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# ***CYMBIDIUM SIGMOIDEUM* (ORCHIDACEAE), A NEW ADDITION TO THE FLORA OF THE PHILIPPINES**

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**ABSTRACT.** *Cymbidium sigmoideum* (Orchidaceae: Epidendroideae) is reported here as a new record for the Philippines based on the collection from Antique Province on the island of Panay. A detailed description and photographs are provided for easy identification of the species. With this discovery, the Philippines now holds a total of 13 species and three subspecies of *Cymbidium*.

**KEY WORDS / PALABRAS CLAVE:** Antique, biodiversity, Cymbidieae, Malesian flora, Panay Island, new record, taxonomy

**Introduction.** Described by Olof Swartz in 1799, *Cymbidium* belongs to the tribe Cymbidieae and is one of the most attractive and desirable orchid genera in the world because of its showy and fragrant flowers (Mandal *et al.* 2018). According to the current taxonomy (Du Puy & Cribb 2007, Govaerts *et al.* 2020), it includes 74 species, four subspecies, 10 varieties and 15 natural hybrids widely distributed in South and East Asia, north to Japan and south through the Malay Archipelago and New Guinea to northern and eastern Australia. In the Philippines, the genus is represented by 12 species and three subspecies (Cootes 2011, Pelser *et al.* 2011).

An unidentified flowering *Cymbidium* specimen was collected during the second and third author's botanical exploration in one of the tropical mountains of Antique Province of Panay island in the Philippines last May 2019. After examination of its morphology and comparison with protologues and the relevant literature as well as digitized type specimens of the genus *Cymbidium* from the Philippines and neighbouring countries, a match was made with *Cymbidium sigmoideum* J.J.Sm.

*Cymbidium sigmoideum* was first discovered in central Sumatra in 1905 by Wilhelm Micholitz who sent his specimens to the nursery of Sander, who sent one to

Kew for identification. However, Rolfe (the first curator of orchid herbarium at the Royal Botanic Gardens, Kew) failed to recognize it as a new species (Du Puy & Cribb 2007). J.J. Smith (1907) later described it based on a collection of Connell from Java. The species was previously known to occur only in Java, Sumatra and Borneo (Du Puy & Cribb 2007). Thus, this paper reports its first record in the Philippines. The species is presented here with a description and photographs to aid accurate identification.

**Materials and methods.** The measurement and description of the species were based on examinations of photographic images of plants *in situ*, living specimens, and voucher herbarium specimens held at the University of Santo Tomas Herbarium (USTH). The description follows the recent work of Zhang *et al.* (2018) with general plant descriptive terminologies following Beentje (2016). Flowers have been preserved in 70% ethyl alcohol for microscopic study. Available type specimens of *Cymbidium* spp. from the Philippines and neighbouring countries were examined in different herbaria (*viz.* B, BM, E, GH, K, KATH, L, LINN, M, P, SBT, SING) through high resolution images accessed at <https://plants.jstor.org/>.

## TAXONOMIC TREATMENT

*Cymbidium sigmoideum* J.J.Sm., Bull. Dép. Agric. Indes Néerl. 13: 52, 1907.  $\equiv$  *Cyperorchis sigmoidea* (J.J.Sm.) J.J.Sm., Bull. Jard. Bot. Buitenzorg, sér. 3, 9: 57, 1927. TYPE: Java Loemadjang, *Connell s.n.* (holotype BO!). Fig. 1.

*Cymbidium kinabaluense* K.M.Wong & C.L.Chan, Sandakan, 2: 86. 1993. TYPE: Sabah, Mt. Kinabalu, *C.L. Chan & Jamili Nais s.n.* (holotype SAN; isotype: SRN).

Perennial, epiphytic *herb*. *Pseudobulbs* inconspicuous, 4.2–4.8 cm long by 2.0–2.3 cm in diameter, with 5–7 leaves. *Leaves* 38.0–43.5 cm long by 0.8–1.2 cm wide, linear-obovate, glabrous both sides, margin entire, apex acute. *Inflorescence* up to 47 cm long, arising from the base of the pseudobulb; *peduncle* horizontal to pendulous, green, covered by overlapping sheaths; *sheaths* 5–6, boat-shaped, 8.5–9.0 cm long, cucullate, yellowish brown to brown, apex acute to subacuminate; *rachis* 10–20 cm long, bearing 4–6 flowers, green, glabrous; *floral bracts* 2–3 mm long, ovate, hyaline green, glabrous, apex acute. *Flower* 3.0–3.5 cm across, waxy; *Pedicel and ovary* 2.0–2.5 cm long, green, terete, glabrous. *Dorsal sepal* 2.5–2.8 cm long by 0.8–1.0 cm wide, narrowly obovate, glabrous, concave, closely covering the column, green with dark or purple-brown spots and stain, margin entire, apex acute, porrect. *Lateral sepals* 2.5–2.8 cm long by 0.8–1.0 cm wide, falcate, glabrous, spreading or reflexed, green with dark or purple-brown spots and stain, margin entire, apex acute. *Petals* 2.1–2.4 cm long by 0.5 cm wide, falcate, glabrous, spreading in the apical half, green with dark or purple-brown spots and stain, margin entire, apex acute. *Lip* 3-lobed, green with dark or purple-brown spots and stain, fused with base of the column for 5 mm, with a glabrous disc (callus) with two slightly raised ridges and a swollen rounded apex; *sidelobes* 5–6 mm broad, broadly triangular, fleshy, erect and clasping the column, minutely papillose, apex subacute; *mid-lobe* small, 7–9 mm long by 2.0–2.3 mm wide, ligulate, glabrous, strongly recurved or coiled, apex acute. *Column* broad, about 2 cm long,

S-shaped, glabrous, yellowish green with purplish red spots, basal quarter fused to the base of the labellum; *anther cap and viscidium* elongated into a projecting rostellum; *pollinia* about 2 mm long, quadrangular-pyriform, cleft. *Fruit* not seen.

DISTRIBUTION: Java, Sumatra, Borneo (Sabah) and the Philippines (Antique). This species warrants further observation and collection to determine whether there are other known populations present in other areas within the Philippine archipelago.

HABITAT: Found growing on trunks and large branches of trees which are covered by moss cushions in deeply shaded mossy forest at elevations between 1500 to 1600 m above sea level.

PHENOLOGY: Observed flowering in the wild in May (this study). According to Du Puy & Cribb (2007), this species flowers all throughout the year.

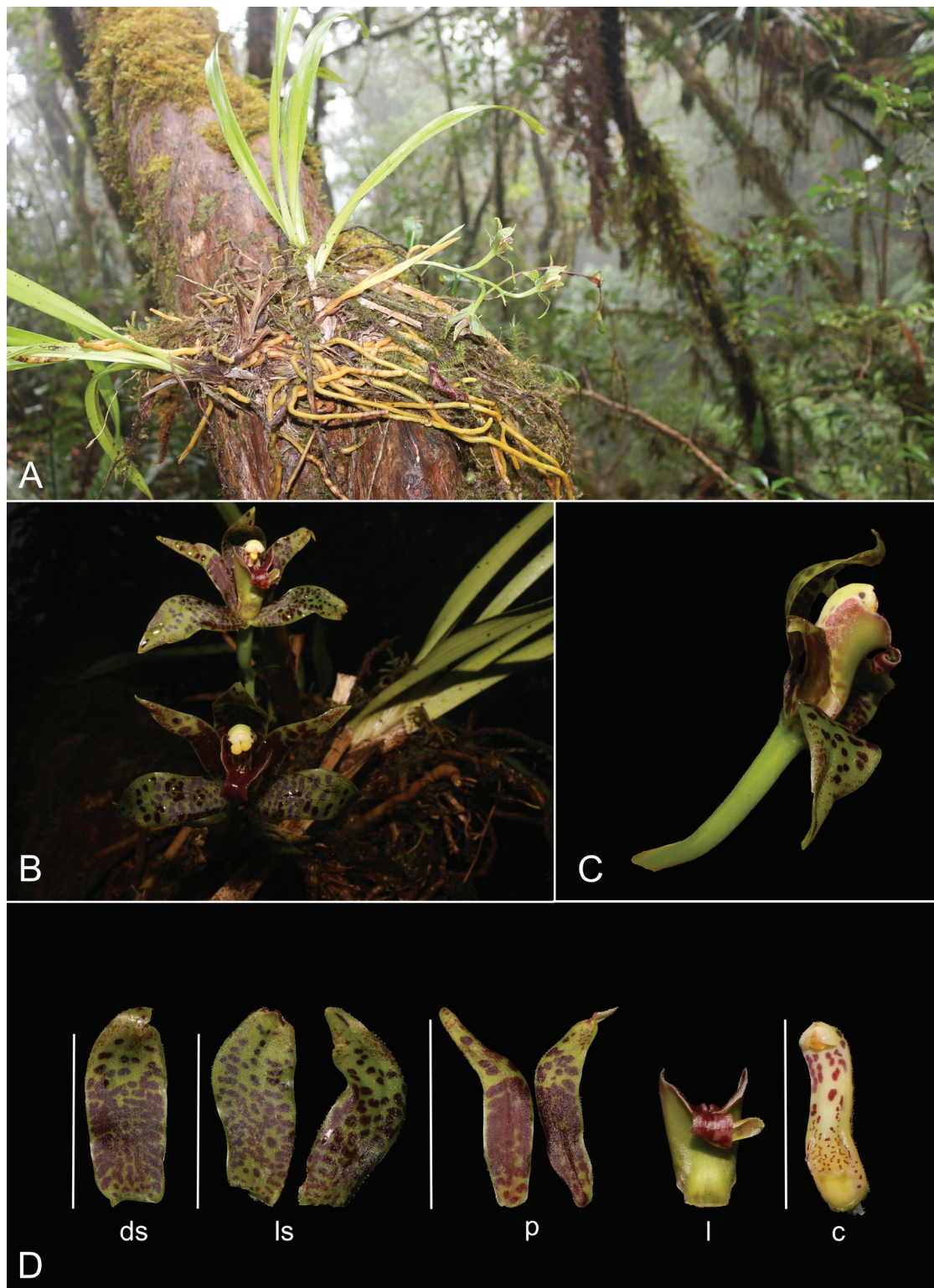
CONSERVATION STATUS: VU A1cd; Blab (Du Puy & Cribb 2007).

SPECIMEN EXAMINED: PHILIPPINES, Visayas, Antique, elev. 1520 m, 10 May 2019, JAGP *Dalisay & PS Bangcaya 102* (USTH). – Full locality data are withheld to prevent potential exploitation of wild populations for commercial purposes.

*Cymbidium sigmoideum* is a species belonging to the section *Cyperorchis* (Blume) P.F.Hunt, characterized by the fusion at the base of the lip and column, two cleft pollinia, narrow petals, porrect dorsal sepal covering the column and quadrangular-pyriform pollinia. According to Du Puy & Cribb (2007), it closely resembles *C. roseum* J.J.Sm. from Java and *C. whiteae* King & Pantl. from Sikkim. However, *C. sigmoideum* differs in having shiny brown spotted, green flowers, narrow falcate petals, narrow, ligulate, recurved midlobe and S-shaped column.

A number of characters shows greater variation based on our recent material than the original given by J.J. Smith. For example, the leaves are smaller (38–43.5 cm long vs. up to 102 cm long), colour of the pedicel and ovary (green vs. purple) and dimensions

Right, FIGURE 1. *Cymbidium sigmoideum* J.J.Sm. **A.** Habit. **B.** Flowers (front view). **C.** Flower (profile view). **D.** Dissected flower (ds: dorsal sepal, scale bar: 2 cm; ls: lateral sepals, scale bar: 2 cm; p: petals, scale bar: 2 cm; l: labellum; c: column, scale bar: 2 cm). Photos by: JAGP Dalisay.



of other parts which can be explained by the stage of development of the inflorescence, growth conditions and processing techniques. Despite these differences, we are in no doubt that our recent collection is *C. sigmoideum*.

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