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# *Cylindrolobus chienii* (Orchidaceae), a new species from Central Highlands of Vietnam

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ABSTRACT: The orchid species new for science, *Cylindrolobus chienii* (Orchidaceae) discovered on Chu Mu Mountain, M'Drak District, Dak Lak Province of southern Vietnam is described and illustrated. It morphologically close to *C. gloensis* and *C. bidupensis* but differs from them in glabrous 2-flowered inflorescence, calli on labellum and character of the lip indumentum.

KEY WORDS: *Cylindrolobus bidupensis*, *C. gloensis*, Endemism, *Eria*, Plant taxonomy.

## INTRODUCTION

The genus *Cylindrolobus* Blume comprises 60–70 species spreading in Southeast Asia from East Himalaya and southern China to New Guinea (Chen *et al.*, 2009; Ormerod, 2014; Ng *et al.*, 2018; Ya *et al.*, 2019). *Cylindrolobus* was firstly established by Blume in 1828 and regarded as a section of *Eria* Lindley in 1858. As reported by Pridgeon *et al.* (2005) *Cylindrolobus* was included into *Callostylis* Blume. According to Ng *et al.*, 2018 by molecular studies suggested section *Cylindrolobus* as separate genus, characterized by multi nodded, erect stems, leaves on apex, short inflorescences, relatively large floral bracts, bearing one or few flowers with subglobose mentum (Wood *et al.*, 2011).

The genus *Cylindrolobus* in Vietnam (previously *Eria* sect. *Cylindrolobus*) included 7 species e.g. *C. bidupensis* (Gagnep.) Schuit., Y.P. Ng & H.A. Pedersen, *C. biflorus* (Griff.) Rauschert, *C. carunculosus* (Gagnep.) Schuit., Y.P. Ng & H.A. Pedersen, *C. dacrydium* (Gagnep.) Schuit., Y.P. Ng & H.A. Pedersen, *C. foetidus* (Aver.) Schuit., Y.P. Ng & H.A. Pedersen, *C. truncatus* (Lindl.) Rauschert, *C. clavicaulis* (Wall. ex Lindl.) Rauschert. With the newly discovered plant and the combination, the number of *Cylindrolobus* in Vietnam increases up to 9 species.

## MATERIALS AND METHODS

The measurements and description of *Cylindrolobus chienii* are based on living plants collected in the field. Besides herbarium voucher specimens, additional material was preserved in 70% ethanol and stored at VNM Herbarium (Institute of Tropical Biology, Ho Chi Minh City). Terminology for the morphological description follows Beentje (2012).

## TAXONOMIC TREATMENT

***Cylindrolobus*** Blume, Fl. Javae, Praef.: 6 (1828)

***Type***: *Cylindrolobus compressus* (Blume) Brieger in F.R.R. Schlechter, Orchideen Beschreib. Kult. Zücht., ed. 3, 1(11–12): 664 (1981).

***Cylindrolobus chienii*** Vuong, Aver., V.C. Nguyen & T.T.D. Pham, ***sp. nov.*** **Figs. 1–3**

Described from the Central Highlands of Vietnam. ***Type.*** VIETNAM, Chu Mu Mountain, M'Drak District, Dak Lak Province, in tropical evergreen forest at elevation 1000–1200 m on granite rocks, 16 February 2020, *Nguyen Van Canh, Pham Thi Thanh Dat, Truong Ba Vuong, BV 514* (Holotype: VNM 00023605!).

***Description.*** Herb lithophytic, with several stems densely clustering on short plagiotropic rhizome. Stems erect, terete, distally slightly thickened, to 28 cm long, 0.8–1 cm in diameter, with 8–11 nodes. Leaves 3–4, on apical part of stem, lanceolate, 10–14.5 cm long, 1.8–2 cm wide, acute. Inflorescence axillary, glabrous, 6–7 mm long, peduncle 4–6 mm long, rachis ca. 1 cm long, 2-flowered; floral bracts dark yellow, ovate to broadly

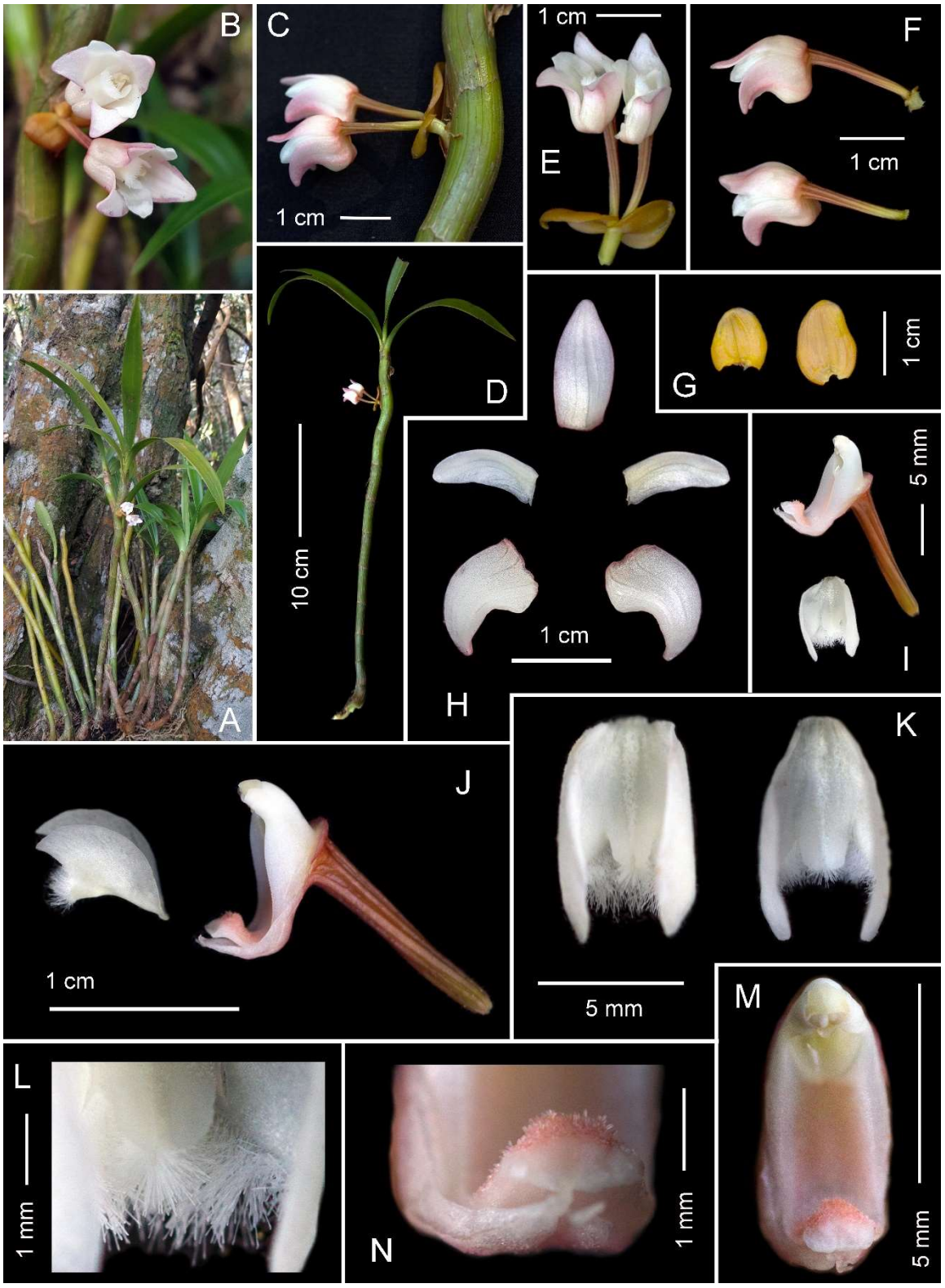


**Fig. 1.** ***Cylindrolobus chienii*** Vuong, Aver., V.C. Nguyen, & T.T.D. Pham. Morphological characters based on living fresh collected plants, prior to preparation of the herbarium type voucher specimen. **A**. Flowering plant in nature. **B**, **C**, **E**. Inflorescence, frontal and side views. **D**. Flowering stem. **F**. Flower, side view. **G**. Flattened floral bracts. **H**. Flattened sepals and petals. **I**. Column and column foot, side view; lip, view from above. **J**. Lip and column, side view. **K**. Lip, view from above. **L**. Hairs on median lobe. **M**. Column, frontal view, **N**. Callus on column foot apex. All photo by Nguyen Van Canh from plant prior preparation the type specimen BV 514, correction and design by L. Averyanov and T. Maisak.

**Fig. 2.** ***Cylindrolobus chienii*** Vuong, Aver., V.C. Nguyen, & T.T.D. Pham. Morphological characters based on alcohol fixed material. **A**. Leaf, adaxial surface. **B**. Flattened sepals and petals. **C**. Intact lip, side view. **D**. Intact lip half-side views. **E**. Intact lip, view from below. **F**. Flattened lip adaxial surface. **G**. Flattened lip, abaxial surface. **H**. Bilobed fleshy plate on distal part of the lip callus at the base of median lip lobe, view from above and frontal view. **I**. Bilobed fleshy plate on distal part of the lip callus, view frontal view. **J**. Indumentum on median lip lobe. **K**. Anther cap, frontal view and view from below. **L**. Pollinia. All photo by Truong Ba Vuong based on alcohol preserved material stored in VNM herbarium collected from specimens used for preparation of the voucher herbarium type specimen BV 514, correction and design by L. Averyanov and, T. Maisak.

**Fig. 3.** ***Cylindrolobus chienii*** Vuong, Aver., V.C. Nguyen, & T.T.D. Pham. Holotype, BV 514 (VNM).

2-flowered; floral bracts dark yellow, ovate to broadly ovate, with 7-veins, 0.6–1.3 cm long, 0.8–1 cm wide, apex rounded; pedicel and ovary reddish brown 1–1.2 cm long. Flowers not widely opening. Sepals outside white with light purple tint, petals and lip white. Dorsal sepal narrowly ovate, 10–12 mm long, 5–6 mm wide, apex obtuse, with 5 veins; lateral sepals narrowly ovate, strongly oblique, 8–12 mm long, 5–6 mm wide, apex obtuse, with 5 veins, connate with column foot forming short sub-globose mentum. Petals oblong lanceolate, slightly oblique, 7–12 mm long, 4–5 mm wide, blunt to roundish at apex, with 3 veins. Lip 3-lobed, ca. 7 mm (from base to tip of lateral sepals), 7 mm wide (at the widest part) attached to the column foot by short claw; side lobes erect, narrowly ovate, falcate, ca. 6 mm long, 2 mm wide, acute to obtuse; median lobe small, 1 mm long and wide, broadly ovate, truncate, slightly down curved, densely hairy with long stiff white glandular hairs; disc with large fleshy, shortly hairy, bi-carinate callus coming distally from the lip base and rising in apical quarter into fleshy bilobulate plate (T-shaped in cross section). Column ca. 4 mm tall, laterally with narrow papillose wings; column foot upcurved ca. 7 mm long, forming almost right angle with column, at apex with prominent pink papillose knob. Anther cap white, ca. 1 mm long, 2 mm wide, hemispheric, helmet-shaped, finely papillulose, at front with slightly protruding apex and 2 rounded lateral valves; stigma obovate; rostelum shorly protrucing, narrowly ovate, apex subacute; pollinia dull yellow, 8 in 4 pairs, broadly obovate.

***Etymology.*** The species epithet refers to the name of the plant discoverer, Mr. Pham Van Chien. The Vietnamese name is Nỉ Lan Chiến (***nov.***).

***Habitat, phenology and conservation status.*** Lithophytic clustering herb growing on mossy vertical cliffs in primary evergreen forests on granite at elevations 1000–1200 m a.s.l. Very rare. Flowers in February – March. Estimated IUCN Red List status - DD.

***Distribution.*** Endemic of southern Vietnam (Chu Mu Moutain, M'Drak district, Dak Lak Province).

***Studied specimen*** (***Paratype***): VIETNAM, Chu Mu Mountain, M'Drak District, Dak Lak Province, in tropical evergreen forest at, elevation around 1000–1200 m on granite rocks, 16 Feb. 2020, *Nguyen Van Canh, Pham Thi Thanh Dat, Truong Ba Vuong, BV 515* (VNM 00023606!).

***Notes.*** The new species may be compared with *C. gloensis* from India (Agrawala & Ormerod, 2014). However, it distinctly differs from *C. gloensis* in glabrous scape, rachis, pedicels and flowers (vs. scape, rachis, pedicels and flowers pubescent), short inflorescence ca. 1.6 mm long (vs. 16 mm long), 2-carinate callus rising distally into prominent bilobulate plate T-shaped in cross section (vs. callus on the disc 2-carinate, turn into half-discoid callus on epichile); prominent knob-like papillose callus at column foot apex (vs. column foot with no distinct callus). The new plant also looks similar to *C. bidupensis* but clearly differs in 2-flowered distinctly lateral, inflorescences 6–7 mm long (vs. inflorescence regularly with more than 2 flowers, subterminal, to 6 cm long), 2-carinate callus forming distally (at base of mid lobe) fleshy bilobulate plate, T-shaped in cross section (vs. disc with 2 separate keels and one median papillous or hairy cushion), median lobe with dense long stiff white hairs (vs. median lobe subglabrous, with dense long stiff white hairs).

Currently *Cylindrolobus chienii* is known from only one location in Chu Mu Mountain (M'Drak District, Dak Lak Province of southern Vietnam). As no more special field studies were undertaken and no one more populations were found this species may be preliminarily assessed as a species with insufficient data on its distribution and unclear conservation status (Data Deficient) according to IUCN criteria (IUCN Standards and Petitions Committee, 2019).

***Cylindrolobus lactiflorus*** (Aver.) Vuong, Aver., V.C. Nguyen, ***comb. nov.*** – *Eria lactiflora* Aver., Lindleyana 14: 219 (1999).

**Artificial key for the genus *Cylindrolobus* Blume in Vietnam**

1a. Plant with several inflorescences along the stem …….. 2
1b. Plant with only terminal or subterminal inflorescence ……. 3
2a. Sepals outside glabrous, lip with two lateral glossy longitudinal calli with short additional median callus near the apex, epichile margin papillose ……..…….. ***C. biflorus***
2b. Sepals outside pubescent, lip with two lateral longitudinal calli insignificant at the base, raising to the apex, with short additional median lamella, epichile margin with densely stiff white hairs ..... ……..…… ***C. foetidus***
3a. Median lobe of the lip, small …… 4
3b. Mid lobe of the lip distinct …… 7
4a. Lip with longitudinal calli …… 5
4b. Lip without longitudinal calli …… 6
5a. Pedicel finely pubescent, median lobe glabrous, 2 longitudinal unbroken calli glabrous, distally swollen, disc with hairy median callus …….. *C. truncatus*
5b. Pedicel glabrous, median lobe pubescent, 2 longitudinal calli broken into two pair of "tear drop" calli, disc with densely villose median callus …….. ***C. dacrydium***
6a. Lip median lobe glabrous, at apex with two lateral pubescent calli and small fleshy median cushion …… ***C. carunculosus***
6b. Lip median lobe with long stiff white glandular hairs, at apex with short hairs and prominent 2-carinate callus …… ***C. chienii***
7a. Lip with 3 longitudinal calli covered by dense stiff and glandular hairs ……..…….. ***C. lactiflorus***
7b. Lip with 2 longitudinal glabrous calli and median hairy keel ….. 8
8a. Lip with 2 low longitudinal glabrous Calli on the disc extends from the middle, median callus fat papillose …….. ***C. clavicaulis***
8b. Lip with 2 rather flat longitudinal glabrous Calli on the disc extends from base to middle, median callus hairy ……. ***C. bidupensis***

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