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# A new miniature species, *Bulbophyllum nghiasonii*, sect. *Brachyantha* (Orchidaceae) from northern Vietnam

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# Abstract

The new species discovered in Thanh Hoa Province of northern Vietnam described here as a new species for science. It is similar to *B. muscicola* but differs in smaller habit, inflorescence shorter than leaves, shorter lateral sepals with unequally lobed blunt apex, and slender stelidia. The newly described species also can be compared with *B. japonicum* but it differs in the size and shape of leaves, tepals, and lip. Detailed morphological description, illustration, data on distribution, and phenology of the new species are presented.

Keywords: endemism, eastern Indochina, plant diversity, plant taxonomy, Thanh Hoa Province

# Introduction

The plant (HAL 12681, LE01055793 LE 01087158) attributed presently to the new species was firstly reported by Averyanov *et al.* (2012: 127, 141, fig. 2) under the name, *B. muscicola* Rchb.f. (Reichenbach 1872: 55). Initially, it was reported that Vietnamese plant differs from the type in several morphological characters. The detailed investigation of this plant, by the studies of available taxonomic literature (i.e. Reichenbach 1872: 275, Duthie 1902: 38, Lindl. in Wallich 1830: 53, Pearce & Cribb 2002, Averyanov *et al.* 2012) and authentic herbaria presented in databases JSTOR and K revealed that the studied plant represents separate species, which is described and illustrated below as *B. nghiasonii*. Three additional specimens were studied i.e. BV 616, BV 740 and BV 1019.

*Bulbophyllum nghiasonii* belongs to the section *Cirrhopetalum* (Lindley 1830: 58) Rchb.f. (Reichenbach 1861: 259) s.l. Following the concept of Vermeulen *et al.* (2014), it belongs to the section *Brachyantha* Rchb.f. (Reichenbach 1861: 264). This section is characterized by 1 leaved pseudobulbs; subumbellate inflorescence, entire dorsal sepal, lateral sepals with upper margin connate in apical part or free, petals and lip entire. The section includes 26 accepted species originated from India, China, Indochinese Peninsula, Japan, and the Philippines, with the single species in New Guinea (Pridgeon *et al.*, 2014).

# Materials and methods

The measurements and description of *B. nghiasonii* were based on the living plants. Studied voucher specimens and additional alcohol-preserved material are stored at LE and VNM Herbaria. The terminology for the morphological description follows Beentje (2012).

### **Taxonomic treatment**

#### Bulbophyllum sect. Brachyantha Rchb.f.

#### B. nghiasonii Vuong, Aver. & V.S.Dang, sp. nov. (Fig. 1)

Type:—VIETNAM, herbarium prepared from cultivated plant in July 2009 by L. Averyanov, T. Maisak, HAL 12681c.1 originated from Phu Tho Province, Tan Son District, Xuan Son Municipality, Du Village, around point 21°06'57"N104°57'17"E, 16 Feb. 2009, L. Averyanov, P.K. Loc, N.T. Vin, L.T. Son (Holotype, LE 01055793! http://en.herbariumle.ru/?t=occ&id=7690 LE 01087158! http:// en.herbariumle.ru/?t=occ&id=18682).

**Paratypes:**—VIETNAM, Thanh Hoa Province, Quan Son District, Son Ha Commune, Ban Ha Village, forest around Tai Stream, 19 April 2020, *Truong Ba Vuong, Dang Van Son, Bui Van Huong, Dang Minh Quan, BV 616* (VNM00024324!). VIETNAM, herbarium prepared from cultivated plants in 30 May 2020, *Truong Ba Vuong, Dang Van Son, BV 740* (VNM00024325!) originated from Thanh Hoa Province, Quan Son District, Son Ha Commune, Ban Ha Village, forest around Tai Stream. VIETNAM, herbarium prepared from cultivated plants in 18 January 2021, *Truong Ba Vuong, Dang Van Son, BV 1019* (VNM00024329!) originated from Thanh Hoa Province, Quan Son District, Son Ha Commune, Ban Ha Village, forest around Tai Stream. VIETNAM, herbarium prepared from Thanh Hoa Province, Quan Son District, Son Ha Commune, Ban Ha Village, forest around Tai Stream.

**Etymology**:—The species is named after Prof. Hoang Nghia Son, the director of the Institute of Tropical Biology (Vietnam Academy of Science and Technology), who established and supported VNM Herbarium as the significant center for studies of the plant taxonomy.

**Description**:—*Miniature clustering branch epiphyte. Pseudobulbs* ovoid, oblique, 6 mm long, 5 mm in diameter connected by stout rhizome, covered by brownish sheaths. Leaves somewhat fleshy, elliptic to broadly elliptic, 20-22 mm long, 8–10 mm wide, apex slightly apiculate or acute, margin finely erose at apical part; adaxially green, abaxially light green, finely papillose; petiole ca. 1.5 mm long, slightly twisted near the base, articulated with pseudobulb. *Inflorescence* arising from the base of pseudobulb, bearing 2 to 3 flowers opening simultaneously; peduncle erect, ca. 3.5 mm, slightly curved, pale yellowish orange, covered by 3 brownish overlapping sheaths; rachis slender, ca. 7 mm long; floral bracts narrowly triangular, attenuate, ca. 1.5–2 mm long, 0.8–1 mm wide; pedicel and ovary 3–3.5 mm long, pedicel curved. Flowers not widely opening, dorsal sepal orange to pale orange, lateral sepals orange to bright orange-red, petals white, lip orange to pale orange. Dorsal sepal with 3 veins, broadly ovate, ca. 3 mm long, 2 mm wide, apex blunt. Lateral sepals oblong narrowly ovate, 4-4.2 mm long, 1-1.5 mm wide, oblique, apex blunt, upper margin revolute inward and connate in apical part becoming free during anthesis, lower margin connate in basal half. Petals with 3 veins, semi-circular, oblique, 8 mm long, 5 mm wide, apex rounded. Lip ligulate, simple, entire, ca. 2 mm long, 1 mm wide, adnate to column foot with white thin appendage, slightly curved and grooved, abaxially with 2 low keels, apex blunt to almost rounded. *Column* short, ca. 1 mm tall, at front with broadly triangular lateral wings; column foot ca. 1.1 mm long, strongly up-curved; stelidia slender, acute, ca. 0.8 mm long, slightly pointing forward or downward; stigma rectangular, lower margin of stigma with 2 small rounded calli; rostellum white, half-circular, distally rounded, slightly forward protruding; anther cap orange, helmet shaped, ca. 0.5 mm in diameter, finely rugose; pollinia 4, unequally ovoid. Capsule not seen.

**Habitat and Phenology**:—Clustering epiphyte on small mossy trees in primary broad-leaved closed wet forest on very steep rocky slopes and cliffs of low remnant mountains composed with highly eroded solid marble-like limestone at elevation 400–500 m a.s.l. Flowers in April–July, and December.

**Distribution**:—Vietnam (Thanh Hoa and Phu Tho provinces). Endemic.

**Proposed conservation status**:—According to available observations the new species is rare. 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).



**FIGURE 1.** *Bulbophyllum nghiasonii*. A. Flowering plants; B. Leaf apex and portion of leaf abaxial surface with high magnification. C. Inflorescences. D. Flowers, frontal and side views. E. Flower bract. F. Intact flower, frontal and side view. G. Dorsal sepal. H. Lateral sepals. I. Petals. J. Lip views from different sides. K. Pedicel, ovary and column, side view, sepals and lip removed. L. Pedicel, ovary and column, side view. M. Column, frontal and half side views. N. Anther cap, views from different sides. O. Pollinia. Photos by Truong Ba Vuong, correction and design by L. Averyanov and T. Maisak.



FIGURE 2. Bulbophyllum muscicola. Photo by R. Amsler of plant (Amsler 295) originated from India and cultivated under that name Cirrhopetalum hookeri.

Additional specimens studied:—INDIA, Uttarakhand State Tehri Garhwal District "Western Himalaya, Tehu-Garhwal District, about 30 miles E. of Tehu, *Mackinnon, P.W. 25402*" (photos: K000829982!, K000829983!, K000829984!), as *Cirrhopetalum hookeri* (Duthie 1902: 38). INDIA, photo made in 4 August 2013 from plant originated from India and cultivated in Switzerland, *Amsler 295*, under the name *C. hookeri* (Fig. 2); JAPAN, Kagoshima province, Kyushu, 21 May 1968, *Furuse F., 39892* (Photo: L0624949!), as *B. japonicum* 

**Notes**:—The newly described species looks similar to *B. muscicola* and *B. japonicum*, but differs in habit and shape of sepals, petals, and lip. The morphological comparison of *B. nghiasonii* and the related species is presented on the **Table 1.** *Cirrhopetalum hookeri* and *C. wallichii* are considered as synonyms of *B. muscicola* (Averyanov, 2012).

**TABLE 1.** Comparison of morphological characters of *Bulbophyllum nghiasonii B. japonicum* and *B. muscicola* (based onReichenbach 1872: 275, Ohwi 1965: 354, Seidenfaden 1973: 184, Pearce & Cribb 2002, Chen & Vermeulen 2009: 424 (inChen et al.), Lin 2019: 345), Cirrhopetalum hookeri (Duthie 1902: 38), and C. wallichii Lindl. in Wallich (1830: 53).

	B. nghiasonii	B. muscicola	B. japonicum
Pseudobulbs	Ovoid, oblique, 6 mm tall	Ovoid, nearly globular, 15–17 mm tall	Ovoid, 5–10 mm tall
Leaves	Elliptic, 20–22 mm long, 8–10 mm wide	Narrowly lanceolate, oblong, 30–40 mm long, 10–12 mm wide	Narrowly lanceolate, oblong, 30–40 mm long, 5–6.5 mm wide
			continued ont the next page

#### TABLE 1. (Continued)

	B. nghiasonii	B. muscicola	B. japonicum
Inflorescence	Shorter than leaves, ca. 3.5 mm	Equal or exceeding leaves ca. 4–6 cm long	Shorter than leaves, 2.5–3.5 mm long
Dorsal sepal	Broadly ovate, blunt	Ovate, emarginate	Elliptic, obtuse or acute
Lateral sepals	Oblong narrowly ovate, blunt, upper and lower margin connate	Narrowly lanceolate, acute, upper margin connate, lower margin free	Ovate, lanceolate, acuminate, upper and lower margin connate
Petals	Distinctly shorter than dorsal sepal, semi-circular	Equal or little shorter than dorsal sepal, narrowly ovate	Little shorter than dorsal sepal, oblong, or spatulate
Lip	Shallowly furrowed, slightly recurved	Deeply furrowed, recurved	Deeply furrowed, strongly recurved
Stelidia	Slender, forward directed or slightly down curved	Triangular acute, forward directed	Subulate, forward directed

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#### References

Averyanov, L.V. (2012) New Orchid Taxa and Records in the Flora of Vietnam. Taiwania 57 (2): 127-152.

Beentje, H. (2012) The Kew Plant Glossary, an illustrated dictionary of plant terms. Royal Botanic Garden, Kew, Richmond, 164 pp.

Chen, S.C. & Vermeulen, J.J. (2009) *Bulbophyllum* Thouars. *In:* Wu, Z.Y., Raven, P.H. & Hong, D.Y. (Eds.) *Flora of China*, Vol. 25. Science Press, Beijing and Missouri Botanical Garden Press, St. Louis. pp. 404–440.

Duthie, J.F. (1902) Some new species of Orchidaceae. Journal of the Asiatic Society of Bengal 71, part 2. Calcutta.

IUCN Standards and Petitions Subcommittee. (2019) Guidelines for using the IUCN Red List categories and criteria ver. 14. Available from: https://cmsdocs.s3.amazonaws.com/RedListGuidelines.pdf (accessed 15 May 2021)

Lin, T.P. (2019) The Orchid Flora of Taiwan: A Collection of Line Drawings. National Taiwan University Press, 1032 pp.

Lindley, J.D. (1830) Cirrhoptealum wallichii. In: Wallich, N. (Ed.) Plantae Asiaticae Rariores 1. London. 84 pp.

Lindley, J.D. (1830–1840) The genera and species of orchidaceous plants. Ridgways, London, 554 pp. https://doi.org/10.5962/bhl.title.499

Ohwi, J. (1965) *Flora of Japan (in English): A Combined, Much Revised and Extended Translation*. Smith Sonian Institution Press, 1067 pp.

https://doi.org/10.5962/bhl.title.43786

Pearce, N.R. & Cribb, P.J. (2002) *The Orchid of Bhutan*. Royal Botanic Garden Edinburgh & Royal Government of Bhutan. Thimphu, Bhutan.

- Pridgeon, A.M., Cribb, P.J., Chase, M.W. & Rasmussen, F.N. (2014) *Genera orchidacearum* 6. *Epidendroideae* 3. Oxford University Press, Oxford, 544 pp.
- Reichenbach, H.G. (1861) Orchides. In: Mueller, C. (Ed.) Synopsis plantarum phanerogamicarum novarum omnium. Walpers Annales Botanices Systematicae 6: 264.

Reichenbach, H.G. (1861) Subclassis VIII. Gynandrae Endl. Annales botanices systematicae 6: 167–933.

Reichenbach, H.G. (1872) Neue Orchideen. Flora 55: 275.

Seidenfaden, G. (1973). Notes on Cirrhopetalum Lindl. Dansk Botanisk Arkiv 29 (1): 1-264.

Vermeulen, J.J., Schuiteman, A. & De Vogel, E.F. (2014) Nomenclatural changes in *Bulbophyllum* (Orchidaceae; Epidendroideae). *Phytotaxa* 166 (2): 101–113.

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