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Bulbophyllum sect. *Hirtula* in eastern Indochina

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ABSTRACT: Modern taxonomic revision of *Bulbophyllum* sect *Hirtula* in the flora of eastern Indochina, including Cambodia, Laos and Vietnam based on all available collections and literature data reports 12 species (*Bulbophyllum clipeibulbum*, *B. dasystachys*, *B. glabrichelia*, *B. nigrescens*, *B. nigripetalum*, *B. parviflorum*, *B. penicillium*, *B. phitamii*, *B. scaphiforme*, *B. secundum*, *B. setilabium*, *B. spadiciflorum*), 2 of which represent new records for the studied flora (*B. parviflorum*, *B. penicillium*) and 3 (*Bulbophyllum glabrichelia*, *B. phitamii*, *B. setilabium*) are described as a new for science. For all accepted taxa the paper provides valid name and main synonyms with appropriate standard taxonomic references, data on type and other authentic materials, description, data on ecology, phenology, expected conservation status, distribution, notes on biology and taxonomy, list of all studied materials, as well as key for identification of species and their line and color illustrations.

KEY WORDS: *Bulbophyllum* sect. *Hirtula*, Orchidaceae, Cambodia, Laos, Vietnam, New species, Plant diversity, Plant taxonomy.

INTRODUCTION

Species of the genus *Bulbophyllum* Thouars presently attributed to the section *Hirtula* Ridl. taxonomically represent one of the most difficult groups of Asian orchids due to their rarity in the nature. Additionally, these rare inhabitants of canopies of tall trees of primary tropical forests have small unattractive flowers and are easily overlooked during botanical surveys and floristic inventories. As a result, species of this group scarcely presented in herbaria and living collections. The lack of collections and visual observations create objective difficulties in their inventory and in understanding of their morphology, variation and distribution, hence our knowledge on this group long remained incomplete. It is noteworthy, that available botanical accounts in countries of eastern Indochina including Cambodia, Laos and Vietnam (Gagnepain, Guillaumin, 1932; Seidenfaden, 1979; Seidenfaden, 1992; Averyanov, 1990, 1994; Ho, 2000; Averyanov, Averyanova, 2003; Ban, Averyanov, Huyen, 2005; Newman *et al.*, 2007; Schuiteman *et al.*, 2008) listed only 3 to 4 species for the *Hirtula* section. Last highly professional monographic revision of the section (Vermeulen, 2002) documented 5 verified species occurring in eastern Indochina.

Present investigation is based on studies of modern botanical collections obtained in extensive fieldworks mainly during last decade. It reports twelve species (*Bulbophyllum clipeibulbum*, *B. dasystachys*, *B. glabrichelia*, *B. nigrescens*, *B. nigripetalum*, *B. parviflorum*, *B. penicillium*, *B. phitamii*, *B. scaphiforme*, *B. secundum*, *B. setilabium*, *B. spadiciflorum*), two of which represent new records for countries of eastern Indochina (*B. parviflorum*, *B. penicillium*) and three (*Bulbophyllum glabrichelia*, *B. phitamii*, *B. setilabium*) are described as a new for science.

The paper represents standard modern taxonomic assessment based on all available collections and literature data, and includes valid name and main synonyms for all accepted taxa with appropriate standard taxonomic references, data on type and other authentic materials, description, data on ecology, phenology, expected conservation status, distribution, notes on biology and taxonomy, list of all studied materials, as well as key for identification of species and their line and color illustrations.

MATERIALS AND METHODS

Studied herbarium and alcohol fixed specimens were collected in the field and in private collections mostly during 2005–2015. A number of previously gathered herbarium collections housed in various Herbaria, mainly in HN, LE and P, also were used in this investigation. Fresh flowers and inflorescences from living plants were fixed and stored in 60% ethanol. Measurements of the floral parts for the descriptions were made on both

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herbarium and liquid-fixed materials. Fresh flowers and their fleshy parts shrink up to 10–15% in size during the drying process of making herbarium specimens. In describing quantitative characters, infrequent extreme values (i.e. rarely occurring minimal and maximal values) of a variation range are parenthesized respectively before and after the normal variation range.

TAXONOMIC TREATMENT

Bulbophyllum Thouars sect. ***Hirtula*** Ridl., 1908, Mat. Fl. Mal. Penins. 1: 68; J.J. Verm., 1991, Orch. Borneo 2: 231; id., 2002, Gard. Bull. Singapore 54: 26; Garay *et al.*, 1994, Nordic J. Bot. 14: 628. **Lectotype**: *Bulbophyllum hirtulum* Ridl. (Vermeulen, 2002: 26).

= *B.* sect. *Barbula* J.J. Sm., 1932, Repert. Spec. Nov. Regni Veg. 32: 328. Type: *Bulbophyllum trichoglottis* Ridl. (= *B. hirtulum* Ridl.).

Epiphytic or lithophytic perennial herbs with creeping plagiotropic rhizome and orthotropic 1-leaved subglobular or oblate pseudobulbs. Inflorescence many flowered raceme or spike, often with swollen rachis. Flowers usually spirally arranged or secund. Sepals and petals free, ciliate or hairy. Lip fleshy, often shallowly grooved, glabrous or hairy, recurved, moveable, at the base with inconspicuous, retrorse auricles. Column with protruding stigma, distinct column foot and stelidia. Anther cap simple, glabrous or finely papillose, ciliate at front. Pollinia 4, paired, stipe absent. **Figs. 2 & 3.**

41 species. Nepal, Bhutan, NE. India, Myanmar, S. China, Thailand, Peninsular Malaysia, Sumatra, Java, Borneo, Sulawesi, Philippines, New Guinea. In eastern Indochina 12 species: Vietnam - 11, Laos - 3, Cambodia - 1. **Fig. 1.**

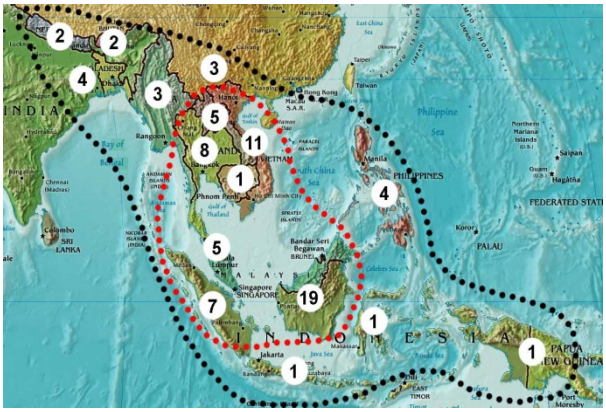
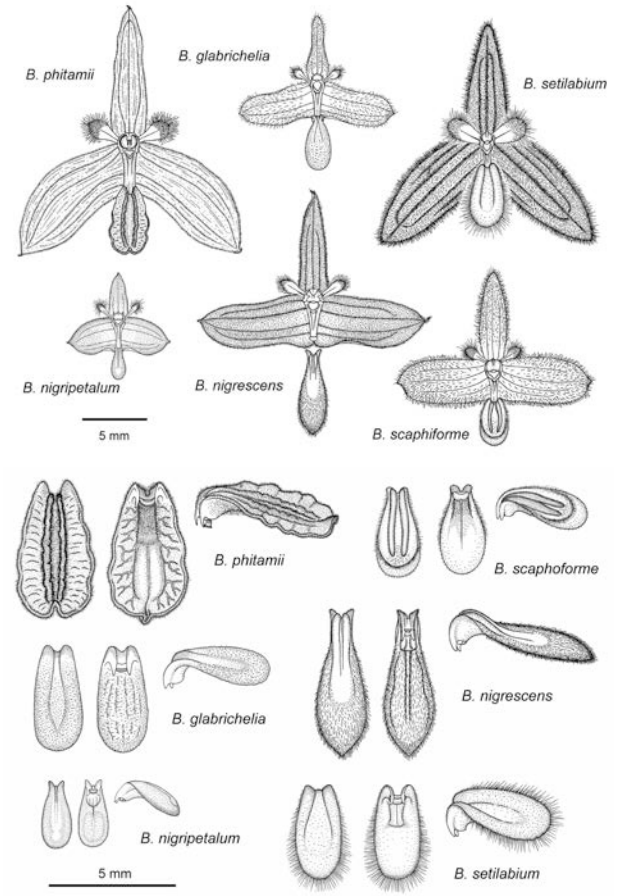


Fig. 1. Geographic area of ***Bulbophyllum*** Thouars sect. ***Hirtula*** Ridl. Black dotted line indicates general area of distribution; red dotted line indicates area of highest diversity of the section; black figures placed in white rounds indicate number of species known in appropriate countries (Nepal - 2, Bhutan - 2, NE. India - 4, S. China - 3, Myanmar - 3, Thailand - 8, Laos - 5, Cambodia - 1, Vietnam - 11, Malacca - 5, Sumatra - 7, Java - 1, Borneo - 19, Sulawesi - 1, Philippines - 4 and New Guinea - 1 species).



Figs. 2 & 3. Comparative floral morphology of species ***Bulbophyllum*** Thouars sect. *Hirtula* Ridl.

Key to species of *Bulbophyllum* sect. *Hirtula*

1a. Rachis spadix- or spindle shaped, swollen, fleshy, distinctly thicker than peduncle ……..…… 2
1b. Rachis not swollen and fleshy as thick as the peduncle ……4
2a. Pseudobulbs flat, discoid, 3-5 cm in diam .... 1. ***B. clipeibulbum***
2b. Pseudobulbs ovoid or subglobular less than 3 cm across ……3
3a. Inflorescence 9-20 cm long, with 16-20 flowers, erect to suberect; floral bracts narrowly triangular, 5-11 mm long, as long as ovary; flowers widely opening; sepals 11-15 mm long ... 7. ***B. penicillium***
3b. Inflorescence 20-50 cm long, many-flowered, pendulous; floral bracts broadly triangular, 1.5-2 mm long, twice shorter than ovary; flowers not widely opening; sepals 3-4 mm long . ***B. spadiciflorum***
4a. Inflorescence 6-15 cm long; sepals adaxially glabrous or finely papillose, sometime sparsely ciliate along margin …… 5
4b. Inflorescence (15)20-60 cm long; sepals adaxially partly or entirely hairy …….. 6
5a. Pseudobulbs distant on 2-10 cm ……. 6. ***B. parviflorum***
5b. Pseudobulbs distant on 0.5-1.8 cm . ……... 10. ***B. secundum***
6a. Rachis, pedicel, ovary, and abaxial surface of sepals densely hispid with short, stiff hairs …….. 2. ***B. dasystachys***
6b. Rachis, pedicel, ovary and abaxial surface of sepals glabrous ……..…… 7
7a. Lip pouch-shaped, deeply concave on the adaxial side …… ……. 9. ***B. scaphiforme***
7b. Lip convex, flat of hardly concave near the base on the adaxial side …….. 8
8a. Lip glabrous, rarely with few sparse hairs near base . ……. ……..... 3. ***B. glabrichelia***
8b. Lip hairy ……..... 9

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9a. Lip almost flat, with thickened margin and 2 prominent fleshy keels running from base to lip apex; lip apex often in form of up curved fold …..…….. 8. ***B. phitamii***
9b. Lip spindle shaped or ovoid, convex adaxially, shallowly grooved to the base, with no keels at the middle and apical part; lip fleshy, obtuse or round …..…….. 10
10a. Flowers 5-7 mm across; sepals 3-4 mm long; lip 2.5-3 mm long ……..... 5. ***B. nigripetalum***
10b. Flowers 12-15 mm across; sepals 7.5-11 mm long; lip 3.4-6.5 mm long …..…….... 11
11a. Lip spindle shaped 5.5-6.5 mm long, entirely hairy with soft wavy hairs; sepals 7.5-9 mm long …….. *4.* ***B. nigrescens***
11b. Lip ovoid to oblong ovoid 3.4-4.2 mm long, hairy along margin with stiff straight hairs; sepals 9-11 mm long ….. 11. ***B. setilabium***

1. ***B. clipeibulbum*** J.J. Verm., 2001, Malayan Orch. Rev. 35: 51; id., 2002, Gard. Bull. Singapore 54: 44, fig. 14, pl. 8; Aver. et Averyanova, 2003, Updated Checklist Orch. Viet.: 14. **Fig. 4A-D.**

Described on the basis of cultivated specimens of unknown origin. **Type** ("Hort. Salzburg *OR 637/94*") – SZU (holotype), SING (isotype).

Description. Creeping epiphyte with simple or few branching rhizome to 1.5 m long, (4)5-6(7) mm diam., with pseudobulbs touching each other or distant to 5 cm apart. Pseudobulbs flattened, discoid, (0.8)1-1.5(1.8) cm tall, (2.5)3-5(6) cm diam. Leaves distinctly petiolate; petiole (3)4-6(7)cm long, terete, (3)3.5-4(4.5) mm diam.; leaf blade oblong elliptic, (12)14-22(24) cm long, (2.5)3-4(5) cm wide, acute. Inflorescence many-flowered, spadix shaped, lax pendulous raceme to 60 cm long; scape (8)10-16(20) cm long; rachis spindle-shaped, (18)20-35(40) cm long, (6)7-10(11) mm in diam., finely papillose rugose. Floral bracts narrowly triangular, falcate, 4-5 mm long, 1-1.5 mm wide, acute. Flowers not broadly opening, several opening at one time. Pedicel and ovary obconoid, (1.5)2-3(3.5) mm long. Sepals glabrous, subsimilar, linear filiform, finely ciliate along margin, straight or recurved, (8)9-11(11.5) mm long, broadening to 2-3 mm at the base, lateral sepals at the base oblique. Petals rectangular ovate, (0.9)1-1.2(1.3) mm long, (0.9)1(1.1) mm wide, obtuse, long ciliate along margin, surface glabrous. Lip recurved, abruptly narrowed from concave basal part 1-1.2 mm wide, into gradually tapering almost linear apical part (4.8)5-6(6.5) mm long, dense hairy along margins with soft, long, wavy hairs. Column (0.9)1-1.1(1.2) mm tall and wide; stigma slightly protruding; stelidia filiform, 1-1.2 mm long, with swelling, globular apex, with inconspicuous, rounded wing along frontal margin. Anther cap helmet shaped 0.4-0.5 mm in diam., papillose, at front with bunch of many stiff hairs. Fruit obovoid to subglobular capsule 8-10 mm long.

Habitat, phenology and conservation status. Creeping trunk and branch epiphyte. Primary broad-leaved and coniferous evergreen shady humid montane forests on granite, often with *Pinus dalatensis*, *P. krempfii*, *Fokienia hodginsii*, *Dacrydium elatum* and *Dacrycarpus imbricatus.* 800–1500 m. Fl. May, December. Rare. Tentatively estimated IUCN Red List status - EN.

Distribution. Vietnam: Chu Yang Sing and Hon Ba Mountains in Dak Lak (Krong Bong district) and Khanh Hoa (Khanh Le district) provinces.

Notes. It is one of the most distinguished local endemic of the southern Vietnam in limits of South Annamese floristic province of the Indochinese floristic region (Averyanov *et al.*, 2003) easily recognized for its curious discoid almost flat pseudobulbs to 5 cm in diameter.

Studied specimens. **VIETNAM**: S. Vietnam, Dak Lac province, Krong Bong district, Cu Pui municipality, elevation from Dak Tour village (12°30'N, 108°30'E) to main peak of Chu Yang Sinh Mt system (12°24'N, 108°26'E) along Dak Tour river by N slope, primary closed wet broad-leaved and mixed forest on steep granite slopes at elevation 1450 m a.s.l., creeping epiphyte on tall trees, inflorescence fleshy up to 0.6 m long, flowers dirty brown-purplish, not common, 7 May 2000, *L.Averyanov, N.T.Hiep, N.Q.Hieu et al., VH 6256* (HN, LE, MO). S. Vietnam., Dak Lak province, Chu Yang Sinh Mt., evergreen forest, 26 April 2015, *Nguyen Van Canh, L.Averyanov, T.Maisak, AL 21* (LE). S. Vietnam, Khanh Hoa province, Khanh Le district, about 8 km from Khanh Le village to the W along Lieng Ly river at 850 m a.s.l., open primary evergreen mountain forest on river side granite slopes above waterfall, epiphyte in shady place, rare, 15 December 1995, *L.Averyanov, N.T.Hiep, VH 2483b* (LE). S. Vietnam, Khanh Hoa province, Hon Ba Mountains, *T.B.Vuong* photo, 27 May 2014 (LE - photo).

2. ***B. dasystachys*** J.J. Verm., Thavipoke et Phelps, 2014, Phytotaxa 184, 1: 14, figs. 4–7. **Fig. 4E-J.**

Type prepared from plants of unknown origin received from street market in Thailand. **Type** ("*Vermeulen 3144, cult. Christiansen*") – L (holotype), BKF (isotype).

Description. Short creeping or clustering trunk or branch epiphyte. Rhizome rigid, semi-woody, 2–3 mm in diam., with close pseudobulbs, touching each other. Pseudobulbs green, broadly ovoid to ovoid oblate, (0.8)1–1.2(1.5) cm in diam., 0.8–1(1.2) cm tall. Leaf obscurely petiolate; leaf blade coriaceous, narrowly oblanceolate, 8–12 cm long, 1.5–2.2 cm wide, tapering into terete, shallowly grooved petiole-like base. Inflorescence erect or somewhat patent, long stalked, lax, many flowered secund raceme to 60 cm tall; peduncle to 40 cm long, straight, light greenish, with few small sterile papyraceous scales at the base, naked above; rachis to 20 cm long, densely papillose, apically slightly curved, with few flowers opening simultaneously. Floral bracts papillose, brownish, narrowly triangular, acuminate, (5)6–7 mm long, 0.8-1.2 mm wide. Pedicel and ovary 2-4 mm long, terete, densely papillose. Flowers spirally arranged, nodding, turned on one side, widely opening, 5-6 mm across. Sepals subsimilar, olive-brown to dark brown, densely hairy with long soft hairs, spreading, narrowly triangular-ovate, obtuse, 2.5-3 mm long, 1.8-2 mm wide. Petals triangular narrowly ovate, obtuse, green to brownish, 0.8-1 mm long, 0.5-0.6 mm wide, ciliate at apex. Lip dull brown-purple with greenish glabrous spot on epichile, fleshy, narrowly oblong obovate, 1.8-2 mm long, 1-1.2

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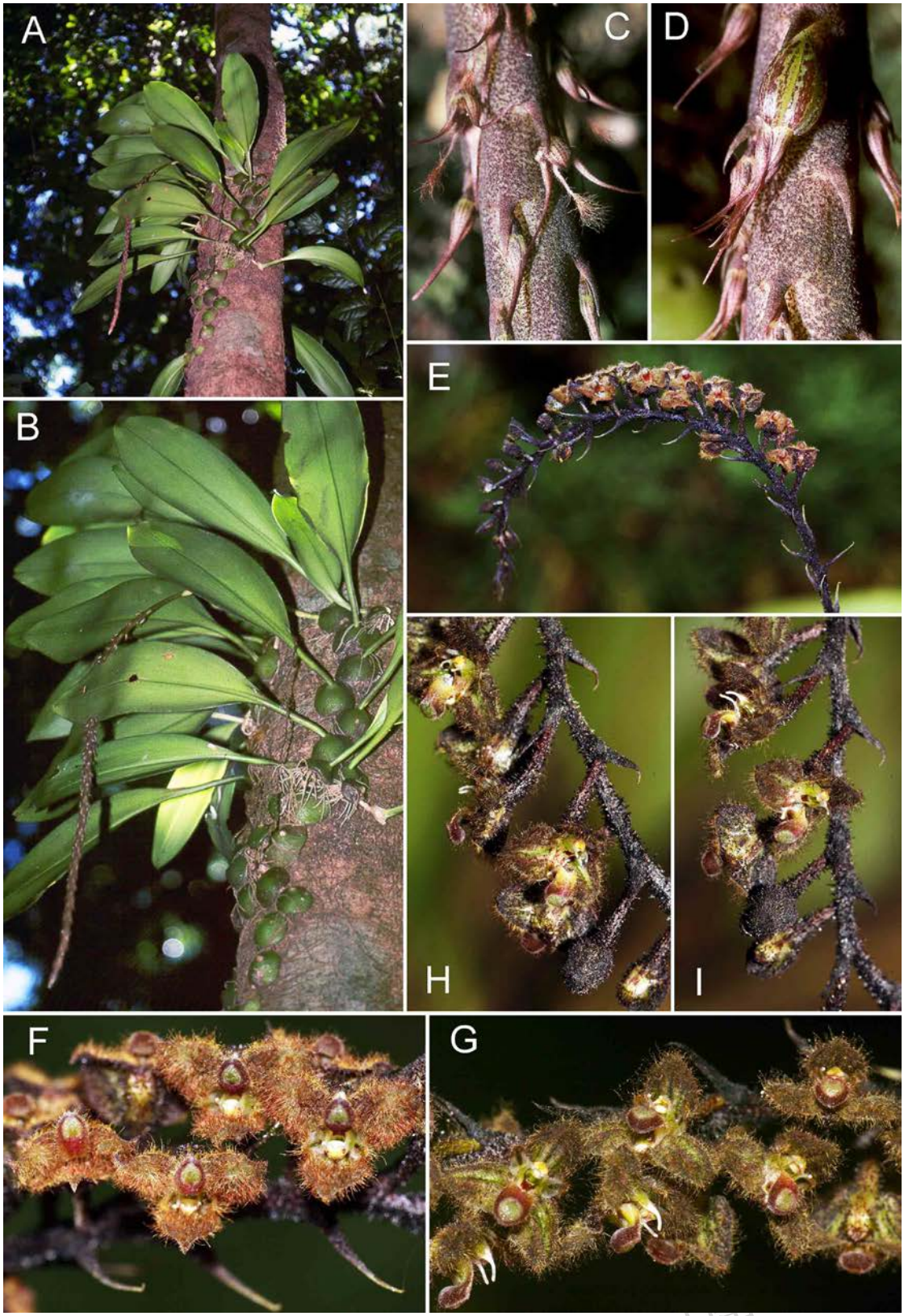


Fig. 4. ***Bulbophyllum clipeibulbum*** J.J. Verm. (A-D - *L.Averyanov, N.T.Hiep, N.Q.Hieu et al.*, *VH 6256*). ***B. dasystachys*** J.J. Verm., Thavipoke et Phelps (E-F - *Nghiem Xoan Son, L.Averyanov, T.Maisak, AL 96*; G - *Le Van Thanh, s.n.*; H-I - *L.Averyanov, s.n.*). All photos by L. Averyanov.

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mm wide, recurved near the base, rounded at apex, hirsute, long ciliate along the margin, at the base with 2 down directed, triangular dents. Column light greenish, shortly cylindric, 1.5-1.6 mm tall, with large, forward curved, subulate, apically swollen white stelidia 0.8-1 mm long; operculum yellow, hemispheric, finely papillose, 0.5-0.6 mm in diam.

Habitat, phenology and conservation status. Creeping branch epiphyte. Primary broad-leaved evergreen submontane forests. (700)1000–1200 m. Fl. March, November – January. Very rare. Tentatively estimated IUCN Red List status – DD.

Distribution. Vietnam: Dak Lak (Chu Yang Sing Mountains), Khanh Hoa (Hon Ba Mountains) and Lam Dong (Bidoup Mountains; Dalat City area; Dam Rong district) provinces. Thailand.

Notes. This species is most similar to *B. lindleyanum* Griff., widely distributed in India, Myanmar and northern Thailand. However, it distinctly differs in character of floral indumentum, long inflorescence, twice smaller flowers and lip glabrous adaxially. It is very rare epiphytic plant with small, unattractive flowers difficult for observation hence species distribution remains unclear. Vietnamese plants differ from few earlier collections made in Thailand (Vermeulen, 2002) in smaller pseudobulbs, smaller leaves, much longer inflorescence and rachis, smaller flowers and other numerical features. Studied plants (description of which is presented here) surely represent eastern race of the species, which may desire rank of separate variety.

Studied specimens. **VIETNAM**: S. Vietnam, Dak Lak province, December 2014, *Nguyen Van Canh, s.n.* (LE - photo). S. Vietnam, Dak Lak province, Chu Yang Sing, Dak Ning forest, 1000 m, March 2014, *Nguyen Van Canh, s.n.* (LE - photo). S. Vietnam, Khanh Hoa province, Nha Trang City district, Hon Ba Mountains, 15 January 2015, *Truong Ba Vuong, s.n.* (LE - photo). S. Vietnam, Lam Dong province, Dalat City area, 7 December 2014, private collection, *L.Averyanov, s.n.* (LE - photo). S. Vietnam, Lam Dong province, Bidoup Mountains, Flowers light brown-gray, lip reddish-brown with dull greenish central spot, 26 November 2015, *Nghiem Xoan Son, L.Averyanov, T.Maisak, AL 96* (LE, LE - photo). S. Vietnam, Lam Dong province, Dalat City area, wild collected plant in private collection, 3 December 2015, *Le Van Thanh, s.n.* (LE - photo). S. Vietnam, Lam Dong province, Dam Rong district, primary evergreen forest at elev. 1100-1200 m a.s.l., 4 December 2015, *Nguyen Phi Tam, L.Averyanov, T.Maisak, AL 146* (LE).

3. ***B. glabrichelia*** Aver., ***sp. nov.*** **Fig. 5 & 6**

Described from NE. Laos ("Houaphan province, Hem district, Na Puok village, Pu Tham Nhon Mountain around point 20°10'00.0"N 103°24'37.0"E, primary and secondary broad-leaved evergreen dry forest on very steep rocky mountain slopes composed by solid marble-like highly eroded limestone at elev. 1050–1150 m a.s.l., epiphyte on mossy tree in shady place near mountain top, common"). **Type** ("11 April 2015, *N.T.Hiep, L.Averyanov, N.S.Khang, N.Q.Hieu, T.Maisak, Pheng Phengsintham, LA-VN 1321a*") - LE (holotype), FOF, HNL (isotypes).

Description. Short creeping or clustering trunk or branch epiphyte. Rhizome rigid, semi-woody, (2)2.5–3(3.5) mm in diam., with close pseudobulbs touching each other. Pseudobulbs dull greenish, depressed-conical, flattened, (0.8)1–1.5(2) cm in diam., (0.8)1–1.2(1.5) cm tall. Leaf obscurely petiolate; leaf blade rather thick or coriaceous, narrowly oblanceolate to oblanceolate, (8)10–15(18) cm long, (0.6)0.8–1.4(1.6) cm wide, tapering into terete, shallowly grooved petiole-like base, 1.5–2.5 cm long, at apex obtuse, rounded or obscurely bilobed. Inflorescence erect or somewhat patent, long stalked, subdense, many flowered secund raceme to 30(35) cm tall; peduncle (12)14–18(20) cm long, straight, light greenish, with few small sterile papyraceous scales at the base, naked above; rachis (6)8–12(14) cm long, glabrous, somewhat glaucous, straight or slightly curved, with almost all flowers opening simultaneously. Floral bracts light yellowish-brown, scarious or papyraceous, narrowly triangular, acuminate, (1.5)1.8–2.2(2.5) mm long, (0.6)0.8-1(1.2) mm wide. Pedicel and ovary (4.5)5-6(8) mm long, ovary obconical, (0.6)0.8-1(1.2) mm in diam. near flower base. Flowers spirally arranged, nodding, turned on one side, not widely opening, 0.8-1 cm across. Sepals white or light yellowish, heavily spotted and striped with blackish-purple to almost entirely black-purple, spreading, narrowly triangular-ovate, (5.5)6-7(7.5) mm long, lateral sepals (2.6)2.8-3.2(3.4) mm wide, median sepal twice narrower, all sepals obtuse, sometimes very shortly apiculate, dorsally glabrous, adaxially densely pubescent throughout with long hairs. Petals almost black, obpyriform spatulate, (1.2)1.4-1.8(2) mm long, (0.6)0.8-1(1.2) mm wide, attenuate at the base, broadening and thickening to the triangular, obtuse apex, pubescent throughout and long ciliate along margin. Lip white or greenish-white, in apical half dull black-purple, fleshy, narrowly oblong obovate, (5)5.5-6(6.5) mm long, 2-2.2(2.4) mm wide, recurved near the base, when fresh with broad shallow groove, adaxially rather flattened, irregularly rugose, without keels or ridges, entirely glabrous or finely shortly hairy near the base, rounded at apex, when dry with prominent branching longitudinal veins, at the base with 2 down directed, narrowly triangular acute dents. Column white, shortly cylindric, 1-1.2 mm tall, with little protruding stigma and small triangular, acute stelidia; operculum light yellowish, hemispheric, 0.5-0.6 mm in diam.

Etymology. Species epithet refers entirely glabrous lip.

Habitat, phenology and conservation status. Short creeping to clustering trunk epiphyte. Primary and secondary broad-leaved evergreen submontane forests on rocky solid marble-like highly eroded limestone, particularly on mossy trees on mountain tops. 950–1450 m. Fl. March – May. Locally common. Tentatively estimated IUCN Red List status - DD.

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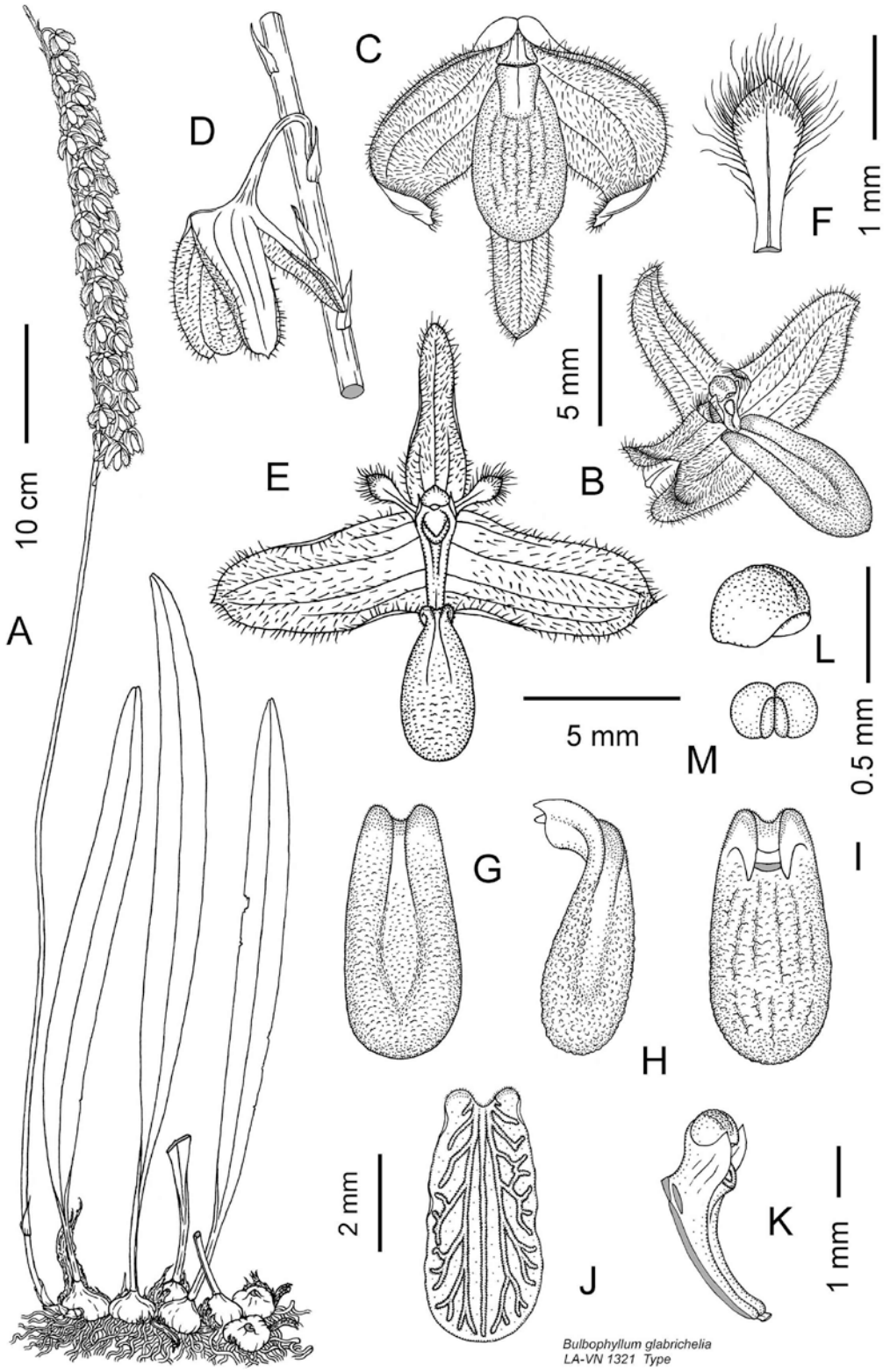


Fig. 5. ***Bulbophyllum glabrichelia*** Aver. **A** - Flowering plant. **B, C** - Flowers, views from below and from above. **D** - Flower, side view. **E** - Flattened flower. **F** - Petal. **G**–**I** - Fresh lip, frontal view, side view and view from behind. **J** - Dry, herbarized lip, frontal view. **K** - Column, side view. **L** - Operculum, half side views. **M** - Pollinarium, frontal view. All drawn from the type - *LA-VN 1321* by L. Averyanov.

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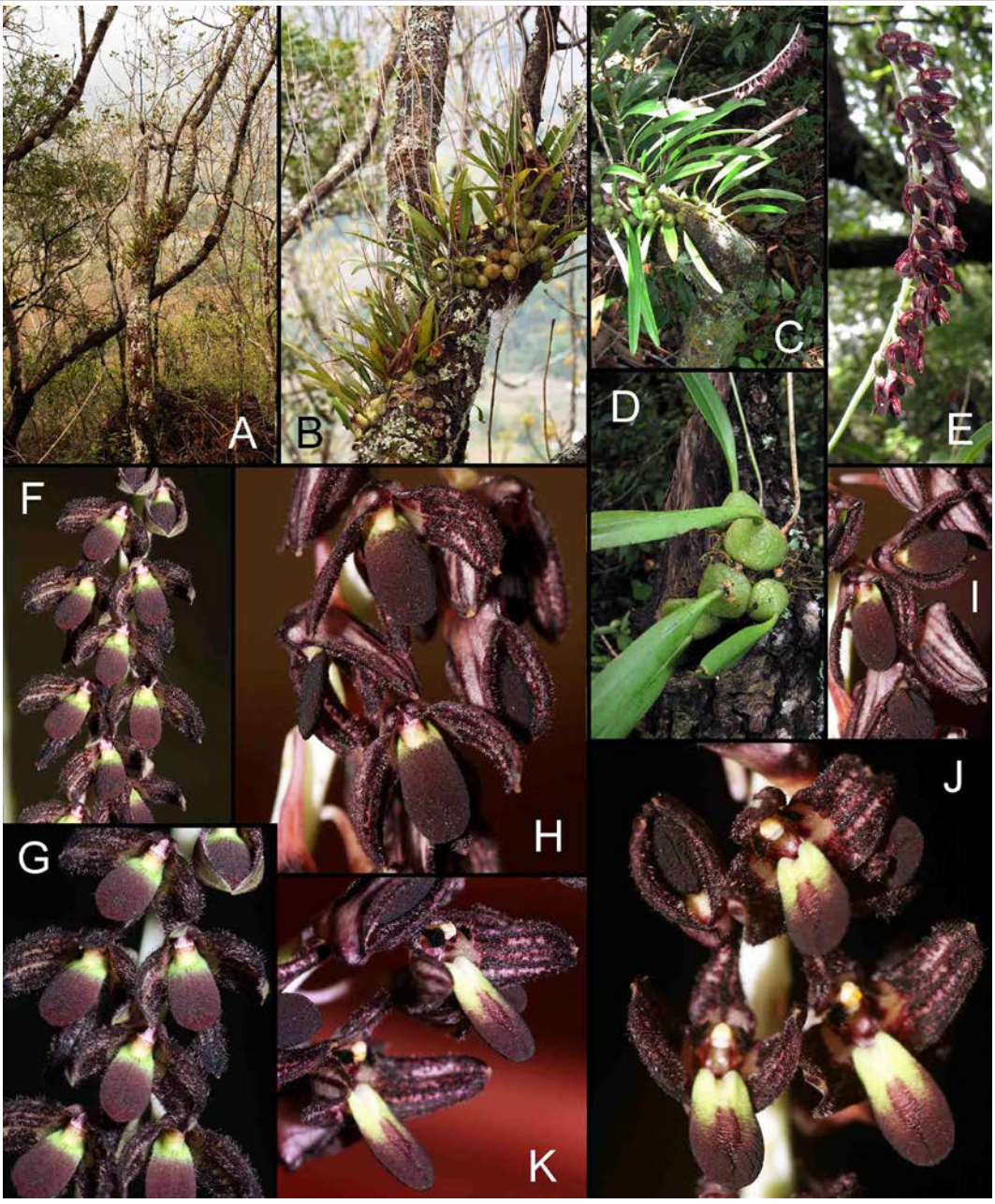


Fig. 6. ***Bulbophyllum glabrichelia*** Aver. (A, B, F, G - *L.Averyanov et al., CPC 2137*; C–E, H-K -- *N.T.Hiep et al., LA-VN 1321a*). Photos by L. Averyanov (A, B, F, G, H–K) and K.S. Nguyen (C–E).

Distribution. Laos: Houaphan (Hem district, Na Puok village, Pu Tham Nhon Mountain), Vietnam: Dien Bien (Dien Bien and Tua Chua districts).

Notes. This species resembles *B. nigrescens* Rolfe distributed in northern Thailand, Yunnan, northern Laos (Phongsali) and northwestern Vietnam, but distinctly differs in broad (not subterete), entirely glabrous lip, which being dry exhibits characteristically branched lateral veins (Fig. 5J) newer seen in *B. nigrescens*. In their vegetative habit, both species are very similar.

Studied specimens (paratypes). **VIETNAM**: S. Vietnam, Dien Bien province, Dien Bien district, Na U municipality, Ca Hau village, around point 21°13'08"N 102°57'14"E, primary closed evergreen broad-leaved submontane forest on rocky crystalline marble-like rocky limestone at elevation 950-1000 m a.s.l., 4 April 2011, *L.Averyanov, P.K.Loc, N.Q.Hieu, N.T.Vinh, CPC 1913a* (LE – photo). S. Vietnam, Dien Bien province, Tua Chua district, Trung Thu municipality, Trung Thu village, around point 21°55’38”N 103°18'05"E, primary evergreen broad-leaved forest on very steep slopes and along remnant ridge composed with solid limestone at elevation 1350-1450 m a.s.l., epiphyte on old mossy tree, flowers nearly black, very common, 10 April 2011, *L.Averyanov, P.K.Loc, N.Q.Hieu, N.T.Vinh, CPC 2137* (LE – photo).

臺灣大學學術期刊資訊網

4. ***B. nigrescens*** Rolfe, 1910, Bull. Misc. Inform. Kew 1910: 158; Gagnep., 1933, Fl. Gen. Indo-Chine 6, 3: 276; Seidenf., 1979, Dansk Bot. Ark., 33, 3: 105, fig. 64, p.p.; id., 1992, Opera Bot., 114: 268, p.p.; Aver., 1994, Ident. Guide Vietnam. Orch.: 254; id., 1990, Vasc. Pl. Synopsis Viet. Fl.: 38; Tran Hop, 1998, Orch. Vietnam: 113, fig. 46 (not pl. 30); Chen Sing-chi *et al.*, 1999, Native Orch. China: 35, p.p.; P.H. Ho, 2000, Ill. Fl. Vietnam 3: 848, fig. 11143; J.J. Verm., 2002, Gard. Bull. Singapore 54: 89, p.p., quoad pl. 27; Aver. et Averyanova, 2003, Updated Checklist Orch. Viet.: 16; Ban, Averyanov, Huyen, 2005, Conspectus Vasc. Pl. Vietnam: 530; Schuit. *et al.*, 2008, Nord. Journ. Bot., 26: 269; Chen Sing-chi, J.J. Verm., 2009, Fl. China, 25: 421. - *B. anguste-ellipticum* Seidenf., 1981, Nordic J. Bot. 1: 209. **Figs. 7 & 8.**

Described from NW. Thailand ("SIAM. Near Chiengmai … Sent for determination from the Botanic Garden, Trinity College, Dublin, by Dr. H. H. Dixon, in May, 1919"). **Lectotype** ("A. Kerr, 84") - K [K000829097], here designated. **Syntypes** ("A. Kerr, 84") – K [K000597306, K000829096].

Description. Short creeping or clustering trunk or branch epiphyte. Rhizome rigid, semi-woody, (2)2.5–3(3.5) mm in diam., with close pseudobulbs, usually touching each other. Pseudobulbs dull greenish, depressed-conical, flattened, (0.8)1–1.6(2) cm in diam., (0.6)0.8–1(1.2) cm tall. Leaf obscurely petiolate; leaf blade coriaceous, lanceolate, (5)6–12(15) cm long, (0.8)1–1.4(1.6) cm wide, tapering into short terete, shallowly grooved petiole-like base, 0.5-1 cm long, obtuse. Inflorescence erect or suberect, long stalked, lax, many flowered secund raceme (16)18-40(45) cm tall; peduncle (10)12–25(30) cm long, straight, glaucous light greenish, with 3-4 (5) small sterile papyraceous scales at the base and (3)4-5 small scarious bracts distant on scape; rachis (4.5)5–12(14) cm long, glabrous, straight or slightly curved, with many to all flowers opening simultaneously. Floral bracts light dull yellowish, papyraceous, narrowly triangular, acuminate, (3)4–5(5.5) mm long, (0.6)0.8-1(1.2) mm wide. Pedicel and ovary (4)4.5-6(7) mm long, ovary obconical, (0.6)0.8-1(1.2) mm in diam. near flower base. Flowers spirally arranged, nodding, turned on one side, not widely opening, 1.2-1.5 cm across. Sepals dull yellowish-green, more or less heavily spotted and striped with brown-purple, spreading, narrowly oblong ovate, (7.5)8-8.5(9) mm long, lateral sepals (3)3.2-3.5(3.8) mm wide, median sepal distinctly narrower, all sepals obtuse, sometimes very shortly apiculate, dorsally glabrous, adaxially densely pubescent throughout with short hairs. Petals almost black, obpyriform spatulate, (1.7)1.8-2(2.2) mm long, (0.6)0.7-0.8(0.9) mm wide, attenuate at the base, broadening and thickening to the triangular, obtuse apex, pubescent throughout apical half and long ciliate along margin. Lip green to greenish, black in apical half, rarely entirely black of dark olive, fusiform, slightly flattened, (5.5)6(6.5) mm long, (1.7)1.8-2(2.2) mm wide, recurved near the base, in basal half with longitudinal green groove and 2 low keels, tomentose throughout with soft hairs, obtuse at apex. Column dull yellowish, shortly cylindric, broad, 1-1.2 mm tall, 1.2-1.4 mm wide, with little protruding stigma and small triangular, acute stelidia; operculum light yellowish to almost white, hemispheric, 0.5-0.6 mm in diam., almost glabrous or finely papillose at apex.

Habitat, phenology and conservation status. Creeping branch epiphyte. Primary and old secondary broad-leaved evergreen submontane forests on any kind of soils. 900–1500 m. Fl. March – May. Not common. Tentatively estimated IUCN Red List status - DD.

Distribution. Vietnam: Dien Bien (Tua Chua, Tua Thang), Lam Dong (Dalat City area), Laos: Phongsali (sine loc.) and Xiangkhouang (Kham district, Huad village, Phou Tat Vinh Mt.; Peak district, Huad village, Phou Tat Vinh Mountain) provinces. S. China?, N. Thailand.

Notes. The coloration of sepals and tepals in this species varies from uniform dull yellow to dark purple-brown spotted or almost black. Usually sepals are dull yellowish-green densely speckled and irregularly striped with dark purple or brown. Lip narrowly obovoid, sometime little flattened, fleshy, "carnose" (Rolfe, 1910), entirely woolly hairy, adaxially almost black with green longitudinal furrow, abaxially more or less light green, black to the apex. In modern monographic assessment of *Bulbophyllum* sect. *Hirtula* (Vermeulen, 2002) this species is mixed with described below - *B. phitamii*. We have seen only one collection of true *B. nigrescens* from Vietnam (*Grillet 272*). All other previous records of this species of Vietnamese authors belong to *B. scaphiforme*. Marginal form with uniform pure yellowish sepals was described as *B. anguste-ellipticum* Seidenf. Presently it is regarded as synonym of *B. nigrescens*. Amended species description provided here is based mainly on our specimens collected in Laos (*LA-VN 1002, 1069*).

Studied specimens. **LAOS:** NE. Laos, Xiangkhouang province, Kham district, Huad village, Phou Tat Vinh Mt., around point 19°32'31.6'N 103°39'40.4'E, primary and secondary broad-leaved evergreen and semideciduous dry forest on very steep rocky slopes of limestone highly eroded mountains composed by solid marble like limestone at elev. 1200-1400 m a.s.l., clustering epiphyte on old mossy tree on steep slope near mountain top, old flowers yellowish, not common, 4 April 2015, *N.T.Hiep, L.Averyanov, N.S.Khang et al., LA-VN 1069* (LE). NE. Laos, Xiangkhouang province, Peak district, Huad village, Phou Tat Vinh Mt., around point 19°33'02.2'N 103°39'56.3'E, primary and secondary broad-leaved evergreen dry forest on solid rocky highly eroded limestone at elev. 1200-1450 m a.s.l., short creeping, clustering epiphyte on tall mossy tree, sepals yellowish with purple-brown nerves, petals almost black, lip greenish with dull brow-green apical part, not rare, 3 April 2015, *N.T.Hiep, L.Averyanov, N.S.Khang et al., LA-VN 1002* (FOF, HNL, LE). **VIETNAM**: N. Vietnam, Dien Bien province, Tua Chua district, Tua Thang municipality, De Chu village, around point 21°53'22"N 103°24'56"E, primary evergreen broad-leaved forest on very steep slopes and on tops of remnant mountains composed with solid limestone at elevation 900-1150 m a.s.l., epiphytic clustering herb on old mossy trees on top of mountain, flowers black, not common, 12 April 2011, *L.Averyanov, P.K.Loc, N.Q.Hieu, N.T.Vinh, CPC 2269* (LE). S. Vietnam, Lam Dong province, Dalat City area, April 2010, *L.Averyanov s.n.* (LE - photo). S. Vietnam, Annam: Dalat, 26 January 1957, *Grillet 272* [P P00348146].

臺灣大學學術期刊資訊網

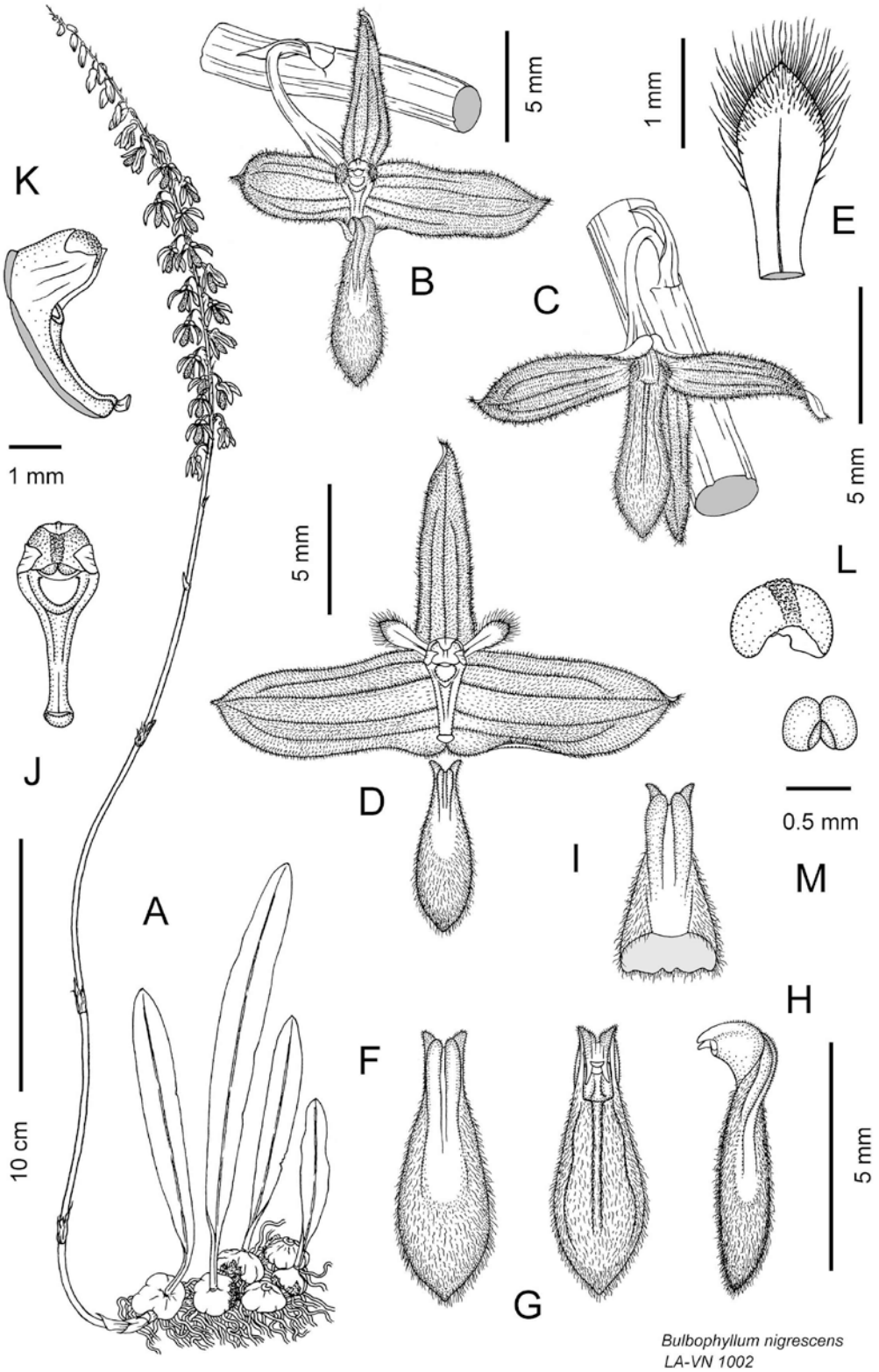


Fig. 7. ***Bulbophyllum nigrescens*** Rolfe. **A** - Flowering plant. **B, C** - Flowers, views from above and from below. **D** -Flattened flower. **E** - Petal. **F-H** - Lip, frontal view, view from behind and side view. **I** - Lip, transversal section. **J, K** - Column, frontal and side views. **L** - Operculum, half side view. **M** - Pollinarium, frontal view. All drawn from the type - *LA-VN 1002* by L. Averyanov.

臺灣大學學術期刊資料庫

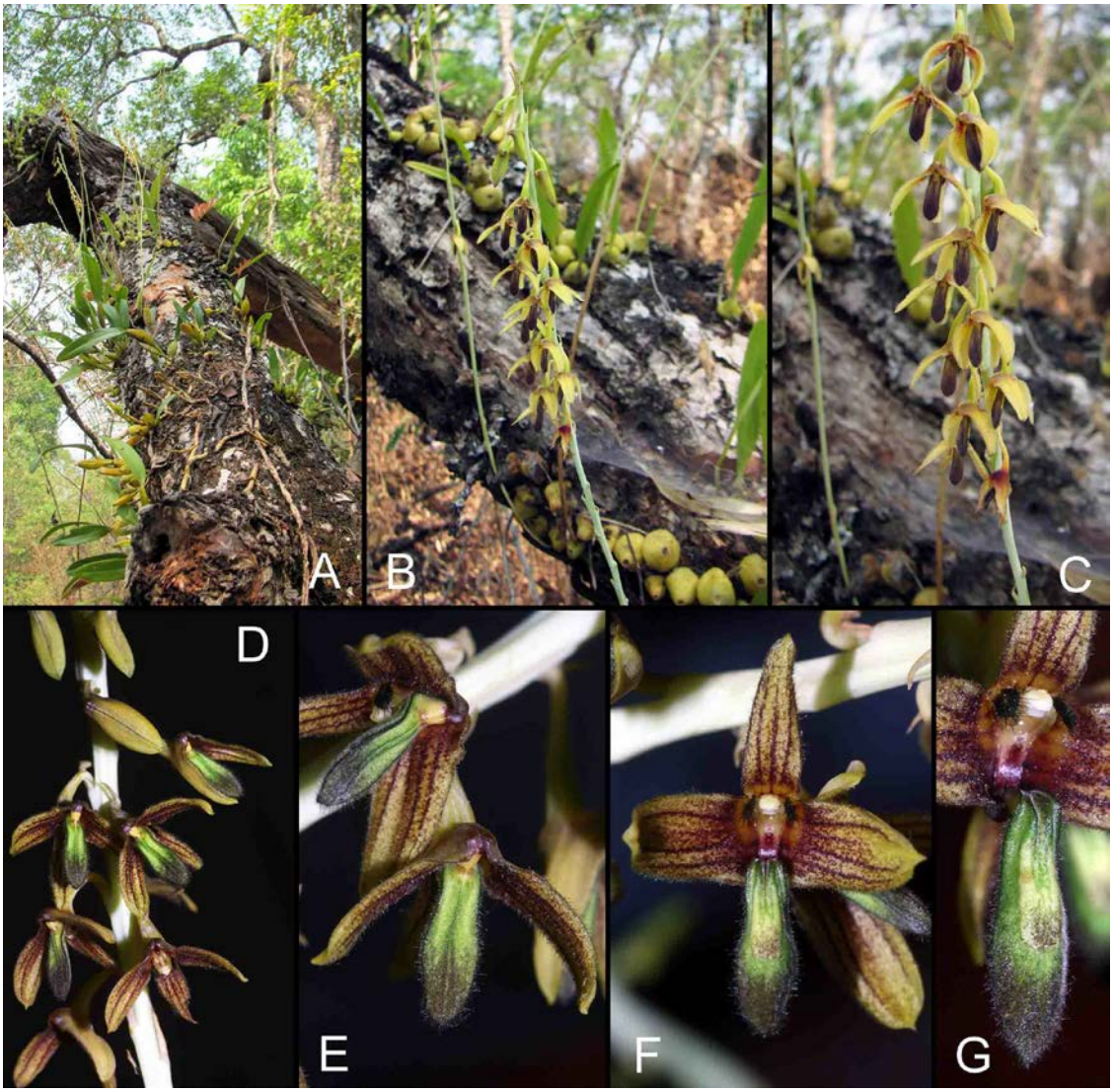


Fig. 8. ***Bulbophyllum nigrescens*** Rolfe. (*N.T.Hiep* et al., *LA-VN 1002*). Photos by K.S. Nguyen (A–C) and L. Averyanov (D–G).

5. ***B. nigripetalum*** Rolfe, 1891, Bull. Misc. Inform. Kew 1891: 197; J.J. Verm., 2002, Gard. Bull. Singapore 54: 86, fig. 32, pl. 25; Schuit. *et al.*, 2008, Nord. Journ. Bot., 26: 269; Chen Sing-chi, J.J. Verm., 2009, Fl. China, 25: 420. - *B. nigrescens* auct. non Rolfe: Tran Hop, 1998, Orch. Vietnam: 113, p.p., quoad pl. 30; Chen Sing-chi *et al.*, 1999, Native Orch. China: 35, p.p. - *B. secunditm* auct. non Hook.f.: Seidenf., 1979, Dansk Bot. Ark. 33, 3: 103, p.p., quoad fig. 63. **Figs. 9 & 10A-D.**

Data in protologue and herbaria sheets about type origin "It is said to have been imported by Messrs. F. Sander & Co., of St. Albans, from the West Coast of Africa" are incorrect. Authentic plants ("… first sent to Kew for determination by Mr. James O'Brien, of Harrow-on-Hill, Middlesex, in May 1889, and again during the present year") presumably were exported from Thailand (Vermeulen, 2002). **Syntypes** ("*O'Brien* cult., 1889") - K [K000810992, K000810991].

Description. Creeping epiphytic herb with rhizome (3)4-8(12) cm long, (1.5)2-2.3(3) mm in diam., pseudobulbs usually dense touching each other. Pseudobulbs ovoid or subglobular, shortly attenuate at apex, (0.5)0.6-1.2(1.4) cm tall and wide. Leaves shortly petiolate; petiole terete, (4)5-12(15) mm long, grooved adaxially; leaf blade oblong elliptic, (5)6-14(16) cm long, (0.6)8-12(16) mm wide, obtuse. Inflorescence glabrous, erect, lax, many-flowered secund raceme, (16)20-50(60) cm long, glabrous; peduncle (10)15-25(30) cm long, with 4-6 sterile, narrowly ovate bracts to 1 cm long; rachis (5)6-18(25) cm long. Floral bracts narrowly triangular, (1.2)1.5-2(2.5)mm long, 0.6-0.8 mm wide, acute. Flowers not widely opening, opening few in one tome. Pedicel and ovary glabrous, (3)3.5-4(4.5) mm long. Sepals (3.2)3.4-3.6(4) mm long, obtuse, ciliate along margin and pubescent adaxially, median sepal narrowly ovate, (0.9)1-1.2(1.4) mm wide,

臺灣大學學術期刊資料庫

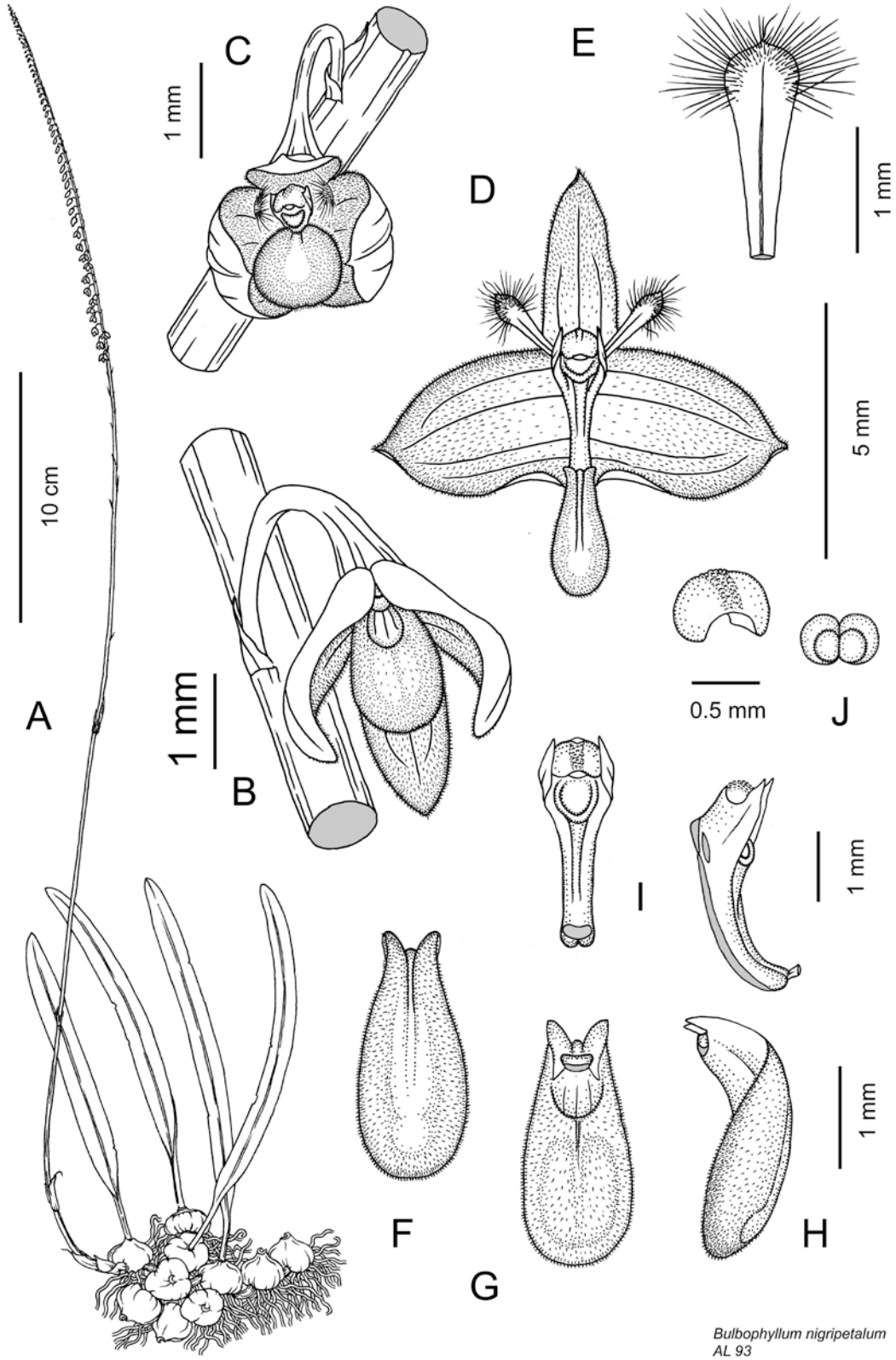


Fig. 9. ***Bulbophyllum nigripetalum*** Rolfe. **A** - Flowering plant. **B, C** - Flowers, frontal view and view from below. **D** - Flattened flower. **E** - Petal. **F**–**H** - Lip, frontal view, view from behind and side view. **I** - Column, frontal and side views. **J** - Operculum, half side view and pollinarium, frontal view. All drawn from specimen - *AL 93* by L. Averyanov.

臺灣大學學術期刊資料庫

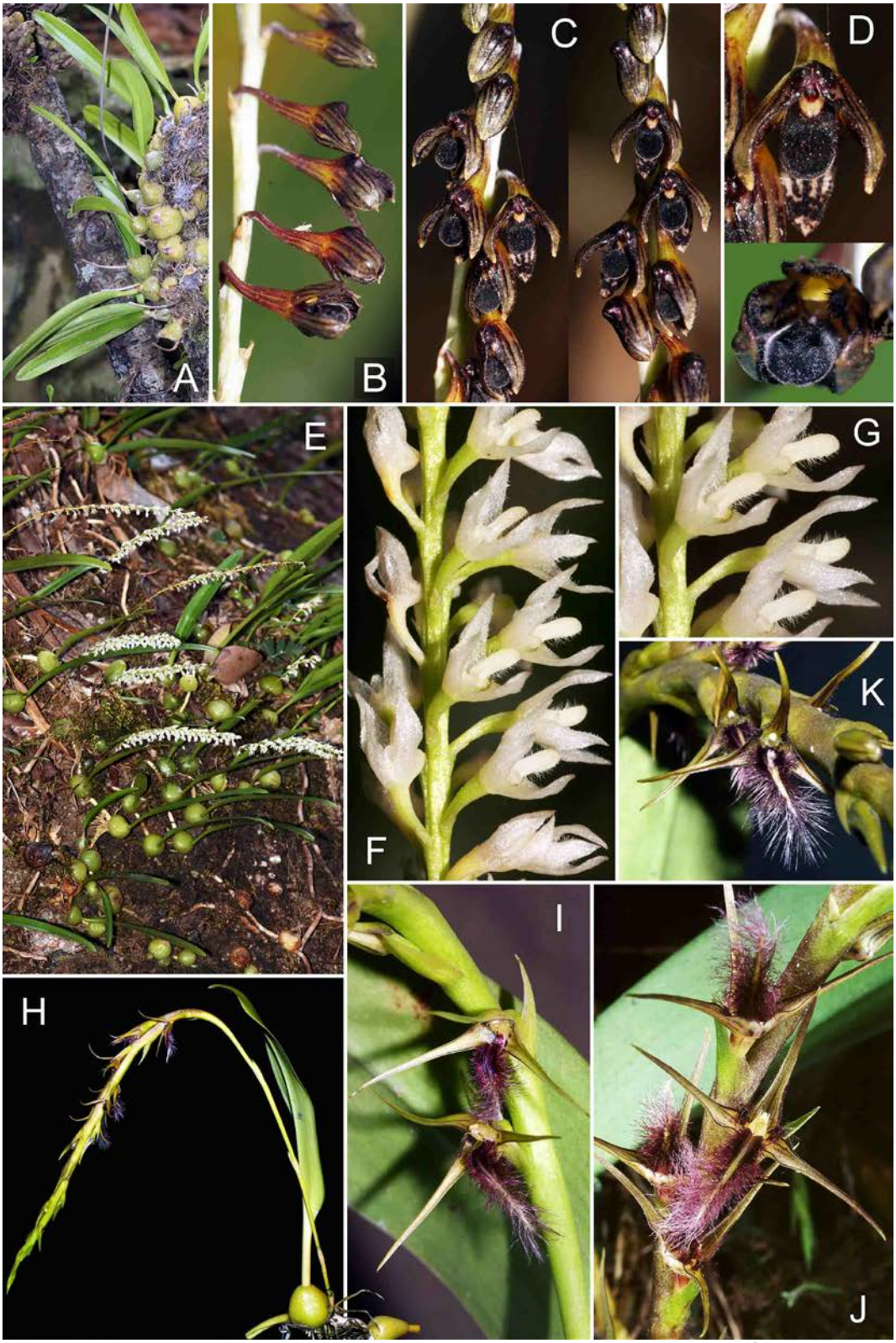


Fig. 10. ***Bulbophyllum nigripetalum*** Rolfe. (**A, B, D** - *L.Averyanov* April 2010, *s.n.*; **C** - *L.Averyanov et al., AL 93*). ***B. parviflorum*** Par. et Rchb.f. (**E**–**G** - *L.Averyanov, T.Maisak, AL 154*). ***B. penicillium*** Par. et Rchb.f. (**H, K** - *N.Q.Hieu, N.T.Hiep, N.T.Vinh et al.*, *CPC 250*; **I** - *L.Averyanov, P.K.Loc, N.T.Vinh, A.Averyanova, HAL 6564;* **J** - *L.Averyanov, P.K.Loc, D.T.Doan, HAL 2828c*). Photos by L. Averyanov (A–G, I, J) and P.V. The (H, K).

臺灣大學學術期刊資料庫

lateral sepals rectangular broadly ovate, (2)2.2-2.4(2.5) mm wide. Petals (1.4)1.5-1.6(1.8) mm long, 0.5-0.6 mm wide, spatulate, more or less gradually broadening from narrow base to obovate apical part, obtuse, densely hairy at apex. Lip recurved, obovoid, (2.5)2.6-2.8(3.2) long, (0.9)1-1.2(1.3) mm wide, rounded at apex, finely ciliate or velutinous, grooved in basal part. Column (0.8)1-1.2(1.3) mm long and wide, stigma protruding, with tooth slightly below; stelidia triangular, (0.3)0.4(0.5) mm long, acute; anther helmet shaped, 0.5-0.6 mm in diam., densely papillose.

Habitat, phenology and conservation status. Short creeping or clustering branch epiphyte. Primary broad-leaved evergreen submontane forests. 1000–1800 m. Fl. November – December. Very rare. Tentatively estimated IUCN Red List status - DD.

Distribution. Laos: Houaphan (Hem district, Na Puok village, Pu Tham Nhon Mountain) and Louang Namtha (sine loc.) provinces, Vietnam: Lam Dong province (Bidoup Mountains). S. China (Yunnan), N. Thailand.

Notes. This species well differs from relatively close *B. nigrescens*, *B. glabrichelia*, *B. phitamii* and *B. scaphiforme* in twice smaller, almost entirely black flowers. Available plants from Laos and Vietnam well fit in their morphology with description and illustrations of. *B. nigripetalum* given recently by Jaap Vermeulen in his monograph of *Bulbophyllum* sect. *Hirtula* (Vermeulen, 2002).

Studied specimens. **LAOS:** NE. Laos, Houaphan province, Hem district, Na Puok village, Pu Tham Nhon Mountain around point 20°10'00.0"N 103°24'37.0"E, primary and secondary broad-leaved evergreen dry forest on very steep rocky mountain slopes composed by solid marble-like highly eroded limestone at elev. 1050-1150 m a.s.l., epiphyte on mossy tree in shady place near mountain top, common, 11 April 2015, *N.T.Hiep, L.Averyanov, N.S.Khang et al., LA-VN 1321b* (FOF, HNL, LE). **VIETNAM**: S. Vietnam, Lam Dong province, Dalat City area, April 2010, *L.Averyanov s.n.* (LE - photo). Vietnam, Lam Dong province, Bidoup Mountains, flowers almost black, 26 November 2015, *Le Trong Chau, L.Averyanov, T.Maisak, AL 93* (LE, LE - photo).

6. ***B. parviflorum*** Par. et Rchb.f. 1874, Trans. Linn. Soc. London, Bot. 30: 152; Seidenf., 1979, Dansk Bot. Ark., 33, 3: 103; J.J. Verm., 2002, Gard. Bull. Singapore 54: 112, fig. 43, pl. 33; Pearce, Cribb, 2002, Fl. Bhutan: 456; Aver. et Averyanova, 2003, Updated Checklist Orch. Viet.: 16; Schuit. *et al.*, 2008, Nord. Journ. Bot., 26: 270; Aver., 2013, Turczaninovia, 16, 4: 30, fig. 1D; id., 2016, ibid., 19, 3: 15, fig. 3F, G. **Fig. 10E-G.**

≡ *Phyllorchis parvifiora* (Par. et Rchb.f.) Kuntze, 1891, Rev. Gen. Pl. 2: 677.

= *Bulbophyllum thomsoni* Hook.f., 1890, Fl. Brit. Ind. 5: 764; id., 1892, Icon. Pl. 21, t. 2041; King et Pantl., 1898, Ann. Roy. Bot. Gard. (Calcutta) 8, tab. 116.

= *Phyllorkis thomsonii* Kuntze, 1891, Revis. Gen. Pl. 2: 677.

Described from Myanmar ("Burma, Tenasserim"). **Type** ("*Parish 305*") – W (holotype Herb № 2273), K (isotype [K000829138]), C, W (isotypes).

Description. Creeping lithophytic and epiphytic herb with rhizome (10)15-25(30) cm long, (1.8)2-4(4.5) mm in diam., with pseudobulbs distant on 2-5(6) cm apart. Pseudobulbs subglobular to broadly ovoid conical, (0.6)0.8-1.2(1.4) mm tall and wide. Leaves petiolate; petiole (1.4)1.6-2(3) cm long, 1-2 mm in diam.; leaf blade lanceolate to oblong lanceolate, (6)8-10(12) cm long, (0.8)1-1.8(2) cm wide, obtuse to acute. Inflorescence glabrous, erect or patent, dense, secund, many-flowered raceme, (7)8-18(20) cm long; peduncle (5)6-8(10) cm long, with 3-6 sterile, narrowly ovate bracts to 8 mm long; rachis (2)3-8(10) cm long. Floral bracts narrowly ovate to triangular, (1.5)2-3(3.5) mm long, 0.8-1 mm wide, acute. Flowers white, not widely opening, all or many opening in one time. Pedicel and ovary filiform, (1.8)2(2.2) mm long. Sepals and petals subsimilar, broadly lanceolate triangular, (2.8)3-3.4(4) mm long, acute, ciliate along margin, median sepal (0.5)0.6-0.7 mm wide, lateral sepal (0.7)0.8-1(1.2) mm wide. Petals narrowly ovate elliptic, (1.1)1.2(1.3) mm long, 0.4-0.5 mm wide, acute, ciliate along margin, glabrous on surfaces. Lip recurved, oblong, (1.5)1.6-1.8(2) mm long, 0.5-0.6(0.7) mm wide, rounded, papillose, ciliate along margin, grooved in basal part. Column 0.4-0.5 mm tall and wide, stelidia narrowly triangular, obtuse, 0.4-0.5 mm long. Anther cap helmet shaped, finely papillose.

Habitat, phenology and conservation status. Creeping epiphyte and lithophyte. Primary and secondary broad-leaved and coniferous evergreen forests on any kind of mother rocks. 500–700 m. Fl. December. Occasional, locally common. Tentatively estimated IUCN Red List status - DD.

Distribution. Cambodia: Sihanoukville town area (Kaoh Rong Samoloem Khong Island), Laos: Vientiane province (Phou Khao Khouay national protected area), Vietnam: Bac Can (Na Ri district), Dak Lak and Dien Bien provinces. Bhutan, NE. India, Myanmar, Thailand.

Notes. Records for Cambodia, Laos and Vietnam presented in this paper are new for the flora of mentioned countries. In Lao PDR this plant was observed as a very common species along stream or small rivers in Vientiane province area at elevations 300-400 m a.s.l. Meanwhile, it was reported that species occurs at elevations to 1500 m a.s.l. in Bhutan, NE. India and Myanmar with flowering time in July and October-November (Pearce, Cribb, 2002; Vermeulen, 2002).

Studied specimens. **CAMBODIA:** S. Cambodia, to the N of Sihanoukville town, Kaoh Rong Samoloem Khong Island in Siam Gulf, low hills around point 10°36'45"N 103°18'38", dry evergreen lowland forest, 19 November 2011, *T.Maisak, M.Telepova, L.Osinovets 847* (LE - photo). **LAOS**: Central Laos, Phou Khao Khouay national protected area to about 40 km NE of Vientiane, dry evergreen primary and secondary forest along rocky stream on sandstone at elev. 350 m a.s.l., lithophytic adpressed creeping herb, flowers pure white, very common, 9 December 2015, *L.Averyanov, T.Maisak, AL 154* (LE, LE - photo). **VIETNAM**: N. Vietnam, Bac Can province, Na Ri district, Kim Hy municipality, vicinities of Lung Hin Con village, 22º17'N 106º03'E, primary evergreen mixed mossy forest with *Pseudotsuga brevifolia* and bamboo along tops of karstic remnant limestone ridge at elev. 650-700 m a.s.l., epiphyte on high trees, not common, 20 October 1999, *N.T.Hiep, P.K.Loc, L.Averyanov, NTH 3728* (LE). N. Vietnam, Dien Bien province area, cultivated, wild collected samples, December 2010, *L.Averyanov s.n.* (LE - photo). S. Vietnam, Dak Lak province area, cultivated, wild collected samples, *N.V.Canh s.n.* (LE - photo).

臺灣大學學術期刊資料庫

7. ***B. penicillium*** Par. et Rchb.f., 1874, Trans. Linn. Soc. London 30, 1: 151; King et Pantl., 1898, Ann. Roy. Bot. Gard. (Calcutta) 8: 79, tab. 108; 2002, Gard. Bull. Singapore 54: 46, fig. 15, plate 9; Pearce, Cribb, 2002, Fl. Bhutan: 456; Aver. et Averyanova, 2003, Updated Checklist Orch. Viet.: 16. **Fig. 10H-K.**

≡ *Phyllorchis penicillium* (Parish et Rchb.f.) Kuntze, 1891, Revis. Gen. Pl. 2: 677.

= *Bulbophyllum inopinatum* W.W. Sm., 1915, Notes Roy. Bot. Gard. Edinburgh 8: 346.

Described from southern Myanmar ("the neighbourhood of Moulmein"). **Type** ("1870, *Parish 303*") - K (holotype [K000829132]), W (isotype).

Description. Creeping epiphytic herb. Rhizome semi-woody, stout, simple or few branching, 2-3 mm in diam., 8-14(18) cm long, with erect pseudobulbs distant on (1)1.5-2.5(3) cm. Pseudobulbs narrowly ovoid to ovoid, (1.2)14-2(2.4) cm tall, (0.6)8-1(1.2) cm wide, at the base with papyraceous or fibrous remains of cataphylls, often slightly oblique. Leaves distinctly petiolate; petiole (1.5)2-5.5(6.5) cm long, 2-3 mm in diam., terete, grooved adaxially; leaf blade elliptic to oblong elliptic, (8)9-18(20) cm long, (1.5)2-3.5(4) cm wide, acute. Inflorescence erect, lax raceme, (9)12-20(25) cm tall, many flowered; peduncle straight, nodding at apex, (6)7-14(16) cm long, with 4-5 distant, tubular, scarious, sterile, acute bracts 5-15 mm long, 3-6 mm wide (being flatten); rachis straight, swollen, spindle shaped, (5)6-14(16) cm long, 3-4 mm in diam., glabrous. Floral bracts narrowly triangular, (5)7-10(11) mm long, 0.8-1 mm wide, acute, as long as ovary. Flowers widely opening, few in one time. Pedicel and ovary obconical, glabrous, (4)4.5-5(5.5) mm long, 1-1.5 mm in diam. Sepals glabrous, narrowly triangular to almost linear, acute, 13-15 mm long, less than 1 mm wide, suddenly broadening to 2.5-3 mm wide at the base. Petals forward directed, broadly ovate, blunt at apex, about 1 mm long and wide, long hairy along margin, glabrous on surface. Lip recurved at base, narrowly triangular to almost linear, gradually tapering to acute apex, 8-9 mm long, 0.4-0.6 mm wide, slightly grooved near broadening base, hairy along margins with long soft wavy hairs. Column 1-1.2 mm tall and wide, with slightly protruding stigma; stelidia linear-filiform, 1.2 mm long, slightly curved, swelling at apex, distinctly longer column itself; operculum hemispheric, glabrous, 0.4-0.5 mm in diam.

Habitat, phenology and conservation status. Creeping epiphyte and lithophyte. Primary broad-leaved and coniferous evergreen humid forests on any kind of mother rocks. 900–1500(2000) m. Fl. February – April. Rare. Tentatively estimated IUCN Red List status - DD.

Distribution. Vietnam: Ha Giang (Quan Ba and Bac Me districts) and Lao Cai (Van Ban district) provinces. Bhutan, NE. India, Myanmar.

Notes. Some specimens from Thailand erroneously identified by G. Seidenfaden (1995: 47, fig. 27, pl. 9a) as *B. penicillium* belong to *B. lanuginosum* J.J. Verm., known until now only by lone incomplete type collection. It differs from *B. penicillium* in smaller stature, shorter peduncle, its crested, obtuse lip with woolly, wavy hairs (Vermeulen, 2002).

Studied specimens. **VIETNAM**: N. Vietnam, Ha Giang province, Quan Ba district, Tung Vai municipality, Ban Thang village, Ta Boc Mountain, 23°03'29.1"N, 104°50'38.8''E, 1365 m a.s.l., limestone primary broad-leaved evergreen closed forest, epiphyte and lithophyte herb on rocky, common, flowers yellowish, 26 March 2010, *N.Q.Hieu, N.T.Hiep, N.T.Vinh et al., CPC 250, CPC 263* (LE – photo). N. Vietnam, Ha Giang province, Bac Me district, Phieng Luong municipality, about 1.5 km to SW of Phieng Luong municipality headquarter, 22º39'29''N, 105º19'35"E, heavily logged primary closed evergreen broad-leaved forest along rocky streamlet valley at the base of steep slopes of mountains composed with solid highly eroded crystalline and partially shale limestone at elevation about 900 m a.s.l., creeping epiphyte on tall tree, rare, 6 March 2005, *L.Averyanov, P.K.Loc, N.T.Vinh, A.Averyanova, HAL 6564* (LE, LE - photo). N. Vietnam, Lao Cai province, Van Ban district, Khanh Yen Ha municipality, to the S of Na Nheo village, 21°59'04"N, 104°15'08"E, primary broad-leaved evergreen wet submontane forest on steep granite and quartzite slopes of stream canyon at elev. 900 m a.s.l., creeping epiphyte on high mossy tree, rare, 27 March 2002, *L.Averyanov, P.K.Loc, D.T.Doan, HAL 2828c* (LE, LE - photo). N. Vietnam, Lao Cai province, Van Ban district, Liem Phu municipality, Khuoi Ngoa village, ridges just west of village, 21°59'31"N 104°19'05"E, 323-1050 m, epiphytic, frequent, on tall trees, inflorescences to 0.3 m, reddish brown, 22 February 2001, *D.K.Harder, P.K.Loc, L.V.Averyanov et al., DKH 6669* (LE, MO).

8. ***B. phitamii*** Aver., ***sp. nov.*** **Figs. 11 & 12.**

- *B. nigrescens* auct. non Rolfe: J.J. Verm., 2002, Gard. Bull. Singapore 54: 89, p.p., quoad fig. 33, pl. 26.

Described from southern Vietnam ("Lam Dong province, Dam Rong district, Phi Lieng municipality, remnants of primary evergreen broad-leaved forest at elevation 800-1000 m a.s.l., 27 May 2014, *Nguyen Phi Tam, s.n.*"). **Type** prepared from cultivated plant ("16 December 2015, *Nguyen Phi Tam, L.Averyanov, T.Maisak, AL 206*") - LE (holotype). **Digital epitype** - d-EXSICCATES OF VIETNAMESE FLORA *0246/AL 206* (Fig. 12).

Description. Short creeping or clustering trunk or branch epiphyte. Rhizome rigid, semi-woody, (4)5–6(6.5) mm in diam., with close pseudobulbs touching each other. Pseudobulbs dull greenish, broadly ovoid to subglobular, (2)2.5–3(3.5) cm across. Leaf obscurely petiolate; leaf blade coriaceous, broadly oblanceolate, (8)10–15(16) cm long, (2)2.2–2.8(3.2) cm wide, tapering into short terete, shallowly grooved petiole-like base, (0.8)1-1.5(1.8) cm long, obtuse or obscurely bilobed at apex. Inflorescence erect or patent to almost horizontal, long stalked, lax, many flowered secund raceme to 60 cm tall; peduncle (20)25–35(40) cm long, straight or slightly flexuose, glaucous light greenish, with 3-4 small sterile papyraceous scales at the base and 2-3 small bracts distant on the scape; rachis (12)14–20(22) cm long, glabrous, straight or slightly curved, with many flowers opening simultaneously. Floral bracts light dull yellowish, papyraceous, narrowly triangular, erect, acuminate, (2)3–

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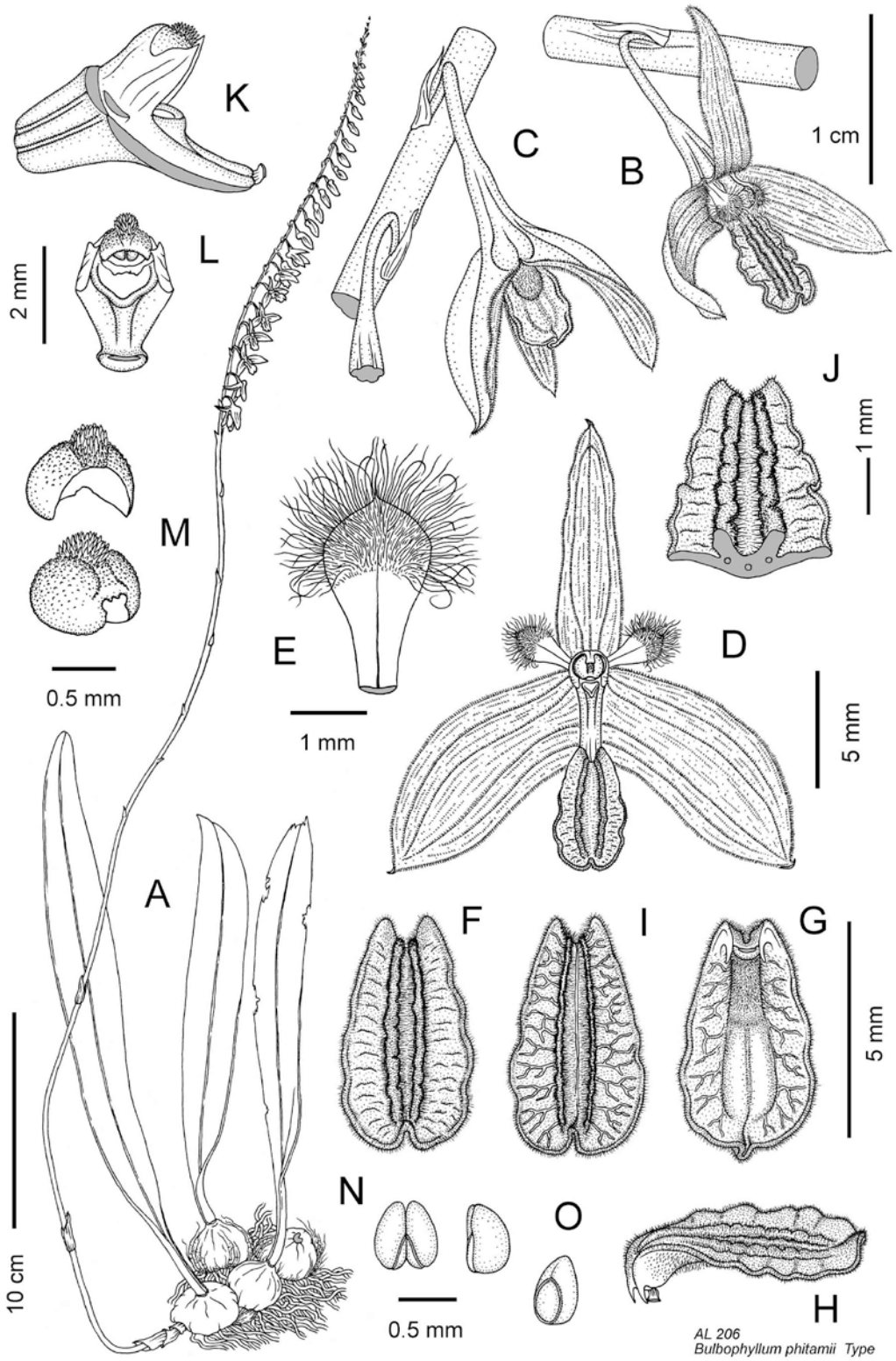


Fig. 11. ***Bulbophyllum phitamii*** Aver. **A** - Flowering plant. **B, C** - Flowers, views from below and from above. **D** - Flattened flower. **E** - Petal. **F**–**H** - Fresh lip, frontal view, view from behind and side view. **I** - Dry, herbarized lip, frontal view. **J** - Fresh lip, transversal section at the middle. **K, L** - Column, side and frontal views. **M** - Operculum, half side views from the front and from behind. **N** - Pollinarium, frontal and side views. **O** - Twin pollinium, adaxial view. All drawn from the type - *AL 206* by L. Averyanov.

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Fig. 12. ***Bulbophyllum phitamii*** Aver. Digital epitype - d-EXSICCATES OF VIETNAMESE FLORA *0246/AL 206*. Photos by L. Averyanov and P.T. Nguyen, design and image correction by L.Averyanov.

臺灣大學學術期刊資料庫

4(4.5) mm long, (0.4)0.6-0.8(1) mm wide. Pedicel and ovary (4)5-6(7) mm long, ovary obconical, grooved, (1)1.2-1.5(1.6) mm in diam. near flower base. Flowers spirally arranged, nodding, turned on one side, not much widely opening, (8)10-12(14) mm across. Sepals dull yellowish, more or less heavily speckled with blackish-purple, sometimes almost entirely dark purple-blackish, spreading, narrowly triangular-ovate, (8.5)9-10(10.5) mm long, lateral sepals (3.2)3.5-4(4.2) mm wide, median sepal twice narrower, all sepals obtuse, sometimes very shortly apiculate, dorsally glabrous, adaxially densely pubescent throughout with short hairs. Petals almost black, obovate, (2.2)2.4-2.5(2.6) mm long, (1.2)1.4-1.5(1.6) mm wide, narrowing to the base, broadening and thickening to the triangular, obtuse apex, pubescent throughout apical half and long ciliate along margin. Lip entirely black, oblong narrowly obovate, flattened, (4.8)5-6(6.2) mm long, 2.8-3.2 mm wide, recurved near the base, attached moveably to the apex of column foot by thin flexible rectangular or subquadrate plate, with 2 fleshy warty longitudinal keels, tomentose throughout with soft short hairs, wrinkled and undulate on flanks, apically often with erect cucullate fold, at the base with 2 down directed narrowly triangular, acute dents. Column dull yellowish, shortly cylindric, broad, 1-1.2 mm tall, 1.8-2 mm wide, with little protruding stigma and rather large triangular, acute stelidia; operculum light yellowish to almost white, hemispheric, (0.7)0.8-0.9(1) mm in diam., long papillose at apex.

Etymology. Species is named after orchid enthusiast, Mr. Nguyen Phi Tam collected perfect material for plant description.

Habitat, phenology and conservation status. Short creeping or clustering branch epiphyte. Primary broad-leaved evergreen submontane forests. 800–1000 m. Fl. December – April. Very rare. Tentatively estimated IUCN Red List status - DD.

Distribution. Vietnam: Lam Dong province (Dam Rong district) and Dak Lak province (sine loc.). Endemic.

Notes. This species looks more or less close to *B. nigrescens*, but well differs in flat, black lip, slightly folded and undulate along margin. Deep median fissure between two fleshy keels and cucullate lip apex are additionally very characteristic. When dry, lip of *B. phitamii* exhibits distinct prominent dichotomous sub-perpendicular venation on its flanks that is absent or hardly visible in rather fleshy, subcylindric lip of *B. nigrescence*. In recent studies, this species was mixed in part with *B. nigrescens* (Vermeulen, 2002). In vegetative habit, both species are very similar.

Studied specimens (paratypes). **VIETNAM**: S. Vietnam, Lam Dong province, Dalat City area, April 2010, *L.Averyanov, s.n.* (LE - photo). S. Vietnam, wild collected plant received from Hanoi street market, 2013, *Nguyen Minh Duc, s.n.* (LE - photo).

9. ***B. scaphiforme*** J.J. Verm., 2002, Gard. Bull. Singapore 54: 84, fig. 31. - *Bulbophyllum nigrescens* auct. non Rolfe: Seidenf., 1979, Dansk Bot. Ark. 33, 3: 104, p.p., quoad fig. 64; Chen Sing-chi *et al.*, 1999, Native Orch. China: 35, p.p. **Fig. 13 & 14A-I.**

Described from N. Thailand, Chiang Rai province ("Thailand, Doi San Yao"). **Type** ("*Seidenfaden & Smitinand (GT) 7464*") - C (holotype).

Description. Short creeping or clustering trunk or branch epiphyte. Rhizome rigid, semi-woody, 2–3 mm in diam., with close pseudobulbs, usually touching each other. Pseudobulbs greenish, broadly ovoid to depressed-conical, 0.8–1.2 cm in diam., 0.7-0.8 cm tall. Leaf petiolate; leaf blade coriaceous, oblong lanceolate, obtuse, (8)10–12(14) cm long, 1.2–1.4 cm wide, tapering into terete, shallowly grooved petiole-like base, 1.6-2 cm long. Inflorescence suberect to patent, long stalked, lax, many flowered secund raceme to 50 cm long; peduncle to 30 cm long, straight, glaucous light greenish, with few small sterile papyraceous scales; rachis to 25 cm long, glabrous, straight or slightly curved, with many flowers opening simultaneously. Floral bracts light dull yellowish, papyraceous, narrowly triangular, acuminate, 2–2.5 mm long, 0.8-1 mm wide. Pedicel and ovary 4-5 mm long, ovary obconical. Flowers spirally arranged, nodding, turned on one side, not widely opening, 5.5-6.5 mm across. Sepals dull yellowish, heavily striped with dark brown-purple, broadly incurved, narrowly oblong ovate, (5.5)6-7(7.5) mm long, lateral sepals 2.5-3.2 mm wide, median sepal distinctly narrower, all sepals obtuse, sometimes very shortly apiculate, dorsally glabrous, adaxially densely pubescent throughout with short hairs. Petals almost black, spatulate, 1.8-2 mm long, 0.8-1 mm wide, attenuate at the base, broadening and thickening to the triangular, obtuse apex, pubescent throughout apical half and long ciliate along margin. Lip almost black, fusiform narrowly obovate in outline, pouch-shaped, 4-4.5 mm long, 2-2.2 mm wide, recurved near the base, lip concavity ciliate along margin, green, with 2 low parallel black, shortly hirsute keels, lip apex almost half globular. Column white, shortly cylindric, broad, 1-1.2 mm tall, 0.8-1 mm wide, with little protruding stigma and small triangular, acute stelidia; operculum white, hemispheric, 0.5-0.6 mm in diam., finely papillose.

Habitat, phenology and conservation status. Short creeping or clustering branch epiphyte. Primary broad-leaved evergreen submontane forests. 1100–1500 m. Fl. March – May. Very rare. Tentatively estimated IUCN Red List status - DD.

Distribution. Vietnam: Lam Dong province (Dalat, Piste de Teurnom; Dalat City area). S. China (Yunnan), Thailand.

Notes. In its habit, this species is very similar to *Bulbophyllum nigrescens*, but in floral morphology it distinctly differs in having a bail-shaped or cymbiform lip.

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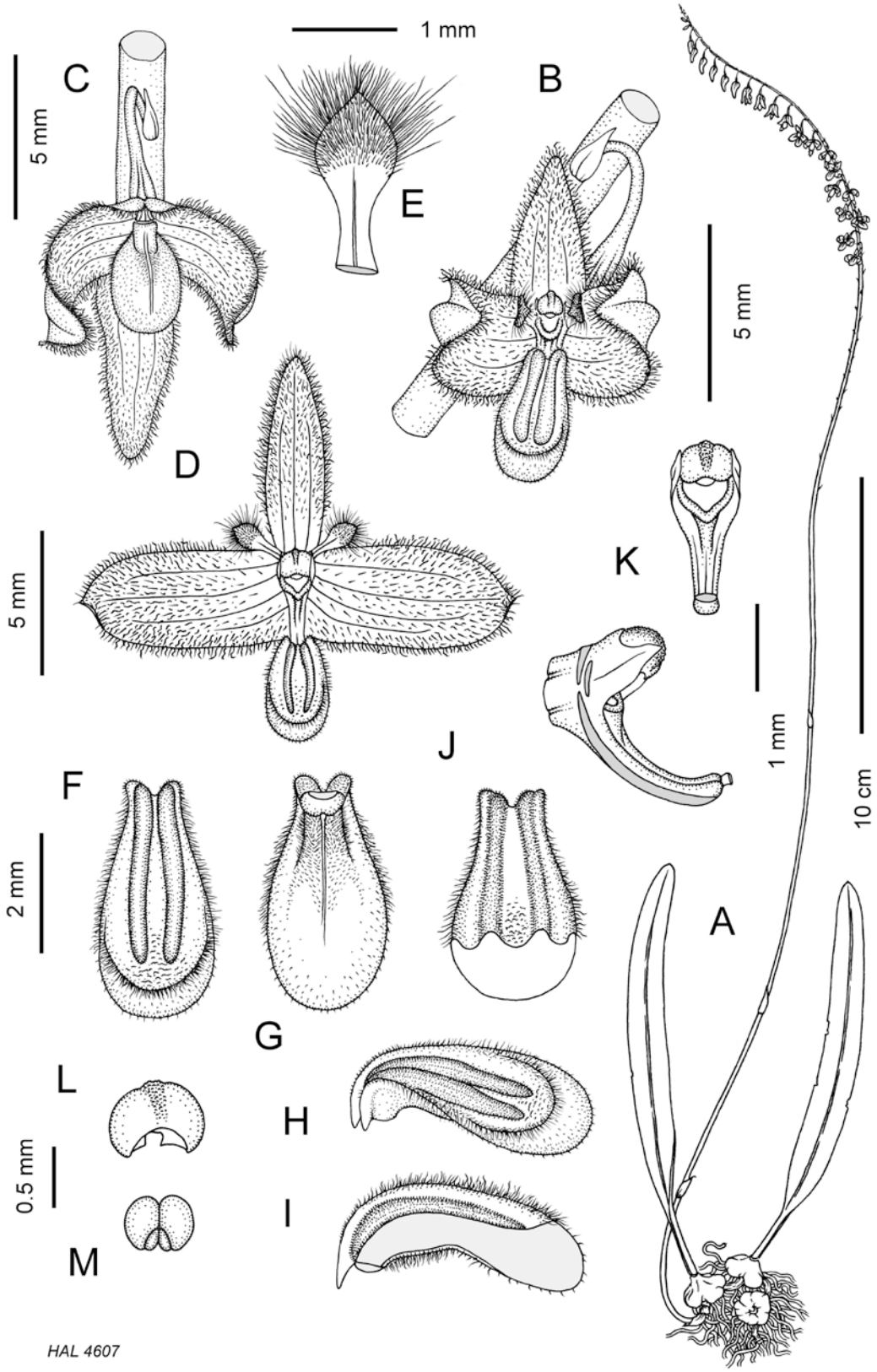


Fig. 13. ***Bulbophyllum scaphiforme*** J.J. Verm. **A** - Flowering plant. **B, C** - Flowers, frontal view and view from below. **D** - Flattened flower. **E** - Petal. **F**–**H** – Lip, frontal view, view from behind and side view. **I** - Lip, sagittal section. **J** - Lip, transversal section. **K** - Column, frontal and side views. **L** - Operculum, frontal view. **M** - Pollinarium, frontal view. All drawn from specimen - *HAL 4607* by L. Averyanov.

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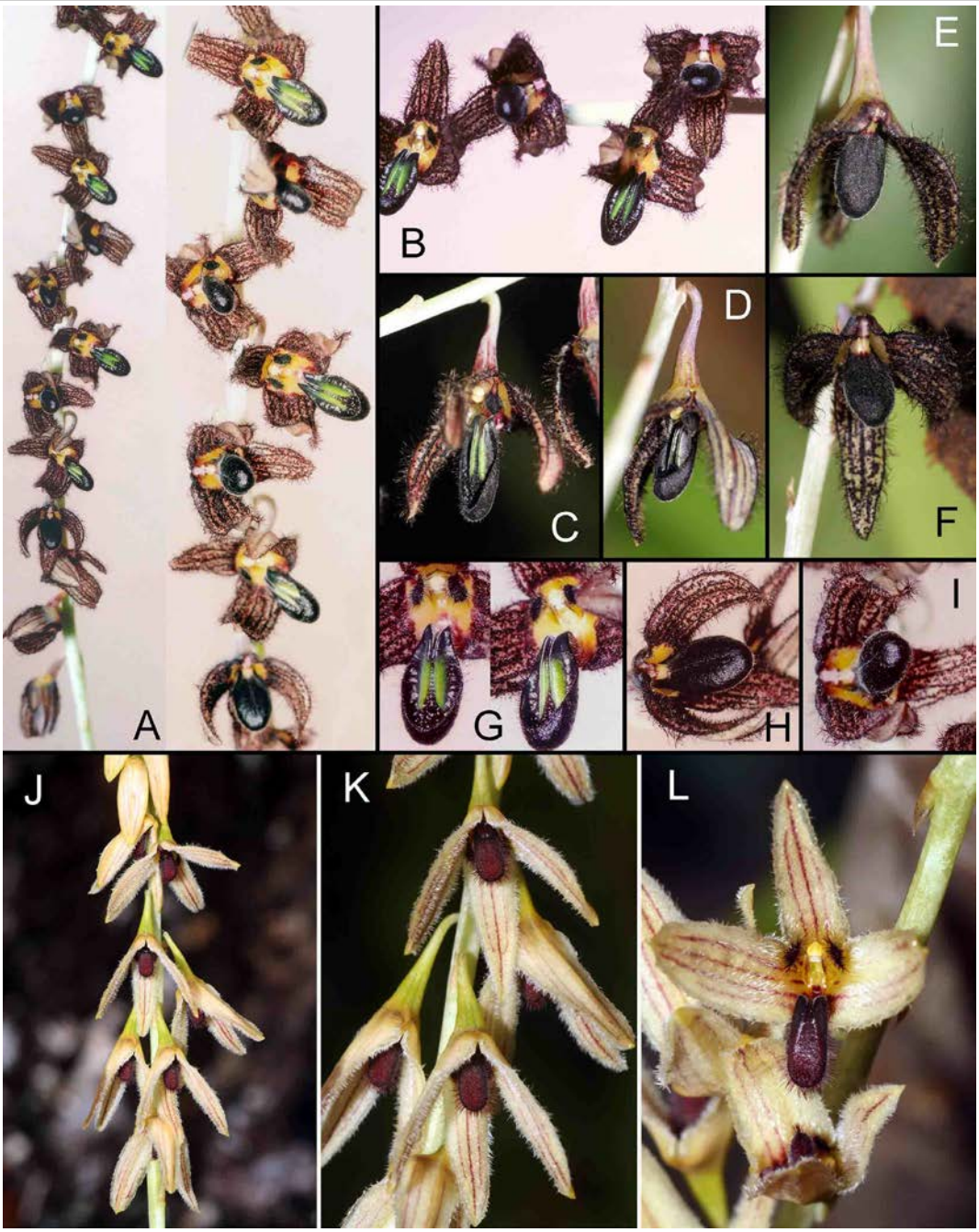


Fig. 14. ***Bulbophyllum scaphiforme*** J.J. Verm. (**A, B, E, G–I** - *L.Averyanov et al., HAL 4607*; **C, D, F** - *L.Averyanov* 2010 April, *s.n.*). ***Bulbophyllum setilabium*** Aver. (**J–L** - *N.T.Hiep et al., LA-VN 1239*, type). Photos by L.Averyanov.

Meanwhile, studied plants from Vietnam well differ in many details from description and illustration of *B. scaphiforme* given by Jaap Vermeulen in his monograph on *Bulbophylllum* sect. *Hirtula* (Vermeulen, 2002). Description presented here is based solely on Vietnamese plants, which are surely different from the type in smaller pseudobulbs, longer, and narrower leaves, smaller flowers, shorter floral bracts and longer inflorescence. Previous record of *B. scaphiforme* for Vietnam (Vermeulen, 2002) based on unidentifiable picture of low quality (Tran Hop, 1998, fig. 64) remains questionable.

Studied specimens. **VIETNAM**: S. Vietnam, Lam Dong province, Dalat, Piste de Teurnom, 1300 m, *Tixier s.n.* [P P00206497]. S. Vietnam, Lam Dong province, Dalat town area, epiphyte, flowers odorless, tepals yellowish-white with numerous deep brown stripes and marks and pure yellow base, lip black with emerald green center, column and anther yellowish-white, 18 April 2004, *L.Averyanov, P.K.Loc, N.T.Hiep, HAL 4607* (LE, LE - photo). S. Vietnam, Lam Dong province, Dalat City area, April 2010, *L.Averyanov s.n.* (LE – photo).

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10. ***Bulbophyllum secundum*** Hook.f., 1890, Fl. Brit. Ind. 5: 764; id., 1892, Icon. Pl. 21, t. 2042; Gagnep., 1933, Fl. Gen. Indo-Chine 6, 3: 275; Seidenf., 1979, Dansk Bot. Ark. 33, 3: 103 (p.p., excl. syn. *B. nigripetalum*); id., 1992, Opera Bot., 114: 268; Aver., 1994, Ident. Guide Vietnam. Orch.: 253; id., 1990, Vasc. Pl. Synopsis Viet. Fl.: 42; Tran Hop, 1998, Orch. Vietnam: 122, fig. 52; P.H. Ho, 2000, Ill. Fl. Vietnam 3: 849, fig. 11145; J.J. Verm., 2002, Gard. Bull. Singapore 54: 113, fig. 44, pl. 34, 35; Pearce, Cribb, 2002, Fl. Bhutan: 457; Aver. et Averyanova, 2003, Updated Checklist Orch. Viet.: 17; Ban, Averyanov, Huyen, 2005, Conspectus Vasc. Pl. Vietnam: 532; Newman et al, 2007, Checkl. Vasc. Pl. Lao: 256; Schuit. *et al.*, 2008, Nord. Journ. Bot., 26: 270; Chen Sing-chi, J.J. Verm., 2009, Fl. China, 25: 420.

≡ *Phyllorchis secunda* (Hook.f.) O.Kuntze, 1891, Rev. Gen. Pl. 2: 678.

= *Bulbophyllum subparviflorum* Z.H.Tsi et S.C.Chen, 1994, Acta Phytotax. Sin. 32: 555.

Described from NE. India ("India, Naga Hills"). **Type** ("1886, *Prain 41*") – K (holotype [K000829129]).

Habitat, phenology and conservation status. Creeping epiphyte and lithophyte. Primary and secondary broad-leaved evergreen montane forests on any kind of mother rocks. 1200–2000 m. Fl. May - June. Very rare. Tentatively estimated IUCN Red List status - DD.

Distribution. Vietnam: Lam Dong (Dalat City area) province. Nepal, Bhutan, NE. India, Myanmar, SW. China (Yunnan), Thailand.

Notes. Seidenfaden (1979) has confused this with *B. nigripetalum* (Vermeulen, 2002), therefore the occurrence of this species in eastern Indochina needs confirmation. Lone known specimen from southern Vietnam housed in P [P00206503] is rather in poor condition giving no possibility of sure identification. We have seen no any more specimens of this species from countries of eastern Indochina. Its adequate description may be found in recent reviews (Vermeulen, 2002; Chen Sing-chi, Vermeulen, 2009).

Studied specimens. **VIETNAM**: S. Vietnam, Lam Dong, Dalat, 5 juillet 1924, *Evrard, 1018* (P [P00206503]).

11. ***Bulbophyllum setilabium*** Aver., ***sp. nov.*** **Figs. 14J-L & 15.**

Described from NE. Laos ("Houaphan province, Xon district, Nong Hua Pa Noi village, around point 20°13'02.1"N 103°24'23.3"E, primary and secondary broad-leaved evergreen forest on very steep rocky mountain slopes composed by shaly limestone at elev. 1100-1200 m a.s.l., clustering epiphyte on tall trees, occasional"). **Type** ("11 April 2015, *N.T.Hiep, L.Averyanov, N.S.Khang, N.Q.Hieu, T.Maisak, Pheng Phengsintham, LA-VN 1239*") - LE (holotype), FOF, HNL (isotypes).

Description. Short creeping or clustering trunk or branch epiphyte. Rhizome rigid, semi-woody, (2)2.5–3(3.5) mm in diam., with close pseudobulbs touching each other. Pseudobulbs dull greenish, depressed-conical, flattened, (1)1.2–1.5(1.8) cm in diam., (0.8)1–1.2(1.4) cm tall. Leaf obscurely petiolate; leaf blade coriaceous, oblong oblanceolate, (8)10–14(18) cm long, (0.8)1–1.2(1.4) cm wide, tapering into terete, shallowly grooved petiole-like base, (0.8)1-1.5(1.8) cm long, round to obtuse. Inflorescence erect or suberect, long stalked, lax, many flowered secund raceme to 35 cm tall; peduncle (10)12–18(20) cm long, straight, glaucous greenish, with (2)3-4 small sterile papyraceous scales at the base, and (1)2-3 small bracts distant on the scape; rachis (5)6–12(14) cm long, glabrous, somewhat glaucous, straight or slightly curved, with many to almost all flowers opening simultaneously. Floral bracts light dull yellowish, papyraceous, triangular ovate, erect, concave, acuminate, (1.2)1.5–2(2.2) mm long, (0.4)0.6-0.8(1) mm wide. Pedicel and ovary (4.5)5-6(7) mm long, ovary obconical, longitudinally grooved (0.6)0.8-1.2(1.4) mm in diam. near flower base. Flowers spirally arranged, nodding, turned on one side, not widely opening, 1.2-1.4 cm across. Sepals white or light yellowish, striped with 3(5) purple veins, spreading, narrowly triangular-ovate, (9)9.5-10.5(11) mm long, lateral sepals 3.8-4.2) mm wide, median sepal distinctly narrower, all sepals obtuse, sometimes very shortly apiculate, dorsally glabrous, adaxially densely pubescent throughout with short soft hairs. Petals purple-black, obovate spatulate, (2.2)2.4-2.5(2.6) mm long, (1.3)1.4-1.5(1.6) mm wide, narrowing to the base, broadening and thickening to the triangular, obtuse apex, pubescent throughout apical half and long ciliate along margin. Lip entirely purple-black, fleshy, oblong obovoid, (3.4)3.5-4(4.2) mm long, (1.4)1.5-1.6(1.7) mm wide, recurved near the base, grooved to the base, rather smooth, without keels or ridges, rounded at apex, densely pubescent with long stiff hairs along margin at apical half, at the base with 2 down directed, narrowly triangular acute dents. Column dull yellowish, shortly cylindric, broad, 1-1.2 mm tall, 1.8-2 mm wide, with little protruding stigma and small triangular, acute stelidia; operculum yellow, hemispheric, papillose, 0.5-0.6 mm in diam.

Etymology. Species name refers setose lip hairiness.

Habitat, phenology and conservation status. Short creeping or clustering branch epiphyte on tall trees. Primary and old secondary broad-leaved evergreen forests on shaly limestone. 1100–1200 m. Fl. March - May. Not common. Tentatively estimated IUCN Red List status - DD.

Distribution. Laos: Houaphan (Hem district, Na Puok village, Pu Tham Nhon mountain; Xon district, Nong Hua Pa Noi village) and Xiangkhouang (Kham district, Huad village, Phou Tat Vinh mt.) provinces. Endemic.

Notes. In vegetative characters, this species is very similar to *B. nigrescens* Rolfe. Meanwhile, in anthesis, plant well differs in short narrowly obovate, uniformly chestnut brown, narrowly furrowed lip, haired along

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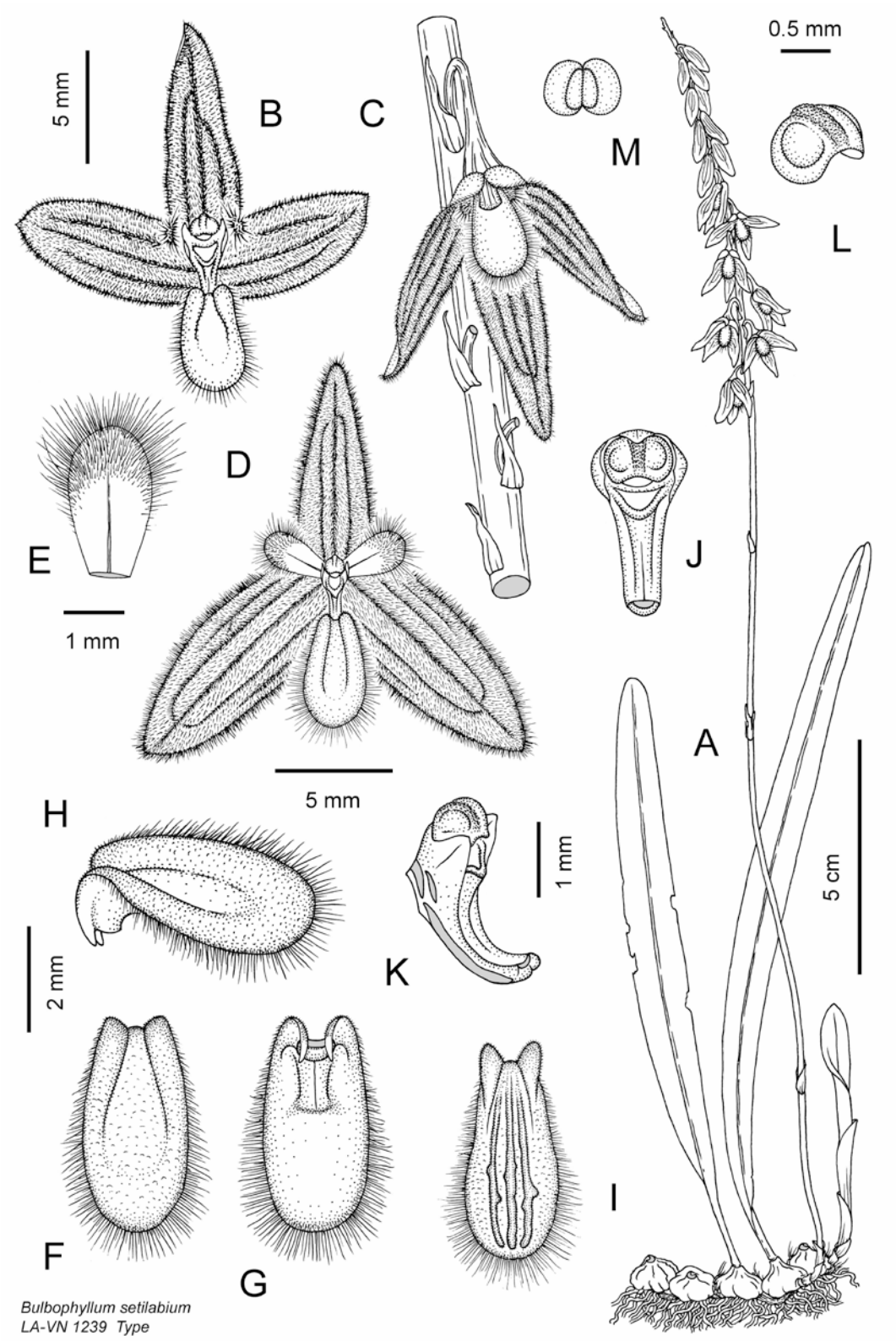


Fig. 15. ***Bulbophyllum setilabium*** Aver. **A** - Flowering plant. **B, C** - Flowers, frontal view and view from below. **D** - Flattened flower, frontal view. **E** - Petal. **F** – **H** - Lip, frontal view, view from behind and side view. **I** - Dry, herbarized lip, frontal view. **J** - Column, frontal view. **K** - Column, side view. **L** - Operculum, half side view. **M** - Pollinarium, frontal view. All drawn from the type - *LA-VN 1239* by L. Averyanov.

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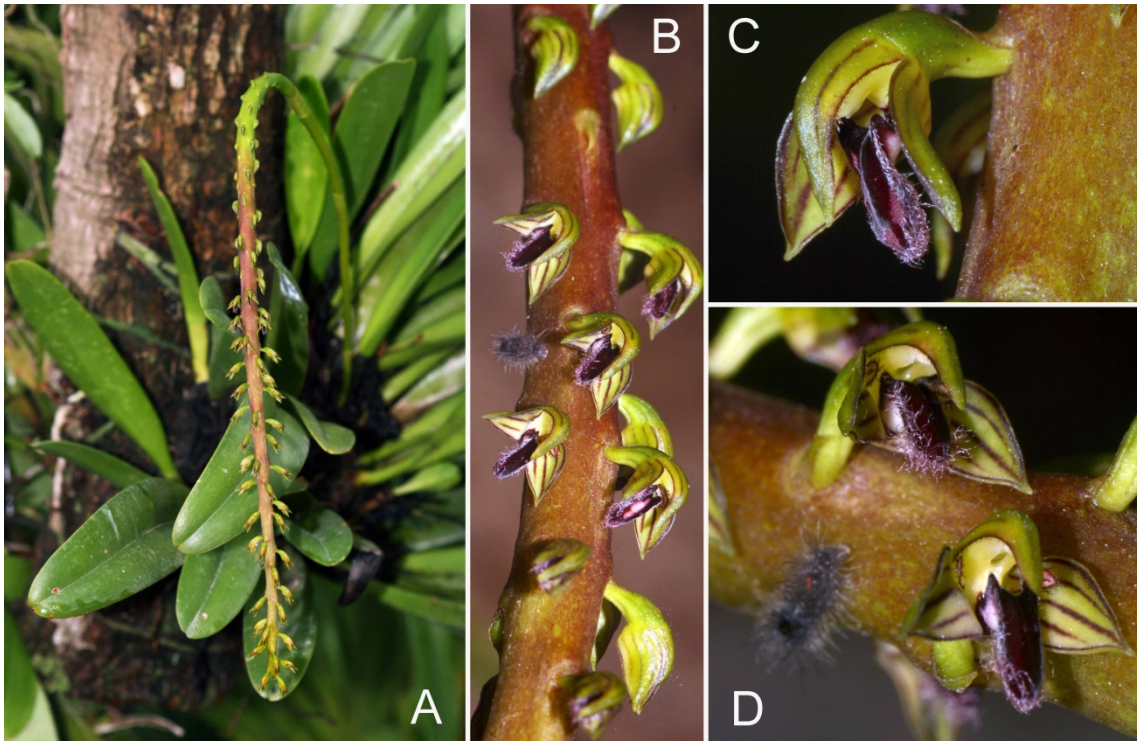


Fig. 16. ***Bulbophyllum spadiciflorum*** Tixier. (**A**–**D** - 2 May 2015, *L.Averyanov s.n.*). Photos by L.Averyanov.

margin with long stiff setose hairs. In contrast, flowers of *B. nigrescens* have fusiform cylindric, olive-brownish lip, greenish to the base, haired throughout with short, soft, woolly hairs.

Studied specimens (paratypes). **LAOS:** NE. Laos, Houaphan province, Hem district, Na Puok village, Pu Tham Nhon Mountain around point 20°10'00.0"N 103°24'37.0"E, primary and secondary broad-leaved evergreen dry forest on very steep rocky mountain slopes composed by solid marble-like highly eroded limestone at elev. 1050-1150 m a.s.l., clustering epiphyte on mossy tree in shady place near mountain top, sepals yellowish-white, lip and petals dirty purple, common, 11 April 2015, *N.T.Hiep, L.Averyanov, N.S.Khang et al., LA-VN 1319* (FOF, HNL, LE). NE. Laos, Xiangkhouang province, Kham district, Huad village, Phou Tat Vinh Mt., around point 19°32'31.6'N 103°39'40.4'E, primary and secondary broad-leaved evergreen and semideciduous dry forest on very steep rocky slopes of limestone highly eroded mountains composed by solid marble like limestone at elev. 1200-1400 m a.s.l., clustering epiphyte on old mossy tree on steep slope near mountain top, old flowers yellowish, not common, 4 April 2015, *N.T.Hiep, L.Averyanov, N.S.Khang et al., LA-VN 1069* (FOF, HNL, LE).

12. ***Bulbophyllum spadiciflorum*** Tixier, 1966, Adansonia 6: 449; Seidenf., 1992, Opera Bot., 114: 268; Aver., 1994, Ident. Guide Vietnam. Orch.: 277; Tran Hop, 1998, Orch. Vietnam: 126, fig. 55, pl. 33; P.H. Ho, 2000, Ill. Fl. Vietnam 3: 849, fig. 11146; J.J. Verm., 2002, Gard. Bull. Singapore 54: 76; Aver. et Averyanova, 2003, Updated Checklist Orch. Viet.: 17.

Fig. 16.

≡ *Osyricera spadiciflora* (Tixtier) Garay, Hamer et Siegerist, 1994, Nord. J. Bot. 14: 643.

Described from S. Vietnam ("Vietnam, Quang Duc, piste de Fyan"). **Type** ("*Hort. Paris 174/65*") - P?

Description. Epiphyte herb with densely clustering pseudobulbs of short stout many branching rhizome. Pseudobulbs rather inconspicuous, erect, narrowly ovoid to cylindric, (0.8)1-1.5(1.8) cm tall, (6)8-10(1.2) cm in diam. Leaves petiolate; petiole (1)1.5-2(2.5) cm long, 3-4 mm in diam.; leaf blade oblong lanceolate, coriaceous, (18)20-25(27) cm long, (2.2)2.5-3)3.2) cm wide, obtuse. Inflorescence pale reddish-brown, arcuate sublax, spadix-like raceme (25)30-45(50) cm long; peduncle erect to patent, (12)15-20(25) cm long, with 4-5 sterile, narrowly ovate bracts 1-2 cm long; rachis arcuate to pendulous, swollen, terete, (16)20-25(30) cm long, 5-6 mm in diam. Floral bracts greenish, narrowly triangular 1.5-2 mm long, acute, as long as half of ovary. Pedicel and ovary green, obconical, 3.5-4 mm long, 1.5-2 mm in diam. at apex, longitudinally grooved. Flowers yellowish-green, spirally arranged, not widely opening, anthesis starts from the apex of rachis. Sepals subsimilar, with 3-4 reddish-brown nerves, triangular, straight, acute, sparsely ciliate along margin, 4-5 mm long; median sepal 0.8-1.2 mm wide; lateral sepals slightly oblique, 2-2.2 mm wide. Petals pink to light purple, spatulate, triangular acute at apex, 1.4-1.6 mm long, 0.5-0.6 mm wide, brownish-purple ciliate along margin in apical part. Lip dark violet, recurved and grooved at base, oblong narrowly obovate, without median ridges, convex in distal half, 3.5-4.5 mm long, 1.2-1.4 mm wide, rounded, glossy glabrous, margins with long soft, wavy, white hairs. Column white to light

臺灣大學學術期刊資料庫

green, 1.6-1.8 mm tall, with triangular obtuse stelidia and large protruding stigma. Anther cap white, narrowly ovoid, papillose, ciliate at front.

Habitat, phenology and conservation status. Creeping epiphyte. Primary broad-leaved evergreen humid forests on granite. 1000–1500 m. Fl. April – May. Very rare. Tentatively estimated IUCN Red List status - EW.

Distribution. Vietnam: Lam Dong (Dalat City area) province. Endemic.

Notes. Neither type, no other herbarium material available, although the species has been observed in several private living collections during 1995-2015. The information on ecology has been compiled from Tixier's description and illustration, as well as on oral data received from local collectors and orchid enthusiasts.

Studied specimens. VIETNAM: **S**. Vietnam, Lam Dong, Dalat City area, *L.Averyanov, VH s.n.* anno 1995 (photo - LE). **S**. Vietnam, Lam Dong, Dalat City area, *L.Averyanov, s.n.* April 2010 (photo – LE). **S**. Vietnam, Lam Dong, Duc Trong town area, collected by N.X. Son s.n. and cultivated in Dalat City, 2 May 2015, *L.Averyanov s.n.* (photo - LE).

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