purple or green suffused purple with darker green to purple reticulate pattern on the front surface, base shortly bilobed, surface minutely pubescent, incised at apex; apical lateral lobes falcate, sometimes slightly incurved, acute; apical central lobe very much reduced, occasionally with a marginal lobule on each side. (A combined description from Cribb (1998) and Leong (2014)).

Distribution:— Peninsular Malaysia and Sumatra.

Habitat and ecology:— Usually growing as terrestrial herb or occasionally lithophytic in deep shaded forest floors to open areas on sloping embankments. It occurs from 200–1300 m altitude.

CONCLUSION

Paphiopedilum barbatum var. *acehense* has been described and illustrated as a new variety and compared to the typical variety of *P. barbatum*. This new variety differs from the typical variety in having strongly undulate greenish petals and lack of pink or purple tinge.

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