



NOTE

Additions to the orchid flora of China and taxonomic notes on orchids of Eastern Himalaya region

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(Manuscript received 12 July 2022; Accepted 27 December 2022; Online published 25 February 2023)

ABSTRACT: Based on the botanical explorations in Eastern Himalaya region of Xizang in China during the period 2020 to 2021, seven orchid species, *Bulbophyllum gamblei*, *B. trongsaense*, *Dendrolirium ferrugineum*, *Taeniophyllum javanicum*, *Nervilia macroglossa*, *Trachoma rhopalorrhachis* and *Uncifera lancifolia*, are reported as new records for China. *Trachoma* Garay is a newly recorded genus in China. Detailed descriptions and photographic illustrations of each species are provided in this paper to facilitate identification. Additionally, *B. xizangense* has been revised as a synonym for *B. linzhiense*. Further, a new combination is made in accordance with current orchid taxonomy, *Dendrolirium pachyphylla* (= *Pinalia pachyphylla*).

KEY WORDS: China, geographical distribution, new record, Orchidaceae, Eastern Himalaya, Xizang.

INTRODUCTION

Orchidaceae is the most diverse flowering plant family, with approximately 750 genera and 28,000 species (Chase *et al.*, 2015). Currently, China has a known orchid flora of 1,751 species in 181 genera (Zhou *et al.*, 2021). Xizang is located in the Eastern Himalaya region, which is one of hotspots of global biodiversity (Myers *et al.*, 2000). Due to its diverse geographical conditions and climate, there are abundance of rare orchids in this region (Wang *et al.*, 2018a). However, it remains one of the least surveyed regions in China.

The number of wild orchid species known to occur in Xizang has increased from 191 species in 1987 (Wu, 1987) to 336 species in 2018 (Wang *et al.*, 2018b). Due to recent extensive botanical surveys, the number seems to climb. For example, some new species, such as *Bulbophyllum reflexipetalum* J. D. Ya, Y. J. Guo & C. Liu, *B. gedangense* Y. Luo, J. P. Deng & Jian W. Li and *Taeniophyllum xizangense* J. D. Ya & C. Liu, and a large number of new records, such as *Cephalantheropsis obcordata* (Lindl.) Ormerod, *Diglyphosa latifolia* Blume, *B. raskotii* J. J. Verm., Schuit. & de Vogel, *Panisea panchaseensis* Subedi, have been found in Yarlung Zangbo region (Li *et al.*, 2021; Liu *et al.*, 2020; Luo *et al.*, 2020; Ya *et al.*, 2019, 2021). These new findings enhance our understanding of orchid diversity, which is important for the conservation of orchids in China and indicate that more work must be done to understand the species diversity of orchids in this region.

From 2020 to 2021, a joint team of researchers from

the Center for orchid conservation of Tibet Agricultural and Animal Husbandry University and Xishuangbanna Botanical Garden, Chinese Academy of Sciences conducted several field investigations in the Eastern Himalaya region of Xizang. After the critical morpho-taxonomic investigation, evaluation of the available literatures (Hooker, 1890; King and Pantling, 1898; Pearce and Cribb, 2002) and consultation of herbaria at K, L, BR, PE, KUN, IBK and HITBC, seven taxa, *Bulbophyllum gamblei*, *B. trongsaense*, *Dendrolirium ferrugineum*, *Taeniophyllum javanicum*, *Nervilia macroglossa*, *Trachoma rhopalorrhachis* and *Uncifera lancifolia* are recorded for the first time from China along with the genus *Trachoma* Garay. Detailed descriptions with updated nomenclature, photos, phenology and distribution are provided to facilitate identification. Additionally, the taxonomy of a further two species from Xizang is reviewed, resulting in synonymization of one name. Furthermore, a new combination is made in accordance with the changes in classification of the orchid family proposed by Ng *et al.*, (2018).

TAXONOMIC TREATMENT

New country records

1. *Bulbophyllum gamblei* (Hook. f.) Hook. f., Fl. Brit. India 6: 188 (1890); *Bulbophyllum leptanthum* var. *gamblei* Hook. f., Fl. Brit. India 5: 759 (1890). **Type:** India, Sikkim, Goompahar, 2130 m, June, 1876, J. S. Gamble, 783A (holotype, K!)

Fig. 1

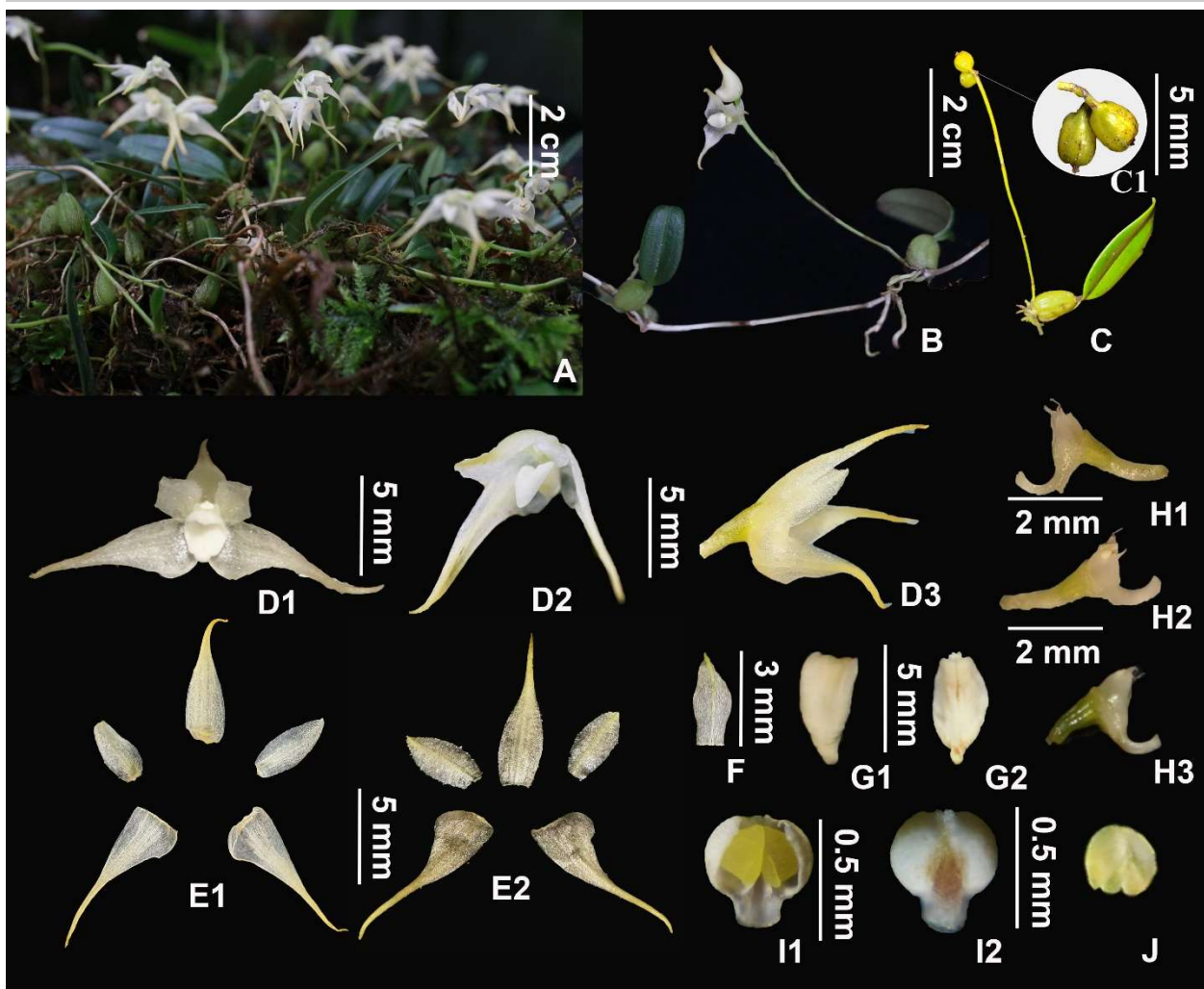


Fig. 1. *Bulbophyllum gamblei* (Hook.f.) Hook. f. **A.** plant and habitat; **B.** plant and inflorescence; **C.** plant and fruit (**C1.** close-up of fruit); **D1-D3.** flower; **E1-E2.** dissected flower; **F.** floral bract; **G1-G2.** close up of lip; **H1-H3.** column and ovary; **I1-I2.** anther cap; **J.** pollinia. (Photos: A by J. P. Deng in Mêdog, B-J by M. K. Li).

Epiphytic herb. Rhizome creeping, 0.5–1 mm in diam. Pseudobulbs 0.5–3 cm apart from each other, ovoid to subcylindric, 0.5–0.7×0.3–0.4 cm in diam., grooved only when aged but not in young stage, with a terminal leaf. Leaf blade oblong, 1.2–2.5×0.5–0.7 cm, petiole short or sessile, apex obtuse. Scape arising from the base of pseudobulb, 4.0–5.5 cm, much longer than pseudobulb and leaf; raceme subumbellate, often 2-flowered; peduncle with 2 or 3 tubular sheaths; floral bracts lanceolate, 3.5–4×ca. 2 mm, apex acute. Flowers white, tinged with yellow at apices of sepals; pedicel and ovary 3.5–3.8 mm. Dorsal sepal ovate-lanceolate, 7–12×3–3.5 mm, apex long acuminate; lateral sepals obliquely ovate-lanceolate, 9–12×3.5–4 mm, base adnate to column, apex long acuminate. Petals ovate-lanceolate, 4–5×2.5–3 mm, apex acute. Lip white, curved and linguiform, ovate-lanceolate, ca. 3×2 mm, fleshy, grooved on upper and lower sides along midrib of lip. Column ca. 1.1 mm, stout; stelia triangular, ca. 0.5 mm; foot slightly upcurved, 1–

1.3 mm. Anther cap subglobose, apex mucronate; Pollinia 4, in 2 pairs, each pair unequal. Fl. July–October.

Habitat. Growing on trees or moss rocks in broad-leaved forest at 1100–2130 m.

Distribution. China (Xizang), Bhutan, India, Nepal.

Vernacular name. Gan Bu Er Shi Dou Lan 甘布尔石豆兰 (Chinese name).

Specimens examined. CHINA. Xizang, Mêdog County, Beibeng village, 1350 m, June, 2020, *M. K. Li* 20200739 (Tibet Agricultural and Animal Husbandry University); Xizang, Mêdog County, Deergong village, 1600 m, 14 June, 2020, *J. P. Deng & Z. Chen* 2054 (HITBC).

2. *Bulbophyllum trongsaense* P. Gyeltshen, D.B. Gurung & Kumar, *Phytotaxa* 436: 85 (2020). **Type:** Bhutan. Dzongkhalum Province, Trongsa District, 2000 m, 20 September, 2019, *P. Gyeltshen* 1905 (holotype, THIM). **Fig. 2**

Epiphytic herb. Rhizome creeping, cylindrical, 4–13×0.4–0.8 cm, covered by membranous sheaths.

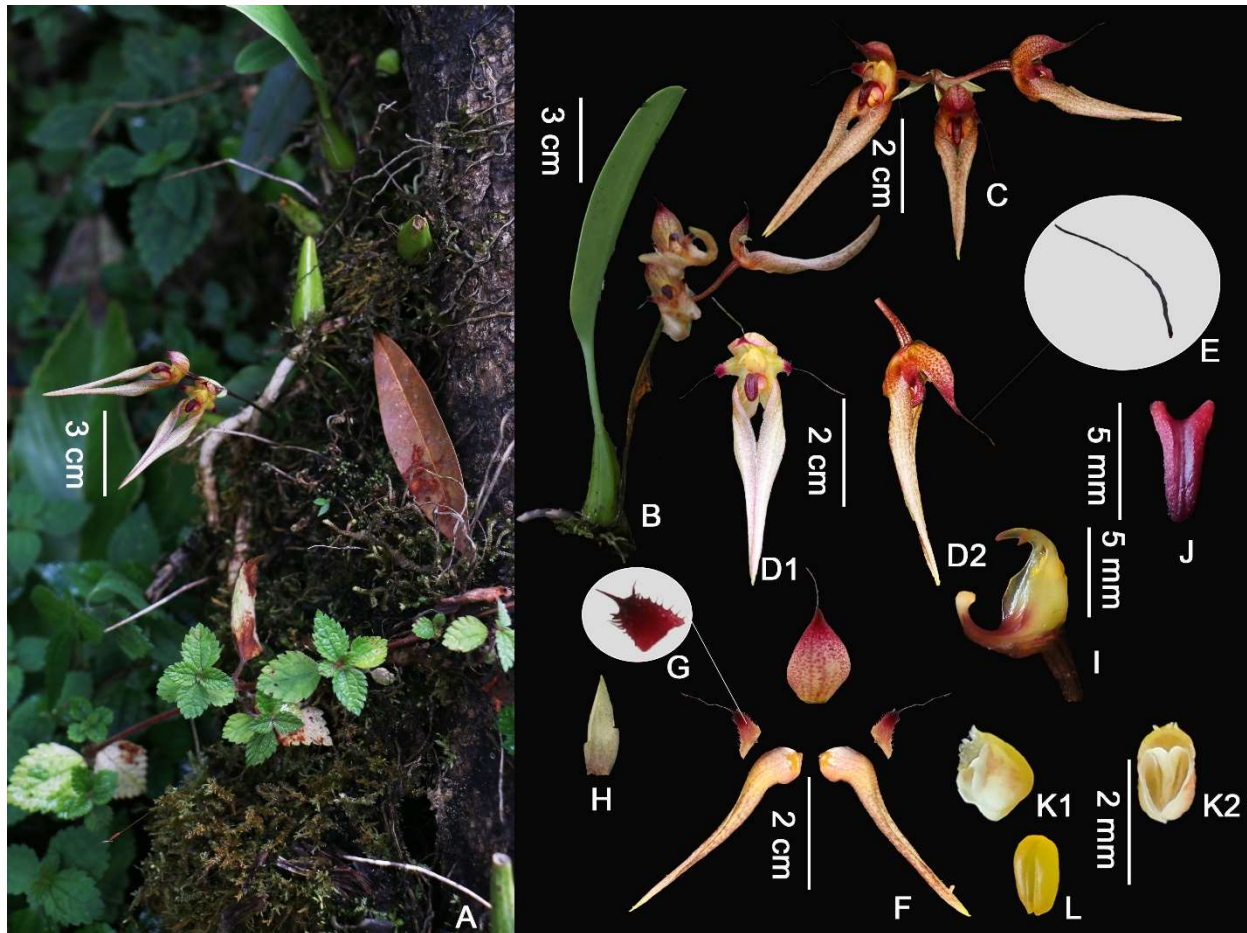


Fig. 2. *Bulbophyllum trongsense* P. Gyeltshen, D.B. Gurung & Kumar A. plant and habitat; B. plant and inflorescence; C. inflorescence; D1-D2. flower; E. close up the awn-like appendage; F. dissected flower; G. close up of petal; H. floral bract; I. column; J. close up of lip; K1-K2. anther cap; L. pollinia. (Photos: A-D by J. P. Deng in Mêdog, E-L by M. K. Li).

Pseudobulbs ovoid-oblong, 3.5–7.0×1.5–2.4 cm. Leaf blade linear-oblong to oblong-elliptic, 10.5–20.0×2.3–6.5 cm wide, apex acute. Scape arising from the base of the pseudobulb, raceme subumbellate 3–7 flowered, 13–20 cm; floral bracts oblong-lanceolate, 0.8–1.2×0.4–0.5 cm, apex acuminate. Flower green with dark brown spots; pedicel and ovary yellowish green with red spots, 1.5–2.5×0.2–0.5 cm. Dorsal sepal ovate, 1.4–1.6×0.7–1 cm, apex with an awn-like appendage, base truncate; lateral sepals obliquely ovate to falcate, 4.0–5×0.6–0.9 cm, base twisted, upper margins joined of terminal half, lower margins also joined of terminal half, apex acuminate. Petals obliquely ovate to obliquely falcate, 5.5–7.0×4.0–4.5 mm, deep maroon, apex with an awn-like appendage, ca. 9 mm long. Lip ovate-oblong, 6–7×2.5–3.0 mm, glabrous, side lobes absent, margin entire, mobile, recurved. Column quadrangular, ca. 5 mm, with tapering base, forwarded and incurved foot; stelidia falcate, 3.5–4.5×0.8–0.9 mm, curved, broader towards center and tapering on both sides; foot rectangular with tapering end, 4.5–5.0×1.5–2.0 mm. Anther cap cucullate, 2.0×1.0–1.5 mm, margin entire on both sides, irregularly dentate on

the front. Pollinia 4 in 2 pairs, ovoid, ca. 1.5×1.0 mm. Fl. September–November.

Habitat. Growing on trees in broad-leaved forest at 2000–2150 m.

Distribution. China (Xizang), Bhutan.

Vernacular name. Tong Sa Juan Ban Lan 通萨卷瓣兰 (Chinese name).

Notes: This species is similar to *B. amplifolium* (Rolfe) Balak. et Chowdhury, the dorsal sepal of *B. amplifolium* with awn ending in a clavate tip, but the awn terete without clavate tip in *B. trongsense*.

Specimens examined. CHINA. Xizang, Mêdog County, Gedang Village, 2150 m, 24 October, 2021, J. P. Deng & Z. Chen 4175 (HITBC).

3. *Dendrolirium ferrugineum* (Lindl.) A. N. Rao, Bull. Arunachal Forest Res. 26: 103 (2010); *Eria ferruginea* Lindl., Edwards's Bot. Reg. 25: t. 35 (1839); *Pinalia ferruginea* (Lindl.) Kuntze, Revis. Gen. Pl. 2: 679 (1891); *Trichotosia ferruginea* (Lindl.) Kraenzl., Beibl. Bot. Jahrb. Syst. 101: 21 (1910). **Type:** India, Hackney, March, 1838, *Loddiges s.n.* (holotype, K!)

Fig. 3

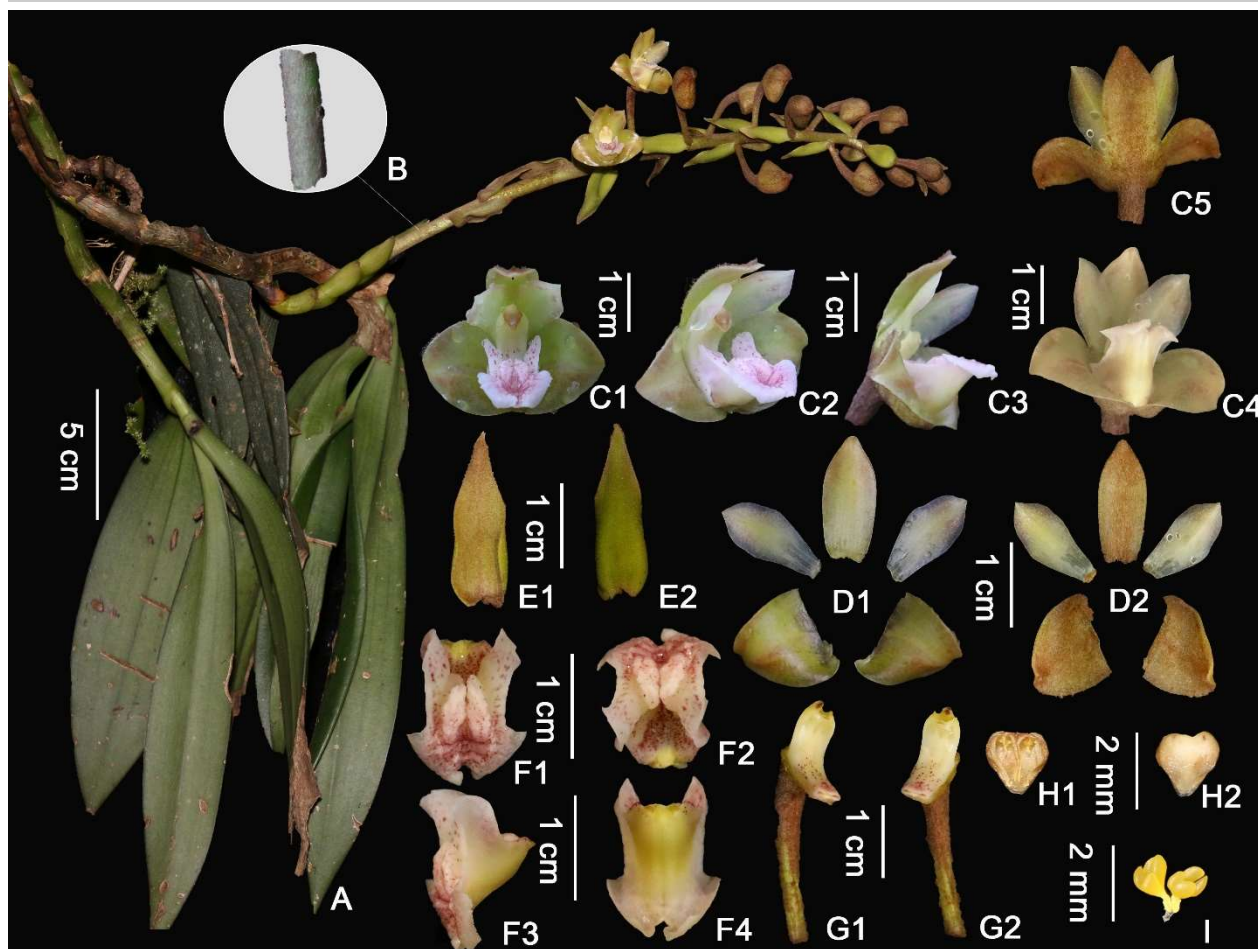


Fig. 3. *Dendrolirium ferrugineum* (Lindl.) **A.** plant and inflorescence; **B.** tomentose in inflorescence; **C1-C4.** flower; **D1-D2.** dissected flower; **E.** floral bract; **F1-F4.** close up of lip; **G1-G2.** column and ovary; **H1-H2.** anther cap; **I.** pollinia. (Photos: A-I by M. K. Li).

Epiphytic, stems up to 10–20 cm long, rhizomes stout, 5–10×0.6–0.8 cm, creeping. Stem cylindric, 10–12×0.9–1.2 cm, internodes 4–5, branched, sheathed. Leaves 2–4, narrowly oblong-elliptic, 12–22×1.2–4 cm, fleshy, acute to sub-acuminate; Inflorescence laxly racemose, 10–25 cm, yellowish brown tomentose, laxly many flowered; floral bracts green, lanceolate, 1.5–2×0.5–1.0 cm, tomentose, reflexed, apex acuminate. Flower yellowish green, fleshy; pedicel and ovary ca. 2 cm, as long as floral bract. Dorsal sepal oblong, 1.1–1.7×0.6–0.7 cm, apex obtuse; lateral sepals ovate, 1.2–1.5×1–1.4 cm, subacute, connate at base. Petals obovate, 1.2–1.5×0.5–0.6 cm, obtuse to subacute. Lip white with red-purple spots, ovate when spread out, ca. 1.2×0.7 cm, apex obtuse, 3-lobed; lateral lobes short, round to sub-quadrate, retuse; mid-lobe transversely elliptic-oblong, broadly 2-lobed, tip reflex outwards; disc with thick, crested-dentate lamellae. Column broad, 0.6–0.7 cm. Pollinia 8, ca. 1.5×0.5 mm. Fl. March–July.

Habitat. Growing on trees and rocks in broad-leaved forest at 770–1200 m.

Distribution. China (Xizang), India.

Vernacular name. Xiu Se Rong Lan 锈色绒兰 (Chinese name).

Taxonomic Notes. The species has undergone several name changes: *Eria ferruginea* Lindl., *Pinalia ferruginea* (Lindl.) Kuntze., and *Trichotisia ferruginea* (Lindl.) Kraenzl. As this species' flowers are heavily lanate on the abaxial surface of the sepals and the ovary, these characteristics are consistent with those of the genus *Dendrolirium*. Therefore, we agree with Rao's treatment that *Dendrolirium ferrugineum* should be the accepted name for this species. Additionally, *Pinalia pachyphylla* (Averyanov) S. C. Chen & J. J. Wood from southern China and northern Vietnam is morphologically similar by both its vegetative and floral characters, and it may be belonged to *Dendrolirium*.

Specimens examined. CHINA. Xizang, Mêdog County, Zha-Mo Road, 800 m, 22 April, 2020, *J. P. Deng & Z. Chen 2340* (HITBC); Xizang, Mêdog County, Beibeng village, 770 m, May, 2013, *T. Zhang et al.*, 13 CS7625 (KUN)

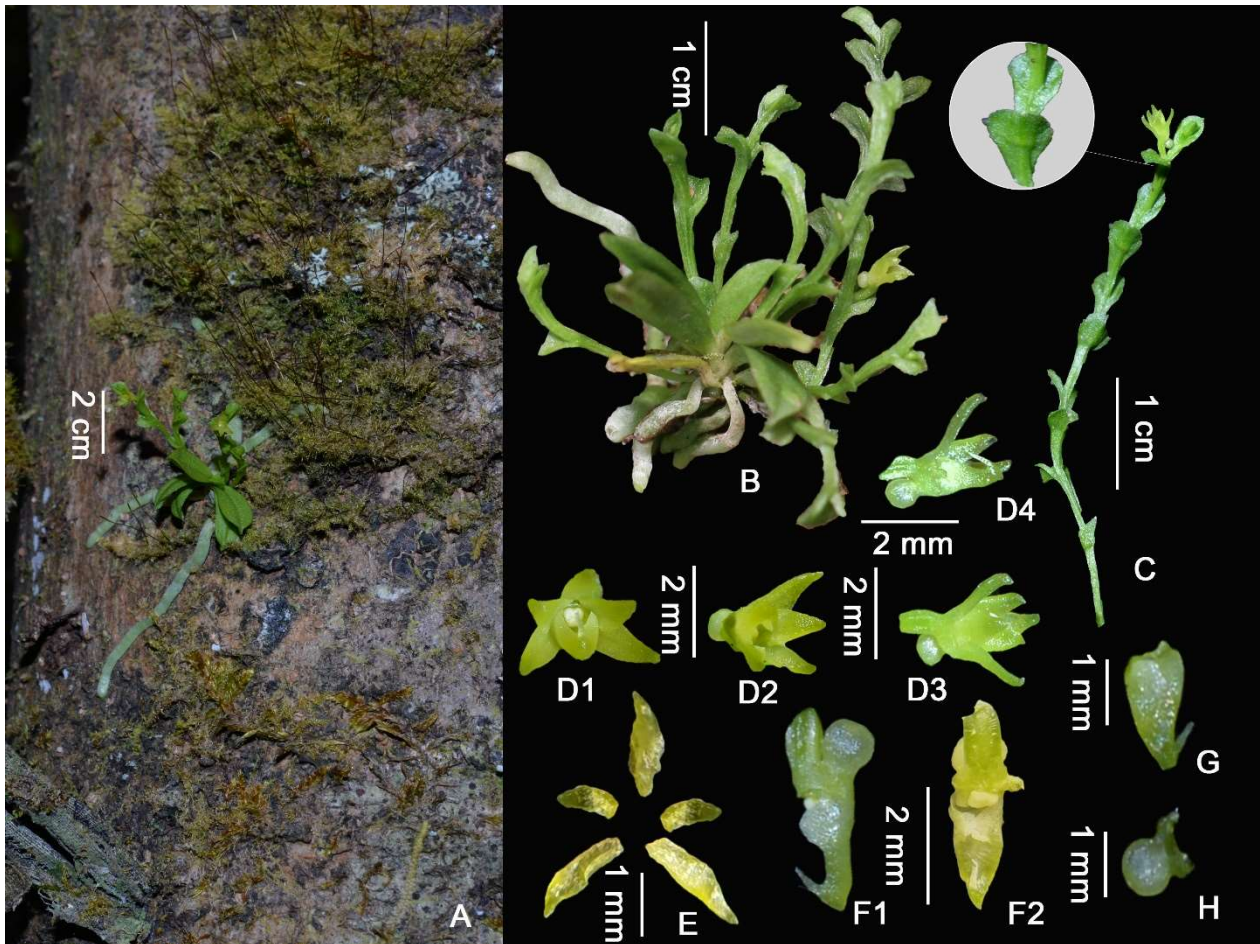


Fig. 4. *Taeniophyllum javanicum* (J.J.Sm.) Kocyan et Schuit. **A.** plant and habitat; **B.** plant and inflorescence; **C.** inflorescence; **D1-D4.** flower; **E.** dissected flower; **F1-F2.** column and lip; **G.** close up of lip; **H.** close up of spur. (Photos: A-D by S. S. Pang in Mèdog, E-H by M. K. Li).

4. *Taeniophyllum javanicum* (J. J. Sm.) Kocyan et Schuit., Phytotaxa 161: 72 (2014); *Microtatorchis javanica* J. J. Sm., Bull. Jard. Bot. Buitenzorg 2, 26: 115 (1918); **Type:** Indonesia, Java, 1000 m, October, 1918, *J. J. Sm.* 920 336 (isotype, L!).

Fig. 4

Epiphytic, very small, 1–2.5 cm high, stemless. Roots flattened, glabrous. Leaves 2–3, oblanceolate-elliptic, 0.5–1.25×0.2–0.4 cm, shortly acute. Inflorescence laxly racemose, several-flowered, 2–4 cm long or much longer than leaves; floral bracts elliptic, ca. 3×2 mm, longer than the ovary, apex acute. Flower green, very small; sepals and petals in basal half connate into a bell-shaped tube; apical lobes of sepals slightly recurved, ovate-lanceolate, 1.5–2×1.0–1.2 mm, dorsally slightly carinate, acute. Petals ovate, 1.6–1.8×1.0–1.1 mm, acute. Lip ovate-lanceolate, 2 mm long, 3-lobed; lateral lobes semicircular, apex obtuse; mid-lobe inverted triangular, apex acute, apical margins thickened, apex with an inflexed elongate process; spur globose, a third as long as the lip blade. Column small, 0.5–0.6 mm. Anther cap deeply bilobed. Pollinia 2, globose; stipe inverted triangle, viscidium

elliptic. Fl. January–June.

Habitat. Growing on shrubs in broad-leaved forest at 1000–1600 m.

Distribution. China (Xizang), Malacca Peninsula, Indonesia, New Guinea, Vietnam.

Vernacular name. Zhao Wa Dai Ye Lan 爪哇带叶兰 (Chinese name).

Specimens examined. CHINA. Xizang, Mèdog County, Dexing village, 1600 m, 19 December, 2021, *M. K. Li* & *S. S. Pang* 20210567 (Tibet Agricultural and Animal Husbandry University).

5. *Nervilia macroglossa* (Hook. f.) Schltr., Bot. Jahrb. Syst. 45: 402 (1911); *Pogonia macroglossa* Hook.f., Fl. Brit. India 6: 120 (1890). **Type:** India. Sikkim Tumlong, March, 1876, *C. B. Clarke* 27725 (holotype, K!).

Fig. 5

Terrestrial plant with globose corm, 1.2–1.5×1.2–1.4 cm. Leaf green, orbicular, 3.8–4.7×4–4.5 cm, apex acute; petiole 5.5–7 cm long, channeled at base of lamina and terete below. Inflorescence 6–13 cm, 1-flowered; peduncle terete, slender, 5–12 cm, with 2 tubular sheaths; floral bract linear-lanceolate, 0.35–0.4×0.2–0.3 cm, acute.

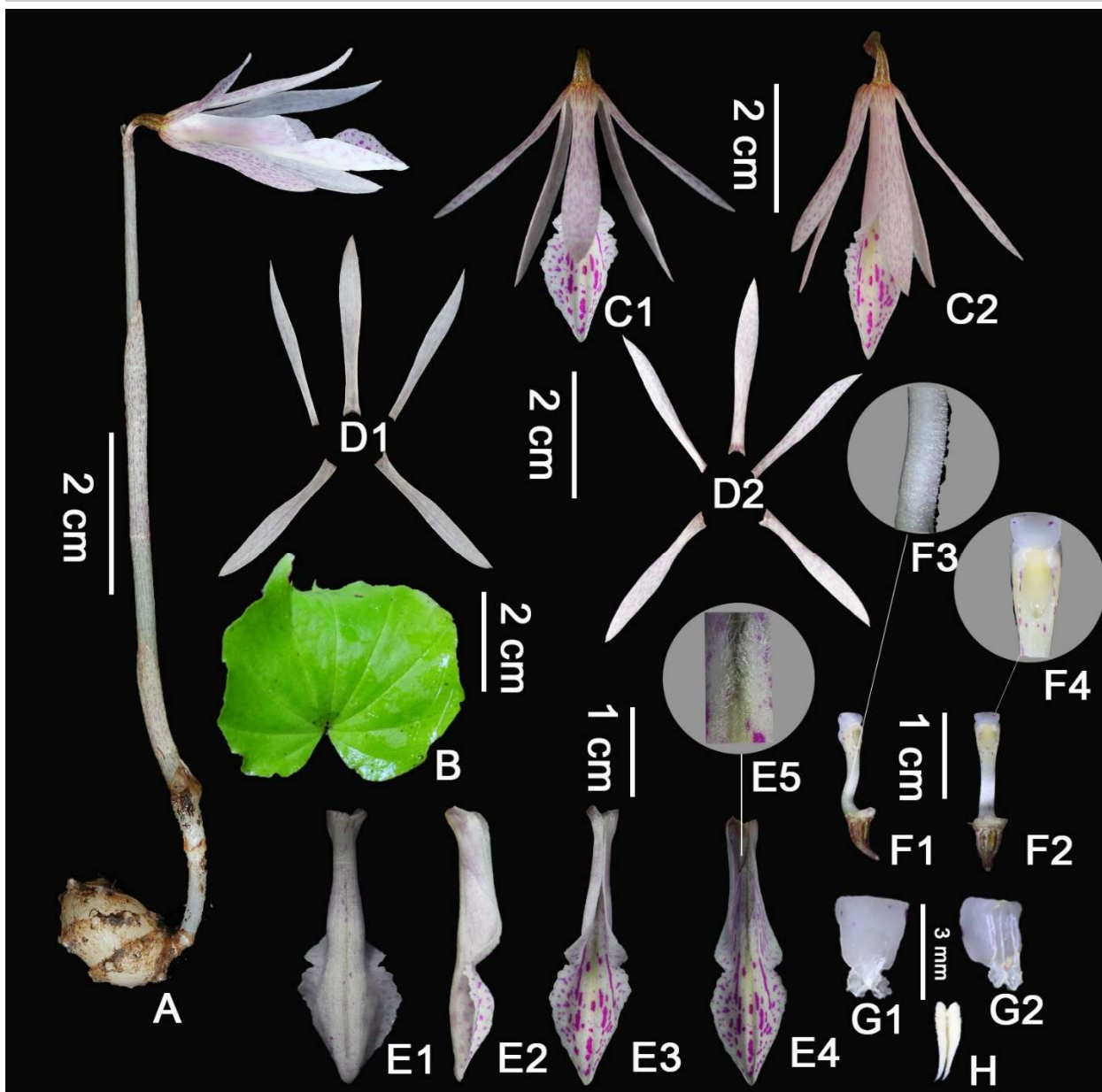


Fig. 5. *Nervilia macroglossa* (Hooker f.) Schltr. **A.** plant and inflorescence; **B.** leaf; **C1-C2.** flower; **D1-D2.** dissected flower; **E1-E5.** lip (**E5.** disk villous); **F1-F4.** column and ovary (**F3.** verrucous of column; **F4.** top of column); **G1-G2.** anther cap; **H.** pollinia. (Photos: A-H by M. K. Li).

Flower white with purple spots, not widely opening; pedicel and ovary 0.4–0.7 cm long, glabrous. Sepals and petals nearly acute to acuminate; dorsal sepal linear-lanceolate, 2.5–3.3×0.2–0.4 cm, acute to acuminate; lateral sepals linear-lanceolate, 2.8–3×0.2–0.4 cm, acute to acuminate. Petals linear-lanceolate, 2.5–2.8×0.2–0.3 cm, acute to acuminate. Lip narrowly oblong or spatulate, 2.4–3.5×0.5–0.8 cm, 3-lobed; lateral lobes convolute around the column; mid-lobe ovate, apex subacute or obtuse; disc densely pilose at base. Column slender, ca. 1.3 cm long, apex clavate. Anther cap ca. 0.3×0.3 cm, bilobulate. Pollinia 2, each pollinium bipartite, light

yellow. Fl. May to June.

Habitat. Growing in dense evergreen forest or bamboo forest at 800–1450 m.

Distribution. China (Xizang), Myanmar, Nepal, Bhutan and India.

Vernacular name. Ju She Yu Lan 巨舌芋兰 (Chinese name).

Notes. Both *N. macroglossa* and *N. mackinnonii* have similar flower characteristics, but the lip disc is quite different, the lip disc of the former is hairy, while the latter is glabrous. Gogoi *et al.*, (2021) also recorded the distribution of *N. macroglossa* in Assam, India. However,

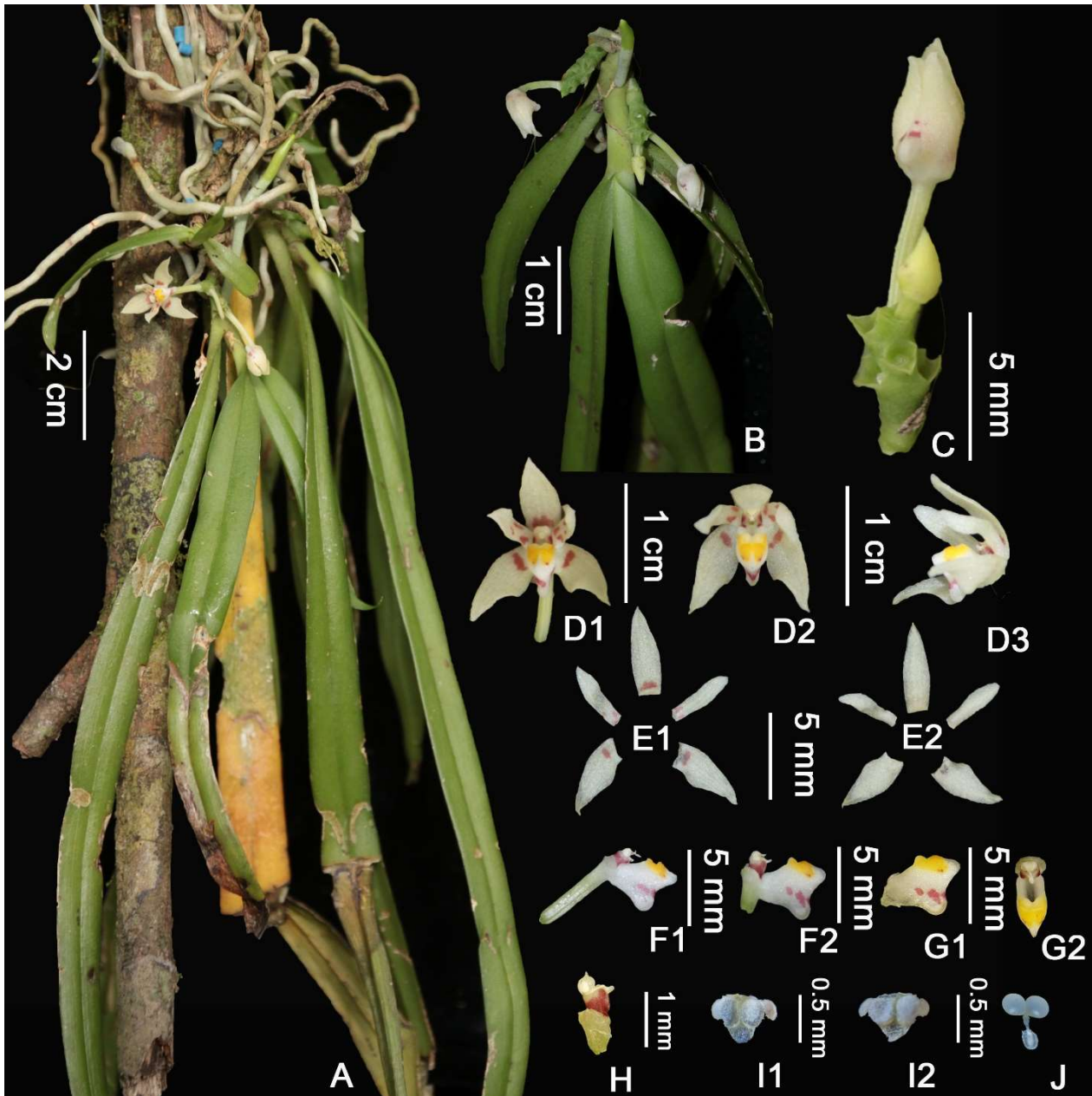


Fig. 6. *Trachoma rhopalorrhachis* (Rchb.f.) Garay **A-B.** plant and inflorescence; **C.** inflorescence; **D1-D3.** flower; **E.** dissected flower; **F1-F2.** column and lip; **G1-G2.** close up of lip; **H.** column; **I1-I2.** anther cap; **J.** pollinia. (Photos: A-J by M. K. Li).

based on the floral characters showed in the article, it should be identified as *N. mackinnonii*.

Specimens examined. CHINA. Xizang, Mêdog County, Naerdong Village, 1450 m · 18 October, 2021, *J. P. Deng & Z. Chen 4071* (HITBC).

6. *Trachoma* Garay, Bot. Mus. Leafl., Harvard Univ., 23, 207 (1972). **Type:** *Trachoma rhopalorrhachis* (Rchb.f.) Garay. **Fig. 6**

Epiphytic herbs. Stem leafy. Leaves coriaceous, linear-falcate, distichous. Inflorescence axillary, racemose, rachis distinctly fleshy, few-flowered, flowers borne in small

clusters throughout the year. Flowers resupinate, ephemeral. Sepals and petals free, spreading. Sepals slightly longer than petals, similar in shape. Lip attached to base of column, laterally compressed, calceoliform, slightly spurred or saccate, interior ecallose, tuberclose or pulvinate-thickened in front. Column lacking a foot; pollinia two, globose, entire or obscurely sulcate, stipe linear, viscidium distinct; stigma suborbicular; rostellum erect, bifid after removal of pollinarium.

Trachoma was established by Garay (1972) based on *Dendrocolla rhiopalorrhachi* Reichb. f. Morphologically, *Trachoma* closely resembles *Tuberolabium*, but it differs



from *Tuberolabium* in the absence of a column foot (Garay, 1972). Wood considered that this feature was not enough for it to be an independent genus, and united it with *Tuberolabium* (Wood, 1990). However, the latest molecular phylogenetic study by Kocyan published in *Genera Orchidacearum* vol. 6 (Pridgeon *et al.*, 2014) demonstrated that *Trachoma* and *Tuberolabium* were distinct (Kocyan and Schuiteman, 2014) and considered *Trachoma* to be an independent genus. Then, some species of *Tuberolabium* are transferred to *Trachoma* (Kocyan and Schuiteman, 2014). There are several differences between these two genera, the flowers of *Trachoma* blooming in successive clusters on short rachis and lasting for hours, and the flowers of *Tuberolabium* blooming almost simultaneously and lasting for several days (Kocyan and Schuiteman, 2014). Here we accept *Trachoma* as an independent genus based on morphological and molecular evidence. The genus of *Trachoma* included 16 accepted species distributed from S.E. Asia, the Philippines to New Guinea and some Pacific Islands (Kocyan and Schuiteman, 2014). It is reported here as a new record genus in China.

Trachoma rhopalorrhachis (Rechb.f.) Garay, Bot. Mus. Leafl. 23: 208 (1972); *Dendrocolla rhopalorrhachis* Reichb. f., Xenia Orch., 1: 214 (1857). **Type:** Indonesia, Java, Bandung, *Zollinger s.n.* (holotype, W).

Fig. 6

Epiphytic. Stems pendulous, 2–15 cm long, with 2–7 leaves in upper part, not or sparsely branching. Leaves oblong to lanceolate, 12–20×1.5–2.5 cm, leathery, apex variable, obtuse to acute. Inflorescence usually horizontal to erect, up to 1–1.5 cm long, a densely many-flowered raceme with the flowers opening in successive clusters; floral bract triangular, especially small, persistent, apex acute. Flower yellowish-white, flowering short. Dorsal sepal oblong, ca. 0.9×0.3 cm, acute; lateral sepals similar but somewhat oblique. Petals oblong ovate, ca. 1×0.2 cm, with erose margins, apex acute. Lip subrhombic, ca. 0.3–0.4 cm, weakly 3-lobed; lateral lobes obliquely oblong, about 0.2 cm below the lip apex, very thick; mid-lobe small, conical, porrect, fleshy; spur conical, ca. 0.1 cm long, obtuse. Column 0.2 cm long, narrow, with very short acute stielidia. Anther cap ovate triangular, ca. 0.5–0.5 cm, apex obtuse; pollinia 2, globose. Fl. March to April.

Habitat: Growing on trees in broad-leaved forest at 700–800 m.

Distribution. China (Xizang), Indonesia (Java, Maluku, Sumatera), New Guinea, Philippines, Australia, Thailand, Vietnam.

Vernacular name. Duan Tou Lan 短头兰 (Chinese name).

Specimens examined. CHINA. Xizang, Mêdog County, Dexing village, 800 m, May, 2021, *S. S. Pang et al.*, 2022079 (Tibet Agricultural and Animal Husbandry University).

7. *Uncifera lancifolia* (King & Pantl.) Schltr, Orchideen Beschreib., Kult. Zücht.: 583 (1914); *Saccolabium lancifolium* King & Pantl., J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 65: 122 (1896). **Type:** India. Sikkim, June, 1895, *Pantling R. 152A* (holotype, BR!).

Fig. 7

Epiphytic. Stems cylindrical, 9–17×0.7–1.2 cm in diameter, pendulous, clustered, rooting at internodes and from base. Leaves linear-lanceolate, 4–9×0.7–1 cm, petiole-like base and tubular sheath, apex acuminate and aristate. Inflorescence pendulous, ca. 3 cm, racemes with several dense flowers, sheathed; floral bracts lanceolate, shorter than pedicel and ovary, apex acute. Flower not opening widely, yellowish-green; pedicel and ovary 0.4–0.5 cm long. Dorsal sepal ovate-oblong, 0.3–0.5×0.2 cm, concave, apex obtuse; lateral sepals ovate-lanceolate, 0.4–0.6×0.3 cm, apex obtuse. Petals oblong-obovate, as long as dorsal sepal, apex obtuse. Lip suborbicular in outline, 0.6–0.7×0.3–0.4 cm, concave-saccate, apical margin thickened and recurved, lobe ovate-triangular; spur funnel-shaped, curved forward, apex obtuse. Column very short, ca. 1 mm long, the rostellum beaked; pollinia 2, globular-ovoid. Fl. June–July.

Habitat: Growing on trees in broad-leaved forest at 1700–2100 m.

Distribution. China (Xizang), India, Nepal, Vietnam.

Vernacular name. Xian Ye Cha Hui Lan 线叶叉喙兰 (Chinese name).

Specimens examined. CHINA. Xizang, Mêdog County, 2090 m · 6 June · 2020, *J. P. Deng & Z. Chen 2217* (HITBC); Xizang, Mêdog County, Beibeng village, 1700 m · 13 July · 2020, *M. K. Li et al.*, 20200618 (Tibet Agricultural and Animal Husbandry University)

New synonym

Bulbophyllum linzhiense Liang Ma & S. P. Chen, Phytotaxa 429 (4): 281 (2020). **Type:** China, Xizang, Mêdog County, 2039 m, 2 October, 2017, *Ma 20171042xz* (holotype, FAFU!).

Bulbophyllum xizangense J. D. Ya & C. Liu, Plant Diversity, 43:362 (2021). **Syn. nov.** **Type:** China, Xizang, Mêdog County, 1625 m, 23 Nov. 2018, *J. D. Ya & C. Liu 18HT2445* (holotype, KUN!).

Taxonomic notes. Ma *et al.*, (2020) described *B. linzhiense* from Mêdog County of Xizang Autonomous region in southwest China, noting that it is similar to *B. rubrolabellum* in floral morphology, but distinguished by apart pseudobulbs, fewer flowers, ovate-lanceolate floral bracts, longer pedicel and ovary, yellow-green flower, and lanceolate lateral sepals. Additionally, they conducted phylogenetic analysis based on nuclear (ITS) and chloroplast DNA sequences (*matK*, *trnL-F*, and *atpI-atpH*) to support it is sister to *B. rubrolabellum*. Ya *et al.*, (2021) described *B. xizangense* also from Mêdog County. They also compared their species with *B. rubrolabellum*, suggesting that *B. xizangense* can be distinguished from *B. rubrolabellum* by having narrow lanceolate leaves, greenish-yellow flowers, falcate-ovoid lateral sepals.

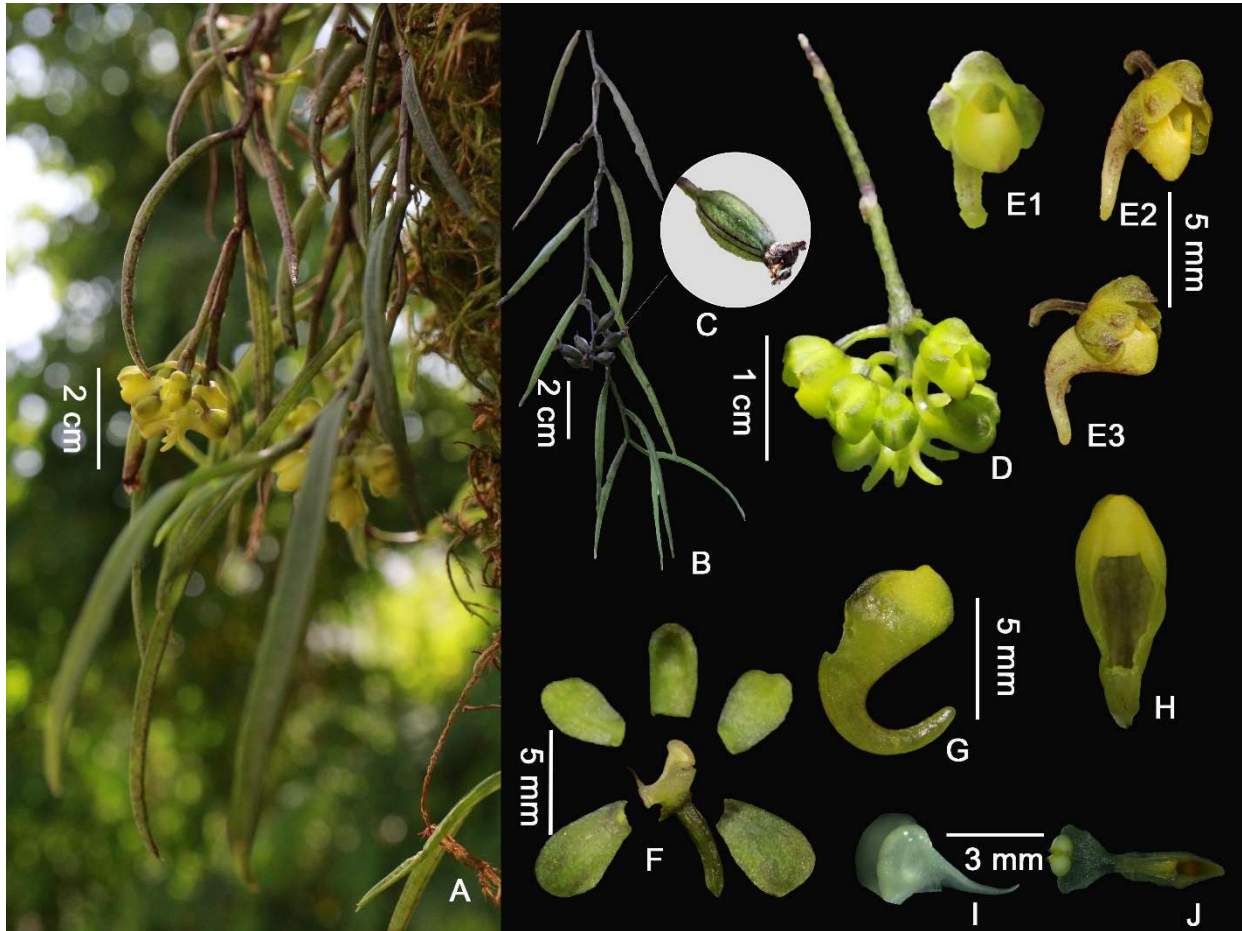


Fig. 7. *Uncifera lancifolia* (King & Pantl.) Schltr. **A.** plant and habitat; **B.** plant and fruit; **C.** close up of fruit; **D.** inflorescence; **E1-E3.** flower; **F.** dissected flower; **G-H.** close up of lip; **I.** anther cap; **J.** pollinia. (Photos: A-E by J. P. Deng in Mèdog, F-H by M. K. Li, I-K by Y. Luo).

Given identical morphological characters of both vegetative and reproductive traits (ovoid pseudobulbs, greenish-yellow flowers, falcate-ovoid lateral sepals, red and ligulate lip) and same locality, *B. xizangense* is reduced to the synonymy of *B. linzhiense*. This species is certainly similar to *B. rubrolabellum* and may be belonged to section *Desmosanthes* (Bl.) J. J. Smith (Pridgeon *et al.*, 2014).

Distribution. China.

New combination

Dendrolirium pachyphylla (Aver.) M. K. Li, Z. Xing & Y. Luo, **comb. nov.**

Eria crassifolia Z. H. Tsi et Z. C. Chen, Acta Phytotax. Sin. 32 (6): 560. fig. 3 (7) (1994), *nom. illeg.*; *Eria pachyphylla* Aver., Turczaninowia 5 (4): 77 (2002); *Pinalia pachyphylla* (Aver.) S. C. Chen & J. J. Wood, Fl. China 25: 355 (2009). **Type:** China, Yunnan Province, Mengla County, 800 m · April, 1992, Z. H. Tsi, 92-415 (holotype, PE!).

Taxonomic notes. *Eria s. l.* Lindl. is morphologically diverse and polyphyletic (Pridgeon *et al.*, 2005; Ng, 2018). It has been separated into multiple genera based on molecular phylogenetic analysis, including *Aeridostachya*

(Hook. f.) Brieger, *Bryobium* Lindl., *Dendrolirium* Blume, *Eria* Lindl., *Pinalia* Buch.-Ham. Ex Lindl., *Trichotosia* Blume *etc.* (Pridgeon *et al.*, 2005; Ng *et al.*, 2018). In a recent study by Ng *et al.*, (2018), *Dendrolirium* is supported as monophyletic by the molecular evidence (four species included in the analysis, including *D. ferrugineum*, *D. lasiopetalum* (Willd.) S. C. Chen & J. J. Wood, *D. ornatum* Blume, *D. tomentosa* (J. Koenig) S. C. Chen & J. J. Wood. *Eria crassifolia* was established by Z. H. Tsi et Z. C. Chen (Tsi & Chen, 1994), however, the species epithet was already taken by *Eria crassifolia* of Ridley (1915), therefore, Averyanov assigned a new name *E. pachyphylla* Averyanov (Averyanov and Averyanova, 2002). Chen *et al.*, (2009) treated *E. pachyphylla* Aver. as *Pinalia pachyphylla* (Aver.) S. C. Chen & J. J. Wood. However, this species with densely wooly pubescence on the inflorescence that arise from a lower internode of the pseudobulb, is more closed to the characteristic of *Dendrolirium*. It is morphologically related to *D. ferrugineum*, which is placed in *Dendrolirium* (Rao, 2010; Ng *et al.*, 2018). Hence, *Eria pachyphylla* is transferred to the genus *Dendrolirium*. Further molecular phylogenetic analysis is required to



fully evaluate the systematic position of these two species.

Distribution. China, Vietnam.

Specimens examined. CHINA. Yunnan, Mengla county, 650 m, April, 1992, *Z. H. Tsi 92-144* (paratype, PE); Yunnan, Mengla county, 1100 m, April, 2013, *J. W. Li 3017* (HITBC); Guangxi, Daxin County, 300 m, April, 1997, *Sino-British expedition ASBK199* (PE, IBK); Guizhou, 1120 m, May, 2000, *X. H. Jin 87* (PE). VIETNAM, Ha Giang Province, Quan Ba District, 650 m, 2 June, 2000, *L. Averyanov et al., DKH 4911* (LE).

ACKNOWLEDGMENTS

The authors are grateful to Liang Chen and Yongsheng Wei from Xizang Agricultural and Animal Husbandry University, Liu Zhan, Forestry and Grassland Bureau of Mêdog County, for their help in field surveys. This study financially on the support system of modern forestry technology in Tibet (2018xz503118002), the National Natural Science Foundation of China (grant No. 31870183), Southeast Asia Biodiversity Research Institute, Chinese Academy of Sciences (Y4ZK111B01) and the Second Tibetan Plateau Scientific Expedition and Research Program (2019QZKK0502).

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