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Dendrobium eruciforme (Orchidaceae), a new species of section *Microphytanthe* from West Papua Province, Indonesia

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Summary. *Dendrobium eruciforme* Schuit., Saputra & Wanma (Orchidaceae), the fourth known species of sect. *Microphytanthe* Schltr., is described and illustrated. A detailed description, morphological comparisons, habitat information, a preliminary conservation assessment and some notes are provided. A key to the four species of sect. *Microphytanthe* is presented. Vegetatively, *D. eruciforme* is one of the smallest *Dendrobium* species, in this respect only equalled or even surpassed by the Australian *D. toressae* (F.M.Bailey) Dockrill.

Key Words. Arfak Mountains, *Dendrobium nummularia*, key, New Guinea, Papua Barat, Red Listing.

Introduction

Dendrobium Sw. is the second largest orchid genus in New Guinea, with c. 629 species belonging to 21 sections (Schuiteman 2013). Although 86% of the species are endemic, at the section level only the small sect. *Microphytanthe* Schltr. is endemic. This section is characterised by creeping rhizomes; 1-leaved pseudobulbs consisting of a single internode; single-flowered inflorescences; long-lasting flowers; a simple lip, sometimes bilobulate at the apex, not adorned with longitudinal crests, and a glabrous column. As the name indicates, the known species are diminutive plants, less than 2 cm tall, but with elongate rhizomes.

Schlechter (1912) initially included two species in sect. *Microphytanthe*, *Dendrobium bulbophylloides* Schltr. and *D. nummularia* Schltr. He later described a third species, *D. prorepens* Schltr. In his revision of sect. *Microphytanthe*, Reeve (1983) reduced *D. prorepens* to the synonymy of *D. nummularia*, and described a new species, *D. margaretae* T.M.Reeve. Schuiteman (1993) later added *D. mayrii* J.J.Sm., first described in sect. *Cadetia*, to the synonymy of *D. bulbophylloides*, while Ormerod (2017) moved *D. prorepens* from the synonymy of *D. nummularia* to that of *D. bulbophylloides*, with which we concur. The type material of all three of Schlechter's species is lost. Whereas *D. bulbophylloides* is widespread throughout New Guinea, *D. margaretae* is only known from the Highlands of PNG, and *D. nummularia*, recorded by Schlechter from present-day Sandaun and Morobe Provinces in PNG, has so far not been found again.

During recent fieldwork by the authors (except CDH) in the western part of the Arfak Mountains in the Testega district of the Indonesian province of West Papua (Papua Barat), a minuscule species of *Dendrobium* was found that evidently belonged to sect. *Microphytanthe*. Because of the congested pseudobulbs and the tiny leaves appressed to the substrate, it could only be compared to the 'lost' *D. nummularia*. Although no material of that species was available, comparison with Schlechter's published illustration (Schlechter 1923 – 1928: t. 154, fig. 577) and description (Schlechter 1912: 458) revealed significant differences, therefore we describe our find here as a new species, the fourth in the section.

Materials and Methods

Living specimens were collected in the field and photographed and dissected. The description was prepared from these specimens and from the resulting photographs. Herbarium acronyms follow Thiers (2024, continuously updated). Specimens seen are annotated "!".

Taxonomic Treatment

Dendrobium eruciforme *Schuit., Saputra & Wanma*, **sp. nov.** (sect. *Microphytanthe*). Type: Indonesia, West Papua Province, Testega Distr., locality withheld for conservation purposes, elevation 1400 m, 13 Nov.

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http://www.ipni.org//urn:lsid:ipni.org:names77360585-1.

Creeping epiphytic *herb* closely appressed to the phorophyte, forming loose mats. *Roots* relatively thick, c. 0.9 mm diam., white, glabrous. *Rhizome* sparsely branching, the unbranched parts 40 – 70 mm long. *Pseudobulbs* enveloping the rhizome, with the new growth arising from the apex of the pseudobulb, strongly dorsoventrally compressed, appressed to the substrate, rectangular-oblong, green, 3.3 – 4.6 × 2 – 2.8 mm, covered by cataphylls that dissolve into persistent fibres. *Leaves* held parallel to the substrate, pointing obliquely sideways relative to the rhizome, those on subsequent pseudobulbs pointing in alternate directions, dark green with paler warts, sessile, somewhat obliquely ovate, 3 – 5.6 × 2 – 3.3 mm, apex unequally bilobulate with obtuse lobules, adaxial surface irregularly verruculose, abaxial surface smooth, the leaf margins slightly thickened abaxially. *Inflorescence* solitary, subsessile, arising near the apex of the pseudobulb on the adaxial side of the leaf, 1-flowered; peduncle c. 0.5 mm long, at the base with c. 3 scarious scales c. 2 mm long; *floral bract* minute, c. 0.3 mm long; *pedicel-with-ovary* obconical, round in cross-section, c. 2.5 mm long, densely papillose. *Flowers* opening widely, 6.5 – 7.2 mm diam. *Sepals* pale to deep reddish-purple with dull yellow margins, free, abaxially sparsely papillose-verruculose. *Dorsal sepal* ovate-ligulate, c. 3 × 2 mm, 3-veined, base truncate, apex obtuse. *Lateral sepals* obliquely triangular-subfalcate, c. 4.5 mm long, 4.7 mm wide at the truncate base, 6-veined, apex rounded, abaxially indistinctly keeled along the mid-vein. *Petals* pale to deep reddish-purple with dull yellow margins, oblong, tapering at apex, c. 2.7 × 1.1 mm, 3-veined, base truncate, basal margins minutely papillose, apex obtuse. *Lip* creamy yellow, pale reddish-purple in basal part below the cross-ridge, at the base with a deep maroon-purple blotch; obovate, c. 5.9 × 2.9 mm, 5-veined, base truncate, apex broadly rounded, sometimes slightly longitudinally conduplicate at apex, on the abaxial side just below the apex with a minute apicule, at c. 2.2 mm above the base geniculate-bent and there with a low and smooth cross-ridge; adaxial surface and margins minutely velutinous apart from the cross-ridge and a bare patch in the centre below it. *Column* creamy yellow, finely speckled with reddish-purple; column-foot reddish-purple with two deep maroon-purple blotches and with a small creamy-yellow blotch at the apex, very short, c. 1 mm long excluding the foot; stelidia short, triangular with slightly erose margins; foot linear, straight, 3.8 mm long. *Anther* light yellow, transversely reniform-elliptic, c. 0.4 mm wide. *Pollinia* light yellow, 4 in 2 pyriform pairs, those within a pair subequal, c. 0.4 mm long. Figs 1 & 2.

RECOGNITION. Within sect. *Microphytanthe*, this species resembles *Dendrobium nummularia,* because of the congested pseudobulbs, the tiny leaves and the habit of growing appressed to the substrate. *Dendrobium eruciforme* differs in the verruculose leaves, 3 – 5.6 mm long, with unequally bilobulate apices (vs leaves when dry with prominent reticulate veins [fide Schlechter], 4 – 8 mm long, apex apiculate in *D. nummularia*); papillose ovary (vs glabrous ovary); lip with cross-ridge below the middle, apex rounded (vs lip without cross-ridge, apex bilobulate); lip surface velutinous (vs lip glabrous with ciliate lobules).

DISTRIBUTION. Indonesia, New Guinea (Bird's Head Peninsula: Arfak Mountains), endemic.

SPECIMENS EXAMINED. INDONESIA. Indonesia, West Papua Province, Testega Distr., locality withheld for conservation purposes, *Schuiteman et al.* 24–144 (holotype MAN!; isotypes BO!, K!).

HABITAT. Epiphyte in mossy, montane forest on vertical tree trunks at breast height and higher but also on branches in the canopy, 1400 m a.s.l. The plants are often overgrown with a kind of lichen, making the covered parts appear whitish.

CONSERVATION STATUS. This species has been observed to be traded online, and, as the locality where such plants were sourced is unknown, it is impossible to estimate the extent of occurrence (EOO). Although the known locality has been well surveyed by orchid specialists, the small size of this species and the fact that it also occurs in the forest canopy means that it could be easily overlooked, which makes it difficult to make a numerical estimate of its population. The area of occupancy (AOO) can be estimated to be 4 – 8 km^2, based on the recommended 2 × 2 km grid, and there are 1 – 2 locations. The known locality is threatened by local-scale logging and the conversion of the forest to pineapple and cassava plantations. It is also close to a road, which increases the likelihood of access by illegal collectors. The size of the AOO, number of locations and the inferred decline in area, extent and quality of habitat at the known locality places this species provisionally in the Endangered category under Criterion B (IUCN 2012), [EN B2ab(ii,iii)]. The observed trade is an additional threat of unknown scale to this species and monitoring of its trade should continue in future. There is a growing demand for miniature orchids like this in Indonesia, with collectors growing them in special cabinets inside their homes.

PHENOLOGY. Flowering observed in November. Fruiting period unknown.

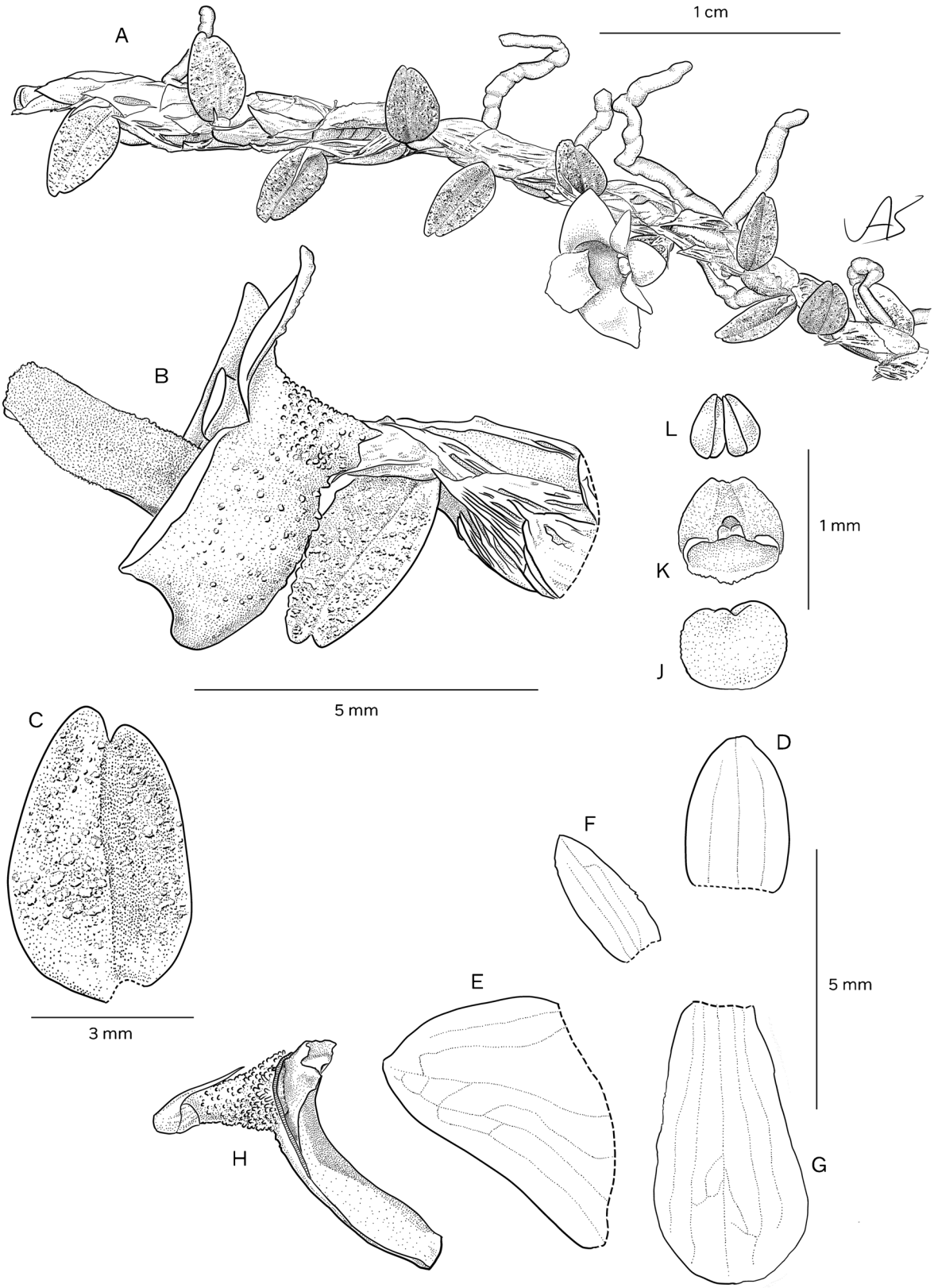

Fig. 1. *Dendrobium eruciforme*. **A** habit; **B** flowering shoot; **C** leaf; **D** dorsal sepal; **E** lateral sepal; **F** petal; **G** lip; **H** column and ovary (lateral view); **J** anther, dorsal view; **K** anther, ventral view; **L** pollinia. DRAWN BY ANDRÉ SCHUITEMAN.

Fig. 2. *Dendrobium eruciforme*. **A** flowering plant; **B** plant in situ; **C** habitat. PHOTOS: ANDRÉ SCHUITEMAN.

ETYMOLOGY. From the Latin *eruca*, a caterpillar, and *-formis*, shaped as, referring to the straight, creeping rhizomes that are closely appressed to the substrate.

NOTES. This is a species of the small sect. *Microphytanthe,* distinctive because of its minute, verruculose leaves, closely spaced, compressed pseudobulbs and velutinous lip with rounded apex. The only known similar species is *Dendrobium nummularia*, with which it is compared above.

The rectangular-oblong and flattened pseudobulbs are so closely spaced that, with the leaves alternating in direction, the plants at first sight seem to possess multifoliate stems. Only closer inspection reveals that the 'stems' consist of chains of 1-leaved pseudobulbs.

In terms of the size of individual growths, *Dendrobium eruciforme* is one of the smallest species in the genus. Only the Australian *D. toressae* (F.M.Bailey) Dockrill (sect. *Lichenastrum*) can be even smaller, as forms of this species may have equally small (but fleshier) leaves while lacking pseudobulbs. The flowers of *D. eruciforme* and *D. toressae* are superficially similar but smaller in the latter. Outside Australia, the only species of *Dendrobium* that can be almost as small are *D. nummularia*, already discussed, and *D. parvulum* Rolfe (sect. *Calyptrochilus*), but the latter has bifoliate pseudobulbs and the plants can form dense mats, more substantial than those we have seen from *D. eruciforme*, which forms much looser mats as its rhizomes tend to branch more sparsely.

Key to the species of *Dendrobium* sect. *Microphytanthe*

1a. Pseudobulbs widely spaced along the rhizome..... 2
1b. Pseudobulbs congested..... 3
2a. Pseudobulbs producing a single inflorescence; lip with a distinct cross-ridge near the middle .....**D. bulbophylloides**
2b. Pseudobulbs sequentially producing two inflorescences; lip without cross-ridge .....**D. margaretae**
3a. Leaves glabrous, apex apiculate; lip with bilobulate apex and without cross-ridge; ovary glabrous..... **D. nummularia**
3b. Leaves verruculose, apex unequally bilobulate; lip with rounded apex and a cross-ridge below the middle; ovary densely papillose.....**D. eruciforme**

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Declarations

Authors' contributions AS wrote the first draft and prepared the illustrations; all authors commented on the manuscript; all authors, except CDH, participated in the fieldwork; LJ prepared the conservation assessment; CDH facilitated the New Guinea TIPAs project on the Indonesian side.

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Conflicts of interest The authors declare that they have no conflicts of interest.

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