



# Additions to the orchid flora of Laos and taxonomic notes on orchids of the Indo-Burma region–II

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(Manuscript received 4 July 2019; Accepted 22 December 2019; Online published 10 January 2020)

**ABSTRACT:** Based on field surveys in Lao PDR conducted during 2012 to 2017, ten new additions to the orchid flora of the country are reported: *Bulbophyllum kingii*, *Cleisostoma nangongense*, *Dendrobium formosum*, *Dendrobium hesperis*, *Dendrobium linguella*, *Dendrobium pachyphyllum*, *Didymoplexiella siamensis*, *Hetaeria oblongifolia*, *Oberonia acaulis* and *Vanda coerulea*. In addition, the following five names are found to be synonymous with four pre-existing taxa: *Bulbophyllum manabendrae* (= *Bulbophyllum oblongum*), *Cleisostoma schoenorchaeifolium* (= *Cleisostoma nangongense*), *Dendrobium abhaycharanii* and *Flickingeria xanthocheila* (= *Dendrobium calocephalum*), and *Habenaria yachangensis* (= *Habenaria dentata*). Finally, two new combinations are made in accordance with current orchid taxonomy, namely, *Vanda hienii* (= *Ascocentrum hienii*) and *Robiquetia luongii* (= *Malleola luongii*).

**KEY WORDS:** Indo-Burma Biodiversity Hotspot, new combination, new record, new synonym, Orchidaceae.

## INTRODUCTION

Lao PDR (hereafter Laos), widely considered botanically under-surveyed (Newman *et al.*, 2007; Schuiteman *et al.*, 2008), is proving to be a key, biodiversity-rich country in the heart of Indo-Burma Biodiversity Hotspot (IBBH). This observation is reflected by the fact that the number of wild orchid species known to occur in the country has increased from 485 species in 2008 (Schuiteman *et al.*, 2008) to 683 species in 2018 (Gale *et al.*, 2018), primarily as a result of the recent upsurge in publications of new distributional records and new species in the wake of fresh botanical surveys (Averyanov 2013; Averyanov *et al.*, 2016a, 2016b, 2018, Gale and Phaxaysombath 2017; Gale *et al.*, 2016, 2018; George *et al.*, 2017; Govaerts *et al.*, 2019; Gruss *et al.*, 2014; Kumar *et al.*, 2016, 2018; Ly *et al.*, 2018; Schuiteman and Bonnet 2009, 2014; Schuiteman *et al.*, 2008, 2018; Souvannakhommane *et al.*, 2018; Svengsuksa and Lamxay 2005). This number is likely to climb further as more surveys are undertaken in remote, relatively pristine areas of the country.

The findings reported here stem from surveys in Laos conducted as part of botanical expeditions undertaken jointly by Kadoorie Farm and Botanic Garden (Hong Kong, China) and the Biotechnology and Ecology Institute (Laos) during 2013–2017 with a view to improving understanding of conservation priorities in the region (Kumar *et al.* 2016). Nine of the resulting new records have been published previously (Kumar *et al.* 2018); the present manuscript presents a further ten new country records, namely, *Bulbophyllum kingii*, *Cleisostoma nangongense*, *Dendrobium formosum*, *Dendrobium hesperis*, *Dendrobium linguella*,

*Dendrobium pachyphyllum*, *Didymoplexiella siamensis*, *Hetaeria oblongifolia*, *Oberonia acaulis* and *Vanda coerulea*. Additionally, the taxonomy of a further four species from Laos and adjacent areas is reviewed, resulting in synonymization of five names. Furthermore, two new combinations are made in accordance with the changes in classification of the orchid family proposed by Pridgeon *et al.* (2014).

## TAXONOMIC TREATMENT

### New country records

1. *Bulbophyllum kingii* Hook.f., Fl. Brit. India 5: 760 (1890); *Phyllorkis kingii* (Hook.f.) Kuntze, Revis. Gen. Pl. 2: 677 (1891). **Type:** India, Sikkim, Rumtek, 6000 ft, October 1877, G.King s.n. (K000846869) (K!-holotype).

*Acrochaene punctata* Lindl., Fol. Orchid. 2: 1 (1853); *Monomeria punctata* (Lindl.) Schltr., Orchideen Beschreib. Kult. Zücht.: 338 (1914). **Type:** India, Sikkim, J.D.Hooker s.n. (K000846868) (K!-holotype).

Epiphytic herb with creeping rhizome. Rhizome terete, 3.5–8.5 cm long, 0.6–0.8 cm wide, bearing vermiform roots. Roots up to 7 cm long, terete. Pseudobulbs ovate or conical, 3.4–4.0 cm long, 1.8–2.4 cm wide, often wrinkled. Leaves solitary, ovate to elliptic, petiolate, 13.0–18.0 cm long, 3.0–3.5 cm wide, acute; petiole up to 3.0 cm long, longitudinally grooved to basal third of the leaf. Inflorescence racemose, 17.0–40.0 cm long, arising from the base of the pseudobulb, initially erect, becoming pendulous with maturity; peduncle terete, green with dark purple-brown patches, with few sheathing sterile bracts clustered at the base and at least two scattered above. Flowers up to 20, laxly arranged on proximal half of the rachis, 1.3–1.8 cm wide, yellowish-green with dark purple-brown spots on outer



surfaces and labellum, and dotted streaks on inner surfaces. Dorsal sepal elliptic-ovate, 1.7–1.9 cm long, 0.4–0.6 cm wide, acute. Lateral sepals obliquely triangular to falcate, 1.0–1.3 cm long, 0.5–0.6 cm wide, acute. Petals triangular, 0.7–0.8 cm long, 0.1–0.2 cm wide, acute, margin ciliate. Labellum fleshy, 3-lobed, 0.6–0.7 cm long, 0.2–0.3 cm wide, clawed at the base; mid-lobe tongue-shaped, deeply grooved on the upper surface; side lobes erect with dentate margins. Column stout, 0.3 cm long, with a column-foot up to 0.5 cm long; steldia rounded.

**Habitat.** Plants of this species were found forming a mat on the edge of a granite boulder in a seasonal stream in disturbed montane forest.

**Global distribution.** India, Laos, Myanmar, Thailand.

**Notes.** *Bulbophyllum kingii* is known from Northeast India, Myanmar and Thailand, hence its occurrence in Laos is not unexpected.

**Specimens examined.** INDIA. Sikkim, Rumtek, 6000 ft, October 1877, *G.King s.n.* (K000846869) (K!); Sikkim, *J.D.Hooker s.n.* (K000846868) (K); Sikkim, 4000 ft, 1859, *J.D.Hooker & Thomson s.n.* (P00419933) (P); Sikkim, 6000 ft, October 1892, *R.Pantling 25* (P00419934) (P). LAOS. Xiengkhuang Province, Khoune District, Ban Nam Meung, 2 Nov. 2017, *Gale, Kumar, Bouamanivong, Phaxaysombath & Lorphengsy HNL-KFBG 1244* (HNL).

2. *Cleisostoma nangongense* Z.H.Tsi, Bull. Bot. Res., Harbin. 9(2): 26. (1989). **Type:** China, Yunnan, Xishuangbanna (Mengla), 20 June 1985, *Z.H.Tsi 215* (PE!-holotype).

*Cleisostoma schoenorchaefolium* Kumar & S.W.Gale, Phytotaxa 374 (2) 157 (2018), **syn. nov.** **Type:** Laos, Xayaboury Province, Parklai District, Mouang Pa Village, Pha Pheung Mountain, 30 June 2016, 455 m, *Fischer, Kumar, Phaxaysombath & Sysouphanthong HNL-KFBG 0729* (HNL!-holotype; KFBG!-isotype).

Epiphytic herb. Stem terete, branched, up to 50 cm long, 1.5–2.0 mm in diameter. Leaves alternate, dark green, distinctly channeled and semi-terete, up to 24.0 cm long, 2.0–2.5 mm in diameter, with a persistent sheathing base, apex subulate with a constriction 1.0–1.5 cm before the tip. Inflorescences lateral, pendent, glabrous, bearing up to 5 flowers in a lax raceme; peduncle terete, bearing 1 or 2 sterile bracts near the base; rachis ribbed, 4.0–5.0 cm long, up to 1.0 mm in diameter. Flowers 1.4–1.7 cm long, 1.0–1.5 cm across, petals and sepals spreading, dark yellowish-green with dark reddish-brown spots, column pale yellow. Petals and sepals spotted reddish-brown towards base, yellowish-green towards apex. Dorsal sepal obovate, 6.0–7.0 mm long, 2.0–2.5 mm wide, acute, 3-veined, slightly concave. Lateral sepals obliquely obovate, 6.5–7.5 mm long, 3.0–3.5 mm wide, obtuse, 3-veined, slightly convex. Petals narrowly obovate, oblique, 5.0–5.5 mm long, 2.0–2.5 mm wide, acute, 2-veined, slightly convex, slightly bent backwards. Labellum fleshy, 3-lobed, spurred, 7.5–8.5 mm long from tip of spur to tip of mid-lobe, 5.0–6.0 mm wide, minutely white-papillose at base; lateral lobes pointing forwards, 2.5–3.0 mm long, 2.0–

2.5 mm wide, acute, with an inconspicuous triangular appendage on apical margin and a prominent wing-like flap near the base; triangular appendage up to 0.5 mm long, pointing upwards; wing-like flap up to 1.5 mm long and 1.2 mm wide, apex rounded, pointing inwards; mid-lobe triangular, fleshy, 2.0–2.3 mm long, 2.5–3.0 mm wide, spreading forwards, base constricted, apex slightly notched; spur elongate, slightly scrotiform at apex, pointing backwards, 5.0–5.5 mm long, 2.0–2.5 mm wide, longitudinally ridged underneath, septate inside. Column stout, 2.5 mm long, 2.5 mm in diameter, wings absent; rostellum flap-shaped, truncate at apex; pollinia 4, arranged in 2 units, yellow, held parallel to the viscidium, 0.7–0.8 mm long, 0.6–0.7 mm wide, each unit comprising one larger and one smaller pollinium, the larger one hemispherical and 0.5 mm wide, the smaller one discoid and 0.3 mm wide; viscidium collar-shaped, 1.3–1.4 mm wide; stipe attached to top of viscidium, 1.3–1.5 mm long, 1.0–1.3 mm wide, broadest at base, flap-like and recurved above, slightly constricted at middle, terminating in a pointed hood 0.4–0.5 mm long and to which the pollinia are attached on either side. (Figure 1).

**Taxonomic notes.** *Cleisostoma schoenorchaefolium* was recently described from Laos (Kumar *et al.*, 2018), overlooking the existence of *C. nangongense* from Yunnan, China (Tsi, 1989). These two names are easily correlated on the basis of similar foliar (semi-terete, channeled leaf, up to 24 cm long, with an subulate apex) as well as floral (wingless column, inverted v-shaped callus on the back wall of spur, complex collar-shaped viscidium, flap-like stipe and two chambered spur with scrotiform tip) morphology. Based on these details, *C. schoenorchaefolium* is here placed in the synonymy of *C. nangongense*, the distribution of which is accordingly expanded to include Laos. The new section *Teretisculum* Kumar & S.W.Gale proposed by Kumar *et al.* (2018) remains valid in accommodating *C. nangongense* within the genus.

**Habitat.** Epiphytic on trunks of small trees in semi-evergreen forest on limestone mountains.

**Global distribution.** China, Laos.

**Notes.** *Cleisostoma nangongense* occurs in semi-evergreen forest. Originally described from Guangxi Province in China, the occurrence of this species over 600 km away in Xayaboury Province in northern Laos suggests a somewhat disjunct distribution, although its occurrence in similar limestone habitats in other parts of northern Laos and in northern Vietnam is likely.

**Specimens examined.** CHINA. Yongle Township, Zhizhi Village, Wendong Village, 26 April 2013, *Huanjiang County Census Team 451226130426045LY* (IBK); Yongle Township, Zhizhi Village, Wendong Village, 26 April 2013, *Huanjiang County Census Team 451226130426045LY* (GXMG); Guangxi Zhuang Autonomous Region, Jingxi County, Bianliang Forest, 10 September 2006, *Y.Liu & W.Xu 0006* (IBK); Yunnan, Mengla County, 27 July 1984, *Y.Ma 144* (PE). LAOS. Xayaboury Province, Parklai District, Mouang Pa Village, Pha Pheung Mountain, 30 June 2016, 455 m, *Fischer, Kumar, Phaxaysombath & Sysouphanthong HNL-KFBG 0729* (HNL, KFBG).



**Fig. 1. *Cleisostoma nangongense*.** A. Plant. B. Inflorescence. C.-D. Side view of flower. E. Front view of flower. F. Dorsal sepal. G. Petal. H. Lateral sepal. I. Callus on the back wall of spur. J. Labellum, flattened and with spur cut longitudinally to show septum and two internal chambers. K. Side view of stipe. L. Pollinarium. M. Ventral view of anther cap with pollinia. N. Dorsal view of anther cap. Drawn by Pankaj Kumar from HNL-KFBG 0729.



3. *Dendrobium formosum* Roxb. ex Lindl. in N. Wallich, Pl. Asiat. Rar. 1: 34 (1830); *Callista formosa* (Roxb. ex Lindl.) Kuntze, Revis. Gen. Pl. 2: 654 (1891). **Type:** Bangladesh, Sylhet, *W. Roxburgh s.n.* (BM000505677) (BM!-holotype).

*Dendrobium formosum* var. *giganteum* W. Bull. Proc. Roy. Hort. Soc. London 4: 175 (1864). **Type:** Bangladesh, Sylhet, *M.R. Smith s.n.* (BM!-holotype).

Epiphytic herb. Stem terete, ridged, up to 40 cm long, erect, swollen in the middle and tapering towards both ends, covered with remains of sheathing leaf bases when young, internodes and sheaths black pilose. Leaves distichous, oblong, 2.0–2.9 cm long, 0.5–0.9 cm wide, obliquely 2-lobed at apex. Inflorescence emerging from towards the apex of the stem, 2–4 flowered on a short peduncle up to 1.0 cm long. Flowers white with yellow to orange patch at the centre of the labellum, fragrant, 5.5–9.0 cm across. Dorsal sepal oblanceolate, 2.5–3.0 cm long, 1.3–1.5 cm wide, acute to acuminate, keeled at the back. Lateral sepals obliquely ovate, 3.4–3.5 cm long, 1.1–1.3 cm wide, acute, keeled at the back. Petals obovate, 4.3–4.5 cm long, 3.3–3.5 cm wide, obtuse to almost truncate with a cuspidate tip, adnate to the side of the column. Labellum obscurely 3-lobed, obtriangular, shortly clawed at base, 5.5–5.8 cm long, 3.5–4 cm wide; mid lobe broad, obscurely 2-lobed, 3.5–4.0 cm wide, 5.0–5.6 cm long, surface tuberculate especially along veins and on orange blotch, margins undulate; side lobes inconspicuous, almost triangular. Column broad, 1.3–1.9 cm long, 0.6–1.1 cm wide; foot short, 2.5–2.8 cm long, curving backwards.

**Habitat.** This epiphytic species was found growing on a roadside Dipterocarpaceae tree.

**Global distribution.** Bangladesh, India, Laos, Myanmar, Nepal, Thailand and Vietnam.

**Notes.** The distribution of *D. formosum* extends from the Dipterocarp forests of central India through the Himalaya and Thailand to Indochina. Hence, its occurrence in Laos is not unexpected. This species is becoming rare due to demand from the horticultural trade (Seidenfaden 1985, Raskoti 2009, Gale *et al.*, 2019).

**Specimens examined.** INDIA. Assam, *Miss Passy 450856* (CAL); Sikkim, *R. Pantling 271* (CAL); Jharkhand, Latehar, Netarhat Plateau, Matigadha, October 2005, *P. Kumar 051048* (WII); Netarhat Plateau, Jobla, October 2005, *P. Kumar 051054* (WII); Netarhat Plateau, Mahuadanr, October 2005, *P. Kumar 051072* (WII); Jharkhand, Singhbhum, Ligirdah, November 2005, *P. Kumar 051121* (WII); Sikkim, *Prain's Collector 67* (CAL); Sikkim, 1000 ft, 1893, *R. Pantling 271* (P00407802) (P); India, *s. loc.*, 1813, *W. Roxburgh s.n.* (BM000505677) (BM). LAOS. Xayaboury Province, Parklai District, Nam Pui National Park, 1 July 2016, *Kumar & Phothisath HNL-KFBG 0797* (HNL). MYANMAR. Javry, April 1901, *S. Mokim 634* (P00407803) (P); Rangoon, Balakrishnan 1481 (DD). NEPAL. 1819–1820, *Wallich s.n.* (BM000958077) (BM). THAILAND. Siam, Kwaie Noi River basin, Tripagodas, Birmese border, *A.J.G.H. Kostermans 402* (P00407806) (P); Kwaie Noi River basin, Tripagodas, Birmese border, *S. Bloembergen 45* (P00407807) (P).

4. *Dendrobium hesperis* (Seidenf.) Schuit. & Peter B. Adams, *Muelleria* 29: 67 (2011); *Flickingeria*

*hesperis* Seidenf., Nord. J. Bot. 2: 16 (1982). **Type:** India, Uttarakhand, Pithoragah, Olga Road, 4–5 km from Askot, 1500 m, *Arora 66130* (BSD!).

Clumped epiphytic herb. Rhizome woody, up to 30 cm long, 0.4–0.6 cm in diameter, pendulous, branched, bearing vermiform roots, 5.0–10.0 cm long. Stem arching upwards, with 4 or 5 internodes terminating in a pseudobulb; internodes 3.5–8.5 cm long, basal internode up to 2.0 mm in diameter, apical internode up to 0.5 mm in diameter; pseudobulbs oblanceolate, slightly oblique, laterally compressed, 5.5–7.0 cm long, 0.9–1.4 cm wide, bearing a solitary leaf at the apex. Leaf oblanceolate, up to 12 cm long, up to 2 cm wide, acute, glabrous, dark green above and pale green underneath with distinct dark green mid-vein. Inflorescence 1-flowered, arising from leaf axil. Flower white, 1.4–1.7 cm long, 1.5–2.0 cm wide, widely opening, non-resupinate. Dorsal sepal ovate, 0.9–1.1 cm long, 0.5–0.6 cm wide, acute. Lateral sepals obliquely triangular, 1.3–1.5 cm long, 0.7–0.8 cm wide, acute, tip recurved backwards, base attached to the column-foot. Petals lanceolate, 1.0–1.1 cm long, 0.2–0.3 cm wide, acute to rounded. Labellum 3-lobed, attached to the base of the column-foot, 1.3–1.4 cm long, 1.1–1.2 cm wide, divided into epichile, mesochile and hypochile, bearing 3 central parallel lamellae; lamellae with smooth margins at the base of hypochile, the 2 outer ones becoming more prominent with folded margins towards the tip of hypochile and then terminating abruptly on the mesochile, the central lamella remaining inconspicuous throughout; hypochile 0.4–0.5 cm long, 0.3–0.4 cm wide, with obliquely triangular side lobes, acute; mesochile narrow, up to 0.2 cm long and 0.3 cm wide; epichile further divided into three lobes, central lobe apiculate, inconspicuous, side lobes falcate with acute apex. Column stout, 1.2–1.3 cm long, 0.5–0.6 cm wide. (Figure 2).

**Habitat.** In the western Himalaya, this species is usually found growing in orchards and on scattered woodland trees in and around Askot Wildlife Sanctuary and Gori Valley in Uttarakhand, India. This area represents the western-most geographic extent of *Dendrobium* section *Crinifera*.

**Global distribution.** India, Laos.

**Notes.** This species was originally thought to be endemic to the Gori Valley of western Himalaya (Seidenfaden and Arora 1982; Deva and Naithani 1986), but it was recently discovered in northeast India (Manipur) by Nanda *et al.* (2014). Its discovery in Laos points toward its probable occurrence in intervening areas of IBBH.

**Specimens examined.** INDIA. Uttarakhand, Pithoragarh, Olga Road, 4–5 km from Askot, 1500 m, *Arora 66130* (BSD); Pithoragarh, *T.A. Rao 6598* (BSD); Pithoragarh, Gori Valley, Jauljibi, *P. Kumar & J. Sharma 100701* (WII); Manipur, Ukhrul District, Kamjong, 2 December 2010, *Nanda et al. 00480* (COGCEHR Herbarium, Hengbung, Manipur). LAOS. Vientiane Province, Kasi District, Tham Tai, 1 December 2015, *Gale & Phaxaysombath HNL-KFBG 0577* (HNL).



**Fig. 2. *Dendrobium hesperis*.** A. Plant. B. Side-view of flower. C.-D. Front-view of flower. E. Bract. F. Dorsal sepal. G. Petal. H. Lateral sepal. I. Labellum. J. Column with ovary. K. Front view of column. L. Operculum. M. Pollinia. Photographs A-D by Thatsaphone Phaxaysombath and F-M by Pankaj Kumar from HNL-KFBG 0577.



5. *Dendrobium linguella* Rehb.f., Gard. Chron., n.s., 18: 552 (1882). **Type:** Sumatra, *sine loc.*, *Reichenbach 21000* (not found).

Pendulous epiphytic or lithophytic herb. Roots vermiform. Stem terete, up to 60 cm long, 0.5 cm wide, pendulous, bearing leaves during flowering. Leaves alternate, lanceolate, up to 10 cm long, 0.8–1.0 cm wide, acute. Inflorescences axillary, emerging from nodes towards the upper part of the stem, bearing 2–4 flowers, pendent. Flowers pinkish-white, up to 2.0 cm across, not opening widely, resupinate. Dorsal sepal ovate, 1.0–1.2 cm long, 5.2–5.6 cm wide, acute. Lateral sepal obliquely triangular, 1.2–1.3 cm long, 1.2–1.3 cm wide, acute. Petals obovate, 1.0–1.1 cm long, 0.4–0.5 cm wide, acute. Labellum cochleariform with semi-circular side lobes, 1.1–1.5 cm long, 1.1–1.3 mm wide, acuminate to apiculate, inner surface pubescent and bearing a thick callus towards the base. Column stout, 0.4–0.7 cm long, with two wings near rostellum, extended into a column-foot at base; column-foot 0.7–0.9 cm long, curved inwards, covered with dark purple hairs; anther cap dark purple, 0.2–0.3 mm in diameter.

**Habitat.** This species was found growing on remnant forest trees in an urban area.

**Global distribution.** Borneo, Laos, Malaysia, Myanmar, Sumatra, Thailand and Vietnam.

**Notes.** *Dendrobium linguella* is distributed from Indochina to Malesia and occurs in both Thailand and Vietnam, hence its occurrence in Laos was expected.

**Specimens examined.** LAOS. Vientiane Province, Vang Vieng District, Phou Din Deng, 30 April 2012, *Fischer, Gale, Kumar, Bouamanivong, Santainsy & Phunthavong HNL-KFGB 0281* (HNL). THAILAND. Tap chang, Kiriwong, Nakon Sritamarat, 200 m, 29 July 1951, *T.Smitinand 794* (P00407946) (P). VIETNAM. Blao, 1954, *C.R.S.T. 417* (P00407947) (P).

6. *Dendrobium pachyphyllum* (Kuntze) Bakh.f., Blumea 12: 69 (1963); *Callista pachyphylla* Kuntze, Revis. Gen. Pl. 2: 654 (1891); *Ceraia pachyphylla* (Kuntze) W.Suarez, Orchideen J. 22: 60 (2015). **Type:** Java, Salak (not found).

*Desmotrichum pusillum* Blume, Bijdr. Fl. Ned. Ind.: 331 (1825). *Dendrobium pusillum* (Blume) Lindl., Gen. Sp. Orchid. Pl.: 77 (1830), **nom. illeg.**; *Callista pusilla* (Blume) Kuntze, Revis. Gen. Pl. 2: 655 (1891); *Bolbodium pusillum* (Blume) Rauschert, Feddes Rept. 94: 443 (1983);

*Dendrobium perpusillum* N.P.Balakr., J. Bombay Nat. Hist. Soc. 67: 66 (1970). **Type:** Java, Nusa, Kambangan, *s.coll. s.n.* (not found).

*Callista pumila* Kuntze, Revis. Gen. Pl. 2: 655 (1891); *Polystachya pumila* (Kuntze) Kraenzl., Repert. Spec. Nov. Regni Veg. Beih. 39: 126 (1926); *Desmotrichum pumilum* (Kuntze) A.D.Hawkes, Lloydia 20: 126 (1957); *Flickingeria pumila* (Kuntze) A.D.Hawkes, Orchid Weekly 2: 458 (1961). *Bolbodium pumilum* (Kuntze) Brieger in F.R.R.Schlechter, Orchideen Beschreib. Kult. Zücht., ed. 3, 1(11–12): 721 (1981); *Dendrobium pumilum* Roxb., Fl. Ind. ed. 1832, 3: 479 (1832), **nom. illeg.** **Type:** Bangladesh, Chittagong, *Roxburgh s.n.* (K).

*Dendrobium carnosum* Teijsm. & Binn., Natuurk. Tijdschr. Ned.-Indië 5: 489 (1854), **nom. illeg.** **Type:** Java, on trees of Mount Salak (not located).

*Dendrobium borneense* Finet, Bull. Soc. Bot. France 50: 373 (1903).

**Type:** Borneo, May 1872, *O.Beccari 442* (P!-holotype, K!-isotype).

*Dendrobium pisibulbum* Guillaumin, Bull. Mus. Natl. Hist. Nat., sér. 2, 34: 408 (1963). **Type:** Vietnam, Annam, Krong Pha, 1961, *P.Tixier 1461* (P00408073) (P!-holotype).

Miniature, clumped epiphytic herb with creeping rhizome. Stem 2.5–3.0 cm long, with 3 or 4 internodes, terminal internode swollen, 0.8–1.2 cm long, 0.5–0.6 cm wide, dark green to brown, shiny, angular, bearing two succulent leaves at the apex. Leaves broadly lanceolate, 1.2–1.5 cm long, 0.5–0.6 cm wide, acute. Inflorescences emerging from leaf axils, bearing 1 or 2 flowers, scape reduced. Flowers white with faint red to purple veins, resupinate, odorous. Dorsal sepal ovate, 3.5–4.0 mm long, 2.5–3.0 mm wide, acute. Lateral sepals falcate, 2.5–3.0 mm long, 7.5–8.0 mm wide, acute. Petals elliptic, slightly oblique, 5.0–6.0 mm long, 1.0–1.5 mm wide, acute, attached to the side of the column foot. Labellum obovate, 1.1–1.3 cm long, up to 0.4 cm wide, 2-lobed at the apex with a distinct notch, lobes orbicular, bearing an irregular callus a few millimeters below the notch. Column rigid, 2.5–3.0 mm long, 2.5–2.8 mm wide, column-foot tapering, arched forward, 0.8–0.9 mm long, tip conical.

**Habitat.** In Laos, plants of this species were found growing exclusively on the lower branches of *Irvingia malayana* trees in a partly burnt-out mixed *Dipterocarp* forest.

**Global distribution.** Bangladesh, Borneo, Cambodia, Java, Laos, Malaysia, Myanmar, NE India, Sumatra, Thailand, Vietnam.

**Notes.** This species occurs throughout IBBH and into Malesia. Laos was the only country in the region in which it had not previously been recorded, and so its confirmation in the country was not unexpected.

**Specimens examined.** INDONESIA. Java, Malang, October 1844, *H.Zollinger 566* (P00328949) (P); Sumatra, Kampong-Fengak, 900 m, 31 January 1907, *F.R.R.Schlechter 15966* (P00328947) (P); Sumatra, Goerach Batoe, Asahan, 100 m, April 1927, *H.S.Yates 2371* (P00328948) (P). LAOS. Attapeu Province, Samakkhixay District, 24 May 2017, *Gale, Kumar, Bouamanivong, Phaxaysombath & Lorphengsy HNL-KFGB 1174* (HNL). THAILAND. Siam, Ta Samet, Hakour Sritamarat, 50 m, 28 January 1928, *A.F.G.Kerr 504* (P00408072) (P). VIETNAM. Annam, Krong Pha, 1961, *P.Tixier 1461* (P00408073) (P)

7. *Didymoplexiella siamensis* (Rolfe ex Downie) Seidenf., Bot. Tidsskr. 67: 99 (1972). *Leucolena siamensis* Rolfe ex Downie, Bull. Misc. Inform. Kew 1925: 416 (1925). **Type:** Thailand, Chiang Mai Province, Doi Suthep, 701 m, 8 May 1910. *A.F.G.Kerr 245* (K000942688) (K!-lectotype, designated by Hu *et al.* 2014).

*Didymoplexiella denticulata* Aver., Taiwania 55: 92 (2010).

**Type:** Vietnam, Quang Binh province, Le Thuy district, Kim Thuy municipality, Lang Ho village, slopes of Khe Nuoc Trong River, 9 April 2008, *L.Averyanov, P.K.Loc, N.T.Vinh et al.*, *HAL 11443* (HN!-holotype).

Holomycotrophic terrestrial herb. Roots vermiform, 5.0–20.0 cm long, occasionally bearing orange nodules. Tubers prostrate, irregularly terete, 3.0–10.0 cm long, 0.3–0.6 cm wide, tapering at both ends. Inflorescence 15–30 cm long, terete; peduncle dark brown, bearing



flowers at the apex in a short raceme that elongates during anthesis. Buds irregularly erose. Flowers opening 1 (rarely 2) at a time, purple with red-brown markings on lateral sepals, opening widely, resupinate, 0.8–0.9 cm in diameter; perianth parts connate to upper third of their length. Bracts triangular, 0.1 mm long, 0.1 mm wide, acute. Dorsal sepal ovate, 9.0–9.5 mm long, 3.0–3.5 mm wide, obtuse, margin minutely erose especially towards the apex. Lateral sepals fused, obovate, 7.5–8.0 mm long, 2.5–3.0 mm wide at base, apical lobes round with adjacent margins free, 2.5–3.0 mm wide, obtuse to rounded. Petals 7.0–7.5 mm long, 3.0–3.5 mm wide, obtuse with minutely erose margin towards apex. Labellum inconspicuously 3-lobed, 7.0–7.5 mm long, 3.0–3.5 mm wide, margins smooth towards base, irregularly dentate towards apex, tapering at both ends, bearing a bright purple to pink thickened callus at ca. 1.5 mm below the apex of the labellum; callus comprising 2 rounded globular structures at the base and terminating in a single bilobed structure; side lobes up to 1.5 mm wide, bent downwards. Column 3.5–4.0 mm, up to 1.0–1.5 mm wide, foot absent, with two fang-like, pointed stelia arising from below the rostellum, up to 2.5 mm long, arching downwards.

**Taxonomic notes.** Averyanov (2010) distinguished *D. denticulata* from *D. siamensis* on the basis of the denticulate margins of its distinctly lobed labellum. However, on closer examination, the labellum in both species was found to be more-or-less lobed with denticulate side lobes, and hence the former was synonymized under the latter by Hu *et al.* (2014).

**Habitat.** Growing in leaf litter in dense evergreen forest.

**Global distribution.** China, Japan, Laos, Taiwan, Thailand, Vietnam.

**Notes.** *Didymoplexiella siamensis* is distributed across China to Japan and Taiwan, and through Thailand to Vietnam. However, it is very habitat-specific and has a very scattered occurrence. Despite its cryptic habit (Hu *et al.*, 2014), its discovery in Laos is not unexpected and its occurrence in other countries of IBBH is probable, too.

**Specimens examined.** CHINA. Hong Kong, Tai Tam, 278 m, 23 April 2013, *P.Kumar 12024* (KFBG). LAOS. Xekong Province, Lemam District, Xe Noy, 23 May 2017, *Gale & Lorphengsy HNL-KFBG 1141* (HNL); Xekong Province, Lemam District, Xe Noy, 23 May 2017, *Kumar, Bouamanivong & Phaxaysombath HNL-KFBG 1156* (HNL). TAIWAN. Taipei County, Chachiao, 100–200 m, *T.C.Hsu 734* (TAIF). THAILAND. Deer Valley, 914 m, 19 August 1912, *A.F.G.Kerr 305* (K000942689) (K); Chiang Mai Province, Doi Suthep, 701 m, 8 May 1910, *A.F.G.Kerr 245* (K000942688) (K); Lampang Province, Wang Nuea District, Doi Luang National Park, 825 m, *J.F.Maxwell 97-385* (BKF). VIETNAM. Quang Binh Province, LE Thuy District, 150–200 m, *L.V.Averyanov, PK.Loc, N.T.Vinh et al. HAL 11443* (HN, LE).

8. *Hetaeria oblongifolia* Blume, *Bijdr. Fl. Ned. Ind.*: 410 (1825). **Type:** Indonesia, Java, *Blume s.n.* (L0061395) (L!).

*Goodyera ovalifolia* Wight, *Icon. Pl. Ind. Orient.* 5: t. 1730

(1851); *Rhamphidia ovalifolia* (Wight) Lindl., *J. Proc. Linn. Soc., Bot.* 1: 181 (1857); *Hetaeria ovalifolia* (Wight) Benth. ex Hook.f., *Fl. Brit. India* 6: 115 (1890). **Type:** India, Courtallum, *Wight s.n.* (K000387657) (K!).

*Hetaeria rubicunda* Rehb.f., *Bonplandia* (Hannover) 3: 214 (1855); *Rhamphidia rubicunda* (Rehb.f.) Rehb.f. in B.Seemann, *Fl. Vit.*: 294 (1868). **Type:** Phillipines, 1841, *H. Cuming 2109* (BM000076670) (BM!).

*Hetaeria helferi* Hook.f., *Fl. Brit. India* 6: 115 (1890). **Type:** Misses Eider Islands, 20 Feb. 1839, Helfer 464 (*Kew Distribution No. 5343*) (K!).

Erect terrestrial herb up to 50 cm tall. Stem creeping at base, ascending, terete, 10–15 cm long, 3.0–4.5 mm in diameter, reddish-brown to greenish-brown, bearing 4–8 scattered leaves. Leaves obliquely ovate, 4.0–7.0 cm long, 3.0–3.5 mm wide, acute to acuminate, distinctly petiolate, young leaves glossy, mature ones with faint dark green reticulation; petiole sheathing. Inflorescence slender, erect, up to 40 cm long, pale greenish-brown, pubescent, bearing 15–40 laxly arranged flowers. Flowers white tinged brownish-red and green, not opening widely, 4.0–5.0 × 4.0–5.0 mm, non-resupinate. Bracts reddish-brown, triangular to ovate, almost equal to or shorter than the length of ovary, up to 4.0 mm long, acuminate, pubescent on outer surface. Dorsal sepal ovate to elliptic, 3.0–3.5 mm long, 2.0–2.5 mm wide, acute, pubescent on outer surface. Lateral sepals ovate, 3.0–3.5 mm long, 1.5–2.0 mm wide, acute, pubescent on outer surface. Petals white, obliquely ovate, 3.0–3.5 mm long, acute, margin wavy. Labellum fleshy, bright yellow, broadly cymbiform, up to 4.0 mm long, divided by a constriction into hypochile and epichile; epichile narrow, up to 0.5 mm long, attenuate; hypochile broad, up to 3.5 mm long, saccate, containing up to 10 papillae. Column short, 1.8–2.0 mm long, with rostellar arms projecting forward.

**Taxonomic notes.** In his protologue for this species, Blume cited the location as “*on slopes of Solassie in Tjanjor Province*”, a reference to Cianjur in West Java. A Javan specimen at Leiden without precise location (*Blume s.n.*; L0061395) is labeled as the holotype of this species, a judgment which we follow here.

**Habitat.** In Savannakhet Province, plants were found growing in thick understorey of disturbed lowland forest on podzolic soils. In Vientiane Province, plants were found growing in thick litter among crevices on a limestone mountain.

**Global distribution.** Southwest India, Indochina to Nansei-shoto and West Pacific.

**Notes.** *Hetaeria oblongifolia* is a very widespread terrestrial orchid distributed throughout tropical Asia to the West Pacific. Laos and Cambodia were the only countries of IBBH in which the species had so far not been recorded.

**Specimens examined.** LAOS. Vientiane Province, Vang Vieng District, Phone Ngueng, 26 Apr. 2012, *Gale, Kumar, Santainsy & Phunthavong HNL-KFBG 0008* (HNL); Savannakhet Province, Xepon District, 08 Dec 2016, *Gale, Kumar, Phaxaysombath, Phothisath & Phoummathep HNL-KFBG 0883* (HNL).



9. *Oberonia acaulis* Griff., Not. Pl. Asiat. 3: 275 (1851).

**Type:** India, Churra, *Griffith 1130* (K!).

Pendent epiphyte with reduced stem, distichous leaves and creeping filiform roots. Leaves up to 5, falcate, 7.0–24.0 cm long, 6.5–8.0 mm wide, acute, laterally flattened, fleshy. Inflorescence sub-terminal, terete, ribbed, up to 25.0 cm long, 0.2 cm wide, bearing many densely-placed flowers. Flowers greenish-yellow to pale brown, dotted with prominent glands, 0.2–0.3 cm across, slightly translucent, resupinate. Bracts longer than the ovary, 2.5–2.8 mm long, margins minutely and irregularly serrate. Dorsal sepal ovate, 1.0–1.2 mm long, 0.6–0.7 mm wide, acute, entire, slightly deflexed. Lateral sepals elliptic-ovate, 0.7–0.8 mm long, 0.3–0.4 mm wide, acute, slightly concave. Petals elliptic-ovate, 0.9–1.0 mm long, 0.6–0.8 mm wide, obtuse, faintly denticulate, bent slightly backwards. Labellum 3-lobed, 1.3–1.5 mm long, 1.2–1.3 mm wide, slightly concave under the column; side lobes broadly oblong or quadrate, 0.6–0.8 mm wide, margins irregularly dentate, slightly reflexed; mid-lobe 2-lobed, lobules elliptic-ovate, 0.6–0.7 mm broad, rounded at apex, margins minutely denticulate. Column 0.2–0.5 mm long, 0.3–0.4 mm broad, without a column-foot.

**Habitat.** Plants were found growing on the trunks of mature canopy trees and on young trees along streams in primary forest.

**Global distribution.** China, India, Laos, Myanmar, Nepal, Thailand, Vietnam.

**Notes.** This is a widespread species of South China, Himalaya and the IBBH. Hence its occurrence in Laos was expected.

**Specimens examined.** CHINA. Yunnan, *X.Jin 8664* (PE-01825305) (PE); Yunnan, *X.Jin 7926* (PE-01526085) (PE); Yunnan, *X.Jin 7940* (PE-01550410) (PE); Yunnan, *X.Jin 7940* (PE-01517660) (PE); Yunnan, *Z.Ji 92-382* (PE-00850158) (PE); Yunnan, *Z.Ji 92-723* (PE-00850160) (PE); Yunnan, *Z.Ji 92-723* (PE-00850159) (PE); Yunnan, *Z.Ji 91-557* (PE-00850156) (PE); Yunnan, *G.Xing et al. 06856* (PE-00523201) (PE); Tibet, *Li Bosheng Cheng Shuzhi 02779* (PE-01377045) (PE); Tibet, *W.Li & S.Cheng 02779* (PE-00805830) (PE); Tibet, *W.Li & S.Cheng 02779* (PE-00805831) (PE). INDIA. Uttarakhand, *J.S.Jalal 13863* (WII); Arunachal Pradesh, 27 Aug 1984, *H.B.Naithani s.n.* (RenZ13953) (RENZ); Mt. Khasia, 2000–4000 feet, *Hooker & Thomson s.n.* (P00404990) (P-syntype); Mount. Khasia, 2000–4000 feet, *Hooker & Thomson s.n.* (P00404991) (P); Mt. Khasia, 2000–4000, *Hooker & Thomson s.n.* (P00404992); Mt. Khasia, 2000–4000 feet, *Hooker & Thomson s.n.* (P00404993) (P). LAOS. Xiengkhuang Province, Khoun District, Ban Tham, 3 Nov. 2017, *Gale, Kumar, Bouamanivong, Phaxaysombath & Lorphengsy HNL-KFBG 1284* (HNL). NEPAL. 29 Oct 1954, *A.Zimmermann s.n.* (RenZ8883) (RENZ).

10. *Vanda coerulea* Griff. ex Lindl. Edward's Bot. Reg. 33: t. 30 (1847). **Type:** India, Khasia Hills, *Griffith s.n.* (K000895730) (K-LINDL!).

*Vanda coerulea* var. *rogersii* Rolfe, Orchid Rev. 22: 31 (1914); *Vanda coerulea* f. *rogersii* (Rolfe) Christenson, Orchid Rev. 117: 222 (2009).

*Vanda delicata* Rolfe, Orchid Rev. 33: 318 (1925); *Vanda coerulea* f. *delicata* (Rolfe) Christenson, Orchid Rev. 117: 222 (2009).

*Vanda coerulea* f. *luwanganba* Kishor, Orchid Rev. 116: 224 (2008).

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Robust, erect epiphytic herb up to 1 m tall. Stem terete, up to 40.0 cm long, lower part sheathed with persistent leaf bases. Leaves 7–25, distichous, 15.0–25.0 cm long, 2.5–3.0 cm wide, sheathing at base, apex obliquely 2-lobed and with 3 subulate points in the notch; sheathing leaf base 2.0–3.0 cm long. Inflorescence axillary, up to 50.0 cm long, terete, bearing up to 20 laxly placed flowers. Flowers pale to dark purple with darker blue tessellations and undulating margins, 5.0–12.0 cm wide, spreading. Pedicel and ovary 5.0–6.5 cm long. Dorsal sepal obovate-spathulate, 3.5–6.0 cm long, 2.5–3.5 cm wide, obtuse. Lateral sepals obliquely obovate, 4.0–5.0 cm long, 2.5–3.5 cm wide, obtuse. Petals oblong-obovate to spatulate, twisted, 4.0–5.0 cm long, 2.5–3.5 cm wide, obtuse. Labellum oblong, 2.5–3.0 cm long, 0.8–1.0 cm wide, 2-lobed at apex, with a conical spur at base pointing backwards; side lobes falcate, hooked. Column stout, 0.6–0.8 mm long, 0.4–0.5 mm wide, white.

**Taxonomic notes.** Originally mentioned by Griffith (1848) in his Itinerary Notes without a specific epithet and type under serial number 1284, this species was validated by Lindley (1847), who provided an epithet and Latin diagnosis. Hence, *Griffith s.n.* (K000895730), housed at K-LINDL, must be considered the holotype for this name. Mention of *Griffith 1284* by Seidenfaden (1988) as type material is regarded as erroneous, because '1284' refers only to the serial number of the name and no specimen exists with this number among Griffith's collection.

**Global distribution.** Bangladesh, China, India, Laos, Myanmar, Thailand.

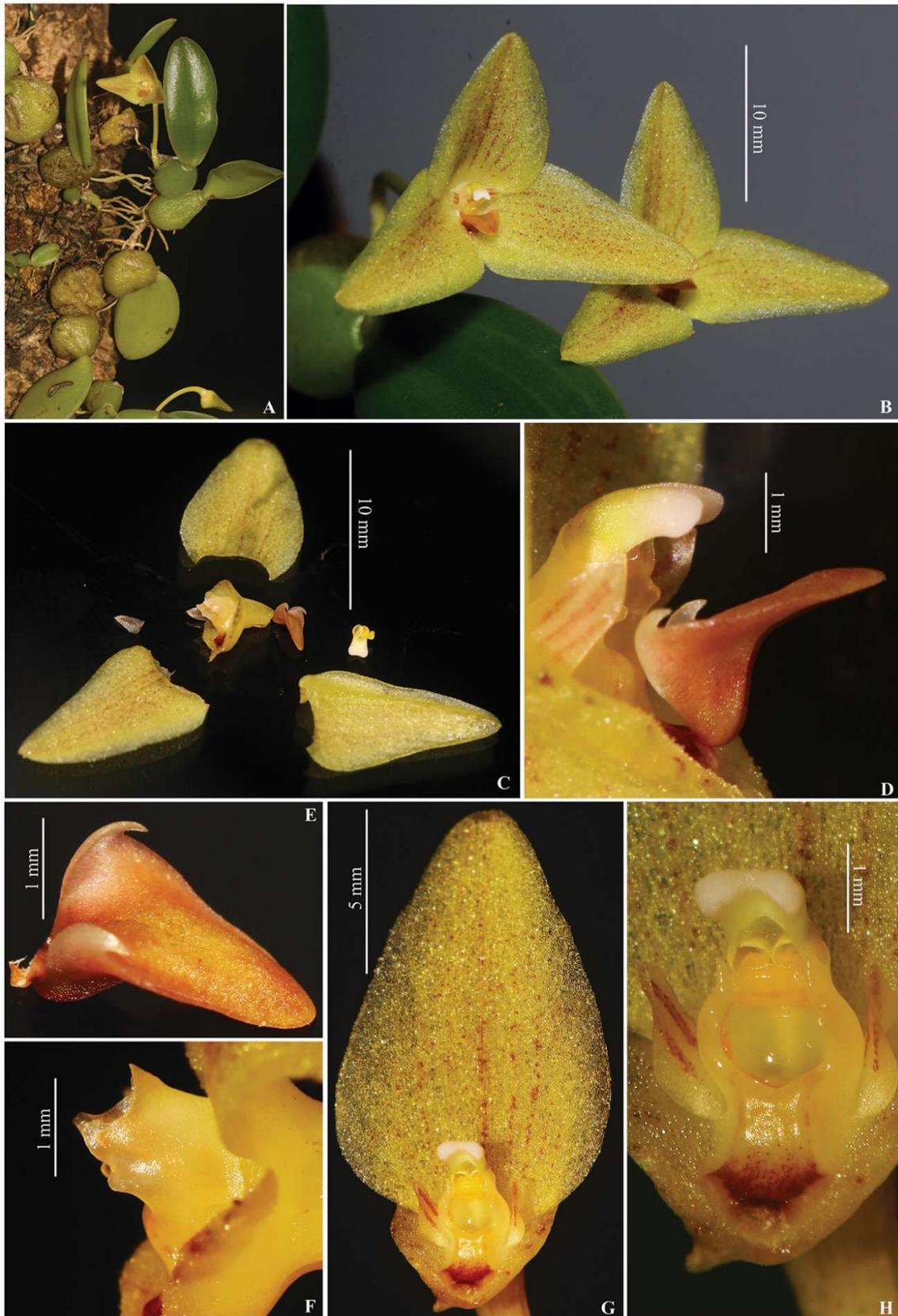
**Notes.** This species was seen growing in the private garden of a hotel in Khoun District of Xiengkhuang Province and was claimed by the hotel owner to have been collected from nearby forest. Since it is known to occur in Yunnan Province of neighbouring South China, as well as in Myanmar and Thailand (Govaerts *et al.* 2019), its occurrence in Laos is to be expected. This plant bears big, bright blue coloured flowers because of which it has been highly sought-after in horticultural trade (Hinsley *et al.* 2018). In India, this species is protected by law (Wildlife Protection Act of India 1972).

**Specimens examined.** INDIA. *J.D.Hooker & T.Thomson 2480* (K000718408) (K); Khasia Hills, *W.Griffith 5189* (K000891519) (K). LAOS. Xiengkhuang Province, Khoun District, 3 Nov. 2017, *Gale, Kumar, Bouamanivong, Phaxaysombath, Lorphengsy HNL-KFBG 1317* (HNL).

## NEW SYNONYMS

1. *Bulbophyllum oblongum* (Lindl.) Rchb.f. in W.G.Walpers, Ann. Bot. Syst. 6: 249 (1861); *Trias oblonga* Lindl., Gen. Sp. Orchid. Pl.: 60 (1830). **Type:** Myanmar, Moulmein (Mawlamyine), *Wallich Cat. 1977* (K001114838) (K-WALLICH!). **Fig. 3**

*Bulbophyllum manabendrae* D.K.Roy, Barbhuiya & Talukdar, Phytotaxa 164: 291 (2014), **syn. nov.** Type: India, Meghalaya, South Garo Hills, Balphakram National Park, Khundol Gup, 12 March 2013, *Roy 129694* (ASSAM).



**Fig. 3.** *Bulbophyllum oblongum*. A. Plant. B. Close-up of flowers. C. Dissected flower. D. Close-up of column and labellum. E. Labellum. F. Column. G. Dorsal sepal with column. H. Front-view of column. Photographs by Roland Amsler.

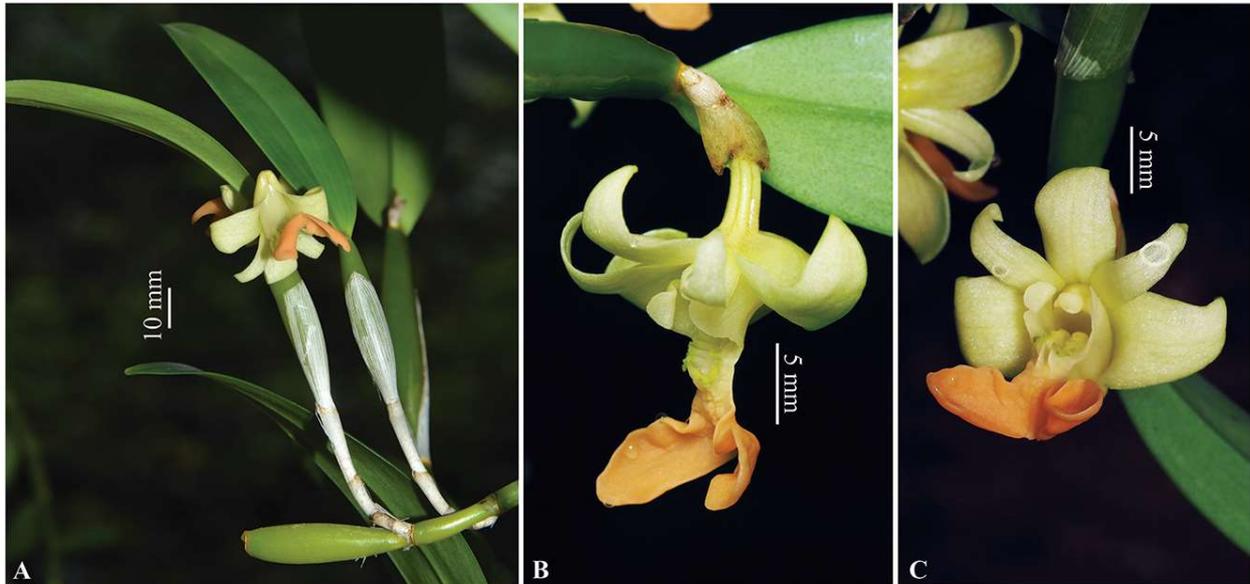


Fig. 4. *Dendrobium calocephalum*. A. Plant. B. Side view of flower. C. Front view of flower. Photographs by Pankaj Kumar.

**Taxonomic notes.** *Bulbophyllum oblongum* was originally described by Lindley (1830) as *Trias oblonga*, being based on Wallich's specimen from Myanmar (Wallich Catalogue # 1977). Although Wallich (1830) also provided a description and an illustration, he stated the collection locality to be in Nepal, even though the location is marked as Moulmein (now spelled Mawlamyine, which is in Myanmar) on the holotype and in the catalogue. In the illustration (Wallich 1830: t. 70), the hooked side lobes on the labellum and variation on the structure of the midlobe (deltoid to elliptic) are quite clear. However, when discussing *Trias oblonga*, Seidenfaden (1976) presented an illustration showing the side lobes of labellum to be rounded and erect, and the mid-lobe as more or less deltoid. Such rounded side lobes are probably an artifact as he was studying an old specimen and did not refer to the type. *Bulbophyllum manabendrae* was described by Roy *et al.* (2014) from the southern Garo Hills of Meghalaya and differentiated from *B. oblongum* on the basis of its smaller leaf size, squarish-oblong operculum without in-rolled edges and hooked side lobes or auricles of the labellum; however, these features are not considered significant for species delimitation and all conform to the plant illustrated in Wallich 1830: t. 70. Variation in the shape of the pseudobulbs is probably due to the plants of Roy *et al.* (2014) being found in harsh growing conditions. Similarly, shaped pseudobulbs can be seen in the plant depicted here in Figure 3.

Given that *B. oblongum* has already been reported from the Garo Hills (Seidenfaden 1976; Kumar 1989) and that many species of *Bulbophyllum* are known to exhibit colour polymorphism (Vermeulen *et al.* 2015), *B. manabendrae* is here merged under the synonymy of *B. oblongum*.

**Global distribution.** India, Myanmar, Thailand.

**Specimens examined.** Myanmar, *W.Griffith s.n.* (P00419883) (P). There are online images of specimens under this name at K but it seems they are a mixture of more than one species and it is hard to make out which one is the true *B. oblongum*. Hence, these specimens are not cited here.

2. *Dendrobium calocephalum* (Z.H.Tsi & S.C.Chen) Schuit. & Peter B.Adams, *Muelleria* 29: 66 (2011); *Flickingeria calocephala* Z.H.Tsi & S.C.Chen, *Acta Phytotax. Sin.* 33: 203 (1995). **Type:** China, Yunnan, Jinghong, 8 June 1991, *Z.H. Tsi 91-720* (PE!-holotype). **Fig. 4**

*Flickingeria xanthocheila* Aver., *Taiwania* 61(4): 338 (2016), **syn. nov.** **Type:** Vietnam, Hoa Binh province, Lac Son district, Tu Do municipality, Mon village, 23 March 2011, *N.Q. Hieu, L. Averyanov, N.T. Hiep, P.K. Loc, P.V. The, N.T. Vinh, T.B. Ngan, N. Tap, D.D. Dao, V.T. Ha, T. Maisak, L. Osinovetz, CPC 1387a* (LE-holotype).

*Dendrobium abhaycharanii* (Phukan & A.A.Mao) Schuit. & Peter B.Adams, *Muelleria* 29: 66 (2011); *Flickingeria abhaycharanii* Phukan & A.A.Mao, *Orchid Rev.* 113: 22 (2005), **syn. nov.** **Type:** India, Manipur, Senapati Hills, cultivated in National Orchidarium, Bot. Surv. India, Shillong, fl. 1.vii.2002, *S.Phukan 68274* (CAL!-holotype, ASSAM-isotype)

**Taxonomic notes.** *Flickingeria calocephalum* was described from Yunnan Province, China, by Tsi & Chen (1995), *F. abhaycharanii* was described from Manipur State, India, by Phukan and Mao (2005) and *F. xanthocheila* was described from Vietnam by Averyanov *et al.* (2016). All three species bear a 1- or 2-flowered inflorescence with similar floral morphology (labellum 3-lobed, orange-brown to orange-pink, bearing 2 parallel lamellae; side lobes erect, obovate to round; lamellae extending from base of the lip to base of the mid-lobe, straight at base, becoming crisped towards apex; column and column-foot up to 8 mm long). The genus *Flickingeria* is in any case now included as a



synonym of *Dendrobium* (Schuiteman and Adams 2011). Hence, *Flickingeria xanthocheila* and *Flickingeria abhaycharanii* are here merged under the synonymy of *Dendrobium calocephalum*.

**Global distribution.** China, Vietnam.

**Specimens examined.** China, Yunnan, Jinghong, 8 June 1991, Z.H. Tsi 91-720 (PE00850602) (PE-isotype); Yunnan, Jinghong, 8 June 1991, Z.H. Tsi 91-720 (PE00850603) (PE-isotype).

3. *Habenaria dentata* (Sw.) Schltr., Repert. Spec. Nov. Regni Veg. Beih. 4: 125 (1919). **Type:** East China, *Abraham Alnoor s.n.* (S-G-7390) (S!-holotype).

### Fig. 5

*Habenaria yachangensis* Z.B.Zhang & W.Guo, Phytotaxa 192: 112 (2015), **syn. nov.** Type: China, Guangxi, Leye County, Yachang Orchid National Nature Reserve, 560 m, 3 September 2013, *Xiao-Hua Jin & Zi-Bin Zhang 13814* (PE-holotype).

**Taxonomic notes.** *Habenaria dentata* is a very widespread species, occurring from south to east Asia (Govaerts *et al.*, 2019). The species exhibits wide variation in the morphology of its labellum. Seidenfaden (1977) synonymized many variants under this name, a stance followed by Schuiteman (2008) and Barretto *et al.* (2011), but not adopted by Govaerts *et al.* (2019). Supposedly novel forms continue to be described as new taxa from time to time. *Habenaria yachangensis* is one such newly described species from China (Zhang *et al.* 2015) that shares similar morphological features with *H. dentata*, including its elliptic-lanceolate leaves with white margins, its white to greenish-white flowers that are densely placed towards the apex of the inflorescence and its pendulous spur that varies considerably in length but which, when present, is always bent and forward-curving at around 0.5–1.0 cm from the base. The labellum is particularly variable, with the side lobes ranging from much reduced or nearly inconspicuous appendages to large, elaborate lobes that vary in shape from linear-lanceolate to obovate. Indeed, peloric and spurless forms of *H. dentata* have been found co-occurring with regular forms at the same site (Kurzweil 2009; authors' personal observation in Houaphan Province, Laos: *HNL-KFBG 1318* and *HNL-KFBG 1319* – regular form, *HNL-KFBG 1327* - peloric form). Given this geographically wide but sympatric variation, *H. yachangensis* is here reduced under the synonymy of *H. dentata*.

**Global distribution.** Cambodia, China, India, Japan, Korea, Laos, Myanmar, Nepal, Peninsular Malaysia, Philippines, Taiwan, Thailand and Vietnam.

**Specimens examined.** *Habenaria dentata*: CAMBODIA. Près massif Dangrek pr, Siêm Réop entre Samrong et Anlong Veng, 30 October 1927, *E.Poilane 13885* (P00426081) (P)–deformed flower (as *H. geniculata*); Siêm Réop et de Stung TReng entre Donh so et Anlong Veng, 4 November 1927, *E.Poilane 14002* (P00426082) (P). CHINA. "Zune tung", *R. Fortune a40* (P00426224) (P); Macao, *C.Gaudichaud 57* (P00426225) (P); Macao, *C.Gaudichaud 59* (P00426228) (P); Hong Kong, New Territories, Tai Mo Shan, 25 August 2013, *P.Kumar 12058* (KFBG!); Hong Kong, New Territories, Tai Mo Shan, 30 August 2007, *Y.W. Lam s.n.* (HK); Hong Kong, Hong Kong Island, Wan Chai Gap, Wan Chai Gap Road, August 1971, *Y.S.Lau 1611* (HK); Hong Kong,

New Territories, Sai Kung, Sai Kung Road, 5 September 1903, *S.T.Dunn s.n.* (HK); Hong Kong, Lantau Island, Tung Chung, Ngong Ping, 24 August 1960, *S.T.Chan s.n.* (HKU); Hong Kong Island, *Champion s.n.* (K); Hong Kong, Between two branches of Tank Ravine, Growson Hill, 16 September 1959, *Urguhart 231* (K). INDIA. Sikkim Himalaya, October 1898, *R.Pantling 97* (P00426073) (P); Naga Hills, September 1896, *D.Prain 2* (P00426074) (P); Mont. Khasia, 3000–4000 m, *J.D.Hooker & T.Thomson s.n.* (P00426075) (P); Tamga, 5000 ft, 1886, Coll. *G.King's Collector s.n.* (P00426077) (P); s.loc., 2000–4000 ft., October 1893, *R.Pantling 97* (P00426078) (P). JAPAN. Nagasaki, 1863, *s.coll.* (P00426229) (P). LAOS. On road from Xiengkhuang to Houaphan, 04 Nov 2017, *Gale, Kumar, Bouamanivong, Phaxaysombath & Lorphengsy HNL-KFBG 1318* (HNL!); On road from Xiengkhuang to Houaphan, 04 Nov 2017, *Gale, Kumar, Bouamanivong, Phaxaysombath & Lorphengsy HNL-KFBG 1319* (HNL!); On road from Xiengkhuang to Houaphan, 04 Nov 2017, *Gale, Kumar, Bouamanivong, Phaxaysombath & Lorphengsy HNL-KFBG 1327* (HNL!) (deformed flower); Phak Lou près "Xiengkhuang traminh", 1500 m, 7 September 1929, *E.Poilane 16894* (P00426080) (P). VIETNAM. s.loc., *Massie s.n.* (P00426083) (P); Iles de Poulo-Condor (Cochinchine française) *F.J. Harmand 693* (P00426087) (P); Ile Poulo Condor, *Dr. Talmy s.n.* (P00426088) (P); Poulo Condor, 1869, *J.M.A. Lanessan s.n.* (P00426090) (P).

**Notes.** There are many specimens at P labelled as *Habenaria dentata*, but they conform to the concept of *H. finetiana* Schltr. *Habenaria finetiana* can be easily differentiated from *H. dentata* on the basis of its lower stature (<25 cm tall), shorter leaves (<5 cm long) and only slightly curved spur which is shorter than the ovary and not angled, in contrast to the much taller (up to 1 m) and longer-leaved (5–15 cm long) plants of the latter, in which the spur is curved and always exceeds the ovary.

## NEW COMBINATIONS

1. *Robiquetia luongii* (Aver. & V.C.Canh) Kumar & S.W.Gale, **comb. nov.**

*Malleola luongii* Aver. & V.C.Canh, *Taiwania* 63 (2): 130 (2018). **Type:** Lam Dong province, Lam Ha District, Dalat, Nam Ba, Ta Nung pass, 1350 m, 18 October 2017, *N.V. Canh et al. s.n.* (*L.Averyanov & T.Maisak et al.* 322) (LE-holotype).

**Taxonomic notes.** *Malleola* J.J.Sm. was merged under the synonymy of *Robiquetia* Gaudich. based on molecular studies and similar morphological characters like, "pendent inflorescence with minute to small (up to c. 2 cm diam.), spurred flowers", by Kocyan and Schuiteman (2013). This treatment was followed by Pridgeon *et al.* (2014). We concur with these two publications and hence make the required new combination here.

2. *Vanda hienii* (Aver. & V.C.Nguyen) Kumar & S.W.Gale, **comb. nov.**

*Ascocentrum hienii* Aver. & V.C.Nguyen, *Taiwania* 63(2) 120 (2018). **Type:** Dak Lak Province, M'Drak District, Chu Mu Mt., 1200 m, 10 August 2017, *N.V. Canh et al. AL 331* (LE!-holotype).

**Taxonomic notes.** *Ascocentrum* Schltr. was merged into *Vanda* R.Br. by Gardiner (2012), based on the findings of Gardiner *et al.* (2013). The treatment was followed by Pridgeon *et al.* (2014). We concur with these three publications and hence make the required new combination here.



**Fig. 5.** *Habenaria dentata*. **A.** Regular and peloric variants growing together at the same site in wild in Laos. **B.** Flower with normal labellum. **C.** Peloric flower with deformed labellum. Photographs by Pankaj Kumar from HNL-KFBG 1318 & 1319.



**Paratype:** VIETNAM, Cao Bang province, Thong Nong district, Yen Son municipality, Ngan Vai village, around point 22°46'53"N, 105°52'58.7"E, primary fractionally logged coniferous forest with *Pseudotsuga brevifolia* along highly eroded rocky limestone ridge at elevation of about 1300 m a.s.l., terrestrial and lithophytic herb to 0.5 m tall in shady places on middle part of mountain slope, common, 7 October 2013, L. Averyanov, N.T. Hiep, L.M. Tuan, N.S. Khang, T. Maisak, L. Osinovets, CPC 5443 (herbarium of Center for Plant Conservation, Hanoi).

## ACKNOWLEDGMENTS

We are thankful to Thatsaphone Phaxaysombath and Somsanith Bouamanivong (HNL) for assistance in the field in Laos and to Roland Amsler (Swiss Botanic Garden) for providing images.

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