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Dendrobium parahendersonii, a new orchid species (Orchidaceae) from Southern Vietnam

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ABSTRACT: *Dendrobium parahendersonii* discovered in southern Vietnam is described as new species to science. It belongs to *D*. sect. *Crumenata*, and resembles *D. hendersonii* and *D. exile* in having a filiform, reed-like stem swollen at the base into a quadrangular ellipsoid pseudobulb and flowering from the leafless part of stem but differs clearly in the details of its tepals and lip. A morphological description, illustrations, data on habitat, phenology, and conservation status for the new species are provided.

KEY WORDS: *Crumenata*, *Dendrobium hendersonii*, new species, Orchidaceae, plant diversity, plant taxonomy.

INTRODUCTION

Dendrobium Swartz is one of the largest orchid genera containing about 1450 known species widely distributed in tropical and subtropical Asia from Sri Lanka and India to Australia, New Guinea, and Pacific islands (Pridgeon *et al*., 2014). In some recent assessments (Pridgeon *et al*., 2014) *D.* section *Crumenata* was included in Section *Aporum* Blume. In this paper, we follow the concept of Wood (2015), which treats D. sect. *Crumenata* as a separate section.

All representatives of the *D*. sect. *Crumenata* are characterized byt the following: a fusiform, pseudobulbous, swollen basal part of the stem consisting of few internodes; leaves terete or dorsiventral, conduplicate; many inflorescences spaced along the leafless apical part of the stem, rarely on the leafy stem; and each inflorescence bearing 1 or 2 flowers; usually white flowers, with or without purple stripes and marks on tepals, with a prominent mentum, and often with a gland at the basal part of the column foot; the lip 3-lobed or rarely entire, with an entire, undulate, erose, or dentate median lobe and a disk usually with three hairy or glabrous keels. The section comprises about 80 species distributed from Myanmar, Thailand, China, Laos, Cambodia, and Vietnam, to Malaysia, and Indonesia.

In Vietnam, Seidenfaden (1992) and Averyanov & Averyanova (2003), list nine species forming two groups for section *Crumanata* (= *D*. section *Rhopalanthe* Schltr.). Species of the first group have terete leaves (*D. exile*, *D. pseudotenellum* Guillaumin, *D. dentatum* Seidenfaden, and *D. lomatochilum* Seidenfaden), and species of the second group have dorsiventral, conduplicate leaves (*D. truncatum* Lindl., *D. hendersonii* A.D.Hawkes & A.H.Heller, *D. podagraria* Hook.f., *D. crumenatum* Swartz, and *D. annamense* Rolfe.).

The new species of the section, which superficially resembles *D. hendersonii* A.D.Hawkes & A.H.Heller and *D. exile* Schltr., was found in Dong Nai Province of southern Vietnam. The morphological description of the new species, the information about its habitat, conservation status, illustrations, and relevant taxonomic notes are presented below.

MATERIAL AND METHODS

The measurements used for the description of *D. parahendersonii* are based on the living plant collected from Dong Nai province of southern Vietnam. Herbarium material was initially preserved in 70% ethanol, then dried and stored at VNM herbarium (Institute of Tropical Biology, Ho Chi Minh City, Vietnam). Terminology for the morphological description follows Beentje (2012).

TAXONOMIC TREATMENT

Dendrobium* sect. *Crumenata Pfitzer, 1888, Pflanzenfamilien 2, 6: 174. – *D.* subgen. *Crumenata* (Pfitzer) Kraenz., 1910, Pflanzenreich 45: 224.

Dendrobium parahendersonii Vuong, Aver. & Nguyen V.C., ***sp. nov.*** **Fig. 1**

Type. VIETNAM, Dong Nai Province, Vinh Cuu District, Ma Da Forest, evergreen lowland forest at elevation about 200 m a.s.l., epiphyte on tree trunks above 3 meters from ground, 1 April 2021, *Truong Ba Vuong, Nguyen Van Canh, Nguyen Van Khuong, Nguyen Thi Lien Thuong, BV 1142* (holotype – VNM 00069899!).

= *D. hendersonii* auct. non A.D. Hawkes & A.H. Heller, 1957: Seidenf., 1992, Opera Botanica 114: 247; Tran Hop, 1998, Orch. Vietnam: 235; Averyanov *et al*., 2015, Wulfenia 22: 153, fig. 5 F & G.

Diagnosis. The new species is morphologically similar to *D. hendersonii* but clearly differs by quadrangular pseudobulbs, quadrate or sub-quadrate in cross section (vs. pseudobulbs distinctly flattened, rhomboid in cross-section), smaller flower ca. 1 cm long (vs. 2–2.5 cm long), shorter pedicel and ovary ca. 5 mm long (vs. pedicel and ovary up to 1 cm long), smaller median sepal ca. 5 mm long, 2 mm wide (vs. median sepal 10–15 mm long, 4–6 mm wide), median lip lobe half-circular (vs. median lip lobe narrowly oblong), lip disc with 5 distally fimbriate keels (vs. lip disc distally with almost glabrous tripartite callus). Morphological details of *D. hendersonii* used for the comparison are based on data reported by Wood (2015).

Description. Epiphytic perennial herb. Stems densely clustering, 30–80 cm long, filiform or reed-like, swollen near the base; swollen part pseudobulbous, narrowly ellipsoid, 2–4.7 cm long, 5 mm wide, consist of 1–3 internodes, quadrate of subquadrate in cross-section. Leaves sessile, lanceolate, conduplicate, thick, 3.2–4.5 mm long, 3–5 mm wide, apical part somewhat narrowed, apex shortly acuminate. Inflorescences many, on leafless apical part of stems, 1–2-flowered; floral bract tubular, acute, ca. 1 mm long. Pedicel and ovary ca. 5 mm long. Flowers not widely opening, ca. 1 cm long from apex of mentum to apex of median sepal, the sepals and petals white, the lip white with purple nerves and orange disc. Median sepal narrowly ovate, ca. 5 mm long, 2 mm wide, with 5 veins, apex acute; lateral sepals oblique triangular, ca. 4 mm long, 6 mm wide (at base), with 5 veins, apex acute; mentum ca. 5 mm long, slightly forward curved, apex obtuse. Petals oblong or narrowly obovate, ca. 4.5 mm long, 1.5 mm wide, with one vein, apex rounded to obtuse. Lip narrowly obovate in outline, slightly recurved, ca. 9 mm long, 4 mm wide, 3-lobed; side lobes oblique ovate, ca. 4 mm long, 1.5 mm wide, rounded at apex, erect; median lobe half-circular, ca. 2 mm long and wide, margin finely undulate; disc with 5 bright orange, distally fimbriate keels, 3 median keels extend from base to center of median lobe, 2 lateral keels much shorter, coming from base to median part of median lobe. Column stout, erect, ca. 2 mm long, with 2 erect, triangular, acute stelidia; column foot ca. 6 mm long, 2 mm wide, slightly forward curved, grooved at base, below middle with small orange callus; anther cap ovoid, ca. 1.2 mm tall, slightly retuse at apex; pollinia 4, each half-ellipsoid, ca. 1.2 mm long arranged in 2 groups; stigma obovate, concave; rostellum in form of small transversal fold, not protruding. Fruits not seen.

Etymology. The species name refers its closest relation to *D. hendersonii.*

Habitat and phenology. Trunk and branch epiphyte in broadleaved evergreen and semideciduous lowland and submontane forests at elevation 200–800 m a.s.l. Flowers all around the year, usually after light short weather cooling.

Distribution. Vietnam, provinces Dong Nai (Vinh Cuu District), Khanh Hoa (Ninh Hoa District), and Lam Dong. Endemic of the eastern part of Central Highlands in southern Vietnam.

Proposed conservation status. The currently available records suggest that the new species is locally common. More field studies are needed for assessment of its true conservation status. According to the IUCN criteria (IUCN, 2019) it may be tentatively assessed at present as "Data Deficient" (DD).

Other specimen examined. **VIETNAM**, southern Vietnam, without exact location, Feb. 2004, sine coll., wild collected plant in culture, herbarium and photos prepared in 9 Dec. 2020, *L. Averyanov, T. Maisak, AL 1279* (LE 01076988 http://en.herbariumle.ru/?t=occ&id=57020, LE 01088333 http://en.herbariumle.ru/?t=occ&id=46984). Khanh Hoa Province, Ninh Hoa District, Ninh Phu Village, Mont Hon Heo (Suoi Hoa Lan area), 18 July 2014*, Le Hong Son et al.*, Tich 05-06-15, under unpublished name – *D. lehongsonii* Tich (SGN, photos LE 01088650 http://en.herbariumle.ru/?t=occ&id=52117, drawing LE 01090981 http://en.herbariumle.ru/?t=occ&id=82430). Khanh Hoa Province, broad-leaved evergreen forest at elevation 400–800 m a.s.l., epiphyte, locally very common, 5 Nov. 2014, *Nguyen Van Canh s.n.* photo and herbarium specimen prepared from cultivated plant in Nguyen Van Canh private garden in 5 Dec. 2014 by *L. Averyanov et al., CPC 7687* (LE 01088649 http://en.herbariumle.ru/?t=occ&id=52116, LE 01066324 http://en.herbariumle.ru/?t=occ&id=14677). Dong Nai Province, Cat Tien National Park, 15 May 2020, *Nguyen Van Canh, Truong Ba Vuong, BV 634* (LE 01073230 http://en.herbariumle.ru/?t=occ&id=15834). Dong Nai Province, Vinh Cuu District, Ma Da Forest, evergreen lowland forest at elevation about 200 m a.s.l., epiphyte on tree trunks above 3 meters from ground, 16 May 2020, *Truong Ba Vuong, Nguyen Van Canh, BV 1141* (VNM00032286).

Notes. *Dendrobium parahendersonii* is morphologically very close to *D. hendersonii* and can be easily misidentified in herbarium collections. Earlier the new species was reported from Vietnam by Seidenfaden (1992), Tran Hop (1998), and Averyanov *et al*. (2015) under the name *D. hendersonii*. At the same time, it was noted that Vietnamese plants originating from Lam Dong Province differs somewhat from the type of *D. hendersonii* in a series of morphological features indicated in Tixier's unpublished description reported by Seidenfaden (1992). In 2014 Nguyen Thien Tich studied plants collected in Khanh Hoa Province with the result that he proposed a new species, *D. lehongsonii* Tich and illustrated his new taxon with an excellent original illustration (LE 01090981 http://en.herbariumle.ru/?t=occ&id=82430) and numerous photos (LE 01088650 http://en.herbariumle.ru/?t=occ&id=52117). Unfortunately, his new species was left unpublished on his death in 2015.

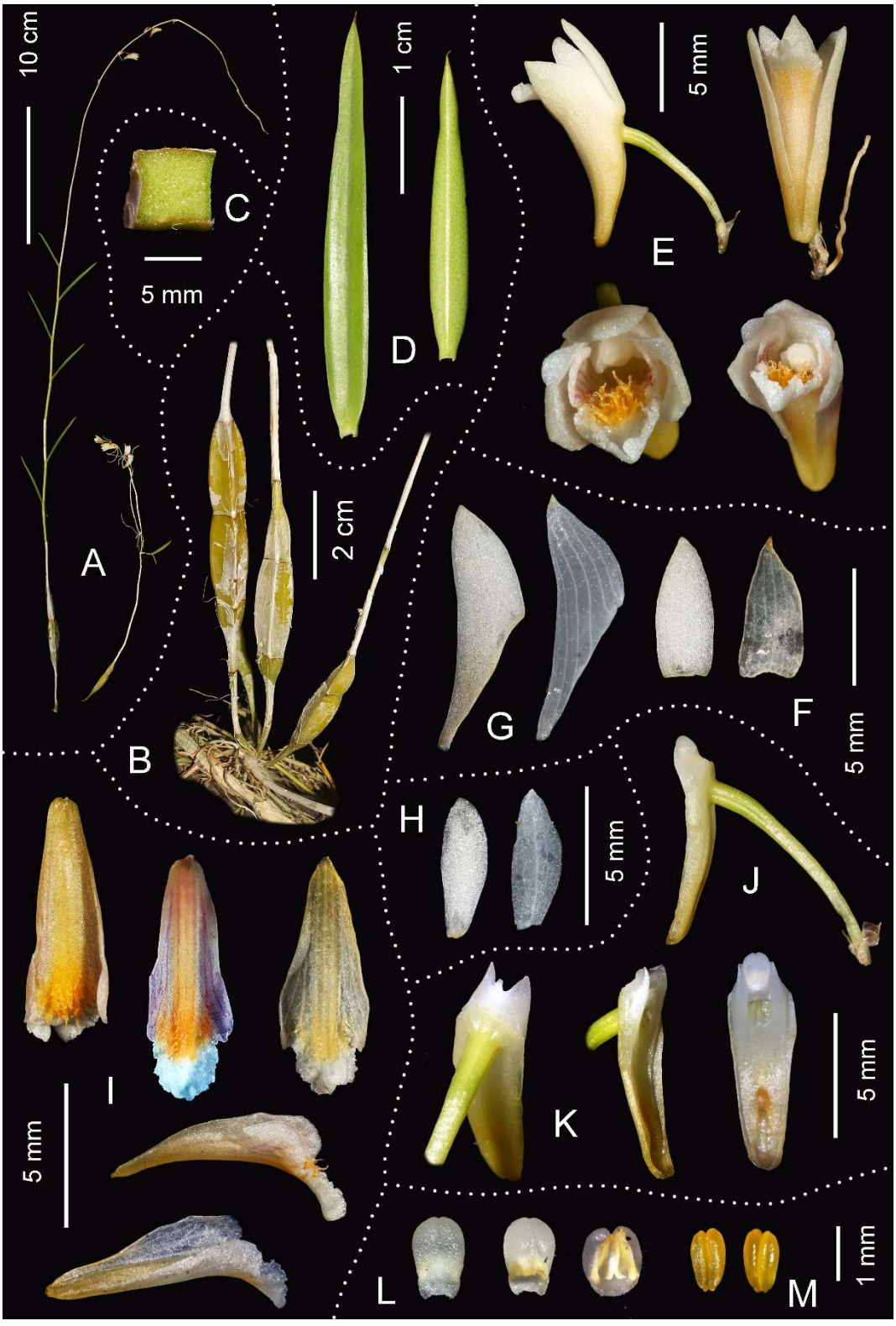

Fig. 1. ***Dendrobium parahendersonii*** Vuong, Aver. & V.C. Nguyen. **A**. Flowering shoots. **B**. Swelling basal parts of stems (pseudobulbs). **C**. Cross section of the swelling part of stem. **D**. Leaves, adaxial and abaxial surface. **E**. Flowers, view from different sides. **F**. Median sepal (fresh and alcohol preserved). **G**. Lateral sepals (fresh and alcohol preserved). **H**. Petals (fresh and alcohol preserved). **I**. Lip, view from different sides. **J**. Column, pedicel, and ovary, side view. **K**. Column and column foot, view from different sides. **L**. Anther cap, view from different sides. **M**. Pollinaria. Photos by Truong Ba Vuong from plant used for preparation of the holotype (Truong Ba Vuong *et al*., BV 1142). Photo correction and design by L. Averyanov and T. Maisak.

The study of additional collections from Dong Nai and Khanh Hoa provinces confirms the distinction of Vietnamese plants as a separate species, which is described here with the name *D. parahendersonii* that refers to its close relations *to D. hendersonii*.

The newly described species may be also compared with *D. exile* Schltr. which has similar quadrangular pseudobulbs. However, our plant differs in having dorsiventral, lanceolate leaves (vs. leaves terete), smaller flowers with sepals about 5 mm long (vs. sepals 10–12 mm long), and half-circular median lip lobe as long as the side lobes (vs. median lip lobe narrowly ovate to elliptic, distinctly longer than side lobes).

Currently, the new species is documented as occurring in Dong Nai, Khanh Hoa, and Lam Dong provinces. However, from personal observations, this species is also fairly common in dry lowland primary forests of Quang Nam and Gia Lai provinces (N.V. Canh unpublished data).

Additional species examined. Dendrobium exile Schltr.: **VIETNAM**, Lam Dong Province, Dalat Town area, fl. et coll. in horto 16 Sep. 1985, *L. Averyanov s.n.* (LE 01077038 http://en.herbariumle.ru/?t=occ&id=82431). Lam Dong Province, Dalat Town area, fl. et coll. in horto 16 Sep. 1985, *L. Averyanov* (LE 01066245 http://en.herbariumle.ru/?t=occ&id=13708); Dong Nai Province, 7 Jan. 1990, *Vu Ngoc Long, B 075* (LE 01066254 http://en.herbariumle.ru/?t=occ&id=13717); Lam Dong Province, Dalat Town area, fl. et coll. in horto 7 July 1987, *L. Averyanov s.n.* (LE 01066245 http://en.herbariumle.ru/?t=occ&id=13708). Daklak, Krong No District, Nam Ha municipality, Day Sap – Gia Long Waterfall Historical, 27 Nov. 2014, *Averyanov et al., CPC 7679* (LE 01066249 http://en.herbariumle.ru/?t=occ&id=13712); VIETNAM, Kon Tum Province, fl. et coll. In horto 17 December 2015, *Averyanov et al., AL 209* (LE 01077039 http://en.herbariumle.ru/?t=occ&id=82432).

Dendrobium hendersonii A.D. Hawkes & A.H. Heller: **THAILAND**, Betong, Pattani, on tree by stream in evergreen forest, 28 August 1923, *A.F.G., Kerr 0102* (K000596869, K000596870, type of *D. herdersonii*) https://apps.kew.org/herbcat/detailsQuery.do?imageId=288180&pageCode=1&presentPage=1&queryId=1&sessionId=F6143BDDE272EEAC4C5E454E04AC13CB&barcode=K000596871

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