



A new species, *Bulbophyllum mamillatum* and a new national record, *B. retusum* (Orchidaceae) in the flora of Vietnam

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ABSTRACT: *Bulbophyllum mamillatum* Vuong, Aver., V.S.Dang is described as a new species for science and *B. retusum* H. Jiang, D.P. Ye & J.D. Ya is reported as a new national record for the orchid flora of Vietnam. Both species belong to *Bulbophyllum* sect. *Brachyantha* Rchb.f. and were discovered in northern Vietnam. Description of new the species is presented. Data on habitat, phenology, distribution, conservation status, and taxonomic notes for both species are provided.

KEY WORDS: *Bulbophyllum* section *Brachyantha*, *Bulbophyllum farreri*, *Bulbophyllum thaiorum*, Eastern Indochina, Orchids.

INTRODUCTION

According to Vermeulen *et al.* (2014), species of *Bulbophyllum* Thouars sect. *Brachyantha* Rchb.f. have one-leaved pseudobulbs placed on a creeping rhizome, subumbellate inflorescence arising from the base of the pseudobulb, lateral sepals from 2 to 6 times longer than median sepal which are twisted at base with upper margin turned inward and adnate to each other, a simple lip connate to the column foot apex, simple or winged column with or without steldia at the apex. The section includes 26 accepted species spreading from India, Myanmar, Thailand, Laos, Cambodia, Vietnam, and China to Japan, the Philippines, and New Guinea.

Two unusual *Bulbophyllum* species belonging to this section were discovered recently in Ha Giang and Son La Provinces in northern Vietnam. The first plant is described here as a new species for science, *B. mamillatum* Vuong, Aver. & V.S.Dang, it looks similar to *B. farreri* (W.W.Sm.) Seidenf. and *B. thaiorum* J.J.Sm. However, it may be distinguished in the numerous branched papillae on the abaxial surface of the lateral sepals and the lip hairy on the basal portion (on the adaxial surface). The second plant is *B. retusum* H. Jiang, D.P. Ye & J.D. Ya (2021), described a few month ago from southeastern China close to the Vietnamese border. This species is firstly recorded for the flora of Vietnam. Both species are listed below with information on their habitat, phenology, distribution, conservation status, and taxonomic notes including data on the types and standard description for the newly described species.

MATERIALS AND METHODS

The measurements of plant organs and the description of the new species were based on the living plants. Studied herbarium and alcohol-preserved authentic materials are deposited at VNM Herbaria. The terminology for the morphological description follows Beentje (2016).

TAXONOMIC TREATMENT

Bulbophyllum Thouars sect. *Brachyantha* Rchb.f., 1861, Ann. Bot. Syst. (Walpers) 6, 2: 264.

B. mamillatum Vuong, Aver. & V.S.Dang *sp. nov.*

Fig. 1

Type: VIETNAM, Ha Giang Province, Quan Ba District, forest around Tung Vai Commune, 11 April 2020, *Truong Ba Vuong, Bui Van Huong, BV 569* (holotype – VNM 00069932, see also analytical photos LE01123037, <https://en.herbariumle.ru/?t=occ&id=124008>).

Description: Miniature branch epiphyte. **Pseudobulbs** narrowly ovoid to ovoid, erect, 1.6–2 cm tall, bearing single leaf, growing close together on creeping rhizome. **Leaves** narrowly oblong, 7.5–8 cm long, 7–8 mm wide, apex rounded, slightly retuse. **Inflorescence** subumbellate raceme, arising from base of pseudobulb; scape green, 11.5–12 cm long, with 2–3 brown tubular overlapping bracts at base and 2 distant bracts in middle part; rachis ca. 5 mm with 4–5 flowers; floral bracts narrowly ovate, greenish-yellow, 6–8 mm

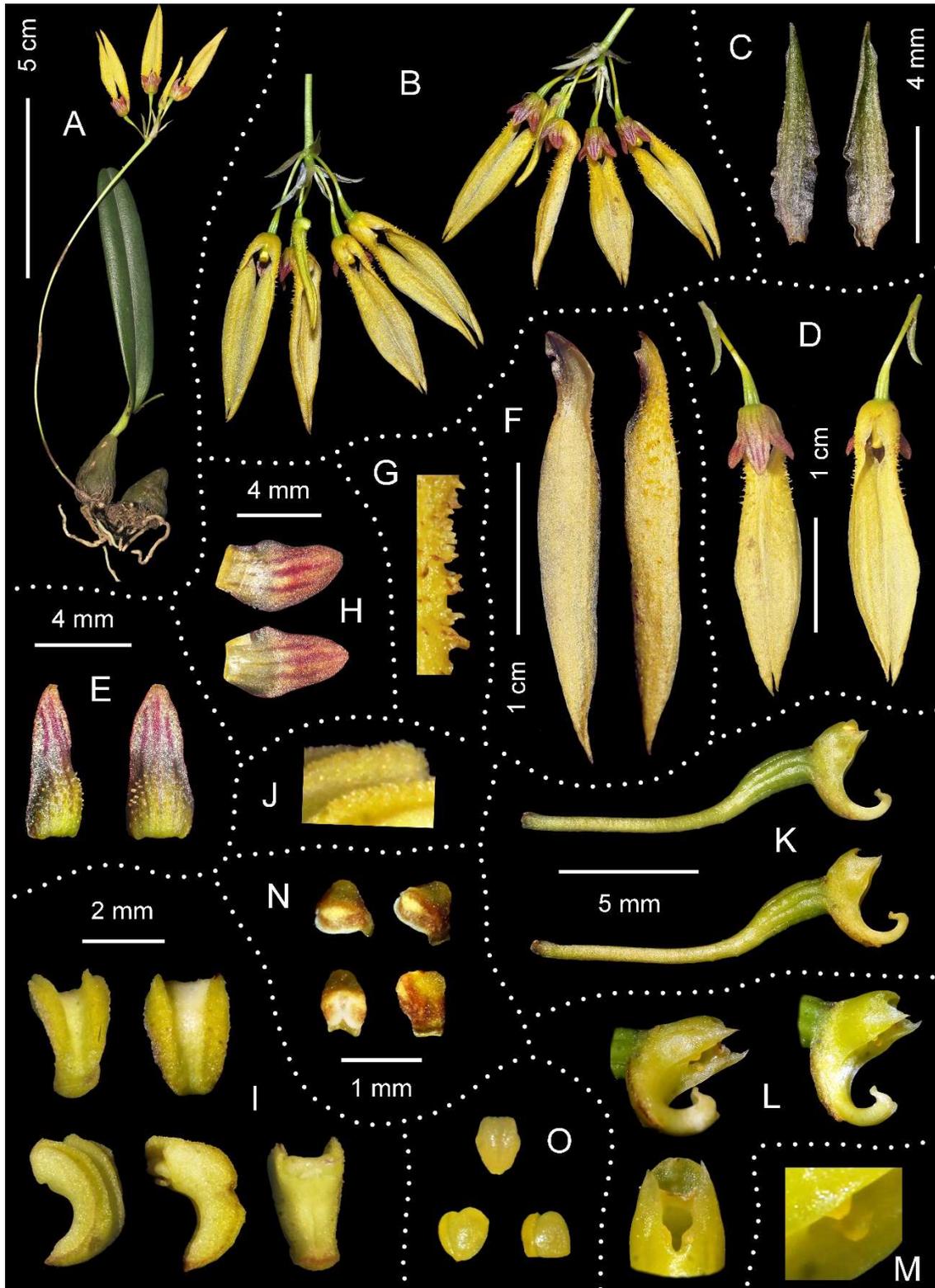


Fig. 1. *Bulbophyllum mamillatum* Vuong, Aver., V.S.Dang. **A.** Flowering plant. **B.** Inflorescences. **C.** Floral bract, abaxial and adaxial side. **D.** Flower, frontal view and view from back. **E.** Median sepal, side view and view from back. **F.** Lateral sepals, adaxial and abaxial views. **G.** Papillose margin of lateral sepal. **H.** Petals, adaxial and abaxial side. **I.** Lip, views from different sides. **J.** Papillose keels on adaxial lip surface. **K.** Pedicel, ovary, and column with anther cap and with anther cap removed, side views. **L.** Column, side and half side views. **M.** Stigma with lateral calli, side view. **N.** Anther cap, views from different sides. **O.** Pollinia. All photos by Ba Vuong Truong (made from the type BV 569), correction and design by L. Averyanov and T. Maisak.

**Table 1.** The comparison of morphological characters of *B. mamillatum* and closely related *B. farreri* and *B. thaiorum*.

	<i>B. mamillatum</i>	<i>B. farreri</i>	<i>B. thaiorum</i>
Scape length	11.5–12 cm	Ca. 7 cm	Ca. 5 cm
Length of pedicel and ovary	Ca. 1 cm	Ca. 0.9 cm long	0.6–0.7 cm
Shape and characters of median sepal	Narrowly ovate, retuse, sparsely papillose at base, margin entire	Ovate oblong, retuse, glabrous at base, margin entire or sparsely ciliolate	Ovate oblong, obtuse or slightly retuse, glabrous at base, margin entire
Size and characters of lateral sepals	2.3–2.6 cm long, broadly oblanceolate, sparsely papillose	ca. 3.5 cm long, oblanceolate, densely papillose	2–2.5 cm long, lanceolate, densely papillose
Character of petal margin	Entire	Ciliolate	Entire
Lip hairiness	Finely hairy along margin and keels	Glabrous	Glabrous
Stigma	Pyriform with 2 lateral calli	Obovate, without calli	Rectangular, without calli

long, margin slightly undulate; pedicel and ovary ca. 1 cm long, pedicel yellowish-green, slender, slightly curved, ovary green, thicker. **Flowers** opening simultaneously; median sepal and petals yellowish with 3 reddish stripes in apical half and pink apex; lateral sepals yellow. **Median sepal** narrowly ovate, ca. 6 mm long 2.5 mm wide, tapering to obtuse truncate apex, concave at base, 3-veined, papillose abaxially on basal convex part. **Lateral sepals** broadly oblanceolate, oblique, 2.3–2.6 cm long, 4–5 mm wide, twisted at base, upper margin incurved and adnate along the margin, free at lower margin, margin at apical part revolute, contracted at base; abaxial surface of sepal densely papillose at base, sparsely papillose above base. **Petals** narrowly ovate, slightly oblique, ca. 5 mm long, 3 mm wide, obtuse, 3-veined, glabrous. **Lip** undivided, narrowly ovate in outline, recurved, with rounded apex; adaxially channeled, with 2 keels arising from base and ending near the apex, margin and keels with fine hair, at base with transverse callus and small appendage joining to column foot, abaxially with 2 inconspicuous keels. **Column** erect, ca. 2 mm tall, pale yellowish-green, at front with inconspicuous triangular wings, column foot ca. 4 mm long, strongly incurved; steldia triangular, acute; stigma pyriform, with 2 prominent triangular yellow calli on either side of stigma pit; anther cap helmet shaped, ca. 1 mm tall, at middle with small callus; pollinia 4, flattened, obovate. **Capsule** not seen.

Etymology: The species name refers to the peculiar mamilla-like calli on lateral sides of the stigmatic concavity.

Habitat and phenology: Creeping epiphyte in primary broad-leaved evergreen forest. Flowers in April.

Distribution: Vietnam (Ha Giang Province). Endemic.

Proposed conservation status: Only three subpopulations of the new species were found in the territory of Tung Vai Commune (Quan Ba District, Ha Giang Province) during conducted fieldworks. These localities generate an EOO of 0.004 km² and an AOO of 4 km². The species is known to be collected for trade in the local market. The three subpopulations occur very close to each other (<25 m radius) and in any threatening event (collection for trade in this case), members of all

three subpopulations are likely to be affected simultaneously. Hence, these three subpopulations qualify to be considered as a single location following IUCN (2019). There is ongoing decline due to collection which is projected to affect EOO, AOO, number of mature individuals and number of locations. On the basis of above information, the species can be assessed as Critically Endangered CR B1+B2ab(i,ii,iv,v).

Note. The new species is morphologically close to *Bulbophyllum farreri* and *B. thaiorum*. The comparison of these studied species is presented in table 1.

Characters of *B. farreri* and *B. thaiorum* are based on data reported by Seidenfaden (1973, 1979), Chen and Vermeulen (2009), Li *et al.* (2009), and Rabgay *et al.* (2021). The correct identity of *Bulbophyllum thaiorum* reported by Rabgay *et al.* (2021) from Bhutan should be *B. farreri*.

Additional specimens studied: *Bulbophyllum thaiorum*: *s. loc., s. coll., s.n.* (**Type:** K000891066! as *Cirrhopetalum papillosum* Rolfe). VIETNAM, Kontum province, Ngoc Linh peak, around 2400 m, 1995, Averyanov *et al.*, *VH* 569 (LE01057956, <https://en.herbariumle.ru/?t=occ&id=8458>); Ha Giang province, Vi Xuyen District, Cao Bo Municipality, Tam Ve Village, on mossy tree trunk, 2000, Harder *et al.* 5483 (LE01057954, <https://en.herbariumle.ru/?t=occ&id=8456>). *Bulbophyllum farreri*: CHINA, *Farrer*, *R. s.n.* (syntype, E00383625 photo!); BHUTAN, Trashigang, Wamrong, 6 October 2019, *K. Rabgay 20191006-08* (THIM photo!), according to Rabgay *per. comm.* and Rabgay *et al.* (2021); hort. cult. 2012, *Averyanov s.n.* (LE01073536, <https://en.herbariumle.ru/?t=occ&id=18045>); Lam Dong province, Da Lat, 1997, *Averyanov, s.n.* (LE01055508, <https://en.herbariumle.ru/?t=occ&id=7264>). LAOS, Champasak, Bolaven Plateau, road Paksong Ban Houay Kong, 1170 m a.s.l., 2015, *Konstaninov et al., AL* 169 – *K* 395 (LE01055510 <https://en.herbariumle.ru/?t=occ&id=7265>).

Bulbophyllum retusum H.Jiang, D.P.Ye & J.D.Ya, *Plant Diversity* 43(5): 8 (2021). **Type:** CHINA, Yunnan: Wenshan Prefecture, Malipo County, Xiajinchang Town, 1550 m, on the trunks of evergreen broad-leaved forest on limestone, 8 Oct. 2012, *H. Jiang 05599* (holotype – YAF; isotype – KUN, YAF).

Fig. 2

Habitat and phenology: Creeping branch epiphyte in primary broad-leaved evergreen forest. Flowers in November – December.



Fig. 2. *Bulbophyllum retusum* H.Jiang, D.P.Ye & J.D.Ya. **A.** Flowering plant. **B.** Leaf apex, abaxial side. **C.** Pseudobulb with infructescence and fruit. **D.** Inflorescences. **E.** Intact flowers, frontal view. **F.** Floral bract, abaxial side. **G.** Flowers, side, frontal, and back views. **H.** Median sepal, abaxial and adaxial surface. **I.** Lateral sepals, abaxial and adaxial surface. **J.** Petals, abaxial and adaxial surface. **K.** Lip, views from different sides. **L.** Pedicel, ovary, lip, and column. **M.** Pedicel, ovary, and column. **N.** Column, frontal and side views. **O.** Anther cap, view from top and bottom. **P.** Pollinarium. All photos by Ba Vuong Truong (made from specimen BV 1325), correction and design by L. Averyanov and T. Maisak.



Distribution: Vietnam (Ha Giang and Son La province), China (SE Yunnan).

Note: The species was first documented in 2007. It was based on the plant originating from northern Vietnam (without precise location) which was cultivated in a private garden by Mr. Nguyen Van Canh. Later this plant was identified by L. Averyanov as a new species close to *B. frostii* and *B. seidenfadenii*. Unfortunately, it was not formally described at that time. Fourteen years later, this species was discovered in China and rediscovered in Vietnam. Morphologically *B. retusum* (section *Brachyantha*) looks similar to *B. frostii* Summerh. (section *Cirrhopetaloides*) in the color scheme, the outline shape but differs by the entire petals (vs petals margin ciliate in *B. frostii*) and lip glabrous (vs lip densely hairs at base), stelia triangular pointing forward (vs triangular pointing downward).

Some floral details of *B. retusum* also more or less similar to *B. spathulatum* (Rolfe ex E.W. Cooper) Seidenf. (section *Brachyantha*) in shorter inflorescence, dorsal sepals broadly obovate (vs spatulate in *B. spathulatum*), dorsal sepal surface verrucosa, margin connate to each other form an slipper shape tube (vs surface more or less glabrous, papillose hairs at basal, margin more or less flat toward the apex). On Ya et al. (2021) they pointed out the character of dorsal sepal showing the differences between 2 species but actually the retuse apex of dorsal sepal can be found also in some cases of *B. spathulatum* as well.

Bulbophyllum retusum is similar to *B. seidenfadenii* A.D. Kerr (section *Brachyantha*) but differs in being a bigger plant, pseudobulbs ca. 20 mm long, well-placed, leaves ca. 100 mm long (vs miniature clustering plant, pseudobulbs ca. 5 mm long, leaves ca. 10 mm long in *B. seidenfadenii*), triangular stelia (vs the large deltoid stelia).

Proposed conservation status: In Vietnam presently two isolated subpopulations of *B. retusum* were discovered and documented in Son La and Ha Giang provinces in addition to one population documented in *locus classicus* near Malipo Town in SE Yunnan (China). The total AOO for species in Vietnam may be estimated as 16 km². Plants are known to be collected for sale and has been known well in orchid trade from even before it's publication as a new species. Additionally, degradation of natural habitat is also observed in all known localities and identified as a main threat to the species. Owing to the presence of these threats, each locality is considered as unique locations, hence a total of 3 locations are known. Based on these information, the species can be assessed as Endangered – EN B2ab(iii,v) on the basis of IUCN guidelines and terms (2019).

Studied specimens: VIETNAM, sine location, plant cultivated in Nguyen Van Canh private garden in Buon Ma Thuot Town, Dak Lak Province, photo made on 15.11.2007 by *Nguyen Van Canh s.n.* (LE01087303 <https://en.herbariumle.ru/?t=occ&id=19258>); Son La

Province, Thuan Chau District, forest around Co Ma Commune, 9 November 2021, *Truong Ba Vuong, Bui Van Huong, BV 1325* (VNM 00069930, LE01123035 <https://en.herbariumle.ru/?t=occ&id=122602> photos), *BV 1326* (VNM 00069931); Son La Province, Thuan Chau District, forest around Co Ma Commune, 21 December 2021, *Truong Ba Vuong, Bui Van Huong, BV 1327* (VNM 00069928), the inflorescence of this specimens is recorded with 16 flowers, *BV 1328* (VNM 00069929), *BV 1329* (VNM 00069947); Ha Giang Province, Dong Van District, cultivated and flowering in Lam Dong province, Da Lat Town, 26 December 2021, *Truong Ba Vuong, Manh Dat Hoang BV 1330* (VNM 00069933).

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