



Calanthe cootesii sp. nov. (Orchidaceae; Epidendroideae; Collabieae): a new species from the Southern Philippines

Mark Arcebal K. NAIVE

Purok 5, Dologon, Maramag, 8714, Bukidnon, Philippines.

* Corresponding author's email: arciinaive19@gmail.com

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ABSTRACT: *Calanthe cootesii* M.A. Naive from Mt. Maagnaw, Kitanglad Mountain Range, Bukidnon, is described and illustrated. Morphological diagnostic characters of related species of the genus are discussed. Though similar to *C. brassii* Ormerod, the new species is clearly distinguished by having a marked difference in the shape of the lip and the reflexed and recurved floral segments. It is also allied to *C. davaensis* Ames, but the new species is clearly distinguished by having smaller and greenish flowers with an indistinct spur.

KEY WORDS: Bukidnon, *Calanthe cootesii*, Kitanglad Mountain Range, Mt. Maagnaw, New species, Orchidaceae, Philippines.

INTRODUCTION

One never ceases to be amazed at the continuous parade of previously undescribed species being found in northern Mindanao, specifically in Bukidnon province. Bukidnon, landlocked by mountain ranges and forest reserves, is a haven for botanists and plant enthusiasts. It harbors a diverse flora and fauna amongst its numerous mountains and forest reserves that provide a habitat for wildlife and support diverse vegetation types which are rich in plant genetic resources, including orchids.

The genus *Calanthe* was erected by Robert Brown in the *Botanical Register* in 1821 with *Calanthe triplicata* (Willem.) Ames being designated as the type species. The generic name is derived from Greek words “kalos” and “anthe” which means “beautiful flowers”, an allusion to the attractive flowers of many of the *Calanthe* species. They are characterized by having pseudobulbs that are sometimes indistinct because of the leaf sheaths covering them. Inflorescences that appear from the base of the pseudobulbs and usually bear many flowers with eight pollinia (Cootes, 2011).

Calanthe species are distributed throughout South Africa, Madagascar, all of tropical Asia, Australia, the Pacific Islands, Tahiti and one member in Central America. There are approximately 207 species in the genus of which 16 have been recorded from the Philippines (Cootes, 2011; Clayton & Cribb, 2013; M.D. De Leon et al., 2017). However, it is believed that there are a number more species from this genus, awaiting discovery and description, especially in Mindanao, knowing that the island is relatively unexplored, botanically.

During a trek to the Mount Kitanglad Range, Bukidnon, Philippines to spend Holy Week (Easter) in the mountains last April 12–15, 2017, I came across a

terrestrial orchid species belonging to the genus *Calanthe*, with tiny reflexed and revolute flowers, which were tinged green. After a careful examination its morphological characters and a search of the relevant literature for the Philippines and neighboring countries, it turned out not to match any known species. I hereby take this opportunity to describe *Calanthe cootesii* as a species new to science.

TAXONOMIC TREATMENT

Calanthe cootesii M.A. Naive, *sp. nov.* Figs. 1 & 2

Type: PHILIPPINES, Northern Mindanao, Bukidnon, Kitanglad Mountain Range, Mt. Maagnaw, terrestrial in mossy forest with deeply shaded locations and humid environments along the trail, elevation 2645 m, 15 April 2017, M.A. Naive 016/2017 (HOLOTYPE: CMUH00010871 with spirit collection)

Diagnosis: *Calanthe cootesii* M.A. Naive is similar to *Calanthe brassii* Ormerod, however, it can be recognized by having a marked difference in the shape of the lip, and the midlobe which is short, bilobed and triangular. It also differs in having revolute and reflexed floral segments and by having a slightly reclinate pedicel and ovary. By having a revolute and reflexed sepals and petals, *C. cootesii* is allied to *Calanthe davaensis*, but differs significantly in smaller and greenish flowers, the shape of the floral segments, and the leaves. Also, *C. cootesii* is clearly distinguished from *C. davaensis* by having an indistinct spur (vs. distinct spur).

Growth habit upright, terrestrial, sympodial, 45–50 cm tall. **Roots** terete, pubescent, up to 2 mm in diameter. **Pseudobulbs** indistinct, short, 0.8–1 cm long by 0.6–0.7 cm wide, enclosed by the overlapping bases of the leaves. **Leaves** petiolate; 2–3, overall 17–19.3 cm long by 3.5–3.8 cm wide, margin entire, apex attenuate,

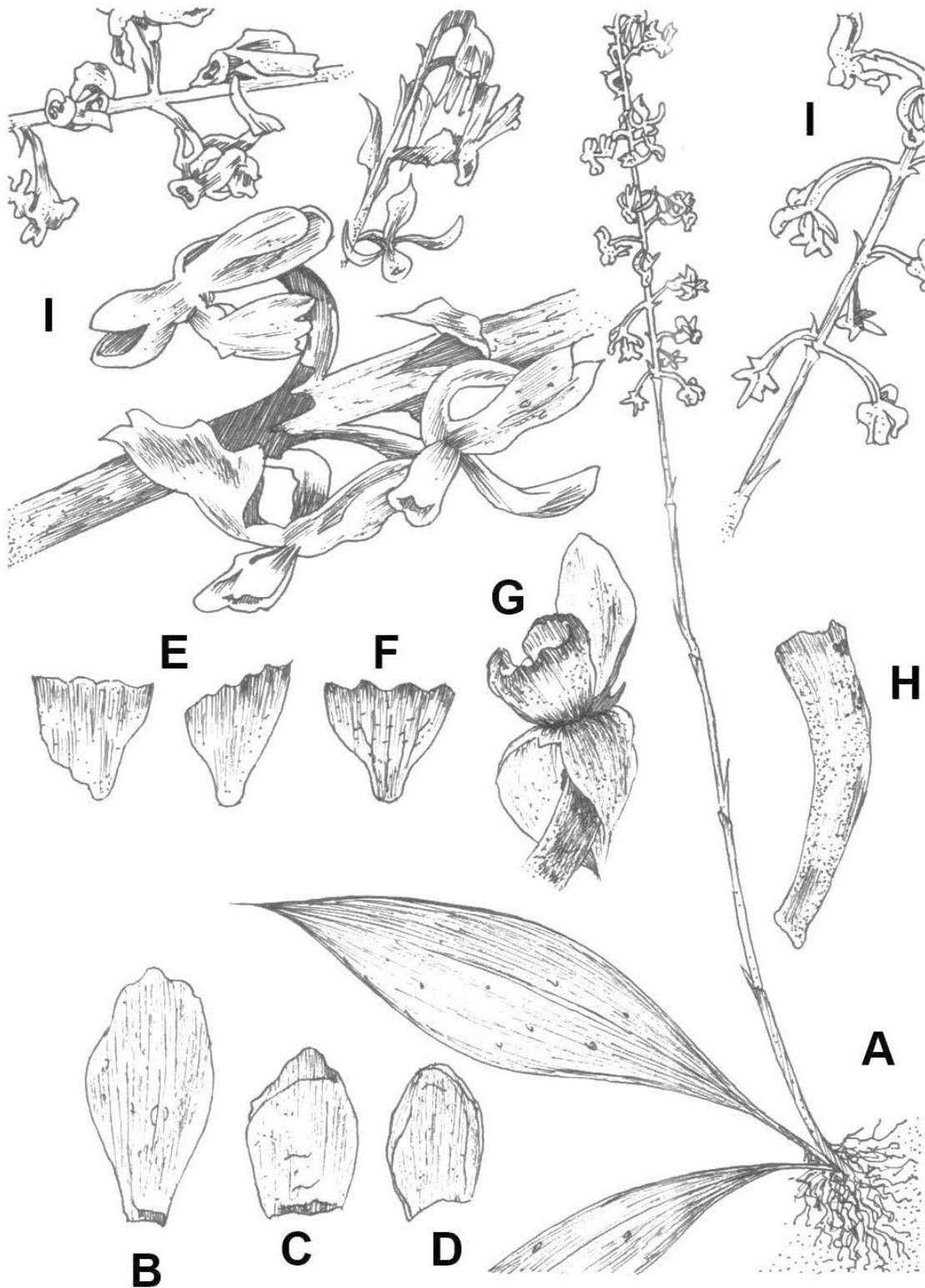


Fig. 1. *Calanthe cootesii* M.A. Naive. **A.** Habit **B.** Petal **C.** Dorsal sepal **D.** Lateral sepal **E.** Floral bracts **F.** Labellum **G.** Column **H.** Ovary with pedicel **I.** Inflorescences Drawn by: Arnel Sagunlay.

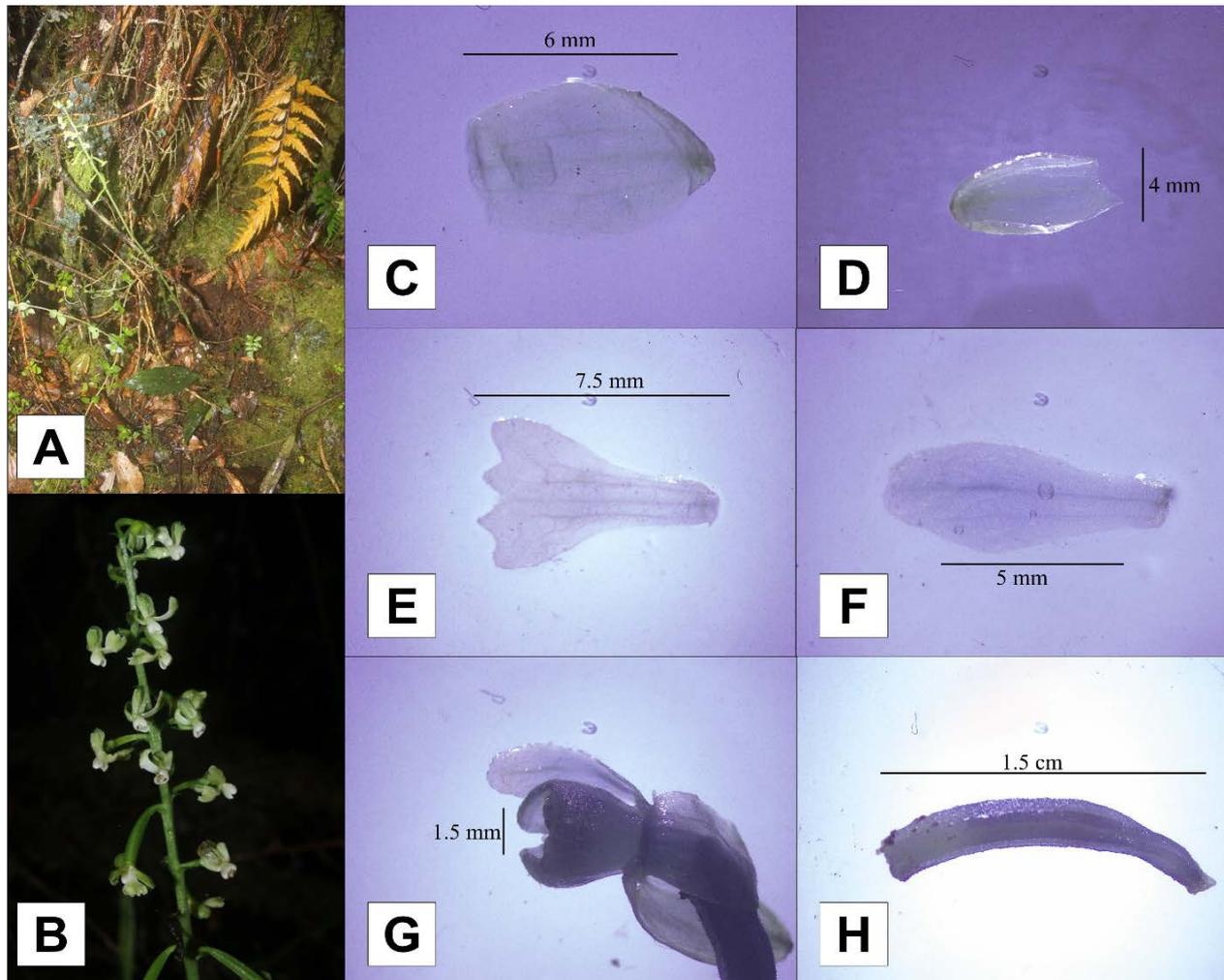


Fig. 2. *Calanthe cootesii* M.A. Naive. **A.** Habit **B.** Inflorescence (Taken from Holotype M.A. Naive 016/2017) **C-H.** Floral dissection under stereomicroscope **C.** Dorsal sepal **D.** Lateral petal **E.** Labellum **F.** Petal **G.** Column **H.** Ovary (with pedicel) Photo by: Mark Arcebal K. Naive.

green; **leaf blade** elliptic–lanceolate, 11–13.3 cm long by 3.5–3.8 cm wide; **petiole** fleshy, whitish green, 4–6 cm long by 0.3–0.4 cm in diameter. **Inflorescence** radical, lax, upright, covered with short white hairs throughout its length, longer than the leaves, 45–46 cm long; **peduncle** terete, pubescent, up to 35 cm long; **sterile bracts** lanceolate, striate, green, 1.8 cm long by 0.6 cm wide, attenuate; **rachis** terete, pubescent, up to 16 cm long, bearing 10–20 flowers; **floral bracts** lanceolate, greenish, with 1 distinct vein at the center, acute, 5–6 mm long by 2 mm wide. **Flower colour** tinged green, column white. **Dorsal sepal** broadly ovate, reflexed, revolute, slightly cucullate, with 3 distinct veins, apex acute, 5 to 6 mm long by 3–4 mm wide. **Petals** oblanceolate to narrowly obovate, reflexed, revolute, with 2 distinct veins, apex rounded, 4–5 mm long by 1.3–1.5 mm wide. **Lateral sepals** ovate, reflexed, revolute, cucullate, outer surface densely puberulent, with 3 distinct veins, apex rounded, 5.5–5.7

mm long by 3.5–4 mm wide. **Labellum** trilobed, reflexed, revolute, cuneiform, with 3 distinct veins, 7–7.5 mm long by 4.5–4.8 mm wide; **sidelobes** oblong to elliptic, 1–1.5 long by 0.5–0.7 mm wide; **midlobe** short, apex acute, bilobed, lobules 0.5 mm long by 0.7 mm wide, triangular. **Spur** very short, indistinct, subglobose, 0.2–0.3 mm long by 0.5 mm across. **Column** short, erect, 4 mm long by 1.5 mm wide laterally. **Ovary** (including pedicel) grooved, green, slightly reclinate, puberulent, 1.2–1.4 cm long.

Fruit not seen.

Distribution: *Calanthe cootesii* is a local endemic species, only collected at the type locality in Mount Maagnaw, Kitanglad Mountain Range, Bukidnon, Northern Mindanao, Philippines.

Ecology: *Calanthe cootesii* is a terrestrial understory herb, growing in leaf litter, humus-rich soils in mossy forest at an elevation between 2600–2700 metres above sea level.

**Table 1.** Comparison between the floral morphology of *Calanthe cootesii* sp. nov. and allied species.

Character	<i>C. cootesii</i>	<i>C. brassii</i>	<i>C. davaensis</i>
Flower Colour	Tinged green, lip greenish white	Green, lip greenish white.	Milky white
Dorsal sepal	Ovate, reflexed, revolute, 3 veined, apex acute, 5–6 × 3–4 mm	Ovate-elliptic, obtuse, 3 veined, 6.0 × 3.7 mm	Elliptic, to 9 × 6 mm, reflexing backward
Lateral sepals	Oblanceolate to narrowly obovate, reflexed, revolute, cucullate, 3 veined, apex rounded, 5.5–5.7 × 3.5–4 mm	Elliptic, subacute, cymbiform, 3 veined, 6.0 × 2.9–3.0 mm	Elliptic, 9 × 6 mm, reflexing backwards
Petals	Spatulate, reflexed, revolute, slightly cucullate, 2 veined, apex rounded, minutely papillose, 4–5 × 1.3–1.5 mm	Obliquely oblanceolate, obtuse or bidentate apically, 1–2 veined, 5.5–6.2 × 2.0–2.2 mm	Oblanceolate, to 8 × 3.5 mm, reflexing backwards
Side-lobes of lip	Cuneate, oblong to elliptic, apex rounded, 1.5 × 0.7 mm	Cuneate, apex rounded, 4.2 × 3.8 mm	Circular, 5.5 mm in diameter
Mid-lobe of lip	Bilobed, triangular, 0.5 × 0.3 mm	Transversely rectangular, 1.1 × 2.0 mm	Divided into two portions which are triangular, 5 × 4.5 mm
Spur	Indistinct, subglobose, 0.2 mm to 0.3 × 0.5 mm	Obtuse, subglobose, 0.9 mm long	Short and straight
Column	Short, erect, 4 × 1.5 mm wide	Short, broad, 2.5–3.0 mm long	Pointing downwards, white

Phenology: Flowering and fruiting in April–May.

Etymology: Named in honour of my mentor, Jim Cootes, a distinguished Philippine native orchid expert and taxonomist.

Conservation Status: There are no adequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status. Following the Red List criteria of the IUCN (2012), I consider *Calanthe cootesii* as Data Deficient (DD).

Notes: *Calanthe cootesii* is very distinctive with its green flowers, reflexed and revolute floral segments and slightly reclinate ovary and pedicel. It seems closest to *C. brassii* Ormerod, which occurs in the Indonesian province of Papua, on the island of New Guinea. *C. cootesii* has similar flower colour and belongs to the same section, however, it differs in the shape of the lip, and the shape of the midlobe which is deeply bilobulate; by having reflexed and revolute floral segments; and the slightly reclinate ovary and pedicel. By having revolute and reflexed sepals and petals, *C. cootesii* is allied to *C. davaensis*, but differs significantly in much smaller and greenish flowers, shape of the floral segments and the leaves. Also, *C. davaensis* has a larger growth habit, large white flowers and a distinct spur in comparison to the small growth habit, small greenish flowers and the indistinct spur of *C. cootesii*.

By having this indistinct spur, and small & greenish flowers, this taxon belongs to the *Calanthe flava* complex, the first species recorded from the Philippines under this section. The *Calanthe flava* (Blume) Morren complex contains about 40 taxa distributed from Nepal to Tahiti with the centre of diversity in New Guinea (ca. 25 species). It is a loosely defined group of species

often with small (sepals 6–8 mm long, but up to 18 mm long) flowers that have greenish (but also white to yellow) sepals and petals.

As the new species is currently known only from a single collection, and the orchid flora of Kitanglad Mountain Range, Bukidnon is generally poorly known, an assessment of its conservation status can obviously not be made. The new species was only seen in this one locality where it was not abundant.

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