


## A NEW SPECIES OF *AERIDES* (AERIDINAE: ORCHIDACEAE) FROM SULAWESI, INDONESIA

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A new species of *Aerides* from Sulawesi Island, Indonesia, is described and illustrated. This new species is placed in *Aerides* sect. *Falcata* and is, so far, the only member of this section recorded from Indonesia. The species is endemic to the northern part of Sulawesi Island.

*Keywords.* *Aerides*, epiphyte, Wallacea

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### Introduction

The genus *Aerides* Lour. (Orchidaceae) is a small genus of 31 species distributed from India, China, to the Philippines, Sulawesi and Papua New Guinea (Christenson, 1984; POWO, 2023). In the past five years, several new species have been discovered and described, including *Aerides agasthiyamalaiana* Karupp. & P.S.S.Rich. from India, *A. phongthuyii* Aver. & V.C.Nguyen from Vietnam, *A. cootesii* Cabactulan *et al.* and *A. turma* M.Leon *et al.* from the Philippines. It is presumed that several new species still await discovery.

Indonesia is known to be one of the most important orchid diversity hotspots in the world and a centre of diversity for many orchid genera, including *Aerides* (Metusala, 2017; Metusala & Supriatna, 2017; Metusala, 2019a, 2019b; Metusala & O'Byrne, 2020; Metusala *et al.*, 2021). Currently, five *Aerides* species are recorded from Indonesia and are distributed from Sumatra in the west to Sulawesi in the east of the archipelago (POWO, 2023). *Aerides odorata* Lour. is the most widespread species and is recorded from Sumatra, Java and Kalimantan (Indonesian Borneo). There are two species from the Lesser Sunda Islands (*Aerides odorata* and *A. timorana* Miq.) and four from Sulawesi (*A. huttonii* (Hook.f.) J.H.Veitch, *A. inflexa* Teijsm. & Binn., *A. odorata* and *A. thibautiana* Rchb.f.), of which all but *A. odorata* are endemic to that island. Based on POWO (2023), there are no records of the genus from Maluku or Indonesian New Guinea.

The Philippines are particularly rich in *Aerides*, having 12 species, 11 of which are endemic to the country. As one of the nearest islands to the Philippines, Sulawesi is also known to be particularly rich in the genus compared with other Indonesian islands. During a botanical expedition undertaken by staff from Purwodadi Botanic Garden in 2000, unidentified specimens of *Aerides* were collected from the northern part of Sulawesi. After many years of cultivation, only a single mature individual has survived, but it flowered for the

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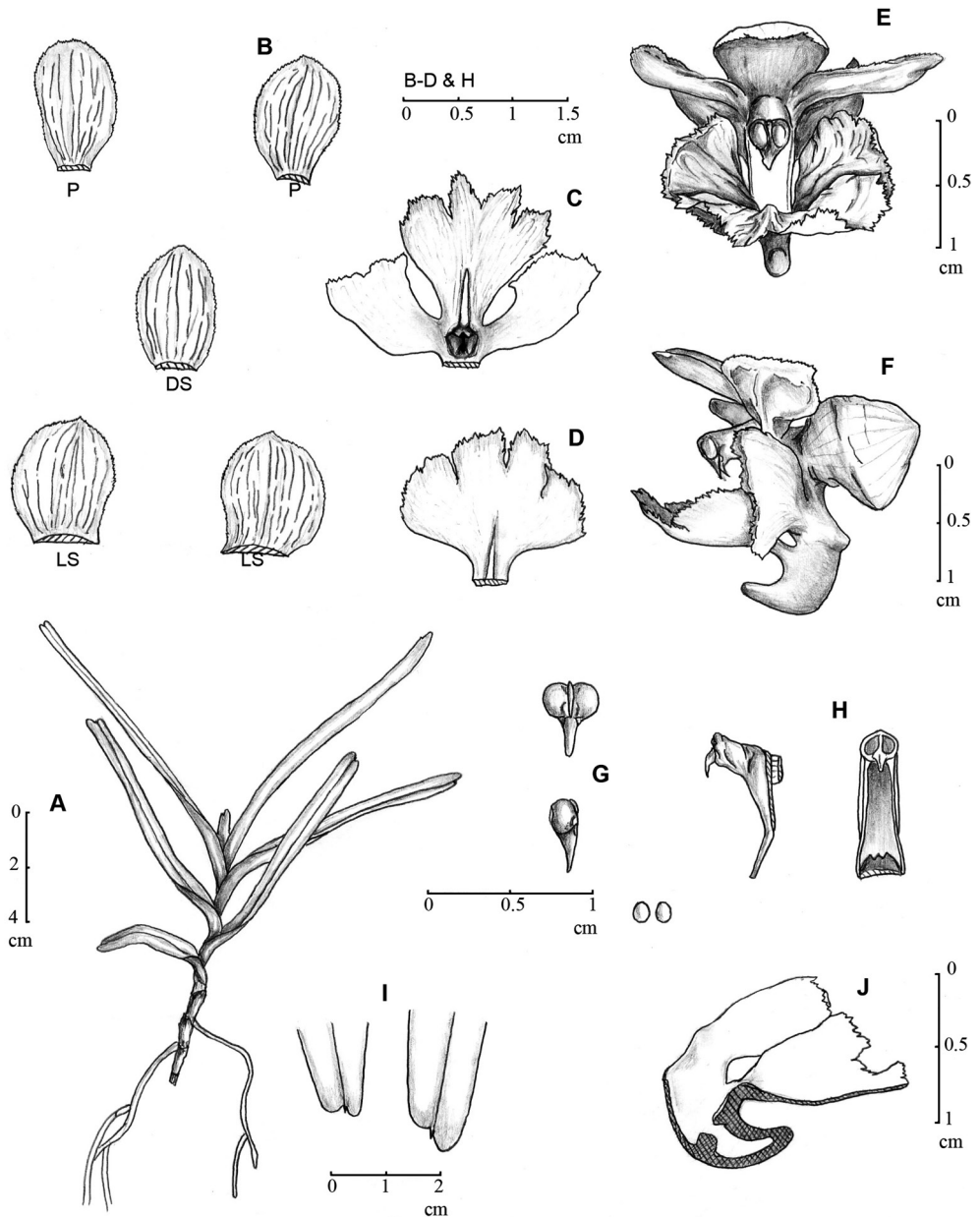
first time in the garden in 2012, allowing it to be recognised as a species of *Aerides* new to science. This new species is described here.

### Species description

#### *Aerides obyrneana* Metusala, sp. nov.

*Aerides obyrneana* is morphologically similar to *A. upcmae* Motes *et al.* but differs in having a broadly flabellate mid-lobe (vs elliptic ovate mid-lobe), mid-lobes deeply incised forming 4 unequally lobules (vs simple with bilobed apex), a low median callus that extends from the spur aperture to the centre of the mid-lobe (vs shallowly channelled at the posterior base), and a spur with an erect subquadrangular lower callus (vs an erect long oblong lower callus). – Type: Indonesia, Sulawesi Island, Gorontalo Province, 300–510 m, RIO 62 (holotype BO). Figures 1, 2.

Epiphytic monopodial herb, plant small to medium size for genus (leafy stem 10–16 cm long), suberect to pendulous. Roots few from stem base, occasionally from nodes along stem, 0.4 cm in diameter, can reach 60 cm long, frequently branching, white. Stem stout, cylindrical, internodes 0.8–1.5 cm long, covered by imbricating basal leaf sheaths, stem length up to 15 cm long, leafy along much of the length. Leaves strap-shaped, 4–13 × 1.2–2 cm, green, slightly stiff and leathery, keeled underneath, rather waxy on adaxial surface, glabrous; apex obliquely and unequally bilobed, lobules obtuse, keel protruding in sinus as a small point. Inflorescences descending, 10–17 cm long, with 5–7 flowers arranged radially on a 5–8 cm rachis, most flowers open at same time; peduncle 5–9 × 2–2.5 mm, cylindrical, glabrous, green, with broadly triangular bract, obtuse to acute, 3–4 mm wide at base × 2–2.5 mm long; floral bract 3–4 × 5–6 mm at base, triangular, obtuse to acute, brown reddish; pedicel-with-ovary cylindrical, 1.3 cm long. Flowers 2.5–2.6 × 2.4–2.5 cm, opening fully, sepals and petals waxy, stiff and shiny; pedicel (with ovary) pinkish white, graduating to darker pinkish purple towards the apex; sepals and petals white with pink-purple blotch near the apex and suffused pink-purple longitudinally in the median, pink-purple more pronounced on the sepals; lip side lobes greenish yellow to yellow, often with purple transverse streaks at base; mid-lobe yellow turning paler towards apex, with purple transverse streaks at base and pink-purple median markings, apex speckled pink-purple; callus white with pink-purple specks on the ridge; spur greenish yellow at base and reddish brown at the tip; column and foot white; anther cap white, turning to pale brown with age; pollinia yellow. Dorsal sepal suberect, 1–1.1 × 0.7–0.8 cm, unequally elliptic to ovate, obtuse, margins minutely erose, slightly concave. Petals horizontally widespread, 1.1–1.2 × 0.7–0.8 cm, unequally obovate, obtuse, margins minutely erose. Lateral sepals horizontally widespread, often slightly deflexed, 1–1.1 × 0.9–1 cm, broadly unequally elliptic, obtuse, apiculate, margins minutely erose. Lip base attached only to column-foot apex, porrect, 16–18 mm long (with spur), 3-lobed and



**Figure 1.** *Aerides obyrneana* Metusala, sp. nov. A, Habit; B, sepals and petals (DS, dorsal sepal; LS, lateral sepal; P, petal); C, lip in natural shape (viewed from above); D, lip mid-lobe, flattened; E, flower in natural shape (front view); F, flower in natural shape (side view); G, anther cap (front and side views); H, column and foot (left, side view; right, ventral view); I, two examples of the leaf apex; J, lip, longitudinal section, natural shape (side view). Drawn from living specimen and spirit collection (holotype R/O 62) by Destario Metusala.



**Figure 2.** *Aerides obyrneana* Metusala. A, Inflorescence; B and C, flower with lip in natural shape (oblique views); D, flower, natural shape (back view); E, lip, mid-lobe and side lobes, natural shape. Photographs: Destario Metusala.

spurred from the base; when flat 25–26 mm wide across the middle; side lobes porrect and slightly spreading, 11 mm long, from a thickened narrow base somewhat falcate, cuneate to oblong, apex truncate to broadly rounded, erose to denticulate; mid-lobe porrect, rising at the sides, broadly flabellate from a narrow thickened base (claw), 13–15 (including claw) × 14–18 mm, the front broadly rounded and deeply incised forming 4 unequal lobules, front margins dentate; 5–7.5 mm long, low median callus extending from spur aperture to centre of the mid-lobe, callus bilobed at the spur entrance; the lobules projecting backwards into the aperture; spur briefly descending then abruptly incurved through 90–100°, in total 9.5–10 mm long, 6 mm wide at base, cylindroconical, tapering to a narrow obtuse apex, thick-walled, the backwall opposite the mid-lobe internally with an erect quadrangular lower callus that projects halfway across the aperture. *Column* porrect, 4.5–5 mm long, slender, apex blunt with a large prominent triangular rostellum; foot descending an obtuse angle, bent in the middle, 10–11 × 3–4.5 mm, lateral margins raised and keel-like, foot apex bears a nectary in a depression. *Anther cap* cucullate, prominently beaked, 4.5–5 mm. *Pollinia* 2, subglobose to subovoid, about 1–1.3 mm high. *Stipe and viscidium* not seen.

Description based on living plant and spirit material.

*Distribution.* Indonesia, Sulawesi Island, Gorontalo Province. Exact locality withheld to protect population from illegal orchid collectors.

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*Habitat and ecology.* Growing as an epiphytic under the shade of old trees in semi-open hilly area. Flowering so far recorded only between April and May (*ex situ* in Purwodadi Botanic Garden, East Java, 300 m). This species has a narrow leaf shape with a thick waxy cuticle layer on the leaf adaxial surface, which in tropical epiphytic orchids is usually related to adaptation to low humidity, hot temperature, relatively high light-intensity environments, and long drought period (Al Farishy *et al.*, 2017; Metusala *et al.*, 2017; Metusala, 2019a; Ishmah *et al.*, 2021; Suffan *et al.*, 2021; Metusala & Al Farishy, 2022).

*Etymology.* The specific epithet honours the late Peter O'Byrne, a Southeast Asian orchid specialist who kindly taught the author during his early career as an Indonesian taxonomist.

*Proposed IUCN conservation category.* *Aerides obyrneana* is so far known only from a single locality in Gorontalo province. The bright attractive colour and very unusual lip shape compared with that of other Indonesian *Aerides* make this species vulnerable to over-collection by commercial collectors and orchid enthusiasts. Intensive collection to meet the high demand from collectors often has a great negative impact on the sustainability of orchid population in their habitat (Metusala, 2017). The quality of natural habitat is also declining, due to conversion of forest to plantations. The species is thus provisionally assessed as Critically Endangered B2ab (i,ii,iii,v) until more data on its current population become available.

*Notes.* From the large lip mid-lobe compared with its side lobe, and its mid-lobe being perpendicular to the side lobes, *Aerides obyrneana* is most similar to species in *Aerides* sect. *Falcata*, a section mostly found in mainland Southeast Asia (Averyanov *et al.*, 2019; Motes *et al.*, 2020). A new species of this group, *Aerides upcmae*, published in 2020 from Mindanao Island in the Philippines (Motes *et al.*, 2020), extended the distribution of the section east. The discovery of *Aerides obyrneana* in the northern part of Sulawesi Island extends sect. *Falcata* south, and it is the only member of this section in Indonesia. It is clear that *Aerides obyrneana* and *A. upcmae* show intermediate characters between sect. *Falcata* and sect. *Aerides*, especially in their spur shape. These sections may ultimately be merged, or a new section may be created to accommodate both species; however, until a more detailed study of the sectional classification in the genus is carried out, *Aerides obyrneana* is placed in sect. *Falcata*.

*Aerides obyrneana* is morphologically similar to *A. upcmae* and *A. houlettiana* (Table). The flowers of *Aerides obyrneana* are similar to those of *A. houlettiana* but differ in having a broadly flabellate lip mid-lobe, unequally oblong lip side lobes that are broader towards the truncate apex with erose apical margins, a low median keel that extends from spur aperture to centre of the lip mid-lobe, a curved spur, and a prominent bilobed callus that is raised on the front wall under the spur aperture. By contrast, *Aerides houlettiana* has a subrectangular to broadly ovate lip mid-lobe, unequally elliptic lip side lobes with obtuse to rounded apex and entire apical margins, two distant longitudinal keels that converge in the base area of the lip mid-lobe, and a straight spur, and is without a prominent callus on the front wall under the spur aperture (Figure 3).

**Table.** Morphological comparison between *Aerides obyryneana* Metusala, sp. nov., *A. houlettiana* and *A. upcmae*

Character	<i>A. obyryneana</i>	<i>A. houlettiana</i>	<i>A. upcmae</i>
Lip mid-lobe	Broadly flabellate and deeply incised, forming 4 unequal lobules	Subrectangular to broadly ovate with bilobed apex	Simple elliptic ovate with bilobed apex
Lip side lobe	Unequally oblong, broadening towards a truncate apex with erose apical margins	Unequally elliptic with obtuse to rounded apex and entire apical margins	Unequally flabellate with truncate apex and erose apical margins
Lip surface ornamentation	A low median keel that extends from spur aperture to centre of the lip mid-lobe	Two distant longitudinal keels that converge at the basal area of the lip mid-lobe	Shallowly channelled at the central posterior base
Spur shape	Curved	Straight	Curved
Upper callus of the spur	A prominent bilobed callus that is raised at the front wall under the spur aperture	Callus absent	A short (1 mm high) paired triangular callus
Lower callus of the spur	An erect subquadrangular lower callus	An erect subtriangular obtuse lower callus	An erect long (2 mm) oblong lower callus

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Figure 3. *Aerides houlletiana* Rchb.f. Lip (mid-lobe and side lobes): A, in natural shape (viewed from above); B, longitudinal section (side view). Photographs: Alfajaruddin.

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