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***Bulbophyllum tseanum* (Orchidaceae) a new record for the flora of Viet Nam**

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ABSTRACT

Bulbophyllum tseanum found in Quang Nam Province is recorded as new for the orchid flora of Viet Nam. Previously this species was only recorded in Hong Kong and Hainan (South-East China). Living specimens were collected from Quang Nam province and flowered successfully in a private garden in Da Lat city, Lam Dong province. Based on morphological characters, *B. tseanum* is very close to *B. lepidum* in plant habit, shape and color scheme of flowers, but can be distinguished by its broadly ovate dorsal sepal, longer lateral sepals, narrow petals with shortly caudate apex, size of stielidia and column wing shape. The description of Vietnamese plants is presented, accompanied with the analytical plate and taxonomic notes.

1. INTRODUCTION

Bulbophyllum tseanum belongs to *Bulbophyllum* sect. *Ephippium* (Blume) Schltr. (Vermeulen, 2015), which presently includes proposed earlier *B. sect. Recurvae* (Garay, Hammer & Siegerist) J.J.Vermeulen in Vermeulen et al. (2014). This section is characterized by the subumbellate inflorescence, fimbriate dorsal sepal and petals, lateral sepals twisted at base, free on lower margin and connate along the upper margin. In Viet Nam, there have been three newly described species belonging to this section, namely *B. layae* Aver. & Vuong, *B. sridithii* Vuong, Aver. & V.S.Dang, and *B. xuandangii* Aver. & V.S.Dang. (Averyanov et al., 2019; Truong et al., 2020; Nguyen et al., 2022). Previous to our studies *B. tseanum* was only known to occur in Hong Kong and Hainan in SE China (Chen & Vermeulen, 2009). Morphologically *B. tseanum* are very close to *B. lepidum* (Blume)

J.J.Sm. in the plant habit, shape, and color of flowers, but can be recognized by its broadly ovate dorsal sepal, longer lateral sepals, narrow petals with short caudate apex, stielidia and column wing shape.

2. MATERIALS AND METHOD

The measurements and plant description are mainly based on living specimens. Studied herbarium voucher specimens and liquid-preserved material (preserved in 70% ethanol) are stored at the VNM Herbarium (The Institute of Tropical Biology, Ho Chi Minh City, Viet Nam) and LE Herbarium (Komarov Botanical Institute, Saint Petersburg, Russia). All photos were taken with a Canon 700D body and Canon EF-S 60 mm f/2.8 Macro USM lens. The terminology for the morphological description follows Beentje (2016).

3. RESULTS AND DISCUSSION

Taxonomic treatment

Bulbophyllum section *Ephippium* (Blume) Schltr.

B. tseanum (S.Y.Hu & Barretto) Z.H.Tsi, Fl. Reipubl. Popularis Sin. 19: 239 (1999); Chen & Vermeulen, Fl. China 25: 434 (2009); Vermeulen, *Bulbophyllum* of Borneo: 95, fig. 145 (2015). (Figures 1 & 3 A)

≡ *Cirrhopetalum tseanum* S.Y.Hu & Barretto, Chung Chi Journal 13: 30 (1976). Type: China, Hongkong, 1975, Barretto, G. 13586 (photo, K000867007!).

= *Bulbophyllum obtusiangulum* Z.H.Tsi, Acta Phytotax. Sin. 33: 578 (1995). Type: China, Hainan, Baoting, 1935, F.C. How 72637B (PE).

Description. Creeping branches and trunks epiphyte or occasionally lithophyte. **Pseudobulbs** ovoid to narrowly ovoid, 1.5–2 cm long, 1-leaved, distant on 1–3 cm long on semi-woody, stout, plagiotropic rhizome, covered by brown thin bracts. **Leaves** shortly petiolate, petiole 3–7 mm long, leaf blade oblong, narrowly obovate, 4–9 cm long, 1.5–2 cm wide, acute. **Inflorescence** arising from the base of pseudobulb, slender, erect; peduncle 14–15 cm long, dark red, at the base covered by 2 to 3 overlapped tubular bracts, above with 1 tubular bract; rachis 1–2 mm, subumbellate, bearing 6–7 flowers; floral bracts white to purplish, narrowly triangular, 5–6 mm long; pedicel and ovary greenish-yellow to red, 8–9 mm long. **Flowers** open simultaneously, dorsal sepal and petals yellow, dark red in apical part, lateral sepals yellow, mottled or flushed with purple-red, lip dark red-brown, at apex brownish-yellow. **Dorsal sepal** broadly ovate, concave, 6–7 mm long, 3–3.5 mm wide, acuminate, fimbriate along the margin. **Lateral sepals** narrowly oblong, somewhat falcate, 3.5–3.7 cm long, 5–6 mm wide, acute, base form a short mentum. **Petals** rhombic-ovate, somewhat falcate, 6–6.5 mm long, 2–3 mm wide, shortly caudate, fimbriate along the

margin. **Lip** simple, fleshy, ligulate, strongly recurved, 3–3.5 mm long, ca. 2 mm wide, acute, attached to column foot by thin, white ligament; adaxially channeled, with one longitudinal keel extending from the base to apical part; abaxially with 2 low keels. **Column** ca. 2 mm long, with broadly crescent wing; column foot 4–5 mm long, curved downward, upcurved at apex; stelia small, acute; stigma rectangular, ca. 1 mm long and wide; anther cap ca. 1 mm long, with round beak at front; pollinia 4, broadly obovate, ca. 1 mm long. Fruits have not been seen.

Habitat and phenology. — Epiphyte on tree trunks and large tree branches, or occasionally lithophytic, in broad-leaved evergreen forests, at elevations about 400 m a.s.l. Flowering in March – April.

Studied specimens. VIETNAM, Lam Dong province, 2019, Averyanov *et al.*, 1215.5., cultivated by Ngo Quang Dang in Da Lat (photo, LE 01061345!); — Hue province, 2005, Averyanov *et al.*, HAL 7899 (photo, LE 01073545!); — Hue province, 2005, Averyanov *et al.*, HAL 7163a (photo, LE 01055530!); — Hue province, 2005, Averyanov *et al.*, HAL 8259 (photo, LE 01073546!); — Hue province, 2005, Averyanov *et al.*, HAL 7065 (photo, LE 01073547); — Hue province, 2005, Averyanov *et al.*, HAL 8254 (photo, LE 01055531!); — Hue province, 2005, Averyanov *et al.*, HAL 7163 (photo, LE 01055530!); — Quang Nam province, 2011, Averyanov *et al.*, CPC 3574a (photo, LE 01055516!); — Quang Nam province, 2011, Averyanov *et al.*, CPC 3574 (photo, LE 1055518!); — Quang Nam province, 2022, successfully cultivated and flowering in Da Lat, Lam Dong province, Truong Ba Vuong & Ngo Quang Dang, BV 1374 (VNM); — *sine loc.*, 2011, Averyanov, *s.n.* (photo, LE 01073551!).

Note. — *Bulbophyllum tseanum* resembles *B. lepidum* (Figures 2 & 3 B), but could be distinguished by morphological characters presented on Table 1.

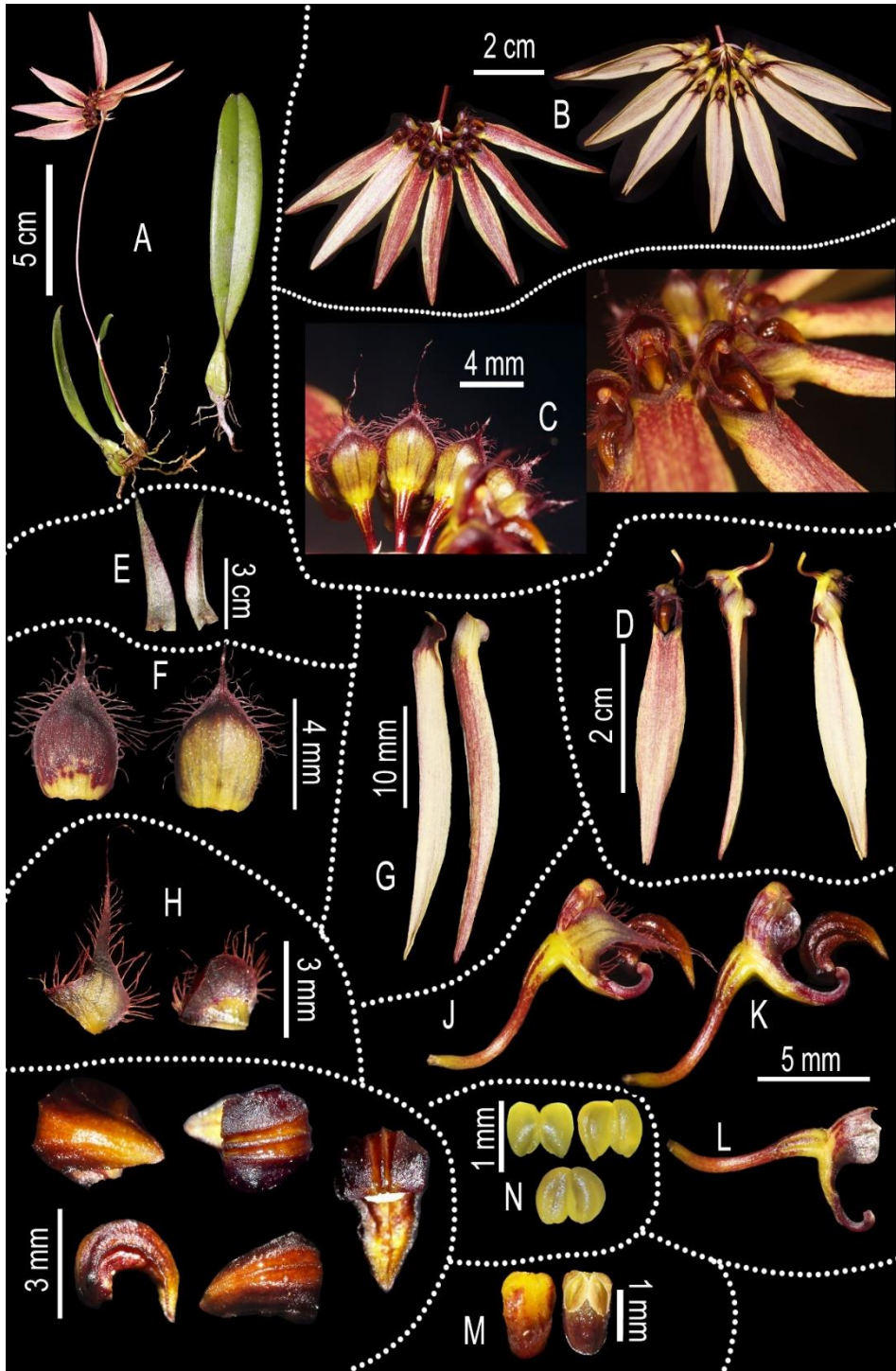


Figure 1. *Bulbophyllum tseanum* (S.Y.Hu & Barretto) Z.H.Tsi.

A. Flowering plant; B. Inflorescence from above and from below. C. Intact flowers, frontal view and view from below. D. Separated flowers, views from different sides. E. Floral bract. F. Dorsal sepal. G. Lateral sepals. H. Petals. I. Lip, views from different sides. J. Pedicel, ovary, column with petals and lip. K. Pedicel, ovary and column with lip. L. Pedicel, ovary and column. M. Anther cap. N. Pollinia. All photos by Truong Ba Vuong from specimen BV 1374.

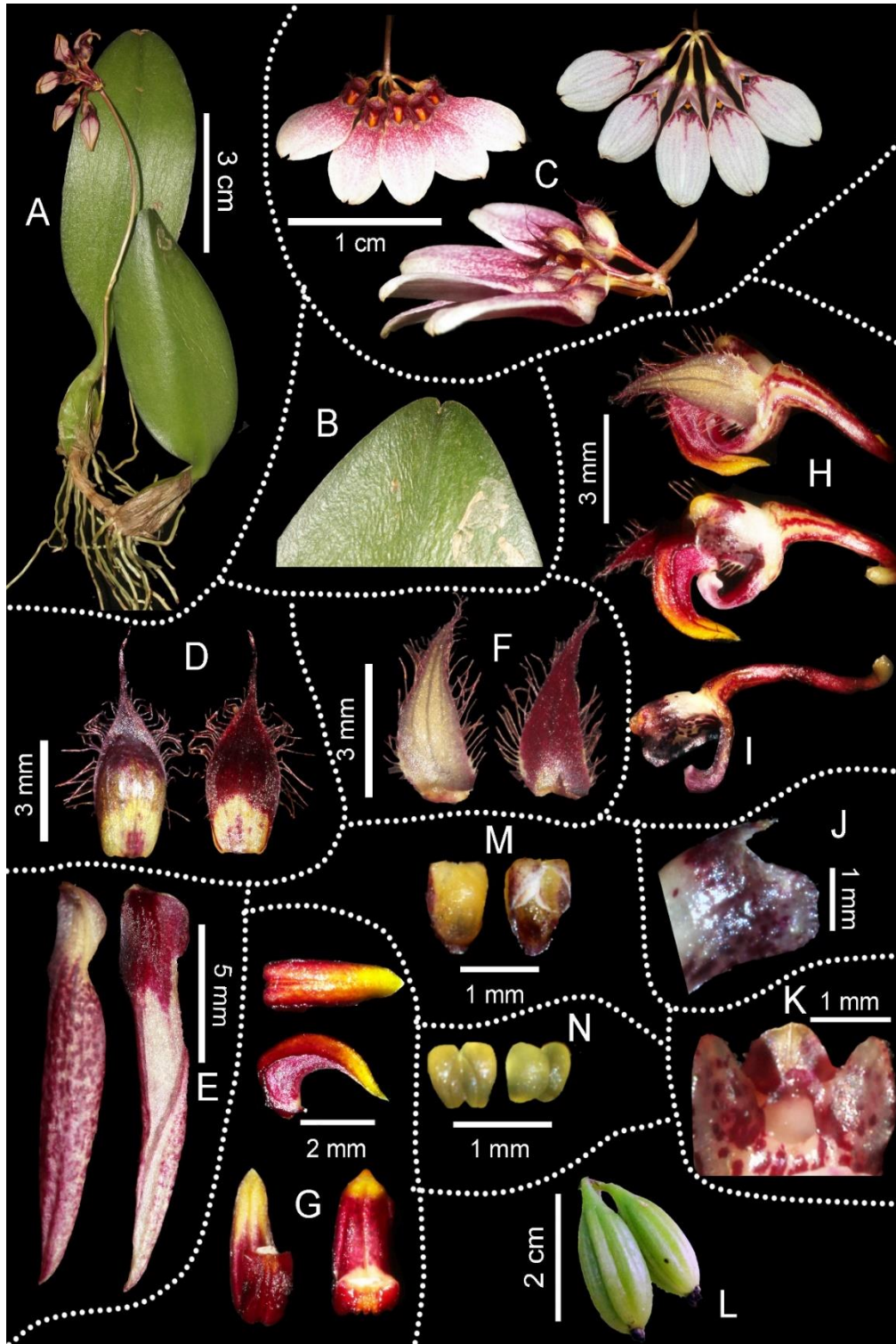


Figure 2. *Bulbophyllum lepidum* (Blume) J.J.Sm.

A. Flowering plant; B. Leaf apex; C. Inflorescence from above, below and side view; D. Dorsal sepal; E. Lateral sepals; F. Petals; G. Lip; H. Column lip and petals; I. Column; J. Stelia; K. Stigma; M. Anther cap; N. Pollinia. L. Fruit (A – N photo by Truong Ba Vuong from BV 1272, (L) photo by Dang Minh Quan)



Figure 3. The inflorescences of *Bulbophyllum*

A. *Bulbophyllum tseanum* (photo from BV 1374). B. *Bulbophyllum lepidum* (photo from BV 1272). All photo by Truong Ba Vuong.

Table 1. Morphological comparison of *Bulbophyllum tseanum* and *B. lepidum*

	<i>B. tseanum</i>	<i>B. lepidum</i>
Dorsal sepal	Broadly ovate	Narrowly ovate
Lateral sepals	Narrowly oblong, 3.5–3.7 cm long, 5–6 mm wide	Oblong, 14–15 mm long, 3–4 mm wide
Petals	Rhombic-ovate, shortly caudate	Narrowly ovate-triangular, attenuate
Column wings	crescent	rounded
Stelidia	Small, but distinct	Hardly visible

4. CONCLUSIONS

The discovery of *B. tseanum* increased the diversity of Vietnam Orchid Flora, but its discovery is not surprising given that the floristic composition of

both South China and Viet Nam has been mentioned by many previous studies and their disjunct distribution. Despite the recent progress in the investigation of *Bulbophyllum* in Viet Nam, its

account is still far from being completed. Further Orchid explorations in the future will reveal additional information not only for the genus *Bulbophyllum*, but also Orchidaceae.

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