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Taiwania 64(2): 176-188, 2019
DOI: 10.6165/tai.2019.64.176

New Orchids (Orchidaceae) in the Flora of Vietnam I. Epidendroideae

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(Manuscript received 27 March 2019; accepted 23 April 2019; online published 11 May 2019)

ABSTRACT: The paper continues our recent publication of new original data on orchid diversity in Vietnam (Averyanov and Gruss, 2018a-d; Averyanov *et al.*, 2018a-e; Gruss *et al.*, 2018) obtained in 2017–2018. It includes data on 3 orchid species new for science (*Coelogyne dolichopoda*, *Liparis robustior* and *Oberonia khuongii*) and 5 species, new for the flora of Vietnam (*Epigeneium nakaharae*, *Liparis bistriata*, *L. rhodochila*, *L. siamensis* and *Nervilia mackinnonii*). Annotated species list provides the valid name, synonyms, type, citations of relevant taxonomic regional publications, data on ecology, phenology and distribution, estimated IUCN Red List status, studied specimens, brief taxonomic notes, and illustrations for each recorded species. Lectotype for *Liparis siamensis* is designated.

KEY WORDS: Indochina, New species, New records, Orchidaceae, Plant geography, Plant taxonomy, Nature protection.

INTRODUCTION

This paper continues our recent publications of new original data on orchid diversity in Vietnam (Averyanov and Gruss, 2018a-d; Averyanov *et al.*, 2018a-e; Gruss *et al.*, 2018) obtained from field studies during years 2017–2018. Like previous papers, it summarizes the results of joint efforts of professional botanists and orchid enthusiasts on studies of Vietnamese native orchids. This paper concerns taxa from subfamily Epidendroideae and includes data on three species new for science, namely *Coelogyne dolichopoda* Aver. & K.S. Nguyen, *Liparis robustior* Aver. and *Oberonia khuongii* Aver. & V.C. Nguyen. Additionally, five species are reported and documented in the paper as a new for the flora of Vietnam. These species are: *Epigeneium nakaharae* (Schltr.) Summerh., *Liparis bistriata* C.S.P. Parish & Rchb.f., *L. rhodochila* Rolfe, *L. siamensis* Rolfe ex Downie and *Nervilia mackinnonii* (Duthie) Schltr. Valid name, synonyms, type, citations of relevant taxonomic regional publications, data on ecology, phenology and distribution, assessed IUCN Red List status and studied specimens as well as brief taxonomic and biological notes are provided for each studied species. Lectotype for, *Liparis siamensis* is designated. An illustrated annotated list of all studied species arranged in alphabetical order is presented below.

MATERIALS AND METHODS

Voucher specimens cited in present study were collected during years 2017–2018. Collected plants, flowers and inflorescences were fixed and stored in 60–65% ethanol before herbarium preparation. Measurements of the floral parts for descriptions were taken on both herbarium and liquid-fixed materials. In describing of quantitative characters, infrequent extreme values (i.e. rarely occurring minimal and maximal values) of a variation range are parenthesized before and after the normal variation range. Detailed analytical photos of plant parts compiled into plates referred to here as "digital plates" or "digital epitypes" were made from the living plants prior to preparation of the appropriate herbarium specimens. Taxa distribution in Vietnam is indicated in the text by mentioning concerned provinces according to the official administrative country division (Vietnam Administrative Atlas, 2007; Provinces of Vietnam, 2019). The online version of the IUCN Red List of Threatened Species (2017) was used for estimation of preliminary species conservation status. Place of the housing of cited specimens is indicated by accepted acronyms of respected Herbaria. The studied taxa are listed below in alphabetical order.

TAXONOMIC TREATEMNT

Coelogyne dolichopoda Aver. & K.S. Nguyen, ***sp. nov.*** **Fig. 1 & 2**

= *C. ecarinata* auct non C. Schweinf, 1941, p.p.: D. Clayton, 2002, Gen. Coelogyne: 43, plate 1F.

Described from northern Vietnam. ***Type***: **VIETNAM**, Ha Giang province, Quan Ba district, Bat Dai Son

commune, Bat Dai Son Nature Reserve, San Chu village, around point 23º08′55.1″N 104º59′45.7″E, 1100–1290 m a.s.l., karstic, highly eroded mountains composed of solid marble-like limestone, primary evergreen coniferous humid forest with *Pseudotsuga sinensis* on rocky mountain tops and ridges, creeping lithophytic vine to 1.5 m long with large erect pseudobulbs, flowers yellowish, locally very common, 13 April 2018, *L. Averyanov, Nguyen Sinh Khang, Chuong Quang Ngan, T. Maisak, VR 27* (holotype – LE01050357!, isotype – LE01050470!, HN!).

Digital epitype: d-EXSICCATES OF VIETNAMESE FLORA *0344/VR 27* (Fig. 1).

***Description*: Epiphytic and lithophytic vine** 1–2(2.5) m long. **Stem** semiwoody, stout, plagiotropic, (4)5–6(6.5) mm in diameter, apically ascending, covered by densely imbricate, pale yellowish-gray, rigid, obtuse bracts, supported above ground by stilt roots. **Roots** stout, rigid, sparse, commonly 1 per fragment of stem between pseudobulbs. **Pseudobulbs** 2-leaved, narrowly ovoid to fusiform, (5)6–9(10) cm tall, (1)1.2–1.6(2) cm wide, somewhat flattened, pale green, erect, distant on (5)6–14(16) cm, covered at the base by papyraceous, partially disintegrated, pale yellowish-gray bracts. **Leaves** shortly petiolate; petiole rigid, stout, adaxially sulcate, (2.5)3–6(7) cm long, (2)2.5–3.5(4) mm in diameter; leaf blade coriaceous, broadly oblanceolate to elliptic, (10)12–20(22) cm long, (2.5)3–6(7) cm wide, acute, gradually narrowed to the base, with prominent median nerve, and rather indistinct 4–6 lateral veins. **Inflorescence** hysteranthous, pedunculate, many flowered raceme producing a single set of flowers; scape green, (10)12–22(24) cm long, thin, slender, suberect or down arching, naked at base and middle, at apex bears distichous cluster of many densely imbricating bracts (2)2.5–4(4.5) cm long; rachis arising from apex of bract cluster, bright glossy green, pendulous, distinctly zig-zag, (6)10–20(22) cm long, with many lax, simultaneously opening flowers arranged in two rows. **Floral bracts** light yellowish-brown, papyraceous, obtuse, rhomboid, conduplicate, (8.5)9–11(11.5) mm long, (4.5)5–6(6.5) mm broad when flattened, deciduous, very early falling. **Pedicel and ovary** bright glossy green, (6)8–11(12) mm long; pedicel terete (3.5)4–6(6.5) mm long, (0.8)1(1.1) mm in diameter; ovary obconoid, longitudinally grooved, (3.5)4–5(5.5) mm long, (1.8)2.0–2.2(2.4) mm in diameter near flower base. **Flowers** widely opening; sepals and petals light greenish, at margins tinged with brown; lip white or white with very light pink tint, brown at apex, side lobes bright brown inside, white outside. **Sepals** subsimilar, narrowly triangular ovate, many-nerved, (14)15–16(17) mm long, median sepal (6.5)7–8.5(9) mm wide, lateral sepal (4.5)5–6(6.5) mm wide, lightly cymbiform, slightly concave at base, acute to shortly acuminate; median sepal forward directed; lateral sepals spreading. **Petals** linear, 1-nerved, little shorter than sepals, (0.7)0.8–1(1.1) mm wide, spreading at flower opening, later strongly recurved to helicoid. **Lip** 3-lobed, somewhat fleshy, concave or shallowly saccate at base; side lobes erect, obliquely semi-orbicular, (3)3.2–4(4.2) mm long and wide, erect, partially embracing column base, finely erose denticulate along margin; median lobe elongate ligulate, (5.5)6–6.5(7) mm long, (1.8)2–2.4(2.6) mm wide, strongly recurved, sometime slightly widening and irregularly crenulate at apex; disc at throughout with 3 low, fleshy, irregularly wavy keels ad sometime with 1–2 short additional keels at middle. **Column** pale yellowish, often tinged with brown, stout, erect, slightly curved, (9)9.5–10(10.5) mm long, (1.8)2–2.2(2.4) mm wide, hardly broadening to apex, wingless. **Anther cap** white with yellowish tint, helmet-shaped, 1.8–2 mm broad, with triangular forward directed beak. **Fruits** unknown.

***Etymology*:** Species epithet refers long stout stilt roots supporting vine-like semiwoody stem.

***Habitat, phenology and conservation status*:** Short epiphytic and lithophytic vine with plagiotropic semi-woody ascending stem supported by long stout stilt roots. Primary broad-leaved, mixed and coniferous evergreen submontane forests on karstic marble-like limestone at elevations (500)900–1300 m a.s.l.. Locally common. Flowers in March – April. Estimated IUCN Red List status – DD, habitat is conservation dependent.

***Distribution*:** Vietnam: Ha Giang province (Quan Ba district, Bat Dai Son Mountains). S. China (SE. Yunnan).

***Notes*:** Species may be formally attributed to *Coelogyne* section *Elatae* Pfitzer for imbricating sterile bracts at the junction of peduncle and rachis, which producing a single set of flowers. In floral morphology it somewhat similar to *C. griffithii* Hook.f. and *C. zhenkangensis* S.C. Chen & K.Y. Lang from eastern Himalaya and western Yunnan, but strikingly differs in long rhizome supported by prominent stilt roots, distant pseudobulbs, long pendulous scape and many flowered drooping rachis. From closest *C. griffithii* new species differs also in long lip, about three time longer than broad with entire blunt to obtuse apex (vs. lip less than twice long as broad with distinctly retuse or bilobulate apex, Clayton, 2002: 35, fig. 5a, 6). In general habit of new species also somewhat resembles *C. ecarinata* C. Schweinf described from upper Myanmar but differs in pendulous inflorescence, flowers color and distinctly carinate lip. Plant figured in modern taxonomical treatment of the genus (Clayton, 2002) under the plate 1F undoubtedly belong to this species. It was observed in southeastern Yunnan (Maguan Conty) very near to "*locus classicus*" of our novelty.

Paratypes: **VIETNAM**, Ha Giang province, Quang Ba district, at Sin Suoi Ho village and river, degraded agricultural land among limestone rocks to ridge-top of exposed limestone under light canopy with many epiphytes and lithophytes on north and east facing slopes, at 23º06'57"N, 105º01'48"E, at elevation 514–900 m a.s.l., climber to

Fig. 1. New orchids in the flora of Vietnam. ***Coelogyne dolichopoda*** Aver. & K.S. Nguyen. Digital epitype (d-EXSICCATES OF VIETNAMESE FLORA *0344/VR 27*) corresponding to the type, *Averyanov et al., VR 27* (holotype – LE01050357). Photos by K.S. Nguyen and L. Averyanov, correction and design by L. Averyanov and T. Maisak.

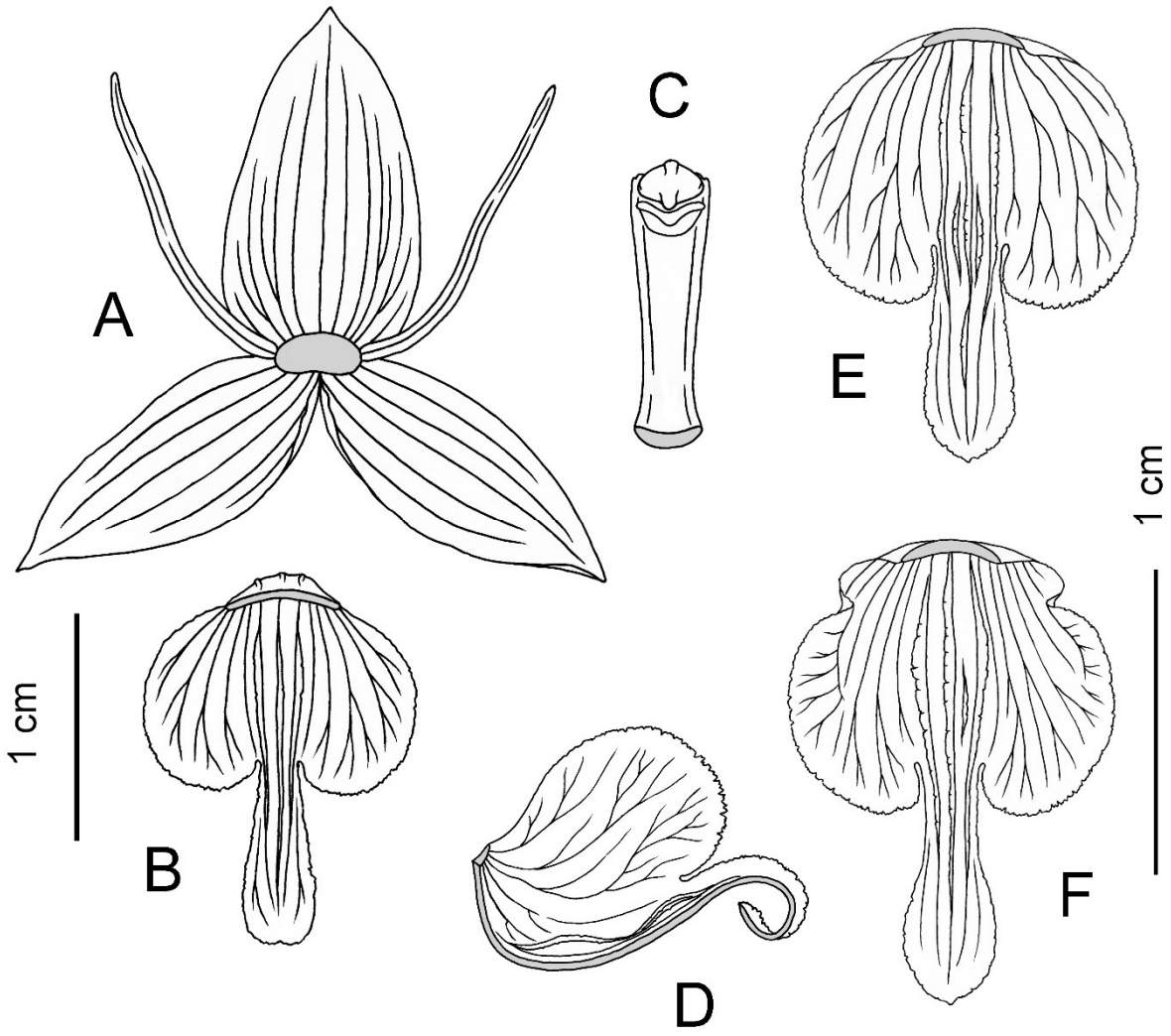

Fig. 2. New orchids in the flora of Vietnam. ***Coelogyne dolichopoda*** Aver. & K.S. Nguyen. **A** – flattened sepals and tepals. **B** – Flattened lip. **C**. Column, frontal view. **D** – Lip, sagittal section. **E**, **F** – Flattened lips with different character of keels. All drawn from the type, *Averyanov et al., VR 27* by L. Averyanov.

3 m, stems brown, frequent, 1 April 2000, *D.K. Harder, N.T. Hiep, L.V. Averyanov, N.Q. Hieu, K. Daria, DKH 4874* (HN, MO); Ha Giang province, Quang Ba district, Bat dai Son, primary forest on limestone with *Biota* sp., *Fraxinus*, *Quercus*, *Pseudotsuga*, *Acer* and *Taxus* dominants along ridge and below peak at elevation 1100–1200 m a.s.l., around point 23º07'N 105º02'E, frequent lithophyte, scales carious at anthesis, inflorescence pendant, scales light green-pink-purple, pedicels green, young ovaries light green, outer three sepals brown-purple, lighter green outside, petals similarly colored, awl shaped, rostellum same color, pollinia light yellow, labellum light green outside, brown-purple on lateral sides inside, purple-brown at tip, dull yellow-cream at lip behind tip, locally abundant, 5 April 2000, *D.K. Harder, N.T. Hiep, L.V. Averyanov, N.Q. Hieu, K. Daria, DKH 5155* (HN, MO, LE – photo); Ha Giang province, Quan Ba district, Bat Dai Son Nature Reserve, Can Ty commune, Pai Chu Phin village, around point 23º07′54.9″N 104º59′24.1″E, 1000–1220 m a.s.l., karstic, highly eroded mountains composed of solid marble-like limestone, primary evergreen broad-leaved and coniferous (with *Pseudotsuga sinensis*) humid forest on steep rocky slopes near mountain tops, creeping lithophyte on very steep shady rocky slope on rocky mountain top, flowers light brownish, lip white, not rare, 16 April 2018, *L. Averyanov, Nguyen Sinh Khang, Chuong Quang Ngan, T. Maisak, VR 307* (LE01050351!, LE01050353!, LE01050432!, LE01050472!, HN!); Ha Giang province, Quan Ba district, Bat Dai Son Nature Reserve, Thanh Van commune, Tan village, Thong (Conifer) Mountain, around point 23º07′40.3″N 104º57′11.2″E, at elevation 1000–1195 m a.s.l., karstic, highly eroded mountains composed of solid marble-like limestone, primary evergreen broad-leaved and coniferous (with *Pseudotsuga sinensis*) humid forest on steep rocky slopes near mountain tops, creeping lithophyte and occasionally epiphyte on mossy rocky cliff, flowers dull yellowish, lip brown, locally very common, 19 April 2018, *L. Averyanov, Nguyen Sinh Khang, Chuong Quang Ngan, T. Maisak, VR 441* (LE01050393!, LE01050431!, LE01050433!, LE01050473!, HN!); Ha Giang province, Quan Ba district, Tung Vai commune, Thang village, around point 23º03′13.4″N 104º51′48.8″E, at elevation 1050–1150 m a.s.l., steep slopes of stream valley composed with eroded stratified highly eroded limestone, primary evergreen broad-leaved very humid forest, lithophytic creeping herb on shady mossy cliff, flowers light brownish, rare, 21 April 2018, *L. Averyanov, Nguyen Sinh Khang, Nguyen Tien Hiep, Nguyen Quang Hieu, Chuong Quang Ngan, T. Maisak, VR 515* (LE01050352!, LE01050392!, HN!).

Epigeneium nakaharae (Schltr.) Summerh., 1956, Kew Bull. 12: 263; Chen *et al.*, 2009, Fl. China 25: 402; Zhou *et al.*, 2016, Phytotaxa 276: 54.

≡ *Dendrobium nakaharae* Schltr., 1906, *Repert*. Spec. Nov. Regni Veg. 2: 169; Su Horng-Jye, 2000, Fl. Taiwan 5: 858, photo 108; Lin *et al.*, 2016, Taiwania 61(2): 93.

Fig. 3

Described from Taiwan ("Formosa: Bei Rakurakusha, blühend im August 1905. – *G. Nakahara*"). **Type** lost, lectotype (proposed by T. Yukawa, H. Ohba, 1995) – TI (T00942).

***Habitat, phenology and conservation status*:** Miniature trunk and branch epiphyte. Mountain forest on granite. Fl. in November – December. Not common. Estimated IUCN Red List status – DD.

***Distribution*:** Vietnam: Kon Tum province (Konplong district, Ngoc Linh Mountains); Taiwan.

***Notes*:** Discovered plant shows considerable disjunction in distribution of *E. nakaharae* regarded earlier as a strict Taiwanese endemic. According to almost all morphological characters, Vietnamese plant looks very close to Taiwanese specimens, but differs in almost flat disk of the lip (vs. disk with 2 low, but distinct keels). In this connection, it may be segregated in future as a separate variety after further studies. Discovery of this species demonstrates rather unusual connections of mountainous flora of Taiwan and highlands of southern Vietnam.

***Studied specimen*:** **Southern Vietnam**, Kon Tum province, Konplong district, Mang Den, Ngoc Linh Mt., 21 October 2017, Nguyen Ta Ton, s.n., voucher herbarium specimen prepared in 15 November 2018, *L. Averyanov, T. Maisak, AL 365* (LE01049435!), flowers odorless, sepals, petals, column and anther light yellow-greenish, sepals and petals outside with brownish tint, lip glossy chestnut-brown, at the base in center pale yellow. Plate – d-EXSICCATES OF VIETNAMESE FLORA *0345/AL 365* (Fig. 3).

Liparis bistriata C.S.P. Parish & Rchb.f., 1874, Trans. Linn. Soc. London 30: 155; Seidenfaden, 1976, Dansk Bot. Arkiv 31, 1: 73, fig. 47; Pearce, Cribb, 2002, Orch. Bhutan: 203; Chen *et al.*, 2009, Fl. China 25: 224; Zhou *et al.*, 2016, Phytotaxa 276: 83.

Liparis condylobulbon auct. non *Rchb*.f. (1862, Hamburger Garten-Blumenzeitung 18: 34): Aver., 2018, Taiwania 63(3): 209, fig, 5, C & D.

Described from peninsular Myanmar ("… in the neighborhood of Moulmein … "). **Holotype** (" Myanmar, Moulmein, *Parish 80*") – K (K000387817).

***Habitat, phenology and conservation status*:** Clustering trunk and branch epiphyte. Submontane evergreen broad-leaved and coniferous forests and woodlands at elevations 1200–1400 m. Fl. in September – November. Very rare. Estimated IUCN Red List status – DD.

***Distribution*:** Vietnam: Lam Dong province (Dalat town area). Bhutan, NE. India, Myanmar, N. Thailand, S. China (Xizang, Yunnan).

***Notes*:** Mentioned plant was recorded for Vietnam under erroneous name *Liparis condylobulbon* Rchb.f. one year ago (Averyanov, 2018e). It was kindly commented by Paul Ormerod (2018, pers. comm.). The discovery of the species in highlands of southern Vietnam is not much surprising as the Himalayan floristic connections are demonstrated many orchid species with their disjunctive distribution. Most probably, the plants figured under the name *L. condylobulbon* in Taiwanese assessment (Lin, 1976, Lin *et al.*, 2016) also belong to *L. bistriata*.

***Studied specimen*:** **Southern Vietnam**, Lam Dong province, Prenn waterfall, 17 October 2017, *Nghiem Xuan Son, L. Averyanov, T. Maisak, AL 302* (LE01049475!).

Liparis rhodochila Rolfe, 1908, Bull. Misc. Inform. Kew 1908 (9): 412; Comber, 1990, Orch. Java: 137, fig.; Wood, Cribb, 1994, Checklist Orch. Borneo: 96.

Fig. 4

Described from Java ("Java"). **Type** ("… *Liparis rhochila* Sept.15th 1908 …") – K (K000943229).

***Habitat, phenology and conservation status*:** Miniature trunk and branch epiphyte. Submontane evergreen forests. Fl. in June – August. Rare. Estimated IUCN Red List status – DD.

***Distribution*:** Vietnam: Lam Dong (Duc Trong district, border with Binh Thuan province). Java, Kalimantan.

***Notes*:** Discovered plant provides one more example of close floristic connection between lowland floras of southern Vietnam and Greater Sunda Islands.

Studied specimens: **Southern Vietnam**, Lam Dong province, Duc Trong district, border with Binh Thuan prov., collected in 2013 by *Nguyen Phi Tam s.n.,* living plant, cultivated in private garden, herbarium specimen prepared in 27 June 2018 by *L. Averyanov, T. Maisak, AL 147* (LE01050005!). **Southern Vietnam**, wild collected plant of unknown origin was obtained in Dalat town street orchid market, 2 August 2018, *Truong Ba Vuong, Ngo Quang Dang, BV 328* (LE01049965!).

Liparis robustior Aver., ***sp. nov.***

Fig. 5

Described from northern Vietnam. ***Type***: **VIETNAM**, prepared from plant flowered in cultivation 15 November 2018, *L. Averyanov, T. Maisak, VR 712a* (holotype – LE01048903!) collected in northern Vietnam, Ha Giang province, Quan Ba district, Tung Vai commune, Thang village, around point 23.05ºN 104.85º″E, steep rocky slopes of stream valley composed with eroded stratified highly eroded limestone at elevation 1000–1200 m a.s.l., primary evergreen broad-leaved very humid forest, clustering epiphyte on mossy tree and occasionally lithophyte, rare, 23 April 2018, *L. Averyanov, Nguyen Sinh Khang, Nguyen Tien Hiep, Nguyen Quang Hieu, Chuong Quang Ngan, T. Maisak, VR 712a.*

Digital epitype: EXSICCATES OF VIETNAMESE FLORA *0342/VR 712a* (Fig. 5).

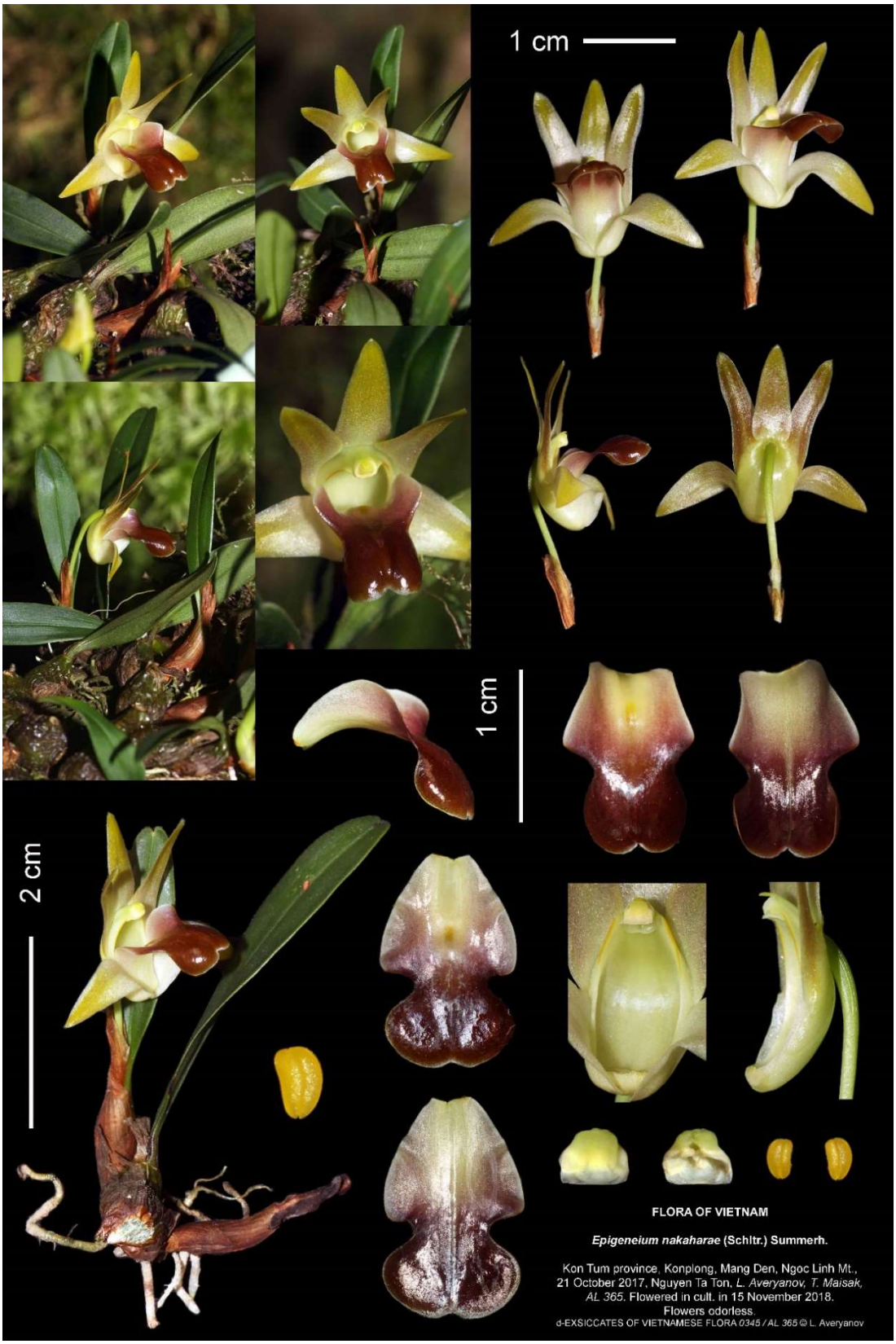

Fig. 3. New orchids in the flora of Vietnam. ***Epigeneium nakaharae*** (Schltr.) Summerh. Plate – d-EXSICCATES OF VIETNAMESE FLORA *0345/AL 365*. Photos by L. Averyanov, design and correction by L. Averyanov and T. Maisak.

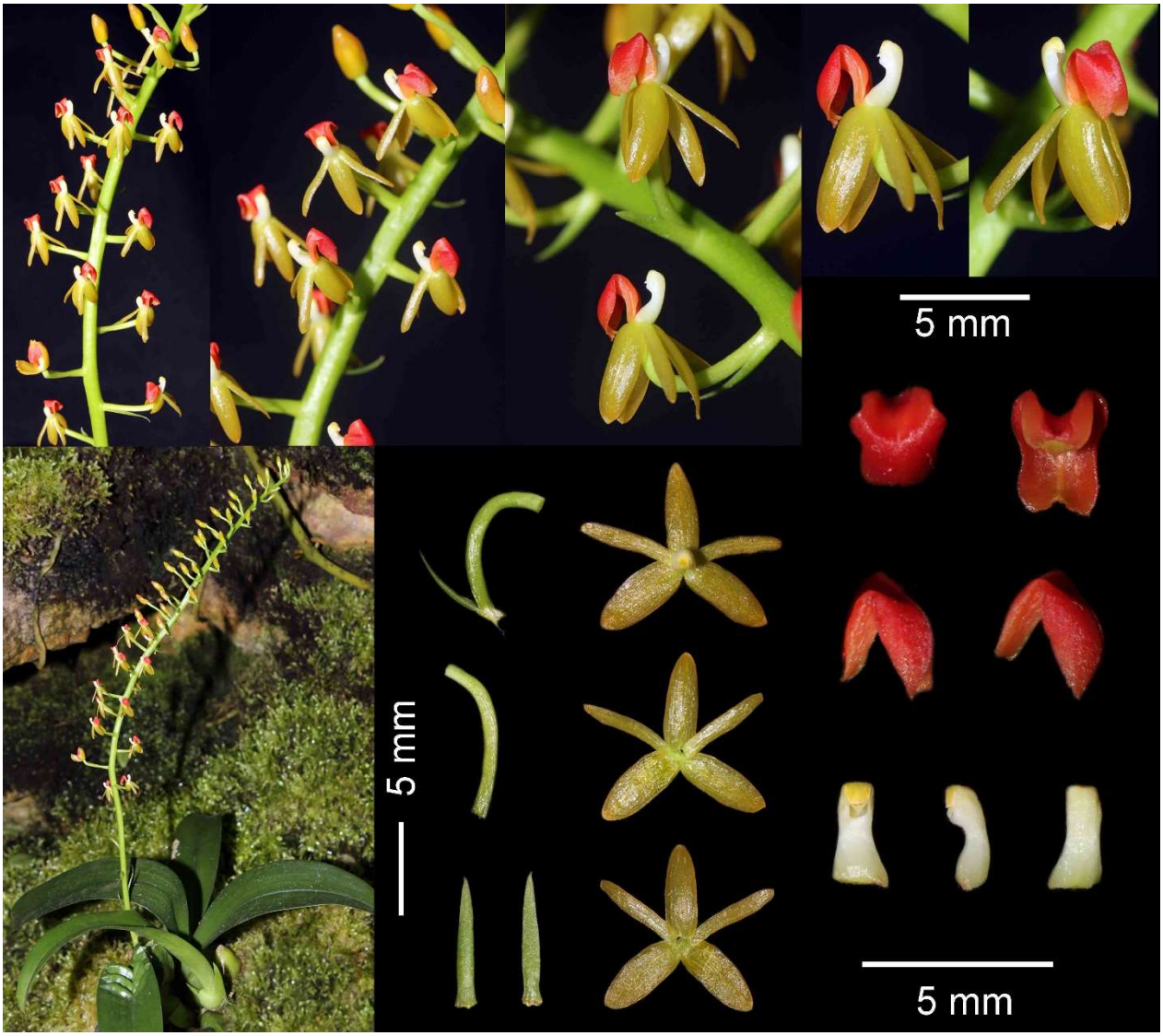

Fig. 4. New orchids in the flora of Vietnam. ***Liparis rhodochila*** Rolfe. Plate – d-EXSICCATES OF VIETNAMESE FLORA *0316/AL* 147. Photos by L. Averyanov, design and correction by L. Averyanov and T. Maisak.

***Description*: Epiphytic and lithophytic herb** with erect pseudobulbs densely crowded on thin short insignificant plagiotropic rhizome. **Pseudobulbs** grassy green, 2-leaved, ovoid, broadly ovoid or subglobular, (2.5)3–4(4.5) cm tall, (1.5)2–3(3.5) cm in diameter. **Leaves** almost sessile, broadly lanceolate to narrowly elliptic, (20)25–35(40) cm long, (3.5)4–4.5(5) cm wide, acute, gradually tapering to conduplicate base, with indistinct articulation. **Inflorescence** erect, pedunculate raceme, (35)40–50(55) cm long with many lax flowers opening in succession; scape grassy green, terete or hardly flattened, (16)18–22(24) cm long, with (2)3(4) linear acuminate erect sterile bracts, (1.5)2–3(3.5) cm long; rachis grassy green, erect, (16)18–24(28) cm long, much elongating during anthesis. **Floral bracts** grassy green, narrowly cuneate, acuminate, erect, (8)10–20(22) mm long, (0.8)1–2(2.2) mm wide, little shorter than flowers. **Pedicel and ovary** grassy green, terete, slightly curved, (8)10–15(1.8) mm long, 0.8–1 mm in diameter (when fresh). **Flowers** olive to yellowish-brown (later orange-brown), 1.6–1.8 cm across. **Sepals and petals** acute, with indistinct venation, 10–12 mm long; sepals lanceolate; petals linear to filiform. **Lip** rectangular obovate, (9)10–11(11.5) mm long, (6)6.5–7.5(8) mm wide, with entire to finely erose margin, at base with large hemispheric callus fused proximally with column base, terminated at apex with 2 glossy conical bosses; disc at the base finely warty; lip apex entire, truncate to somewhat round. **Column** white, pale brownish at base and apex, slightly arcuate, (4.2)4.5–5(5.2) mm tall, 1.4–1.6 mm wide near apex, prominently broadening to fleshy base 2.4–2.6 mm broad, at apex with broad and low insignificant wings. **Operculum** light green, hemispheric, somewhat flattened, 0.9–1 mm in diameter, truncate at front.

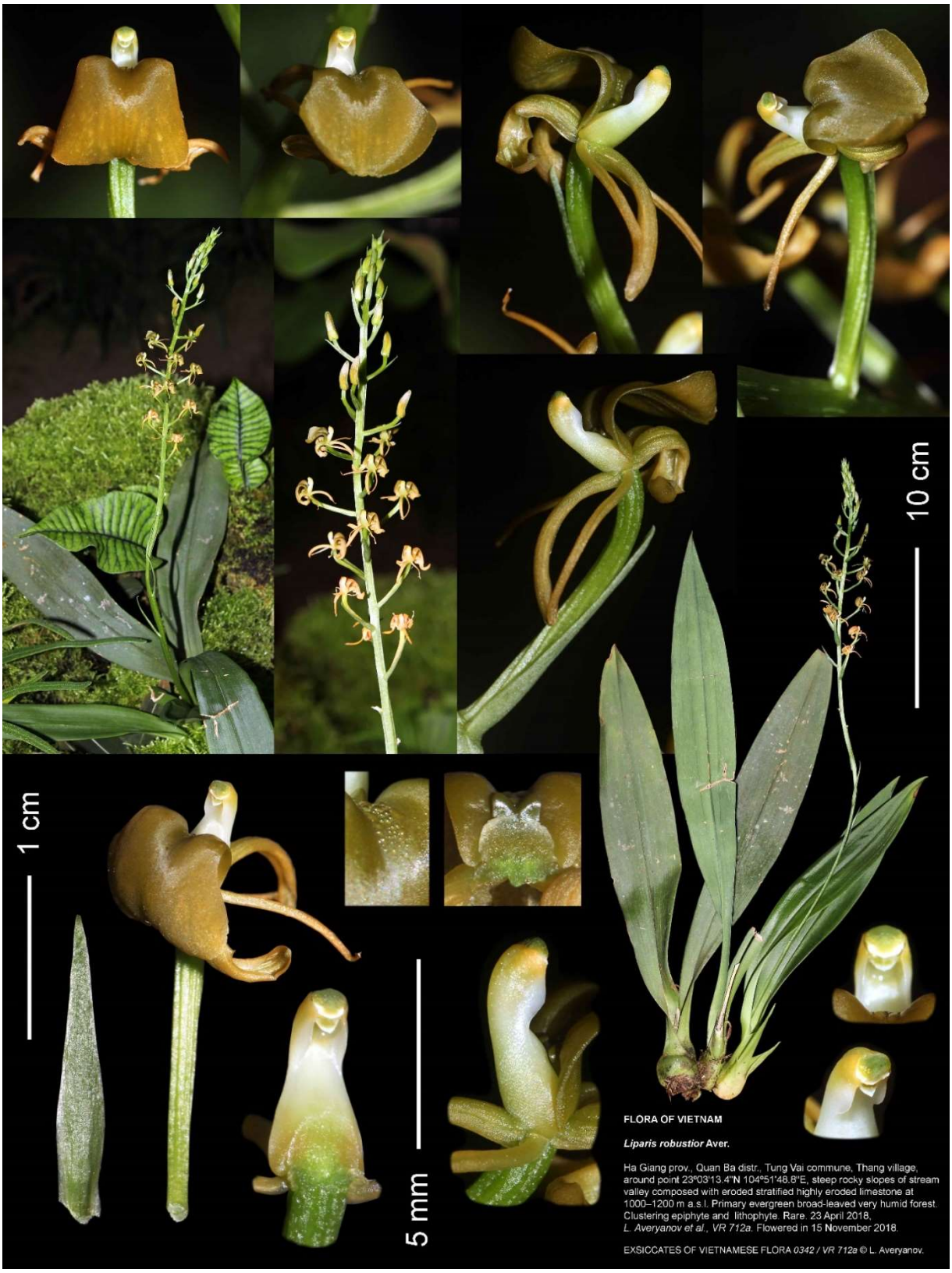

Fig. 5. New orchids in the flora of Vietnam. ***Liparis robustior*** Aver. Digital epitype (d-EXSICCATES OF VIETNAMESE FLORA *0342/VR 712a*) corresponding to the type, *L. Averyanov, T. Maisak, VR 712a* (holotype – LE01048903). Photos by L. Averyanov, design and correction by L. Averyanov and T. Maisak.

Fig. 6. New orchids in the flora of Vietnam. ***Liparis siamensis*** Rolfe ex Downie. Plate –d-EXSICCATES OF VIETNAMESE FLORA *0346/AL 419*. Photos by V.C. Nguyen, design and correction by L. Averyanov and T. Maisak.

***Etymology*:** Species epithet refers robust plant habit.

***Habitat, phenology and conservation status*:** Clustering epiphyte and lithophyte. Primary broad-leaved evergreen humid submontane forests on limestone at elevations 1000–1200 m a.s.l. Rare. Fl. in cultivation in November – December. Estimated IUCN Red List status – DD, habitat conservation dependent.

***Distribution*:** Vietnam: Ha Giang province (Quan Ba district). Endemic of northern Vietnam, known from one location.

***Notes*:** Discovered plant belongs to *Liparis* section *Cestichis* Thouars ex Lindl., and in its floral morphology somewhat similar with widespread and variable *L. bootanensis* Griff. However, new species strikingly differs in robust plant habit with leaves to 40 cm long, 5 cm wide (vs. leaves commonly much less than 20 cm long and 2.5 cm vide), 2-leaved, ovoid to almost globular pseudobulbs 1.5–3.5 cm wide (vs. 1-leaved, narrowly conoid pseudobulbs less than 0.8 cm wide), inflorescence 35–55 cm long with rachis 16–28 cm long (vs. inflorescence less than 20 cm long with rachis less than 10 cm long), bracteate scape (vs. usually naked scape), large flowers with tepals 10–12 mm long (vs. tepals less than 8 mm long) and column having very insignificant, hardly visible wings (vs. column with prominent, elongate, hook-like wings). Species was found not far from Chinese border, hence its occurrence may be expected in limestone areas of China allied to Vietnam.

Liparis siamensis Rolfe ex Downie, 1925, Bull. Misc. Inform. Kew 1925: 371; Seidenfaden, 1976, Dansk Bot. Arkiv 31, 1: 24, fig. 13; Neuman *et al.*, 2007, Checklist Vasc. Pl. Lao PDR: 273; Chen *et al.*, 2009, Fl. China 25: 218; Zhou *et al.*, 2016, Phytotaxa 276: 86; Neuman, 2019, Data base. Checklist Vasc. Pl. Lao PDR [*Liparis siamensis*].

Fig. 6

Described from northwestern Thailand ("Doi Sutep, 330-450 m., deciduous jungle, flowers green, July 6th, *Kerr 158, 158a*"). **Lectotype** ("… *Kerr 158* … ") – K (K000596254), designated here. **Isolectotype** ("… *Kerr 158* … ") – K (K000596253). **Syntype** ("… *Kerr 158a* … ") – K (K000596255).

***Habitat, phenology and conservation status*:** Terrestrial tuberiferous herb. Open dry Dipterocarp forests and woodlands at elevation about 300 m a.s.l. Fl. in August – September. Estimated IUCN Red List status – DD.

***Distribution*:** Vietnam: Dak Lak province (Buon Don district, Yok Don National Park). Myanmar, Thailand, S. China (Yunnan), Laos.

***Notes*:** The discovery of this species is not much surprising but it expands known species area for about 1000 km on southeastern direction. In Vietnam, it grows in similar habitat conditions that were reported for its locations in northern Thailand. The information on epiphytic occurrence of this species in Laos is certainly wrong (Lee, 2016).

***Studied specimen*: Southern Vietnam**, Dak Lak province, Buon Don district, Yok Don National Park, open dry lowland Dipterocarp forest, at elevation about 300 m a.s.l. 15 August 2018, *Van Canh Nguyen, AL 419* (LE01049335!).

Nervilia mackinnonii (Duthie) Schltr., 1911, Bot. Jahrb. Syst. 45: 402; Seidenf., 1978, Dansk Bot. Ark. 32, 2: 155, fig. 97; Chen *et al.*, 2009, Fl. China 25: 199; Maan Bahadur Rokaya *et al.*, 2012, Nordic Journ. Bot. 31: 537; Zhou *et al.*, 2016, Phytotaxa 276: 94.

≡ *Pogonia mackinnonii* Duthie, 1902, Journ. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 71: 43.

Described from N. India ("Western Himalaya: near Mussoorie, at elevations between 4,500 and 6,000 feet, *P.W. Mackinnon*."). **Syntypes** ("*Pogonia Mackinnonii* Mussoorie 21.6.99 *P.W. Mackinnon No. 22705 & 22705A*") – K (K000387594, K000387595, K000387596, K000387597).

Fig. 7 (d-EXSICCATES OF VIETNAMESE FLORA *0315/AL 262/1*)

***Habitat, phenology and conservation status*:** Terrestrial tuberiferous herb. Lowland and submontane primary and secondary evergreen broad-leaved forests on any kind of soils at elevations (300)500–1200 m a.s.l., commonly in shady places. Locally common. Fl. in March – April. Estimated IUCN Red List status – DD.

***Distribution*:** Vietnam: Gia Lai province (Kon Ka Kinh National Park), Ha Giang province (Quan Ba district, Bat Dai Son Nature Reserve). Nepal, NE. India, Myanmar, S. China (Guizhou, Yunnan).

***Notes*:** The discovery of this Himalayan species in northern and southern Vietnam expands known area of this plant on about 1500 km in southeastern direction. According to available observations it flowers with no leaves in March – April. Leaves appear soon after anthesis and remain until January. Species looks very close to *N. macroglossa* (Hook.f.) Schltr. reported for Vietnam by some accounts with no citations of any voucher specimens (Maan Bahadur Rokaya *et al.*, 2013). Meanwhile, *N. macroglossa* differs from *N. mackinnonii* in much larger flowers and narrow lip. We have not yet seen similar plants in Vietnam.

***Studied specimens*: Northern Vietnam**, Ha Giang province, Quan Ba district, Bat Dai Son commune, Bat Dai Son Nature Reserve, San Chu village, around point 23º08′55.1″N 104º59′45.7″E, 1000–1200 m a.s.l., karstic, highly eroded mountains composed of solid marble-like limestone, primary and partially degraded evergreen broad-leaved humid forest on rocky mountain slopes, terrestrial herb in shady place (leafless when flower), occasional, 13 April 2018, *L. Averyanov, Nguyen Sinh Khang, Chuong Quang Ngan, T. Maisak, VR 61* (LE01048917!). **Southern Vietnam**, Gia Lai province, Kon Ka Kinh national park, locally very common, 13 October 2016, *Vo Van Cong, AL 262*, herbarium prepared from cultivated plants: leaves prepared in 20 January 2018, flowers prepared in 2 April 2018, *L. Averyanov, AL 262/1* (LE01049961! 01050045!). d-EXSICCATES OF VIETNAMESE FLORA *0315/AL 262/1* (Fig. 7).

Oberonia khuongii Aver. & V.C. Nguyen, ***sp. nov.***

Fig. 8.

Described from southern Vietnam. ***Type***: VIETNAM, Dak Nong province, Dak Song district, evergreen broad-leaved forest, at about 700 m a.s.l., epiphyte, common, flowers reddish-pink, lip center red, 15 June 2017, *Van Canh Nguyen, AL 437* (holotype – LE01042183!).

Digital epitype: d-EXSICCATES OF VIETNAMESE FLORA *0332/AL 437* (Fig. 8).

***Description*: Miniature branch or trunk epiphyte. Stems** numerous, densely clustering, (1)1.5–2(2.5) cm long, with few, gray to grey-greenish, wiry roots at the base. **Leaves** (4)5–7(8), distichous-equitant, laterally compressed, suberect, oblique lanceolate to ensiform, (1)1.2–2.5(2.8) mm long, (2.2)2.5–3(3.2) mm wide, base not articulate, apex acute and shortly apiculate, covered throughout by very small, sparse, brownish one-celled glands. **Inflorescence** dense to subdense raceme 2.8–3 mm in diameter; peduncle (1.2)1.4–1.8(2) cm long, terete, 0.4–0.5 mm in diameter, with (2)3–4(5) sterile triangular acuminate bracts 0.8–1.2 mm long; rachis (2.5)3–4(4.5) cm, many flowered; floral bracts narrowly triangular, acuminate, (0.6)0.8–1(1.1) mm long, 0.2–0.3 mm wide, margin entire. **Flowers** spirally arranged or in indistinct 5-6-flowered whorls, widely opening, reddish pink, lip center bright red, (1.5)1.6–2(2.1) mm in diameter; pedicel and ovary terete, pale red, (1.6)1.8–2(2.2) mm long, 0.25–0.3 mm in diameter. **Sepals** subsimilar, ovate to broadly ovate, 0.55–0.6 mm long, 0.4–0.5 mm wide, lateral sepals little broader, back recurved. **Petals** oblong narrowly obovate, 0.6–0.65 mm long, 0.25–0.3 mm wide, with erose to shortly irregularly fimbriate margin. **Lip** almost circular in outline, 1.1–1.3 mm long, (1.5)1.6–1.7(1.8) mm wide, median lobe very indistinct; lip blade deeply dissected into 8(10) long, finger-shaped, tapering, terete, verruculose segments (0.25)0.3–0.8(0.9) mm long, 0.1 mm in diameter (distal segments distinctly longer than proximal segments); disc somewhat concave. **Column** simple, shortly cylindrical, 0.25–0.3 mm tall and 0.3 mm wide; anther cap hemispheric with small insignificant beak.

***Etymology*:** Plant discoverer, Nguyen Van Canh named plant after his father, Nguyen Van Khuong.

***Habitat, phenology and conservation status*:** Miniature branch epiphyte. Primary and old secondary evergreen broad-leaved submontane forests on granite at elevations about 700 m a.s.l. Very rare. Flowers in June – July. Estimated IUCN Red List status – DD.

***Distribution*:** Vietnam: Dak Nong province (Dak Song district). Endemic.

***Note*:** New species is quite dissimilar with all its Asian congeners in character of the lip dissection into finger-like segments. The somewhat similar scheme of a lip dissection is found in *Oberonia cavaleriei* Finet and

Fig. 7. New orchids in the flora of Vietnam. ***Nervilia mackinnonii*** (Duthie) Schltr. Plate – d-EXSICCATES OF VIETNAMESE FLORA *0315/AL 262/1*. Photos by L. Averyanov, design and correction by L. Averyanov and T. Maisak.

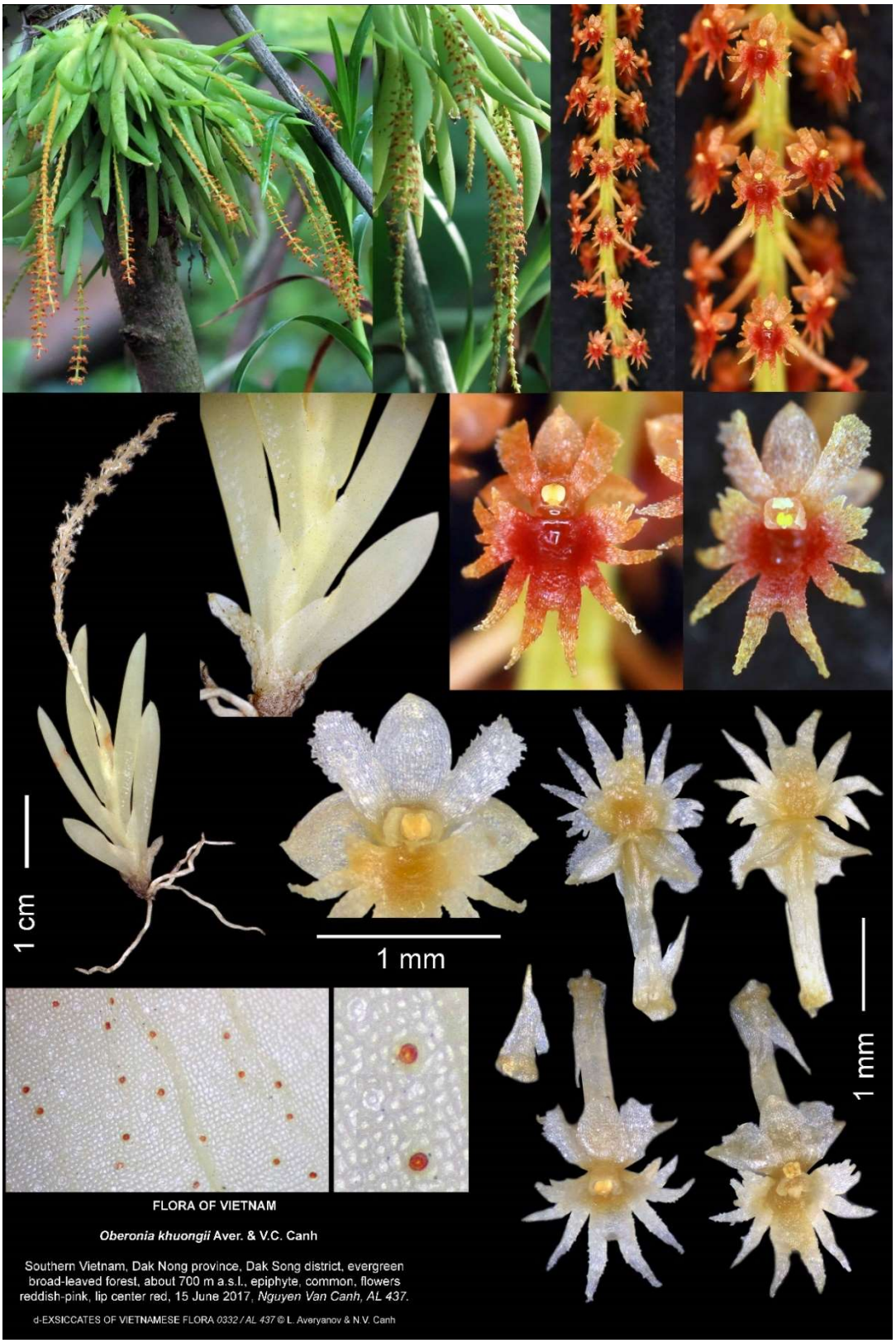

Fig. 8. New orchids in the flora of Vietnam. ***Oberonia khuongii*** Aver. & V.C. Nguyen. Digital epitype (d-EXSICCATES OF VIETNAMESE FLORA *0332/AL 437*) corresponding to the type, *Van Canh Nguyen, AL 437* (holotype – LE01042183). Photos by V.C. Nguyen and L. Averyanov, correction and design by L. Averyanov and T. Maisak.

O. mucronata (D. Don) Ormerod & Seidenf., which are very different in plant habit and floral morphology. Formally, our plant may be also compared with Himalayan *O. anthropophora* Lindl., *O. falcata* King & Pantl. *O. griffithiana* Lindl. and *O. rufilabris* Lindl. having similarly dissected median lip lobe, as well as Taiwanese *O. arisanensis* and Malaysia – Indonesian *O. flabellifera* Holttum, *O. insectifera* Hook.f., *O. polyschista* Schltr. and *O. stenophylla* Ridl. with somewhat dissected lip side lobes. Meanwhile, discovered species strikingly differs from mentioned species in its lip deeply dissected into terete finger-like verruculose segments, relatively large erose or irregularly fimbriate petals and shortly apiculate leaves bearing sparse brownish one-cellular glands.

ACKNOWLEDGEMENTS

Research work, the results of which are presented in this paper, were financially supported in parts by Vietnam Academy of Science and Technology, QTRU01.07/18-19 and The Russian Foundation for Basic Research, 18-54-54005 Viet_a in limits of project "Assessment of the plant diversity in Bat Dai Son Mountains, Ha Giang province" and were carried out in the framework of institutional research project of the Komarov Botanical Institute of the Russian Academy of Sciences "Study of the flora of Indochina" (AAAA-A18-118031290070-6). The authors cordially thank following persons for their kindest assistance in plant collecting and access to their scientifically significant garden collections: Nguyen Tien Hiep, Chuong Quang Ngan, Nghiem Xuan Son, Nguyen Quang Hieu, Nguyen Ta Ton, Vo Van Cong, as well as Dmitry Slastunov for his kind technical assistance for herbarium specimen scanning and image processing.

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