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New orchid species (*Orchidaceae*) in the flora of Laos

Новые виды орхидных (*Orchidaceae*) во флоре Лаоса

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Abstract. This paper continues the publication of new data obtained during field studies in remote and poorly studied regions of Laos in 2015–2018. It provides descriptions of two new species (*Bulbophyllum brachyscapum* Aver. and *Sunipia saccata* Aver.), emended descriptions of two previously published but insufficiently known species (*Cleisostoma verrucosum* Aver. and *Oberonia vesiculifera* Aver.) and reports of eight species newly recorded in the flora of Laos (*Biermannia calcarata* Aver., *Bulbophyllum farreri* (W. W. Sm.) Seidenf., *Didymoplexiella trichechus* (J. J. Sm.) Garay, *Eria eriopsidobulbon* C. S. P. Parish et Rchb. fil., *Habenaria ciliolaris* Kraenzl., *Liparis caudata* Aver. et K. S. Nguyen, *Odontochilus umbrosus* (Aver.) Ormerod, and *Porpax ustulata* (C. S. P. Parish et Rchb. fil.) Rolfe). Appropriate citations of regional literature, color illustrations, data on types and distribution, descriptions, etymology, as well as notes on taxonomy and related species are provided for the studied species.

Keywords: *Orchidaceae*, Laos, flora, plant diversity, new species.

Аннотация. Статья продолжает серию публикаций новых данных, полученных в ходе полевых исследований в отдаленных и малоизученных районах Лаоса в 2015–2018 гг. Описаны два новых для науки вида: *Bulbophyllum brachyscapum* Aver., *Sunipia saccata* Aver. Даны расширенные описания двух видов, описанных ранее недостаточно полно (*Cleisostoma verrucosum* Aver. и *Oberonia vesiculifera* Aver.). Восемь видов впервые обнаружены во флоре Лаоса (*Biermannia calcarata* Aver., *Bulbophyllum farreri* (W. W. Sm.) Seidenf., *Didymoplexiella trichechus* (J. J. Sm.) Garay, *Eria eriopsidobulbon* C. S. P. Parish et Rchb. fil., *Habenaria ciliolaris* Kraenzl., *Liparis caudata* Aver. et K. S. Nguyen, *Odontochilus umbrosus* (Aver.) Ormerod, *Porpax ustulata* (C. S. P. Parish et Rchb. fil.) Rolfe). Информация, приведенная при видах, содержит ссылки на протологи и региональные сводки, цветные иллюстрации, данные о типах, распространении, этимологии, а также примечания о систематике и родственных таксонах.

Ключевые слова: *Orchidaceae*, Лаос, флора, разнообразие растений, новые виды.

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The orchid flora of Lao People's Democratic Republic (Laos) is one of the richest in Indochina. Despite a series of floristic accounts (Seidenfaden, 1992; Newman et al., 2007; Schuiteman et al., 2008; Averyanov, 2013b; Averyanov et al., 2016, 2018a, 2019; Kumar et al., 2016, 2018; Gale et al., 2018) and recent records of numerous species (Schuiteman, Bonnet, 2008, 2009; Gruß et al., 2014; Gale et al., 2016; Gale, Phaxaysombath, 2017; Hu et al., 2017; Averyanov et al., 2018b; Schuiteman et al., 2018) it remains poorly studied. This paper continues the publication (Averyanov, 2013b; Averyanov et al., 2016, 2018a) of new data obtained during field studies in remote and poorly studied regions of Laos in 2015–2018. It provides descriptions of two new species (*Bulbophyllum brachyscapum* Aver. and *Sunipia saccata* Aver.), emended descriptions of two previously published but insufficiently known species (*Cleisostoma verrucosum* Aver. and *Oberonia vesiculifera* Aver.) and reports of eight species newly recorded in the flora of Laos (*Biermannia calcarata* Aver., *Bulbophyllum farreri* (W. W. Sm.) Seidenf., *Didymoplexiella trichechus* (J. J. Sm.) Garay, *Eria eriopsidobulbon* C. S. P. Parish et Rchb. fil., *Habenaria ciliolaris* Kraenzl., *Liparis caudata* Aver. et K. S. Nguyen, *Odontochilus umbrosus* (Aver.) Ormerod, and *Porpax ustulata* (C. S. P. Parish et Rchb. fil.) Rolfe). Appropriate citations of regional literature, color illustrations, data on types and distribution, descriptions, etymology, as well as notes on taxonomy and related species are provided for the studied species.

The images of the cited specimens stored at LE Herbarium are freely available on the database "Herbarium LE" (http://en.herbariumle.ru).

Biermannia calcarata Aver. 1988, Bot. Zhurn. (Moscow & Leningrad), 73: 429, fig. 8; id. 1994, Identification Guide Viet. Orch.: 237, fig. 19; Aver., Averyanova, 2003, Updated Checklist Orch. Viet.: 12. — Fig. 1: *1, 2*.

Described from northern Vietnam. — Type: "Hai Phong, Cat Hai, Cat Ba, on mossy branches of small trees along freshwater lakeside in the central part of the island, 21 XII 1986, Averyanov et al., LX-VN 3331" (holotype — LE: LE 01055101).

Distribution. Laos, Vietnam.

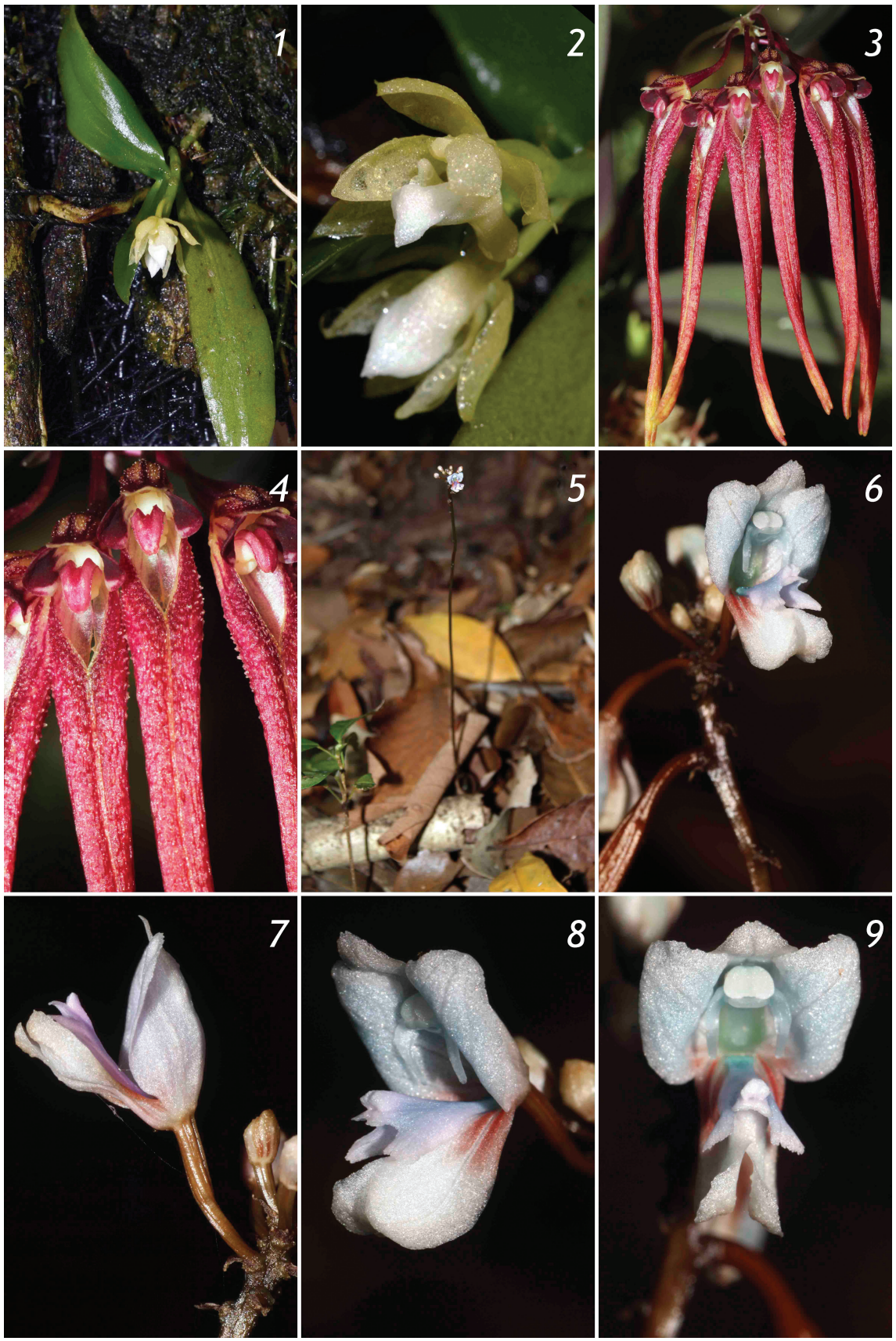
Examined specimen. Lao PDR, Houa Phang Prov., Xon Distr., Hay Lao village, around point 20°33′ N 103°83′ E, at elevation around 850 m a. s. l., 6–11 IX 2017, N. L. Orlov, L. K. Ioganssen, herbarium specimen prepared 4 IV 2018, N. L. Orlov, NLO 84 (LE 01048921).

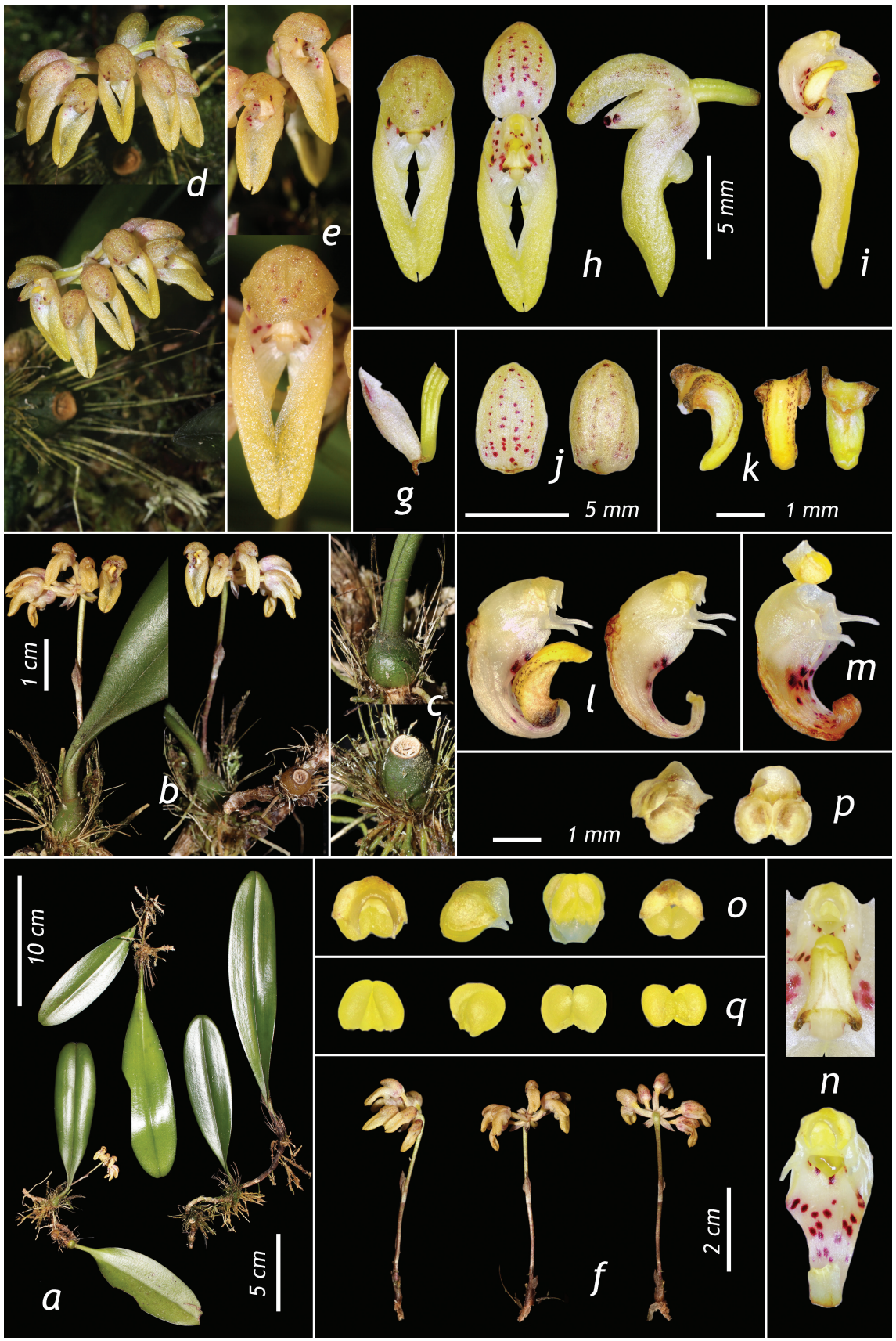
Note. The only earlier known record of this species for the flora of Laos (Phongsali Prov., P. Bonnet et al., PB265) probably belongs to a new and not yet described species (Schuiteman et al., 2008). Our plant (LE 01048921) is indistinguishable from the type specimen.

Bulbophyllum brachyscapum Aver., sp. nova (sect. *Cirrhopetalum* (Lindl.) Rchb. fil.). — Fig. 2.

Perennial, creeping, sympodial epiphyte. Rhizome plagiotropic, thick, semi-woody, simple or branching occasionally, pale dirty-brownish-gray, (8)10–20(25) cm long, with pseudobulbs placed at (2.5)3–6(7) cm intervals. Pseudobulbs 1-leaved, glossy green, erect, ovoid to almost globose, (4.5)6–8(10) mm long, (4)5–6(7) mm diam., with several thin, wiry, rigid roots at the base. Leaves sessile, conduplicate, narrowly oblong-obovate, (12)15–20(22) cm long, (2.5)3–4(4.5) cm wide, blunt to rounded at apex, narrowing into petiole-like grooved base, articulated with pseudobulb apex. Inflorescence few-flowered, umbel (2.2)2.8–3.6(4) cm diam. Scape arising from the base of pseudobulb, ascending to erect, light green, heavily marked with dull dirty purple, (3.5)4–5(6) cm long, 1.6–1.8 mm diam., with 1(2) sterile brownish hyaline bracts at the middle and 2–3(4) brownish bracts at the base; bracts triangular-ovate, acute, (4.5)6–10(12) mm long and (3)4–6(8) mm wide (when flattened). Flowers (4)5–7(8), simultaneously opening, odorless. Pedicel and ovary light greenish, terete, 3.5–4.5 mm long, ovary longitudinally grooved, 1.2–1.4 mm diam. Sepals and petals with entire margins, light lemon- or ochre-yellow, inside sparsely marked with small purple dots, somewhat projecting forwards. Median sepal ovate, concave, 5–6 mm long, 4–4.5 mm wide, blunt and somewhat cucullate at apex. Lateral sepals oblique, narrowly oblong-triangular, (10)10.5–11.5(12) mm long, (2)2.2–2.4(2.6) mm wide near the base, joined in distal third, free and obliquely acute at apex, with prominent saccate, subglobular fold near the base. Petals narrowly triangular-ovate, obtuse, 3.5–4 mm long, 2–2.2 mm wide, with dark purple spot at apex. Lip light yellow, with fine purple marks, simple, triangular-conoid, recurved, adaxially slightly grooved, 2–2.2 mm long, 0.9–1.1 mm wide, movable. Column white to yellowish-white, 1.6–1.8 mm tall and wide, with prominent, straight, finger-like, white, forward

Fig. 1. New orchids in the flora of Laos.
1, 2 — Biermannia calcarata (NLO 84, LE 01048921); *3, 4 — Bulbophyllum farreri* (AL 169 / K 395, LE 01055510); *5–9 — Didymoplexiella trichechus* (AL 1086, LE 01048691). Photos by N. Orlov (*1, 2*) and L. Averyanov (*3–9*), correction and design by L. Averyanov.


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projecting stelidia 0.8–1 mm long, laterally with broad wings; stigma concave, broadly triangular; column foot white, incurved, 1.8–2 mm long, narrowing to the apex. Anther cap helmet-shaped, pale yellow, 0.7–0.8 mm tall and wide, laterally with prominent triangular tips; pollinia 2, bright lemon-yellow, each consisting of two unequal halves. Fruits not seen.

Type: "Laos, Vientiane Prov., Vang Vieng Distr., close vicinity of Vang Vien Town, secondary degraded evergreen forest on steep slopes of small rocky stream on limestone at elevation 300–400 m, creeping epiphyte on tall tree, not rare, 12 XII 2015, L. Averyanov et al., AL 178, herbarium specimen prepared 17 IV 2019, L. Averyanov, AL 178.1" (holotype — LE: LE 01049506).

Analytical plate: 0351 / L. Averyanov AL 178.1 (http://go.herbariumle.ru/exs-herb-0351).

Etymology. The specific epithet refers to the short scape of the inflorescence.

Distribution. Central Laos (Vientiane Province, Vang Vieng District). Endemic to limestone areas in central part of Laos.

Ecology, phenology and conservation status. Primary and old secondary broadleaved forests on karstic limestone at elevations of 300–400 m a. s. l., usually a creeping epiphyte on tall trees along stream. Not rare. Fl. III–V. Estimated IUCN status — DD.

Note. The new species belongs to the group of medium-sized species having flowers with sepals and petals entire along their margins. This group is traditionally placed into *Bulbophyllum* sect. *Cirrhopetalum* (Seidenfaden, 1979, 1992). In eastern Indochina, it includes such related species as *B. elatum* (Hook. fil.) J. J. Sm., *B. guttatum* Schltr., *B. guttulatoides* Aver., *B. umbellatum* Lindl., and *B. violaceolabellum* Seidenf. However, our plant is very distinct from these species in its specific floral morphology. Among species of other regions, the new species may be compared with the east Himalayan *B. sarcophyllum* (King et Pantl.) J. J. Sm. from which it differs by having pale yellow flowers marked with purple dots (vs. flowers evenly dark purple-brown), glabrous sepals (vs. sepals densely glandular hairy), larger pseudobulbs 4.5–10 mm long (vs. less than 4 mm long), short scape 3.5–6 cm long (vs. 7–10 cm long), smaller flowers 10–12 mm long (vs. 18–20 mm long), and protruding forward (vs. erect) stelidia. The new species has tepals with striking purple markings, particularly in terms of the large dark purple dots at the apex of the petals.

Bulbophyllum farreri (W. W. Sm.) Seidenf. 1974 (1973), Dansk Bot. Ark. 29, 1: 212, fig. 115; Aver. 1999, Bot. Zhurn. (Moscow & Leningrad), 84, 10: 127; Aver., Averyanova, 2003, Updated Checklist Orch. Viet.: 14; S. C. Chen, J. J. Verm. 2009, Fl. China, 25: 426. ≡ *Cirrhopetalum farreri* W. W. Sm. 1921, Notes Roy. Bot. Gard. Edinburgh, 13: 196. — Fig. 1: *3, 4*.

Described from northern Myanmar ("Upper Burma"). — Type: "Coll. Farrer. Cult. R. B. G. Edinb. October 1920" (holotype — E00383625).

Distribution. Myanmar, China (Yunnan), Laos, Vietnam.

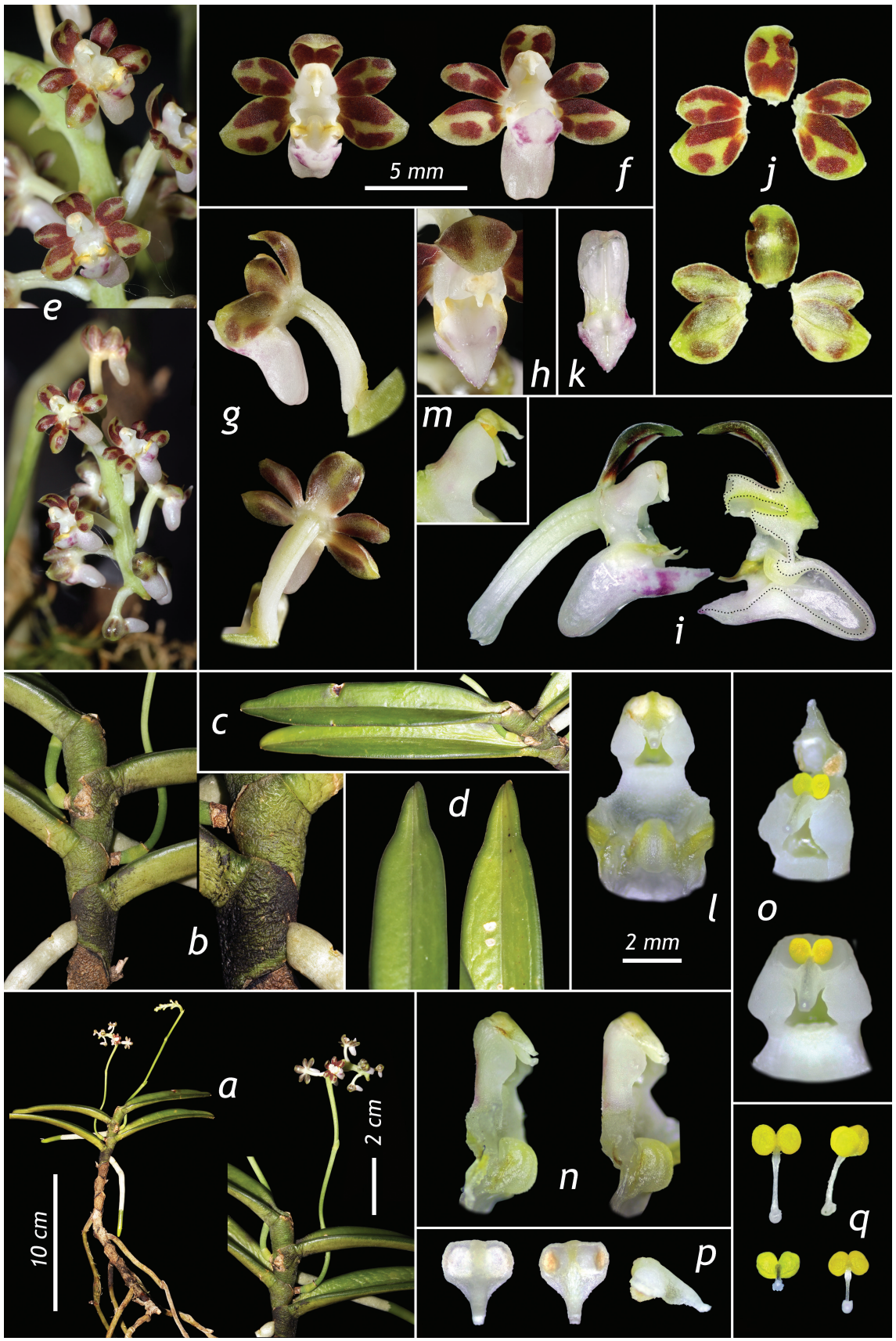
Examined specimen. Laos, Champasak Prov., Bolaven Plateau, road Paksong — Ban Houay Kong, 1170 m a. s. l., 15°14.191 N 106°25.694 E, epiphyte in canopy of tall tree, 26 IX 2015, E. Konstantinov et al., AL 169 / K 395, herbarium specimen prepared 30 V 2018, L. Averyanov, AL 169 / K 395 (LE 01055510).

Note. The discovered locality of the species considerably extends its range southwards. The Laotian plant is almost identical to those reported from Vietnam (Averyanov, 1999; Averyanov, Averyanova, 2003) — LE 01055508.

Cleisostoma verrucosum Aver. 2019, Pl. Divers. Fl. Veg. HNN NPA: 143–144, fig. 1208, 1209; descr. emend. — Fig. 3.

Emended description. Perennial monopodial lithophytic or epiphytic herb. Stem simple or few-branched, rigid, ascending to erect, (15)20–25(30) cm long, (6)7–8(10) mm diam., with few wiry, straight to flexuous roots branching at apex; internodes (7)8–10(12) mm long. Leaves dark green, sessile, dorsiventral, fleshy, very rigid, almost perpendicular to stem and slightly arcuate, conduplicate, oblong lanceolate, (6)7–9(11) cm long, (6)8–10(11) mm wide, with abruptly constricted, acute apex; leaf sheaths equitant, rigid, verruculose. Inflorescence a lateral raceme (8)10–14(16) cm long, scape and rachis light grassy green; scape (6)7–12(14) cm long, erect, straight or slightly flexuous, with 3–5 short, broad, light green sterile bracts, rachis straight to curved, (1.2)1.5–2.5(3.5) cm long, with many spirally arranged, lax flowers placed at (2)3–4(4.5) mm intervals. Floral bracts minute, triangular, acute, 1.4–1.6 mm long and wide. Pedicel and ovary light green to almost white, perpendicular to rachis, (5)5.5–7(7.5) mm long, 1–1.2 mm diam., slight-

Fig. 2. New orchids in the flora of Laos: *Bulbophyllum brachyscapum*, analytical plate (AL 178.1, LE 01049506).
a — flattened flowering plants; *b* — plants with intact inflorescences; *c* — pseudobulbs; *d* — intact inflorescences; *e* — flowers, front view; *f* — flattened inflorescences; *g* — floral bract and ovary; *h* — flower, front and side views; *i* — flower with lateral sepal and petal removed; *j* — median sepal, abaxial and adaxial views; *k* — lip, side, front and back views; *l* — column with lip and with lip removed, side view; *m* — column with half removed operculum, side view; *n* — column with lip and with lip removed, front view; *o* — operculum with pollinia; *p* — operculum with pollinia removed; *q* — pollinia. Photos, correction and design by L. Averyanov and T. Maisak.


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10 cm
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ly curved, terete, glabrous. Flowers widely opening, (6.5)7–7.5(8) mm diam.; sepals and petals rather fleshy, glabrous, spreading or median sepal somewhat forward directed, pale yellow with large chestnut-brown blotches; lip white, with light purple tint on sides of median lobe and yellow near side lobes base; column pure white; anther cap white with light yellow tint; pollinia bright yellow. Sepals narrowly obovate, slightly concave, rounded at apex, (2.8)3–3.2(3.4) mm long, (2)2.2–2.4(2.6) mm wide, lateral sepals slightly oblique. Petals broadly oblong-lanceolate, blunt, as long as sepals, (1.4)1.5–1.7(1.8) mm wide, slightly oblique. Lip spurred, (3.2)3.4–3.6(3.8) mm long (from spur apex to the base of sepals), 3-lobed; side lobes filiform-subulate, more or less straight, forward directed, (0.8)0.9–1(1.1) mm long, strongly broadened at the base; median lobe fleshy, triangular sagittate, (1.3)1.5–1.6(1.8) mm long, (1.3)2.4–2.5(2.7) mm wide, acute, straight, forward directed or slightly upright, smooth or finely irregularly rough, longitudinally conduplicate concave, side lobules narrowly triangular, acute, back directed (forming sagittate structure), disc with 1 glossy inflation continuing into the spur in form of high almost glabrous keel (incomplete septum); spur broadly conoid, distinctly dorsiventrally compressed, almost parallel to ovary, (3.4)3.6–3.8(4) mm long, (2.2)2.4–2.6(2.8) mm wide, with somewhat emarginate apex and incomplete longitudinal septum inside. Backwall callus light lemon-yellow, in form of large stalked ovoid glossy smooth swelling grooved longitudinally from abaxial side, (1.2)1.3–1.4(1.5) mm long, (0.8)0.9–1(1.2) mm wide, constricted at the base into short fleshy stalk. Column short, broad, (2.3)2.4–2.5(2.6) mm high and wide, with short semicircular lateral forward directed wings; rostellum entire, conical, forward directed, furrowed above; stigma obscurely triangular. Anther cap hemispherical, 0.9–1 mm long and wide, with long, narrowly triangular beak. Pollinarium comprising viscidium, stipe and 2 pollinia. Pollinium ovoid to subglobular, incompletely split into 2 hemispheric lobes. Stipe (tegula) simple, linear filiform, 0.8–0.9 mm long; viscidium simple, in form of small circular gland, 0.15–0.2 mm diam. Fruits not seen.

Type: "Laos, Khammouane Prov., Boualapha Distr., herbarium specimen prepared 10 VIII 2018, L. Averyanov, T. Maisak, AL 968/1" (holotype — LE: LE 01048677).

Analytical plate: 0319 / AL 968/1 (http://go.herbariumle.ru/exs-herb-0319).

Etymology. The species name refers to rugulose leaf sheaths typical of species of *Cleisostoma* sect. *Echioglossum* (Blume) Seidenf.

Ecology, phenology and conservation status. Lithophyte or epiphyte. Primary dry evergreen and semideciduous broadleaved limestone forests, commonly on tops of karstic hills at elevations of 400–600 m a. s. l. Fl. VIII–IX. Locally common. Estimated IUCN Red List status — DD.

Distribution. Central Laos (Khammoune Prov., Boualapha Distr., Hin Nam No Nature Protected Area). Endemic.

Note. In floral morphology, this species is most closely allied to *C. paniculatum* (Ker Gawl.) Garay, but differs by having a verruculose stem (typical of species of *C.* sect. *Echioglossum*), prominent constriction of apical part of leaf, subulate side lobules of median lip lobe and stalked (placed on short up-directed stalk) backwall callus.

Didymoplexiella trichechus (J. J. Sm.) Garay, 1954, Arch. Jard. Bot. Rio de Janeiro, 13: 34; J. B. Comber, 2001, Orch. Sumatra: 111; H. A. Pedersen et al. 2014, Fl. Thailand, 12, 2: 482; Tsukaya, Suleiman, Okada, 2014, Acta Phytotax. Geobot. 65, 2: 109, fig. 1C, D; 3. ≡ *Didymoplexis trichechus* J. J. Sm. 1920, Bull. Jard. Bot. Buitenzorg, 3, 2: 19. — Fig. 1: *5–9*.

Described from Bangka and Sumatra ("Banka: Koba, Goenoeng Pading, 170 m., on dead wood in forest; rare. (H. A. B. Bünnemeijer n. 2169, December 1917). Suma[t]ra: Goenoeng Talamau on the western slope, 600 m., in forest. (H. A. B. Bünnemeijer n. 559, May 1917)"). — Lectotype not designated (BO?).

Distribution. Thailand, Laos, Sumatra, Bangka, Kalimantan.

Examined specimen. Laos, Khammoune Prov., Boualapa Distr., Langkhang Village, steep southern slopes of sandstone ridge allied to the road from the north between points 17°34′02.2″ N 105°42′42.6″ E, 200 m and 17°34′51.1″ N 105°43′01.2″ E, 535 m a. s. l., primary lowland semideciduous and evergreen dry forest on very steep rocky slopes, terrestrial achlorophyllous aphyllous herb to 20 cm tall on steep rocky slope, flowers light violet to almost white, rare, 15 V

Fig. 3. New orchids in the flora of Laos: *Cleisostoma verrucosum*, analytical plate (AL 968/1, LE 01048677).
a — flattened flowering plants; *b* — portions of stem; *c* — leaves; *d* — apical part of leaf, abaxial and adaxial surface; *e* — portions of inflorescence; *f* — flowers, front views; *g* — flower, side and adaxial views; *h* — column and lip, front view; *i* — flower with lateral sepal and petal removed and sagittal flower section, side views; *j* — flattened sepals and petals, abaxial and adaxial views; *k* — lip, top view; *l* — column and back wall callus; *m* — column, side view; *n* — column and back wall callus, side view; *o* — column with half removed operculum and with operculum removed; *p* — operculum; *q* — pollinaria. Photos, correction and design by L. Averyanov, D. Slastunov and T. Maisak.

2018, L. Averyanov, Khang Sinh Nguyen, T. Maisak, AL 1086 (LE 01048691).

Note. This discovery of the species is not surprising, since it was recently reported from Thailand not very far from its locality in Laos. Most probably the plant discovered in Vang Vieng town area (Vientiane Province, central Laos) and proposed for publication under the name *D. laosensis* S. W. Gale et Kumar (S. W. Gale, pers. comm.) belongs to this species.

Eria eriopsidobulbon C. S. P. Parish et Rchb. fil. 1874, Trans. Linn. Soc. London, 30: 148; Seidenf. 1982, Opera Bot. 62: 113, fig. 67; id. 1992, Opera Bot. 114: 187; Aver. 1994, Identification Guide Viet. Orch.: 235; Aver., Averyanova, 2003, Updated Checklist Orch. Viet.: 34. ≡ *Pinalia eriopsidobulbon* (C. S. P. Parish et Rchb. fil.) Kuntze, 1891, Revis. Gen. Pl. 2: 679. — Fig. 4: *1–3*.

Described from Myanmar ("...collected by the Rev. E. C. Parish in the neighbourhood of Moulmein"). — Type: "Presented by Rev. C. Parish, April 1872, № 281" (lectotype (Seidenfaden, 1982) — Herb. Reichenbach, 19957; isolectotype — K00082378).

Distribution. Myanmar, Thailand, Laos, Vietnam.

Examined specimen. Xiangkhouang Prov., Kham Distr., Huad Village, Phou Tat Vinh Mt., around point 19°32′ N 103°39′ E, primary and secondary broadleaved evergreen and semideciduous dry forest on very steep rocky slopes of limestone highly eroded mountains composed by solid marble-like limestone at elevation 1200–1400 m a. s. l., epiphyte on tall old trees along ridge edge, 4 IV 2015, N. T. Hiep, L. Averyanov, N. S. Khang, N. Q. Hieu, T. Maisak, Pheng Phengsintham, herbarium prepared 18 VII 2019, L. Averyanov, LA-VN 1093a / TM 1264 (LE 01057892).

Note. The discovery of this species in Laos is quite expected, since it was earlier reported from Myanmar, Thailand and Vietnam. We cannot accept recent reanimation of the genus *Pinalia* Lindl. (Ng et al., 2018) based on molecular studies insufficiently supported by visual plant morphology.

Habenaria ciliolaris Kraenzl. 1893, Bot. Jahrb. Syst. 16: 169; Seidenf. 1977, Dansk Bot. Ark. 31, 3: 95, fig. 56; id. 1992, Opera Bot. 114: 58, fig. 29, pl. 4; Aver. 1994, Identification Guide Viet. Orch.: 69; Aver., Averyanova, 2003, Updated Checklist Orch. Viet.: 38; S. C. Chen, P. J. Cribb, 2009, Fl. China, 25: 155; H. A. Pedersen et al. 2011, Fl. Thailand, 12, 1: 93, fig. 49; Xiaoxu Zhou et al. 2016, Phytotaxa, 276, 1: 69. — Fig. 4: *4–6*.

Described from China ("Hongkong. Little Hongkong"). — Type: "*Habenaria ciliolaris* mihi. Kränzlin. Little Hongkong, Hongkong, 14 Aug. 1884, C. F[ord], [№] 95" (holotype — K00079642).

Distribution. Continental SE China, Taiwan, Laos, Vietnam.

Examined specimen. Laos, Khammoune Prov., Boualapha Distr., Nong Seng Village, Vang Phae Lay Mt., around point 17°31′02.7″ N, 105°47′17.2″ E, primary dry evergreen and semideciduous broadleaved forest on very steep rocky slope near karstic hill top composed with solid, marble-like highly eroded limestone at 300–530 m a. s. l., lithophytic tuberiferous ephemeroid herb, 11 V 2018, L. Averyanov, Khang Sinh Nguyen, T. Maisak, Littideth Xaiyavongsa, Siphanom Keovankham, herbarium specimen prepared 11 VII 2019, L. Averyanov, AL 912.2 (LE 01057741).

Note. The plant discovered in Laos and reported here is almost identical morphologically with the plants collected in Vietnam (LE 01058608, LE 01058609).

Liparis caudata Aver. et K. S. Nguyen, 2015, Wulfenia, 22: 162, fig. 9B, C; 10. — Fig. 4: *7–9*.

Described from northern Vietnam. — Type: "Thanh Hoa Prov., Thuong Xuan Distr., Bat Mot Municipality, Vin Village, Xuan Lien Natural Reserve, 1000–1200 m, around point 19°58′51.6″ N 104°59′38.08″ E, 5 IX 2013, L. Averyanov, N. T. Hiep, N. S. Khang, N. D. Thang, L. V. Tien, CPC 6809" (holotype — LE: LE 01058641; isotypes — Herbarium of the Center for Plant Conservation (CPC), LE 01058642; paratypes — CPC 6787, LE 01058643); epitype (Averyanov, designated here) — LE: LE 01058644.

Distribution. Laos, Vietnam.

Examined specimens. Laos, Khammouane Prov., Boualapha Distr., Nong Seng Village, southern sandstone slopes at summit of Phou Chuang (Poujeuang) Mt. around point 17°35′00.3″ N, 105°47′35.6″ E, primary evergreen mixed and coniferous dense wind-formed forest at elevation 1000–1400 m a. s. l., epiphyte on mossy trees on mountain top, not common, 4 V 2018, L. Averyanov, Khang Sinh Nguyen, T. Maisak, Littideth Xaiyavongsa, Siphanom Keovankham, AL 676 (LE 01048747). *Ibidem*, herbarium specimen prepared 10 X 2018, L. Averyanov, AL 676.1 (LE 01049000). Vietnam, Thanh Hoa Prov., Thuong Xuan Distr., Bat Mot Municipality, Vin Village, Xuan Lien Natural Reserve, 1000–1200 m, around point 19°58′51.6″ N 104°59′38.08″ E, 5 IX 2013, L. Averyanov, N. T. Hiep, N. S. Khang, N. D. Thang, L. V. Tien, herbarium specimen prepared 10 XI 2017, L. Averyanov CPC 6809a (LE 01058645).

Note. This is not a surprising discovery of the species regarded earlier as a strict endemic of Vietnam. It was found not far from *locus classicus*. The newly discovered locality in Laos extends the known species range about 150 km further SSE.

Fig. 4. New orchids in the flora of Laos.
1–3 — Eria eriopsidobulbon (LA-VN 1093a/TM 1264, LE 01057892); *4–6 — Habenaria ciliolaris* (AL 912.2, LE 01057741); *7–9 — Liparis caudata* (AL 676.1, LE 01049000).

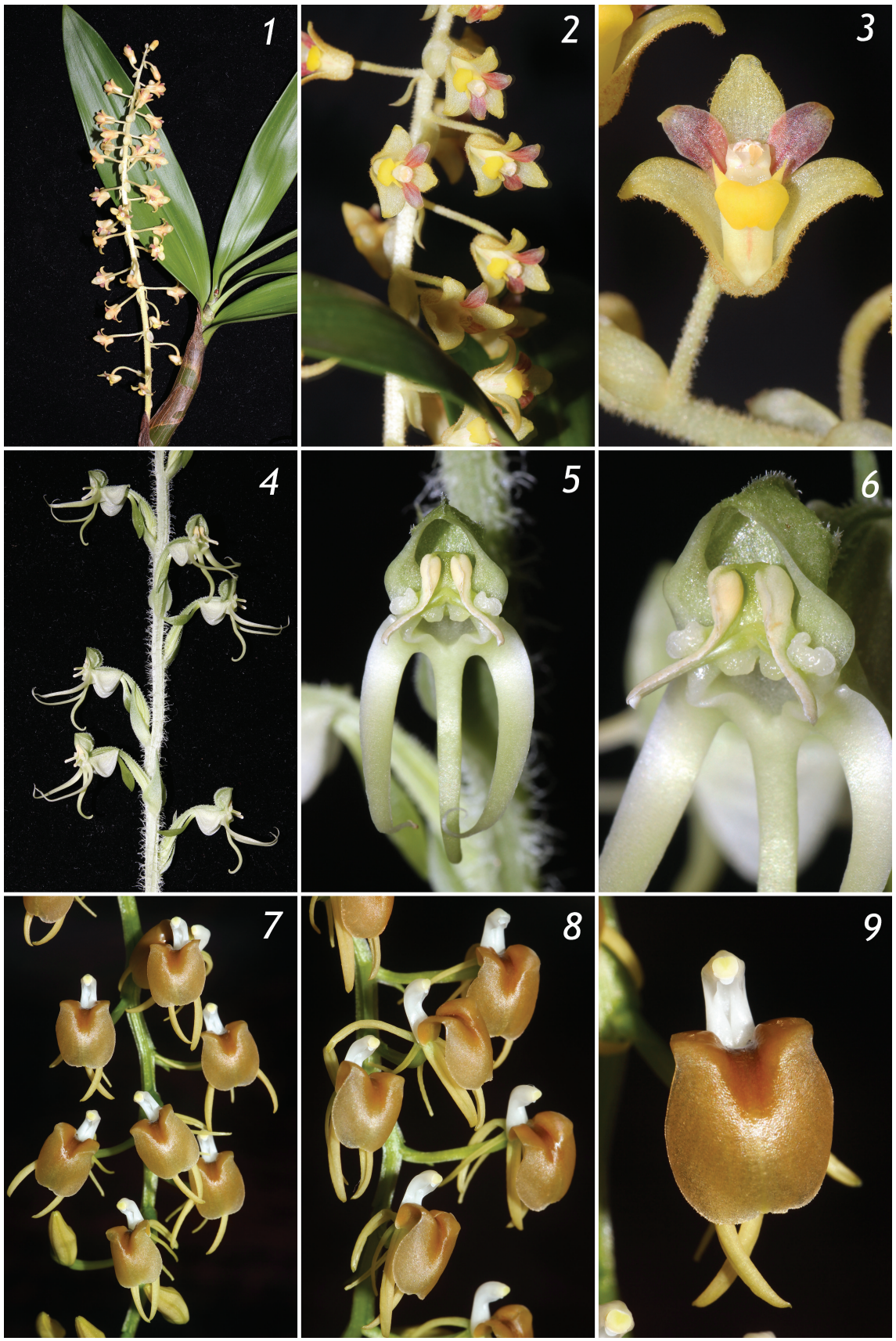

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Fig. 5. New orchids in the flora of Laos: *Oberonia vesiculifera*, analytical plate (AL 965/1, LE 01048682).
a — flowering plant; *b, c* — portion of inflorescence; *d, e* — flower, front and side views; *f, g* — intact lip, side and half side views; *h* — intact lip, front view; *i* — lip margin. Photos, correction and design by L. Averyanov.

Oberonia vesiculifera Aver. 2019, Pl. Divers. Fl. Veg. HNN NPA: 151–152, fig. 1292, descr. emend. — Fig. 5.

Emended description. Perennial, sympodial, lithophytic herb. Stem simple, very short, ascending to erect, (0.5)1–1.5(2) cm long, completely covered by bases of dense equitant leaf bases. Leaves light green, sessile, ensiform, laterally flattened, fleshy, erect to suberect, (8)10–14(16) cm long, (6)8–10(11) mm wide, apex acute. Inflorescence a subapical spike-like raceme (4)5–7(8) cm long, scape and rachis light green; scape (1.6)1.8–2(2.2) cm long, suberect, straight or slightly curved, naked or with one small sterile bract, rachis usually curved, (4.5)5–6(6.5) cm long, with many dense, spirally arranged flowers. Floral bracts lanceolate, acuminate, 2–3 mm long, 0.3–0.4 mm wide, with



Fig. 6. New orchids in the flora of Laos: *Odontochilus umbrosus* (NLO 83, LE 01061433).
Photos by N. Orlov, correction and design by L. Averyanov.

erose denticulate margin. Pedicel and ovary light green, at 45° to rachis, 1.6–1.8 mm long, 0.3–0.4 mm diam., terete, glabrous. Flowers widely opening, 2–2.2 mm diam.; sepals and petals glabrous, spreading, bright yellow; column yellow; anther cap light green; pollinia yellow. Sepals subsimilar, ovate to narrowly ovate, with entire margin, concave, obtuse, about 1 mm long, 0.8 mm wide, lateral sepals often somewhat reflexed. Petals similar to sepals in shape and size, with erose denticulate margin. Lip spurless, more or less flat, 3-lobed, 1–1.2 mm long and wide; side lobes rectangular, truncate, spreading, 0.6–0.7 mm long, 0.2–0.3 mm wide, with many globular glands along the margin; median lobe suborbicular, 0.7–0.8 mm across, with erose denticulate margin, shallowly emarginate at apex, near base and in center with many large subglobular gland-like cells; disc at the center (near the base of side lobes) with 2 half-ovoid calli. Column simple, short, terete, 0.2–0.3 mm high and wide. Anther cap hemispherical, 1–1.2 mm diam., truncate at front. Pollinia light yellow, narrowly ovoid, 0.8–0.9 mm long. Fruits light gray-brownish, ellipsoid to obovoid, longitudinally ribbed, 3–4 mm long, 1.5–2 mm diam.

Type: "Laos, Khammouane Prov., Boualapha Distr., Nong Seng Village, Chanh Daeng mountain, around point 17°31′11.1″ N, 105°46′41.4″ E, primary dry evergreen and semideciduous broadleaved forest on very steep rocky slope near karstic hill top composed with solid, marble-like highly eroded limestone at 400–600 m a. s. l., lithophytic herb on shady vertical cliff, common, 11 V 2018, L. Averyanov, Khang Sinh Nguyen, T. Maisak, Littideth Xaiyavongsa, Siphanom Keovankham, AL 965/1" (holotype — LE: LE 01048682).

Analytical plate: 0320 / AL 965/1 (http://en.herbariumle.ru/?t=occ&id=65&rid=image_0004258).

Distribution. Central Laos (Khammouane Prov., Boualapha Distr., Hin Nam No Nature Protected Area). Endemic.

Ecology, phenology and conservation status. Primary dry evergreen and semideciduous broadleaved limestone forest, commonly on shady vertical cliffs near mountain tops at elevation 300–600 m a. s. l. Fl. IV–V. Locally common. Estimated IUCN Red List status — DD.

Notes. The plant is close to the widespread *O. ensiformis* (Sm.) Lindl., from which differs by having much smaller habit (leaves three times shorter and narrower), spirally arranged (vs. whorled) flowers, tuberculate callosity on the lip disc (vs. flat or slightly concave disc), and numerous large dense spherical gland-like cells on the sides of the lip (vs. lip with entire margin without large spherical cells). Both species have two prominent calli on the lip base. This apomorphic feature segregates these two species from all other congeners occurring in Indochina.

The supposition by D. L. Geiger (2019) on the identity of this species and *O. ensiformis* does not fit well with a quite

different morphology of these two species (cf. *O. ensiformis* in eastern Indochina — Averyanov, 2013a: 152, fig. 76b, c; 77h; LE 01058571, LE 01061430, LE 01061431, LE 01061432).

Odontochilus umbrosus (Aver.) Ormerod, 2002, Lindleyana, 17: 225. ≡ *Pristiglottis umbrosa* Aver. 1996, Bot. Zhurn. (Moscow & Leningrad), 81, 10: 78, fig. 3. — Fig. 6.

Described from southern Vietnam. — Type: "S. Vietnam, Kon Tum Prov., Dak Gley Distr., about 15–18 km NW of Dak Gley Town, between Mang Khen (Dak Che) and Dak Polo Villages, near Laos boundary, primary evergreen mountain forest at 1250–1450 m alt., 22 XI 1995, L. Averyanov, N. T. Hiep, P. K. Loc, VH 1932" (holotype — LE: LE 01058603; isotypes — HN).

Distribution. Laos, Vietnam.

Examined specimen. Laos, Luong Nam Tha Prov., Nam Tha Distr., Nam Kong Village, Luang Nam Tha NP, around point 21°12′ N 101°23′ E, at elevation about 1100 m a. s. l., 26 IX — 2 X 2017, N. L. Orlov, L. K. Ioganssen, NLO 83 (LE 01061433).

Note. For a long time, *O. umbrosus* was known only from its type locality. Our finding of this rare species is the second one, and new to the flora of Laos. It extends the known species range 350 km further NW.

Porpax ustulata (C. S. P. Parish et Rchb. fil.) Rolfe, 1908, Orchid Rev. 16: 8; Seidenf. 1977, Bot. Tidsskr. 72, 1: 8, fig. 7; S. C. Chen, J. J. Wood, 2009, Fl. China, 25: 360; Xiaoxu Zhou et al. 2016, Phytotaxa, 276, 1: 123; Aver. et al. 2018, Taiwania, 63, 3: 217, fig. 10C, D. ≡ *Eria ustulata* C. S. P. Parish et Rchb. fil. 1874, Trans. Linn. Soc. London, 30: 147. — Fig. 7.

Described from Myanmar ("...collected by the Rev. E. C. Parish in the neighbourhood of Moulmein"). — Type: "*Orchidaceae* № 62 *Eria* (*Conchidium*) *ustulata* Parish. Presented by Rev. C. Parish, April 1872" (lectotype (Seidenfaden, 1977) — K001085616; isolectotype — Herb. Reichenbach 31330).

Distribution. Myanmar, Thailand, S. China (Yunnan), Laos, Vietnam.

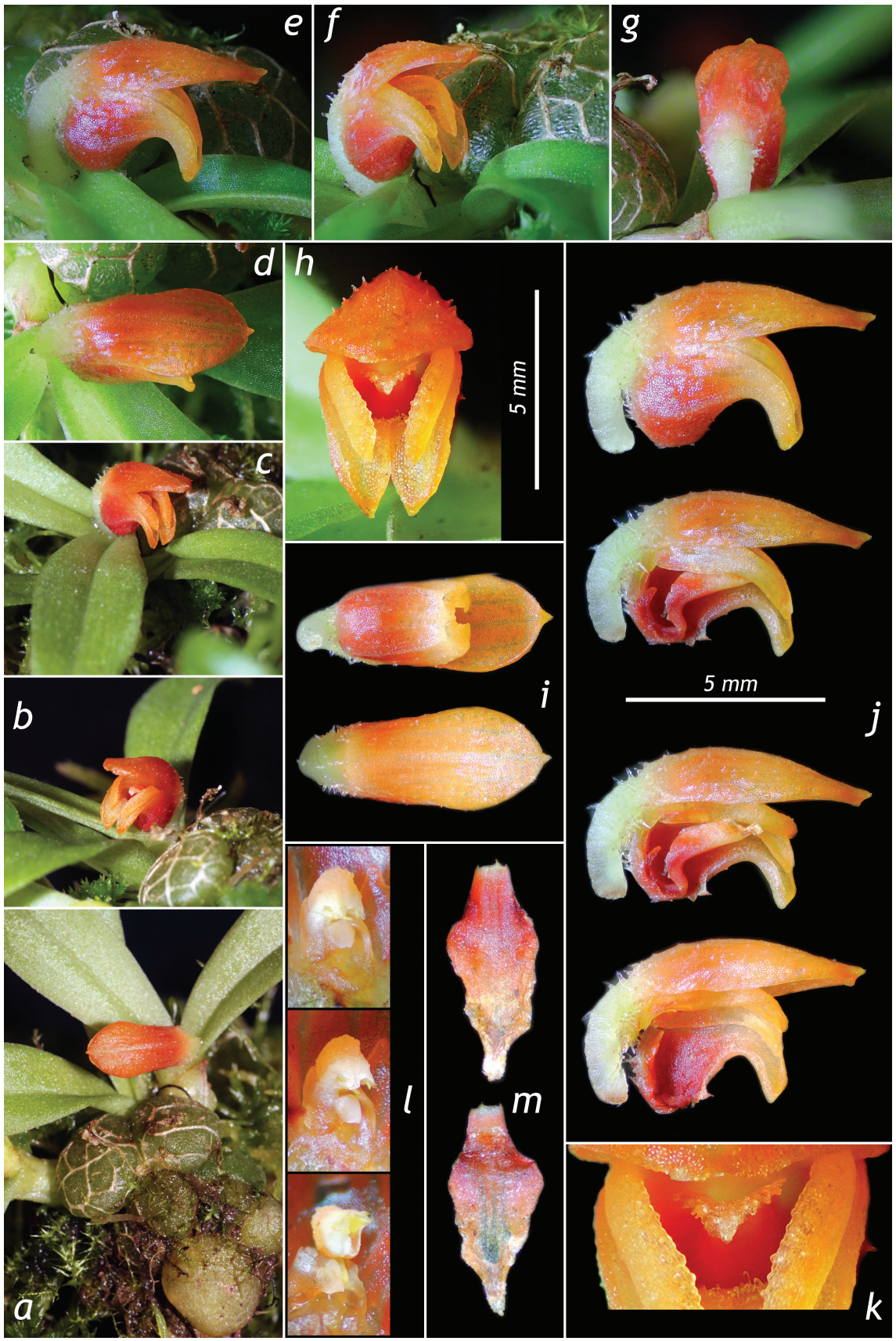
Studied specimen. Laos, Khammouane Prov., Boualapha Distr., Nong Seng village, southern sandstone slopes at summit of Phou Chuang (Poujeuang) Mt. around point 17°35′00.3′ N, 105°47′35.6″ E, primary evergreen mixed and coniferous dense wind-formed forest at elevations of 1000–1400 m a. s. l., clustering epiphyte and lithophyte, occasional, 4 V 2018, L. Averyanov, Khang Sinh Nguyen, T. Maisak, Littideth Xaiyavongsa, Siphanom Keovankham, AL 656/1b. Analytical plate 0366 / AL 656.1b (LE 01055963).

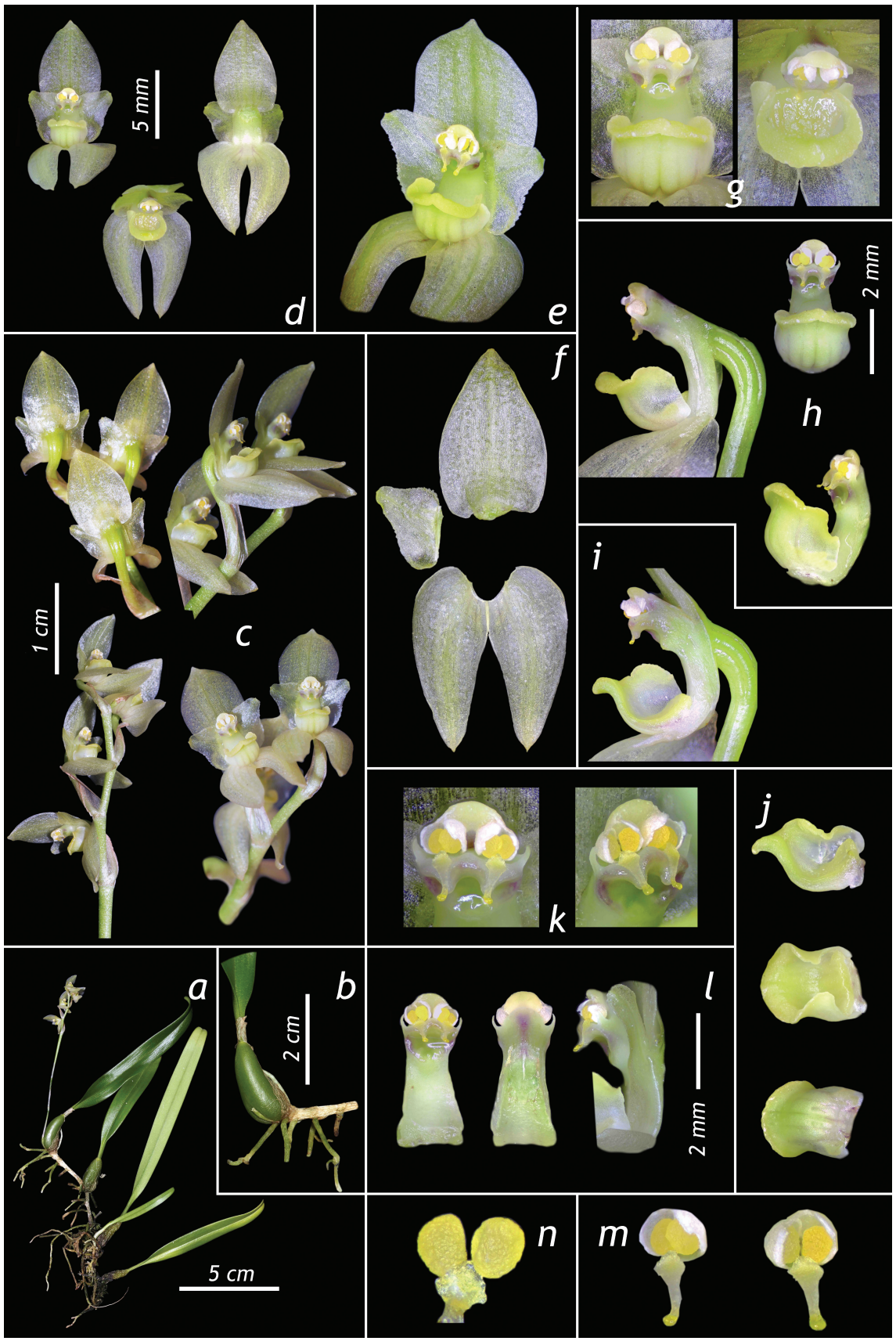
Note. The previously known distribution of this species comprises Myanmar, Thailand and China (southern Yunnan). Its discovery in Laos (Khammouane Province) considerably extends the species range southwards. The plants found in Laos distinctly differ from the type by having smaller flowers and almost glabrous sepals. They could be further segregated as a separate variety, but that would need analysis of more material.

Sunipia saccata Aver., sp. nova. — Fig. 8.

Creeping, rhizomatous epiphytic herb. Rhizome rigid, dull yellowish to gray, (2)2.5–2.8(3) mm thick, with (3)4–6(8) distant pseudobulbs and numerous thin rigid wiry flexuose roots. Pseudobulbs erect, narrowly ovate, (1.2)1.4–1.8(2) cm tall, (0.4)0.5–0.7(0.9) cm wide, glossy green, young smooth, older finely verruculose and wrinkled, with 1 apical leaf. Leaves shortly petiolate; petiole almost terete, adaxially grooved, (4)5–8(9) mm long; leaf blade coriaceous, erect, lanceolate to narrowly oblong-lanceolate, conduplicate, slightly unequally bilobed at apex, (6)7–10(12) cm long, (6)8–10(12) mm wide. Inflorescence arising from the base of pseudobulb, erect to patent, lax raceme with (2)4(6) flowers; peduncle thin, green, straight, (4.5)5–6(6.5) cm long, with (2)3(4) small tubular scarious sterile bracts; rachis (1.5)2(2.5) cm long, slightly zigzag. Floral bracts pale yellowish to almost white, scarious, narrowly triangular, acute, (5)6–7(8) mm long, (1.6)2–2.5(2.8) mm wide near the base. Pedicel and ovary ascending to erect, light glossy green, (5.5)6–7(8) mm long, 0.5–0.7 mm wide, shallowly longitudinally grooved. Flowers entirely light green, resupinate, widely opening, with light sweet fragrance. Tepals very thin, almost flat. Median sepal ovate, obtuse, (6.5)7–7.5(8) mm long, (4.2)4.5–4.8(5) mm wide, with 3 indistinct greenish nerves, with entire margin. Lateral sepals oblique, narrowly ovate, acute, (8)8.5–9(9.5) mm long, (3.2)3.4–3.6(3.8) mm wide, each with 1 nerve, joined at the base at 0.25 of their length, with entire margin. Petals oblique triangular, roundish and shortly apiculate at apex, (2.8)3–3.5(3.7) mm long and wide at the base, with 1 nerve, finely irregularly serrulate along the margin. Lip green to light yellowish-green, fleshy, suborbicular, entire, saccate, pouch-shaped, (2)2.2–2.4(2.6) mm long and wide, with entire straight incurved mar-

Fig. 7. New orchids in the flora of Laos: *Porpax ustulata*, analytical plate (AL 656.1b, LE 01055963).
a–c — flowering plants; *d–h* — intact flower, top, side, half side, back and front views; *i* — flower, bottom and top views; *j* — intact flower, side view, flower with lateral sepal removed, flower with lateral sepal and petal removed, flower with lateral sepal, petal and lip removed; *k* — intact lip, front view; *l* — column with operculum, front and side views, lip with operculum half removed; *m* — lip, adaxial and abaxial views. Photos, correction and design by L. Averyanov and T. Maisak.


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5 mm
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2 mm
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1 cm
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2 mm
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gins in basal part and slightly recurved at apex, with 5 prominent veins, abaxially longitudinally grooved, inside with large broad callus rising from the lip middle to its base. Column light green, shortly cylindrical, 2–2.2 mm tall, 1.2–1.3 mm wide, at apex with prominent flat, semicircular stelidia 0.8–0.9 mm long and wide and fleshy slightly incurved column foot 2.2–2.4 mm long, solidly fused with the lip base; stigma circular, concave; rostellum fleshy arc-like. Operculum cap-shaped, with no beak, light yellowish to almost white. Pollinaria 2, each with 2 equal pollinia attached to narrowly deltoid caudicle, 0.9–1.1 mm long, distally attenuate and terminated with small hemispheric bright yellow viscidium; pollinia solid, bright yellow, almost globular, 0.3–0.4 mm across. Fruits not seen.

Type: "Laos, Xiangkhouang Prov., Peak Distr., Oran village, around point 19°38′53″ N 103°23′12″ E, primary and secondary broadleaved evergreen dry forest on shale sandstone slopes and along ridge edge at elevation 1750–1850 m a. s. l., epiphyte on tall mossy tree along ridge edge, not rare, 2 IV 2015, T. Maisak, L. Averyanov, N. T. Hiep, N. S. Khang, N. Q. Hieu, Pheng Phengsintham, herbarium specimen prepared 1 X 2018, L. Averyanov, LA-VN 931a / TM 1224 (holotype — LE: LE 01058572).

Analytical plate: 0322 / LA-VN931a/TM 1224 (http://go.herbariumle.ru/exs-herb-0322).

Etymology. Species name refers to the saccate, pouch-like lip.

Distribution. Laos (Xiangkhouang Prov., Peak Distr.). Endemic.

Ecology, phenology and conservation status. Creeping branch epiphyte on tall trees. Primary broadleaved evergreen dry forest on shale sandstone. 1750–1850 m a. s. l. Fl. IX–X. Rare. Estimated IUCN Red List status — DD.

Note. *Sunipia saccata* is a very distinct species, differing from all its congeners by having an almost spherical, saccate, pouch-shaped lip. This rare and potentially strictly endemic plant has a very limited distribution in the mountainous regions of northeastern Laos. In some recent surveys the genus *Sunipia* Buch.-Ham. ex Sm. is regarded as a synonym of *Bulbophyllum* Thouars, nom. cons. (Pridgeon et al., 2014). Despite this opinion *Sunipia* (= *Ione* Lindl.) remains well segregated genus based on many morphological characters. We accept it here as a well defined genus, which distinctly differs from almost all *Bulbophyllum* species.

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Fig. 8. New orchids in the flora of Laos: *Sunipia saccata*, analytical plate (LA-VN 931a/TM 1224, LE 01058572). *a* — flattened flowering plants; *b* — pseudobulb; *c* — inflorescences; *d* — flower, front and back views; *e* — flower, half side view; *f* — flattened sepals and petal; *g* — column and lip, front view; *h* — intact column and lip, front and side views; *i* — column and lip, sagittal section, side view; *j* — lip, side, top and bottom views; *k* — column, front and half side views; *l* — column, front, back and side views; *m* — operculum with pollinarium; *n* — pollinarium. Photos, correction and design by L. Averyanov and T. Maisak.

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