



## 斯勒卷瓣兰, 中国云南南部兰科一新种

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# 斯勒卷瓣兰，中国云南南部兰科一新种

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**摘要:** 描述并绘制了云南南部兰科石豆兰属一新种: 斯勒卷瓣兰(*Bulbophyllum dresslerianum* Z. D. Han & H. Wang)。该新种属于双叶卷瓣兰组(section *Tripudianthes* Seidenf.), 在形态上与该组的 4 种, 即狄氏卷瓣兰(*B. dickasonii*)、堪布里石豆兰(*B. kanburiense*)、皱掌卷瓣兰(*B. rugosisepalum*)和拟双叶卷瓣兰(*B. tripudians*)近似, 主要区别在于该种唇瓣前缘具囊泡, 侧面及腹面被稀疏的短腺毛; 侧萼片棕黄色, 表面光滑。编制了斯勒卷瓣兰及其近缘种的检索表。目前, 该种仅在云南南部墨江县发现一个居群, 濒危状况有待评估。

**关键词:** 新种; 石豆兰属; 唇瓣; 双叶卷瓣兰组; 云南

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## *Bulbophyllum dresslerianum* (Malaxideae: Orchidaceae), a New Species from Southern Yunnan, China

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**Abstract:** *Bulbophyllum dresslerianum* Z. D. Han & H. Wang (Orchidaceae), a new species from southern Yunnan, China, is described and illustrated. The new species belongs to section *Tripudianthes* Seidenf., sharing some vegetative and floral traits with *B. dickasonii*, *B. kanburiense*, *B. rugosisepalum* and *B. tripudians*, but differs on the basis of a suite of floral characters. Globular papillae decorate the lip epichile with the abaxial side and margins bearing sparse short glandular hairs. In addition, its lateral sepals are brownish-yellow and glabrous. A key to *B. dresslerianum* and its related species is provided. Currently, this species is only found in one population, its conservation status requires further assessment.

**Key words:** New species; *Bulbophyllum*; Labellum/lip; Section *Tripudianthes*; Southern Yunnan

*Bulbophyllum* Thouars is the largest genus in the orchid family in the subfamily Epidendroideae, with ca. 2 200 species<sup>[1-3]</sup>. It is widely distributed in tropical and subtropical regions of the Americas, Africa, Madagascar, Asia, and Australasia<sup>[4]</sup>. Most species within the genus *Bulbophyllum* are epiphytic or lithophytic

with long, creeping or dangling rhizomes. Secondary stems grow as pseudobulbs with one or two usually fleshy or leathery leaves at their apices. The scape arises from the base of the pseudobulb producing a racemose or umbellate inflorescence. The dorsal sepal is free from the lateral sepals while the lateral

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sepals are free or connate. The petals are also free from each other and smaller than the lateral sepals. The lip (labellum) is often fleshy, curved and hinged at the base of the column. Variation in floral modifications based on size, organ shape, pigmentation patterns and epidermal sculpturing makes *Bulbophyllum* one of the most complicated genera within the family<sup>[2,5]</sup>.

Approximately 110 species of the genus *Bulbophyllum* are distributed through tropical and subtropical forests in southern China<sup>[6]</sup> and this includes several new taxa described in recent years<sup>[7–9]</sup>. Ongoing biogeographic analyses of *Bulbophyllum* s.s. with ancestral area reconstructions identify the Asian-Pacific region as the ancestral area of the lineage suggesting an early-to-late Miocene dispersal from east to west with subsequent speciation events<sup>[10]</sup>.

During fieldwork in Mojiang County, Yunnan Province, we found some small plants of an unidentified *Bulbophyllum* species growing on the trunks of native *Quercus* trees in February and March 2017. We collected some plants for cultivation in the nursery of Yunnan Academy of Forestry. Three plants flowered in March 2017 providing us with sufficient material for comparative morphological analyses and a subsequent description of a new species. The surviving plants showed vegetative and floral traits indicative to Section *Tripudianthes* Seidenf.

Section *Tripudianthes* remains a small section within genus *Bulbophyllum*. Almost all members of this section are deciduous, dropping their leaves at the onset of winter. The section consists currently of 13 species<sup>[11–12]</sup> distributed from India to Indochina, Thailand, Java, and China. Seven species are distributed in Yunnan, China<sup>[13]</sup>. Therefore, we needed to compare these Yunnan specimens with previously described taxa within section *Tripudianthes* focusing on four congeners with distributions in southern Asia. This permitted segregating and describing a new species in section *Tripudianthes*.

## 1 Materials and methods

All morphological traits and measurements of the

three plants in the vegetative state were taken from living specimens *in situ*. Measurements and observations continued using the same plants as they flowered in the greenhouse of the Yunnan Academy of Forestry. Flowering plants were photographed using Nikon D300. Floral traits were recorded using a fresh flower from a plant designated as the holotype. Floral organs were carefully dissected, photographed and measured with digital calipers to an accuracy of 0.1 mm, prior to pressing them with the holotype. We pressed other plants in flowers as isotypes.

We developed a data set based on vegetative and floral traits using our living plants *in* and *ex situ*. We also checked additional herbarium sheets of *Bulbophyllum* species belonging to the Yunnan Academy of Forestry (YAF), the Kunming Institute of Botany, the Chinese Academy of Sciences (KUN) with additional sheets from Chinese collections at PE and IBSC. Unfortunately, there were no specimens available of the four species in section *Tripudianthes* considered most closely allied to our plants (Table 1). Therefore, to compare floral traits of our plants to *B. dickasonii* Seidenf., *B. kanburiense* Seidenf., *B. rugosisepalum* Seidenf., and *B. tripudians* CSP Parish & Rchb. f., we used photos of flowers of online herbarium sheets including types from AMES, MNHN, NL and K. We also used Seidenfaden<sup>[11]</sup> to compare previous descriptions of related species in section *Tripudianthes* to our own measurements and descriptions.

## 2 Results

***Bulbophyllum dresslerianum* Z. D. Han & H. Wang sp. nov.** Figs. 1, 2

**Diagnosis:** *Bulbophyllum dresslerianum* is similar to *B. dickasonii*, *B. kanburiense*, *B. rugosisepalum*, and *B. tripudians* in terms of morphological structure of flowers. This new species can be distinguished from *B. rugosisepalum* by dorsal sepal ovate to narrowly ovate, lateral sepals absent rugose-papillae, and the margins and adaxial side of epichile with sparsely short glandular hairs. It can be distinguished from *B. tripudians* with the epichile of lip with

globular papillae. In addition, the new species can be distinguished from *B. dickasonii* and *B. kanburiense* with the margins of dorsal sepals irregularly fimbriated, the petal ovate-lanceolated and the margins of petal fimbriated.

**Type:** CHINA. Yunnan: Kunming, voucher from the cultivated plant at Yunnan Academy of Forestry, 15 March 2016, H. Jiang et al. 07360 (Holotype: KUN!; Isotypes: YAF!), collected originally in CHINA. Yunnan: Mojiang County, Mengnong Town, Bingman village, in mixed broadleaf-conifer forest. Alt. 1 400 m, 23°45' N, 101°30' E.

**Description:** Epiphytic herb. Pseudobulbs clumped and congested, brownish-green, depressed ovoid, 1.5–2.0 cm in diameter, with 2 leaves at each apex. Leaves deciduous prior to anthesis, oblong, ca. 13.0 cm × 2.0 cm, leaf lamina with an acute apex. Inflorescence racemose and nodding arising from the base of the current year's pseudobulb, terminating in ca. 20 overlapping flowers, 20 cm long, with 3 tubular sheaths, ca. 6.0 cm. Floral bracts yellowish, ovate-lanceolate, ca. 5.0 mm, apex acuminate. Dorsal sepal brownish yellow, wide ovate-lanceolate, ca. 5.0 mm × 2.0 mm, margins irregular and minutely dentate, apex long acuminate. Lateral sepals brownish yellow with purple spots, narrowly oblong, 27.0 mm × 3.5 mm, glabrous, twisted near bases, and connate on lower edges, margins entire, apex obtuse. Lateral petals with whitish centers and purple-red margins, obliquely ovate-triangular, ca. 2.0 mm × 1.0 mm, margins irregular fimbriate-ciliate, apex long acuminate. Labellum/Lip surface deep purple-maroon with a white abaxial surface, subligulate, ca. 2 mm long, fleshy, basal part attached to a column foot by a mobile hinge, margins and abaxial side of epichile sparsely decorated with short hairs, epichile densely ornamented with shiny globular papillae, apex obtuse. Column white and reduced, ca. 2.0 mm long, column wings triangular-falcate, ca. 0.5 mm long with a white, short, column foot. Anther cap subglobose, apex densely papillate. Pollinia 4, in 2 pairs.

**Etymology:** The species is named for the late Robert Louis Dressler (1927–2019), an authority on

the taxonomy of Neotropical Epidendroideae (including the Malaxideae) and his contributions to the evolutionary ecology of the Orchidaceae.

**Chinese vernacular name:** 斯勒卷瓣兰 (sī lè juǎn bàn lán)

**Phenology:** This new species was observed flowering in March, and fruiting from May to June.

**Distribution and habitat:** *Bulbophyllum dresslerianum* is currently found only in one location in southern Yunnan. We did investigate other possible locations near Mojiang in 2017, but without success. It is an epiphytic species growing on oak tree trunks in the mixed coniferous forest at an elevation of 1 400 m.

**Specimens of related species examined using herbarium sheet photos:** *Bulbophyllum dickasonii*: Burma, Ranpetlet, Chin Hills, 7 500 ft (c. 2 300 m), Dickason 8 444 (holotype AMES!); Manipur, Chandel Distr., Chakpikarong, 24°23.484' N, 94°07.088' E, alt. 1 434 m, in subtropical rain forest, 25 Jan. 2013, Chowlu 00333 (CAL); Chowlu 000325 (Herbarium of Centre for Orchid Gene Conservation Eastern Himalayan Region, Hengbung). *Bulbophyllum tripudians*: Vietnam, Annam: un peu au sud de la station agricole de Blao, prov. du Haut Donai, 750 m, Poilane, E. 22157 (MNHN-Paris); Thailand, Province: Chiang Mai, District: Chiang Dao, Doi Chiang Dao Animal Sanctuary, near Huay Mae Gawk Station, 1 450 m, 4 March, 1995, Maxwell, J F95-200 (NL); Myanmar, Parish, C. S. P. 308, K000829091 (K).

**Conservation status:** The new species is known only from the type locality. It is restricted to one population of ca. 20 individual plants discovered during our field trips. As more populations may be found with additional field surveys in these under-explored regions we regard this species as Data Deficient (DD: IUCN 2019)<sup>[14]</sup>.

### 3 Discussion

Orchids in this section are unique among the Asian *Bulbophyllum* species as they have two leaves per pseudobulb and leaf like floral characteristics similar to those described in of section *Cirrhopetalum*

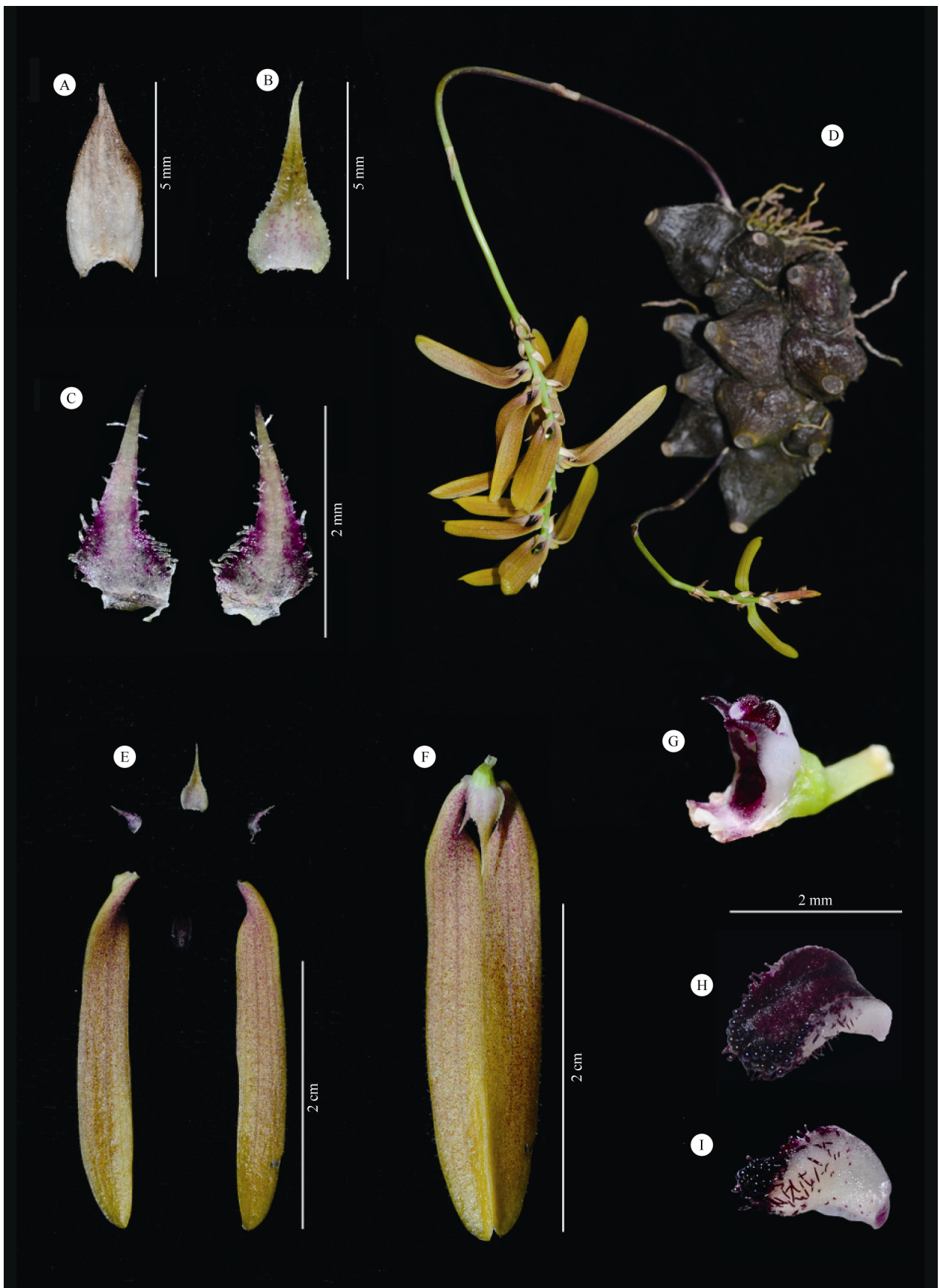


Fig. 1 *Bulbophyllum dresslerianum*. A: Bract; B: Dorsal sepal; C: Petals; D: Plant; E: Sepals, petals, and lip; F: Flower (front view); G: Column with ovary; H: Lip (lateral view); I: Lip (dorsal view). All photos from a flower of the holotype.

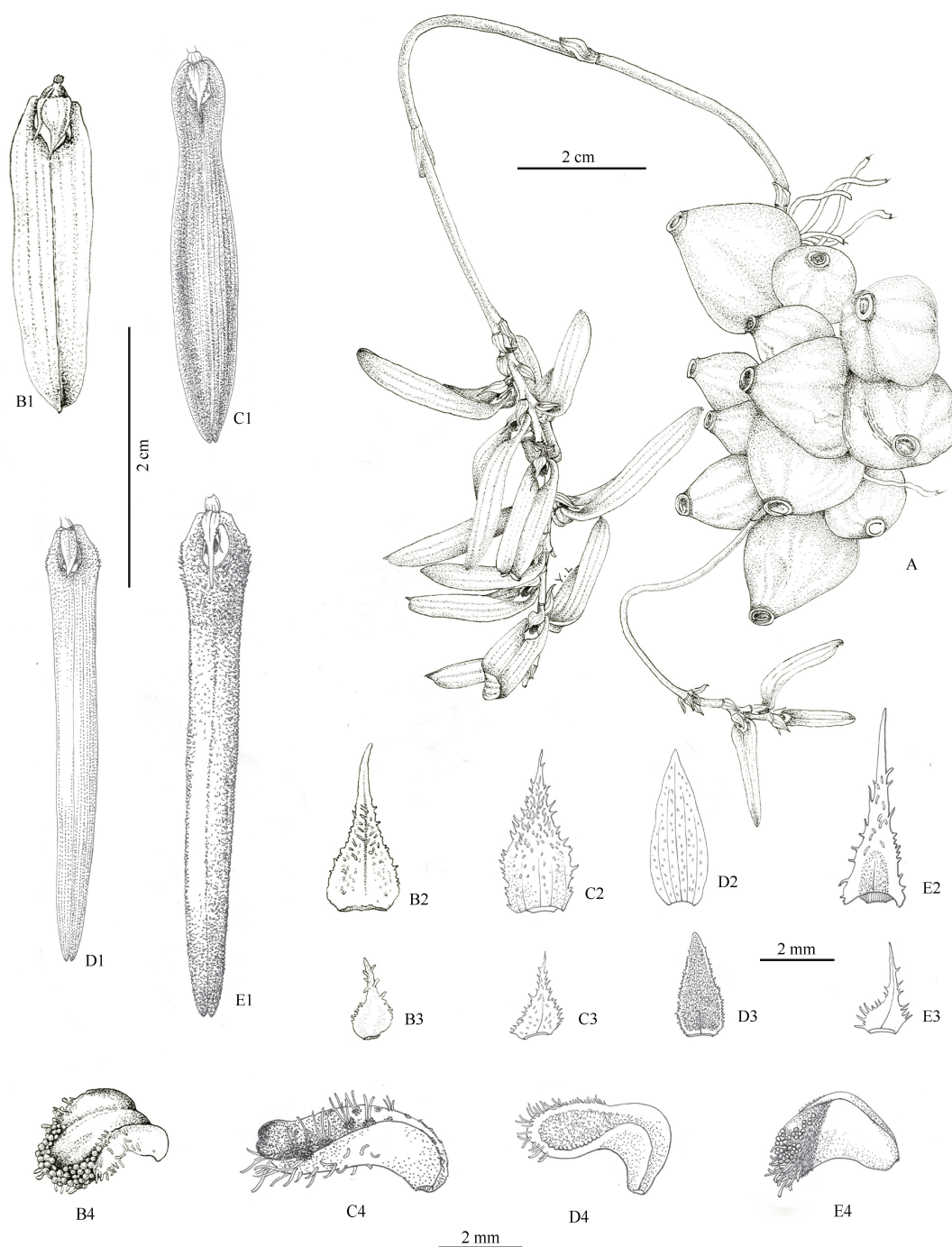


Fig. 2 Comparison of three related species with *Bulbophyllum dresslerianum*. A: Plant of *B. dresslerianum*; B: *B. dresslerianum*; C: *B. tripudians*; D: *B. dickasonii*; E: *B. rugosisepalum*; 1: Flower (front view); 2: Dorsal sepal; 3: Petal; 4: Lip (Drawn by Lan Yan and Lin Wang based on type photos of *B. dresslerianum* and *B. dickasonii*, and drawing of *B. tripudians*).

(Lindl.) Rchb. f.<sup>[5]</sup>. Most plants in section *Tripudianthes* are deciduous, the leaves dropping in the winter, and then the inflorescence arises from the leafless pseudobulbs during the winter or in the following spring. These distinct characters made this section easy to distinguish from other in the genus.

Section *Tripudianthes* occurs through subtropical-tropical regions with *B. dickasonii* is distributed from India to Myanmar, *B. kanburiense* found in Myanmar and Thailand, *B. rugosisepalum* in Thailand, while *B. tripudians* occurs in Myanmar, northern Thailand, and Vietnam. Our new species expanded the distri-

bution of this section further north into southern Yunnan.

The new species, *Bulbophyllum dresslerianum*, does not have vegetative characters distinct from *B. dickasonii*, *B. kanburiense*, *B. rugosisepalum*. and *B. tripudians*. It does not have unique floral traits absent in all, four, allied, species either (Table 1). Instead, the new species is unique due to a linked suite of labellum and lateral petal traits that do not link in the remaining four species. It is the only species in which the epichile surface is densely decorated with globular papillae while its abaxial surface wears a few, short glandular hairs. In turn, these labellum traits link with the flower’s ovate lateral petals with fimbriate margins. A key to distinguish *B. dresslerianum* with other four

allied species was provided.

The transition from tropical, to subtropical, to temperate into montane vegetation in southern Yunnan allows some orchid lineages, including the genus *Bulbophyllum*, to colonize new niches based on extensive variations in topology and climate<sup>[15]</sup>. With the description of *B. dresslerianum*, Section *Tripudianthes* extends northward into a cooler, coniferous-oak ecosystem. It is not surprising that new plant taxa are found continuously in this biodiversity hotspot<sup>[16]</sup>. With further field investigations, we expect to find more populations of this new species and perhaps more new *Bulbophyllum* species considering the high vagility of orchid seeds and the speciation model proposed by Trenblay et al.<sup>[17]</sup>.

Table 1 Comparative floral morphology of *Bulbophyllum dresslerianum* and four allied species in section *Tripudianthes*

| Part          | <i>B. dresslerianum</i>                                                                                  | <i>B. dickasonii</i>                                                                            | <i>B. kanburiense</i>                                                                 | <i>B. rugosisepalum</i>                                                                              | <i>B. tripudians</i>                                                                                                 |
|---------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Dorsal sepal  | Margins irregularly fimbriate, ovate to narrow ovate, 5–6 mm×ca. 2 mm                                    | Margin entire, ovate to lanceolate, 7–8 mm×ca. 2.5 mm                                           | Margin entire, narrow ovate, 5 mm×1.5–2 mm                                            | Margins and adaxial side irregularly fimbriate, narrow triangular, 6–7 mm×ca. 2 mm                   | Margins irregularly fimbriate, broad ovate apiculate, 4.3–4.8 mm×ca. 2 mm                                            |
| Lateral sepal | Brownish-yellow without papillae, smooth, 27 mm×3.5 mm                                                   | Yellowish-brown with fine brown spots, smooth, 45–55 mm×2.5–2.7 mm                              | Orange to brownish-yellow, smooth, 45–50 mm×ca.5 mm                                   | Reddish-yellow with densely rugose-papillose papillae, sparsely hairy along edges, 45–50 mm×ca. 2 mm | Uniformly golden brown, rust-colored or orange-yellow, sometimes with small purple dots, smooth, 40–45 mm×2.2–2.7 mm |
| Petal         | Ovate-lanceolate, margins fimbriate, rarely dentate, ca. 2 mm×1 mm                                       | Ovate acute with densely papillose on the inner surface, margins erose                          | Long ovate acute with densely papillose on the inner surface, middle of margins erose | Falcate-lanceolate, basaloblique, margins fimbriate                                                  | Ovate-lanceolate, margins fimbriate, rarely dentate                                                                  |
| Lip           | Epichile with globular papillae, margins and abaxial side of epichile with sparsely short glandular hair | Epichile without globular papillae, margins and abaxial side of epichile with densely fine hair | Epichile without globular papillae, with very sparsely and short hair                 | Epichile with globular papillae, margins and abaxial side of epichile with densely long hair         | Epichile without globular papillae, margins and abaxial side of epichile with fine hair                              |

Key to the four species related to *Bulbophyllum dresslerianum*

1. Lateral sepals with densely rugose-papillose papillae surface ..... *B. rugosisepalum*
1. Lateral sepals with smooth surface
2. Dorsal sepal with entire margin
3. Lip with very sparsely and short hair ..... *B. kanburiense*
3. Lip with densely fine hair ..... *B. dickasonii*
2. Dorsal sepal with irregularly fimbriate margin
4. Lip without globular papillae ..... *B. tripudians*
4. Lip with globular papillae ..... *B. dresslerianum*

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