

FIRST WILD RECORD OF *DENDROCHILUM WARRENII* (ORCHIDACEAE: EPIDENDROIDEAE) CONFIRMS A PHILIPPINE PROVENANCE

MARK ARCEBAL K. NAIVE^{1,5} & BARBARA GRAVENDEEL^{2,3,4}

¹Department of Biological Sciences, College of Science and Mathematics, Mindanao State University-Iligan Institute of Technology, Andres Bonifacio Ave, Iligan City, 9200 Lanao del Norte, Philippines

²Naturalis Biodiversity Center, Endless Forms, 2300 RA Leiden, The Netherlands

³University of Applied Sciences Leiden, 2333 CK Leiden, The Netherlands

⁴Institute Biology Leiden, Leiden University, 2300 RA Leiden, The Netherlands

⁵Corresponding author: arciinaive19@gmail.com

ABSTRACT. Recent explorations on one of the mountains of the Bukidnon province on the island of Mindanao in the Philippines resulted in a wild collection of *Dendrochilum warrenii*, an Orchidaceae species described in 2004 from a cultivated plant of unknown provenance. In this publication, an extended species description along with color photographs are provided to aid future identification. Information on the distribution, ecology and phenology of the species in the wild is also provided.

KEY WORDS: Coelogyninae, Mindanao, sect. *Platyclinis*, taxonomy, tropical botany

Introduction. Described by Blume in 1825, the genus *Dendrochilum* belonging to the subfamily Epidendroideae, is a largely Malesian orchid genus encompassing over 280 species (Sulistyo *et al.* 2015, Ormerod 2017). With approximately 120 known species, the Philippines are considered as a center of diversity for this genus (Cootes 2011, Pelsner *et al.* 2011). Given that most *Dendrochilum* species are restricted to cool, humid, and often exposed conditions in montane forests with an unusually high share of narrow endemism (Pedersen 2007a), it is believed that there are still a number species awaiting discovery and description, especially in Mindanao, as this island is composed of a number of high mountains which are relatively unexplored botanically (*e.g.* Cootes 2017, Naive *et al.* 2017).

Fresh materials of an interesting but unknown *Dendrochilum* plant identified as a member of the section *Platyclinis* because of the synanthous inflorescences, entire rostellum, presence of stelia and an apical wing on the column, was collected during the first author's excursion in the province of Bukidnon on the island of Mindanao in the Philippines in June 2017. After meticulous examination of its morphology and comparison with protologues and

digitized type specimens of *Dendrochilum* sect. *Platyclinis* species from the Philippines (JSTOR 2018) and neighbouring countries, we found the material matches with *Dendrochilum warrenii* H.A. Pedersen & Gravend. (2004: 358). This species was first exhibited at the European Orchid Conference in London by Blair Sibun (Pedersen *et al.* 2004). It was then described by Pedersen and Gravendeel in 2004 based on a specimen in cultivation provided by Richard C. Warren (after whom the species was named), with unknown provenance. Based on molecular phylogenetic analyses, these authors hypothesized that the species could be originating from the Philippines and/or Sulawesi (Pedersen *et al.* 2004, Sulistyo *et al.* 2015). The present publication reports the first collection of *D. warrenii* from the wild, confirming a Philippine origin. An extended species description based on this new collection in the field incorporating all current knowledge is provided together with color photographs to aid future identifications.

Materials and methods. Fresh plant material was collected during a botanical excursion in June 2017 in the Bukidnon province of the island of Mindanao in the Philippines. A spirit collection was deposited in the

University of Santo Tomas Herbarium (USTH). Our descriptions of vegetative and reproductive characters are based on living plants and the spirit collection. The species description follows the style of Pedersen (2011) using general plant terminology of Beentje (2016). Below, we provide a detailed description and colored photographs as well as notes on the distribution, phenology, and ecology in the wild.

TAXONOMIC TREATMENT

Dendrochilum warrenii H.A.Pedersen & Gravend., *Blumea* 49: 358–359. 2004.

TYPE: *Warren EQ 3066* (holotypus C), sine loco et coll./cult. Richard C. Warren anno 2003. Fig. 1.

Small, tufted, epiphytic *herb*. *Roots* arising from the rhizome, 1.0–1.5 mm in diameter, unbranched. *Pseudobulbs* clustered on a very short rhizome, fusiform, 1.0–2.1 cm long by 0.4–0.5 cm in diameter, unifoliate, covered with 1–4 tubular, attenuate to acuminate, papery cataphylls which soon disintegrate into persistent fibres. *Leaf* petiolate; *petiole* up to 1 cm long, distinctly canaliculate; *lamina* dorsiventrally complanate, coriaceous, narrowly linear, 10.0–10.2 cm long by 0.1–0.2 cm wide, with prominent midrib, margin entire, apex subacute. *Inflorescence* synanthous, racemose; *peduncle* straight to arching, up to 10.5 cm long, terete, very slender; *rachis* nodding to pendent with distichously alternating flowers, dense, up to 12-flowered with internodes of *ca.* 2 mm, slightly furrowed, 3.0–3.5 cm long, basally with 3–4 non-floriferous bracts. *Flowers* white to greenish white; *floral bracts* persistent, glumaceous, lanceolate to narrowly lanceolate, 5–6 mm long by 2.0–2.1 mm wide, papery, striate, many veined, margin entire, apex acuminate. *Dorsal sepal* 3-veined, linear, 6.0–6.1 mm long by 1 mm wide, incurved, margin entire, apex acute to attenuate. *Lateral sepals* 3-veined, linear, 6.5–6.6 mm long by 2.7–3.0 mm wide, glabrous on both sides, margin entire, apex acuminate. *Petals* 3-veined, narrowly lanceolate, 4.4–4.5 mm long by 0.8–0.9 mm wide, glabrous on both sides, finely erose, apex subacute. *Labellum* 3-veined, sessile, lanceolate, 2.0–2.2 mm long by 1.0–1.1 mm wide, glabrous on both sides, margin finely erose, apex acute. *Column* short, subclavate, slightly incurved, 1.0–1.1 mm long, glabrous, distally prolonged into a bidentate wing

exceeding the anther; *steldia* inconspicuous, two, erect, margin entire, apex obtuse. *Pollinia* four, subpyriform. *Rostellum* flat, triangular. *Ovary* (including pedicel) semiterete, *ca.* 2.2 mm long, glabrous. *Capsule* not seen.

DISTRIBUTION: The Philippines, Mindanao, province of Bukidnon.

ECOLOGY: The species grows as an epiphyte at elevations approximately between 1,000 to 1,200 m asl among mosses on the trunks and branches of trees under shaded to slightly lit conditions in montane broad leaf forest.

PHENOLOGY: Observed flowering in the wild in the months of June and July.

CONSERVATION STATUS: Following IUCN (2017), we propose this species to be treated as ‘Data Deficient’ (DD). Further field surveys are needed, as there is insufficient information to assess the status of this species with only limited distributional data and no information on population size, trends or threats to the species in the wild.

SPECIMEN EXAMINED: PHILIPPINES. Mindanao: Bukidnon, elevation 1,200 m asl, 25 June 2017, *M.A.K. Naive 101* (USTH, spirit material) – Full locality data are withheld to prevent potential exploitation of wild populations for commercial purposes; *Warren EQ 3066* (holotypus C), sine loco et coll./cult. Richard C. Warren anno 2003.

Following the publication of protologues based on cultivated material since 2000, *D. warrenii* is the sixth species of *Dendrochilum* located in the wild. Earlier on, wild plants of *D. coccineum* H.A.Pedersen & Gravend. (Pedersen *et al.* 2004), *D. croceum* H.A.Pedersen (Pedersen 2005), *D. quinquecallosum* H.A.Pedersen (Pedersen 2007b), *D. undulatum* H.A.Pedersen (Pedersen 2007b) and *D. hampeii* Sulistyo, Gravend., R.Boos & Cootes (Sulistyo *et al.* 2015) were discovered in the field after having been traded for several years under commercial names such as ‘Sherborne Star’ (*D. warrenii*) and ‘Big Pink’ (*D. hampeii*) before their formal taxonomic descriptions were published. Following recommendations by Pedersen (2011) and Sulistyo *et al.* (2015), we rechecked The International Orchid Register (accessed on 16 September 2018) to verify whether any new artificial hybrids had been



FIGURE 1. *In situ* photograph of *Dendrochilum warrenii* H.A. Pedersen & Gravend. showing its habit and flowers (inset). Photos made by M.A.K. Naive in the field in the Philippines.

described but the latest addition for *Dendrochilum* was from 2000. Finding this species in the wild in a remote and pristine montane rainforest, together with the congruent molecular phylogenetic positions provided by biparentally inherited nuclear genes and maternally inherited plastid genes and distinct single peaks in all chromatograms (Pedersen *et al.* 2004, Sulistyó *et al.* 2015, Pedersen *et al.* in prep.) convinces us that *D. warrenii* is not of human assisted hybrid origin.

ACKNOWLEDGEMENTS. We wish to thank the students of Bukidnon National High School in Malaybalay in the Philippines together with their adviser Mrs. Irene Escrupulo for accompanying the first author during his botanical excursions.

LITERATURE CITED

- Beentje, H. (2016). *The Kew Plant Glossary, an illustrated dictionary of plant terms (Second edition)*. Royal Botanic Gardens, Kew: Kew Publishing.
- Cootes, J. (2011). *Philippine native orchid species*. Quezon City: Katha Publishing Co.
- Cootes, J. (2017). *Dendrochilum marknaivei* spec. nov. Cootes (Orchidaceae), a new species from Southern Philippines. *Die Orchidee*, 3(18), 121–126.
- JSTOR. (2018). Global Plants. Retrieved from <http://plants.jstor.org/> [Accessed 2 September 2018].
- IUCN Standards and Petitions Subcommittee. (2017). Guidelines for Using the IUCN Red List Categories and Criteria. Version 13. Retrieved from <http://www.iucnredlist.org/documents/RedListGuidelines.pdf> [Accessed 2 September 2018].
- Naive, M. A., Boos, R., De Leon, M. D. & Cootes, J. (2017). Two new *Dendrochilum* (Orchidaceae) species from Mindanao, Philippines. *OrchideenJournal*, 24, 56–60.
- Ormerod, P. (2017). *Checklist of Papuanian Orchids*. Lismore, Australia: Nature & Travel Books.
- Pedersen, H. Æ. (2005). A new miniature *Dendrochilum*. *Orchid Review*, 113, 286–287.
- Pedersen, H. Æ. (2007a). Hotspots of narrow endemism: adequate focal points for conservation in *Dendrochilum* (Orchidaceae). *Lankesteriana*, 7, 83–92. doi: 10.15517/LANK.V7I1-2.18444
- Pedersen, H. Æ. (2007b). Changes to *Dendrochilum*. *Orchid Review*, 115, 220–226.
- Pedersen, H. Æ. (2011). Three new species of *Dendrochilum*, with notes on the practice of formally describing cultivated species of unknown provenance. *Malesian*

- Orchid Journal*, 7, 117–124.
- Pedersen, H. Æ., Gravendeel, B. & Mudiana, D. (2004). Three new species of *Dendrochilum* (Orchidaceae) and their phylogenetic positions according to plastid and nuclear ribosomal ITS sequences. *Blumea*, 49, 351–360. doi: 10.3767/000651904X484315
- Pelser, P. B., Barcelona, J. F. & Nickrent, D. L. (Eds.). (2011 onwards). Co's Digital Flora of the Philippines. Retrieved from www.philippineplants.org. [Accessed 2 September 2018].
- Sulistyo, B. P., Boos, R., Cootes, J. E. & Gravendeel, B. (2015). *Dendrochilum hampelii* (Coelogyninae, Epidendroideae, Orchidaceae) traded as 'Big Pink' is a new species, not a hybrid: evidence from nrITS, matK and ycf1 sequence data. *PhytoKeys*, 56, 83–97. doi:10.3897/phytokeys.56.5432