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New species, Bulbophyllum trongquyetii (Orchidaceae) from Vietnam

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Abstract

Bulbophyllum trongquyetii is described as new for science from Vietnam. Detailed morphological description, illustration, data on distribution, and phenology are provided. Described species resembles *B. nipondhii* but differs in the bigger size of plant, longer inflorescence, and uniform yellow or reddish-orange flowers. It can be also compared with *B. thaiorum* and *B. farreri* but easily distinguished by the bigger size of plant and flowers, as well as smooth or sparsely papillose lateral sepals.

Keywords: Bulbophyllum, endemism, eastern Indochina, plant diversity, plant taxonomy

Introduction

The genus *Bulbophyllum* Thouars (1822, t. 3) is recognized as one of the largest genera of Orchidaceae, comprising over 2200 species, distributed globally in the tropics and subtropics (Chen & Vermeulen 2009, Pridgeon *et al.* 2014). At present, there are 145 species of the genus in 16 sections known from Vietnam, constituting, one of the largest genera in the orchid family in Vietnam (Averyanov & Averyanova 2003, Averyanov *et al.* 2016, Truong & Sridith 2016, Averyanov *et al.* 2017, Nguyen & Averyanov 2017, Averyanov *et al.* 2018, Truong *et al.* 2019a, b, c, Averyanov *et al.* 2019a, b). However, the inventory of *Bulbophyllum* species in Vietnam is far from complete, because of many species are miniature epiphytes, which inhabit canopies of tall trees and difficult to observe or even to collect. Future field researches in remote mountain areas of the country will certainly provide many more new findings.

New species was found on small fallen branches of tall tree in Dak Koi Commune, Kon Ray District, Kon Tum Province and was latter cultivated in the private orchid garden of Mr. Phan Trong Quyet in Da Lat Town (Lam Dong Province, southern Vietnam). During anthesis, it was recognized and described as a species new for science after careful study of available taxonomic literature (list references consulted) and herbarium specimens housed in different Herbaria, i.e. VNM, VNMN, as well as specimen images presented in on-line resources like JSTOR, LE, K and P.

The new species, *B. trongquyetii*, belongs to the section *Cirrhopetalum* (Lindley 1830: 58) Reichenbach (1861: 259), which are usually characterized by 1-leaved pseudobulbs; subumbellate inflorescences arising from the base of pseudobulbs; dorsal sepal free, entire, erose, ciliate, or paleate; lateral sepals much longer than dorsal sepal, twisted at the base and more or less connate along their margins; labellum simple, entire (Pridgeon *et al.* 2014).

Materials and methods

The measurements and description of new species were based on living plants. Voucher specimens and additional alcohol-preserved material are stored at VNM herbarium (ITB – Ho Chi Minh City). Terminology for the morphological description follows Beentje (2012).

Taxonomic treatment

Bulbophyllum trongquyetii Vuong, Aver., R.Amsler, & V.S.Dang, sp. nov. (Figs. 1 & 2)

TYPE:—VIETNAM. 8 March 2020, *Truong Ba Vuong, Nguyen Van Canh, Ngo Quang Dang, BV 546* (holotype VNM00023650!) prepared from plants cultivated by Mr. Phan Trong Quyet in Da Lat Town (Lam Dong Province, southern Vietnam) and originated from Dak Koi Commune, Kon Ray District, Kon Tum Province, southern Vietnam.

Etymology:—The species is named after Mr. Phan Trong Quyet, an orchid enthusiast who cultivated and collected materials used for the preparation of the type specimen.

Description:-Epiphytic herb, rhizomatous, creeping, glabrous. Rhizome rigid, 2 mm in diameter, covered with brown sheaths. *Pseudobulbs* dark green, narrowly ovoid 2.5–2.8 cm long, 1–1.5 cm apart on the rhizome. *Leaves* solitary, narrowly elliptic to elliptic, adaxially green, abaxially dull purple with prominent mid keel, 7-8 cm long, 1.5-2 cm wide, apex retuse to blunt; petiole twisted, 8-10 mm long. Inflorescence subumbellate, peduncle slender, arising from the base of pseudobulbs, bearing 6–10 flowers, ca. 6 cm long, with 2 to 3 tubular acuminate sterile sheaths 4-6 mm long; floral bracts acuminate, 3-4 mm long; pedicel with ovary 8-9 mm long. Flowers uniformly yellow or reddish-orange, opening simultaneously. Dorsal sepal narrowly ovate, ca. 5 mm long, 2 mm wide, concave at base, 3-veined, apex blunt to round, sparsely papillose; lateral sepals glabrous or sparsely papillose, 3.2–3.3 cm long, 2 mm wide (broadest at base), adnate to column foot at the base, twisted, with median keel from base; upper margin connate up to the tip, lower margin connate along 2/3 from the apex. Petals ovate, slightly oblique, 3.7-4 mm long, apex roundish, 3-veined. Lip simple, entire, glabrous, canaliculate, narrowly ovoid to pyramidal, 3–3.5 mm long, 1–1.5 mm wide, apex blunt to obtuse, recurved, margin somewhat revolute at middle; abaxially with 2 low keels running from base to apex. Column (including stelidia) ca. 2 mm tall; upper margin with minute obtuse tooth, frontal margin with insignificant lateral wings, stelidia filiform subulate; column foot upcurved, with 2 insignificant lateral wing at apex; stigma obscurely rectangular; anther cap yellow brown, hemispheric, ca. 0.8 mm in diameter, rough at margin; pollinia 4.

Phenology:—Flowering in March–July.

Habitat:—Epiphyte in canopies of medium-sized and tall trees (mostly species of Fagaceae family) in open mixed forests at elevation 1000–1100 m.

Distribution:—Southern Vietnam, provinces Kon Tum (Kon Ray District) and Quang Nam (Nam Giang District). Endemic.

Additional specimens studied (paratypes):—VIETNAM, Quang Nam Province, Nam Giang District, Song Thanh Nature Reserve, mixed forest, near river, elev. 1070 m. 2.05.2019, *Nuraliev M.S., Kuznetsov A.N., Kuznetsova S.P., 2468* (LE01058722, http://en.herbariumle.ru/?t=occ&id=9375). VIETNAM, Herbarium specimen was prepared in 8 July 2019 by *Truong Ba Vuong, Dang Van Son, Ngo Quang Dang, BV 365* (VNM00023646), from plants cultivated by Mr. Phan Trong Quyet in Da Lat Town (Lam Dong Province, southern Vietnam) and originated from Dak Koi Commune, Kon Ray District, Kon Tum Province, southern Vietnam. VIETNAM, Herbarium specimen was prepared in 25 May 2020 by *Truong Ba Vuong, Ngo Quang Dang, BV 627* (VNM00023884), from plants cultivated by Mr. Ngo Quang Dang in Da Lat City (Lam Dong Province, southern Vietnam) and originated from Dak Koi Commune, Kon Tum Province, Southern Vietnam. VIETNAM, Herbarium specimen was prepared in 6 April 2020 by *Truong Ba Vuong, Ngo Quang Dang, BV 658* (VNM00023645), from plants cultivated by Mr. Phan Trong Quyet in Da Lat City (Lam Dong Province, southern Vietnam) and originated from Dak Koi Commune, Kon Ray District, Kon Tum Province, southern Vietnam. VIETNAM, Herbarium specimen was prepared in 6 April 2020 by *Truong Ba Vuong, Ngo Quang Dang, BV 658* (VNM0023645), from plants cultivated by Mr. Phan Trong Quyet in Da Lat City (Lam Dong Province, southern Vietnam) and originated from Dak Koi Commune, Kon Ray District, Kon Tum Province, southern Vietnam) and originated from Dak Koi Commune, Kon Ray District, Kon Tum Province, Southern Vietnam) and originated from Dak Koi Commune, Kon Ray District, Kon Tum Province, Southern Vietnam, flowers reddish yellow-orange, different color form from type specimen.

Notes:—*Bulbophyllum trongquyetii* is morphologically close to *B. nipondhii* Seidenfaden (1985: 162) (photo LE01087024, http://en.herbariumle.ru/?t=occ&id=18119, LE01087028, http://en.herbariumle.ru/?t=occ&id=18123), but differs in larger petiolate leaves, up to 7.5 cm long, 2 cm wide (vs. sessile leaves, ca. 2.5 cm long, 0.6 cm wide),

longer inflorescence up to 6 cm long (vs. inflorescence 3.5 cm long), floral bract shorter than pedicel with ovary (vs. floral bracts slightly longer pedicel with ovary); lateral sepals 3.3 cm long (vs. lateral sepals 1.8–2 cm long); lip shallowly channeled (vs. deeply channeled); stelidia with small tooth above (vs. stelidia without tooth). In addition, the flowers color in new species is uniformly yellow or reddish-orange (vs. dorsal sepal and petals with purple stripes, lateral sepals and lip purple). New species is also close to B. thaiorum J.J.Smith (1912: 28), studied on the base of following specimens: "no location, s. coll., s. n." (type, K000891066, http://specimens.kew.org/herbarium/K000891066) and "VIETNAM, Kon Tum Province, Ngoc Linh Peak, 07.03.1995, L.V. Averyanov et al., VH 569" (LE01057956, http://en.herbariumle.ru/?t=occ&id=8458, P00362004, https://science.mnhn.fr/institution/mnhn/collection/p/item/ p00362004), but differs in pseudobulbs 2.5–2.8 cm long (vs. pseudobulbs 2 cm long), leaves 7–7.5 cm long, 1.5–2 cm wide (vs. leaves 4 cm long, 0.7–0.8 cm wide), the floral bract 3–4 mm long, twice shorter than pedicel and ovary, pedicel and ovary 8-9 mm long (vs. floral bracts 6-7 mm long, as long as pedicel and ovary or little shorter, pedicel and ovary 6-7 mm long), lateral sepals glabrous or sparsely papillose at base (vs. lateral sepals densely hispidpapillose), lateral sepals ca. 3.3 cm long, connate along their apical third (vs. lateral sepals 2–2.5 cm long, in apical part free). Additionally, the new species bear similarity with B. farreri W.W.Smith (1921: 196) Seidenfaden (1974: 212). Studied specimens: "CHINA, Farrer, R. s.n." (syntype, E00383625, http://data.rbge.org.uk/herb/E00383625), "MYANMAR, 17 May 1914, Kingdon-Ward Francis, 1560" (syntype, E00745700, http://data.rbge.org.uk/herb/ E00745700), "VIETNAM, Lam Dong Province, Da Lat Town area, 12.03.1997, Averyanov L. s.n." (LE01055508, http://en.herbariumle.ru/?t=occ&id=7264, LE01073537, http://en.herbariumle.ru/?t=occ&id=18046), "VIETNAM, Lam Dong Province, Da Lat City, 11 April, 2020, Truong Ba Vuong, Ngo Quang Dang BV 574" (VNM 00023885), "VIETNAM, Lam Dong Province, Da Lat City, 21 April, 2020, Truong Ba Vuong, Ngo Quang Dang BV 659" (VNM 00023647), "VIETNAM, Lam Dong Province, Da Lat City, 5 May, 2020, Truong Ba Vuong, Ngo Quang Dang BV 631" (VNM 00023886), but can be recognized by the lateral sepals glabrous or sparsely papillose (vs. lateral sepals densely papillose), lateral sepals rounded at apex (vs. lateral sepals acute), flowers uniform yellow or reddish-orange (vs. flowers red, orange or brownish). See Table 1.

	B. trongquyetii	B. nipondhii	B. thaiorum	B. farreri
Pseudobulb	2.5–2.8 cm long, narrowly ovoid, distant on 1–1.5 cm	ca. 1 cm long, narrowly ovoid, distant on 1–1.5 cm	ca. 2 cm long, narrowly ovoid, clustering	2.5 cm long, ovoid to orbicular, clustered or distant on 1 cm
Leaves	petiolate, 7.5–8 cm long, 2 cm wide	sessile, ca. 2.5 cm long, 0.6 cm wide	shortly petiolate, ca. 4 cm long, 0.7–0.8 cm wide	petiolate, ca. 7.5 cm long, 2 cm wide
Peduncle	ca. 6 cm	ca. 3.5 cm	ca. 5 cm	ca. 2–9 cm
Floral bract	3–4 mm, shorter than pedicel and ovary	4-5 mm, little longer than pedicel and ovary	6–7 mm, as long as pedicel and ovary or little shorter	ca 1 cm, as long as pedicel and ovary or little shorter
Lateral sepals	3.2–3.3 cm, glabrous or sparsely papillose at base	1.8–2.0 cm, smooth	2–2.5 cm, densely papillose-hispid	ca. 3.5 cm, papillose
Color scheme of flower	all tepals uniform yellow or reddish-orange	Dorsal sepal and petals white or pale purplish with purple stripes, lateral sepals and lip uniform purple	Dorsal sepal and petals pale purple with dark purple stripes, lateral sepals spotted with red-brown	all tepals uniform purple, red or orange

TABLE 1. Morphological comparison of Bulbophyllum trongquyetii, B. nipondhii, B. thaiorum, and B. farreri.

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FIGURE 1. *Bulbophyllum trongquyetii*. A. Flowering plant; B. Leaves; C. Inflorescence at different views; D. Portion of inflorescence; E. Flower, ovary and pedicel at different views; F. Proximal portion of flower at different views; G. Flower with sepals removed, side view; H. Lateral sepals; I. Dorsal sepal; J. Petals; K. Lip at different views; L. Column and ovary at different views; M. Anther cap at different views; N. Pollinia at different views. Photos by Truong Ba Vuong taken from the type specimen; correction and design by L. Averyanov and T. Maisak.



FIGURE 2. Bulbophyllum trongquyetii with reddish yellow-orange color form specimens BV 658 (VNM00023645). Photo by Nguyen Van Canh.

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