

## 中国兰科石豆兰属 (*Bulbophyllum*) 二新种

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**摘要:** 对兰科 (Orchidaceae) 石豆兰属 (*Bulbophyllum*) 二新种, 副萼石豆兰 (*B. malipoense* Z. J. Liu, L. J. Chen & W. H. Rao) 和小副萼石豆兰 (*B. minor* Z. J. Liu, L. J. Chen & W. H. Rao) 作了描述和绘图。该二新种属于石豆兰属副萼组 (*Bulbophyllum* section *Biseta* J. J. Verm. ex N. Pearce, P. J. Cribb & J. Renz), 与该组的刺萼石豆兰 (*B. bisetum* Lindl.) 相似, 区别在于两新种的叶片先端二裂和唇瓣无毛。小副萼石豆兰与副萼石豆兰的区别在于假鳞茎椭圆球形; 叶片卵状椭圆形, 长 1.2 ~ 2 cm; 侧副萼片较短, 长约 1 mm; 中副萼片几乎与两侧萼片边缘合生。  
**关键词:** 石豆兰属副萼组 (*Bulbophyllum* section *Biseta*); 副萼石豆兰 (*B. malipoense*); 小副萼石豆兰 (*B. minor*); 新种; 兰科 (Orchidaceae)

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## Two New Species of *Bulbophyllum* (Orchidaceae) from China

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**Abstract:** *Bulbophyllum malipoense* Z. J. Liu, L. J. Chen & W. H. Rao and *Bulbophyllum minor* Z. J. Liu, L. J. Chen & W. H. Rao, two new orchid species from China, are described and illustrated. Both of them belong to *Bulbophyllum* section *Biseta*, and are akin to *B. bisetum*. *Bulbophyllum malipoense* differs from *B. bisetum* by having bilobed-tipped leaves and a glabrous lip, and *B. minor* differs from *B. malipoense* by having ellipsoid-globose pseudobulbs, ovate-elliptic leaves 1.2 – 2 cm long, shorter lateral calyculs ca. 1 mm long, and a central calycul almost entirely adnate to the connate margins of the lateral sepals.

**Key words:** *Bulbophyllum* section *Biseta*; *B. malipoense*; *B. minor*; New species; Orchidaceae

*Bulbophyllinae* Schltr., a pantropical orchid subtribe, contains 10 – 15 genera<sup>[1]</sup>, of which only *Bulbophyllum*, *Monomeria*, *Sunipia*, and *Trias* are found in China<sup>[2,3]</sup>. Most species in this subtribe belong to *Bulbophyllum*, a genus of some 1000 species with 12 sections. There are around 100 species in China<sup>[2,4]</sup>.

The plants treated here were collected from southeast Yunnan during a botanical trip in 2008.

They were found on the tree trunks of *Castanopsis* and *Quercus*. Although they are rather similar to each other, further observation revealed that they consist of two entities, both having three bristle-like organs close to the sepals. These organs do not seem to be appendages of sepals because the color and structure of the organs differ obviously from that of sepals. Moreover, the organs adjoin but are external to the sepals. The organs could

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be regarded as nothing but calyculus, an outer row of bracts around the calyx.

In the whole family Orchidaceae, calycle can only be found in the *Bulbophyllum* section *Biseta*<sup>[5]</sup> and *Lecanorchis*<sup>[6]</sup>, a saprophytic genus widely distributed in tropical Asia and extending to Japan and China. However, the calycle in *Lecanorchis* is a toothed cup, showing little relationship with the plants we collected from Yunnan.

Our plants definitely belong to *Bulbophyllum* section *Biseta*<sup>[5]</sup>. They are akin to but appreciably different from *B. bisetum*. In the present paper, the two entities are described as two new species.

## 1 Materials and Methods

The two flowering entities were collected from Malipo county in southeast Yunnan of China in August, 2008. Two small clumps were brought back, and four fresh flowers were carefully examined under stereoscope (Guiguang XTL-500, China).

A comparison in floral morphology between our plants and related species of *Bulbophyllum* was made in the herbaria of the National Orchid Conservation Center of China (NOCC), the Institute of Botany (PE), the South China Botanical Garden (SCBI), and Chinese Academy of Sciences, as well as with the aid of reference books<sup>[7-9]</sup>.

The plants were found in a broad-leaf evergreen forest on a limestone slope. The dominant trees, shrubs, and herbs were collected and identified. Meteorological data were provided by local institutions.

## 2 Results and Discussion

### 2.1 Morphological observation

Observation of the fresh materials collected showed that there was no difference in vegetative features between our plants and species of *Bulbophyllum*, but the floral structure of our plants was very unusual.

The flowers of our plants had three bristle-like organs adjoining the sepals. Two of them

were free and found at angles formed by the dorsal and lateral sepals, and the third was found between the two lateral sepals with 1/2 – 2/3 of its length adnate to the back of the column foot and partly to the connate margins of the lateral sepals. The organs looked adnate to the ovary with apical parts somewhat free, but were different in color and structure to the sepals. These organs were obviously neither additional members of sepals nor their lobes, as pointed out by R. A. Rolfe (1889)<sup>[10]</sup> when he published his new species *B. fallax*: “these arise from the apex of the ovary, and are external to the sepals”.

Some species of *Bulbophyllum*, such as *B. bisetum*, *B. bisetoides* and *B. fallax*, have such an organ, as pointed out by G. Seidenfaden (1979)<sup>[7]</sup>. They all belong to *Bulbophyllum* section *Biseta* Vermulen, and the organ is commonly called “seta”, although no scientific explanation has yet been made. In the present paper, this organ is considered as a calycle, an organ originating from bracts and resembling an outer calyx around the sepals.

### 2.2 Ecological environment

The two new species of *Bulbophyllum* were collected from Malipo county (ca. 23° N) in southeast Yunnan of China at an altitude of about 1000 m, where the average annual temperature is 17.6°C, average minimum temperature is 10.1°C and average maximum temperature is 23°C. The climate is influenced by the monsoon from the Indian Ocean. Its dry season begins in December and lasts to the following March. During the wet season, from April to November, early morning and evening fog often covers their habitats. The soil is dominated by calcareous corpuscles. The vegetation includes broad-leaf forests, needle-leaf forests, shrub-woods and grasslands<sup>[11]</sup>.

The dominant trees in the habitat are *Castanopsis platyacantha* Rehd. & Wils., *C. tonkinensis* Seem., *Quercus setulosa* Hick. & A. Camus, *Q. engleriana* Seem., and *Lithocarpus tenuilimbus*

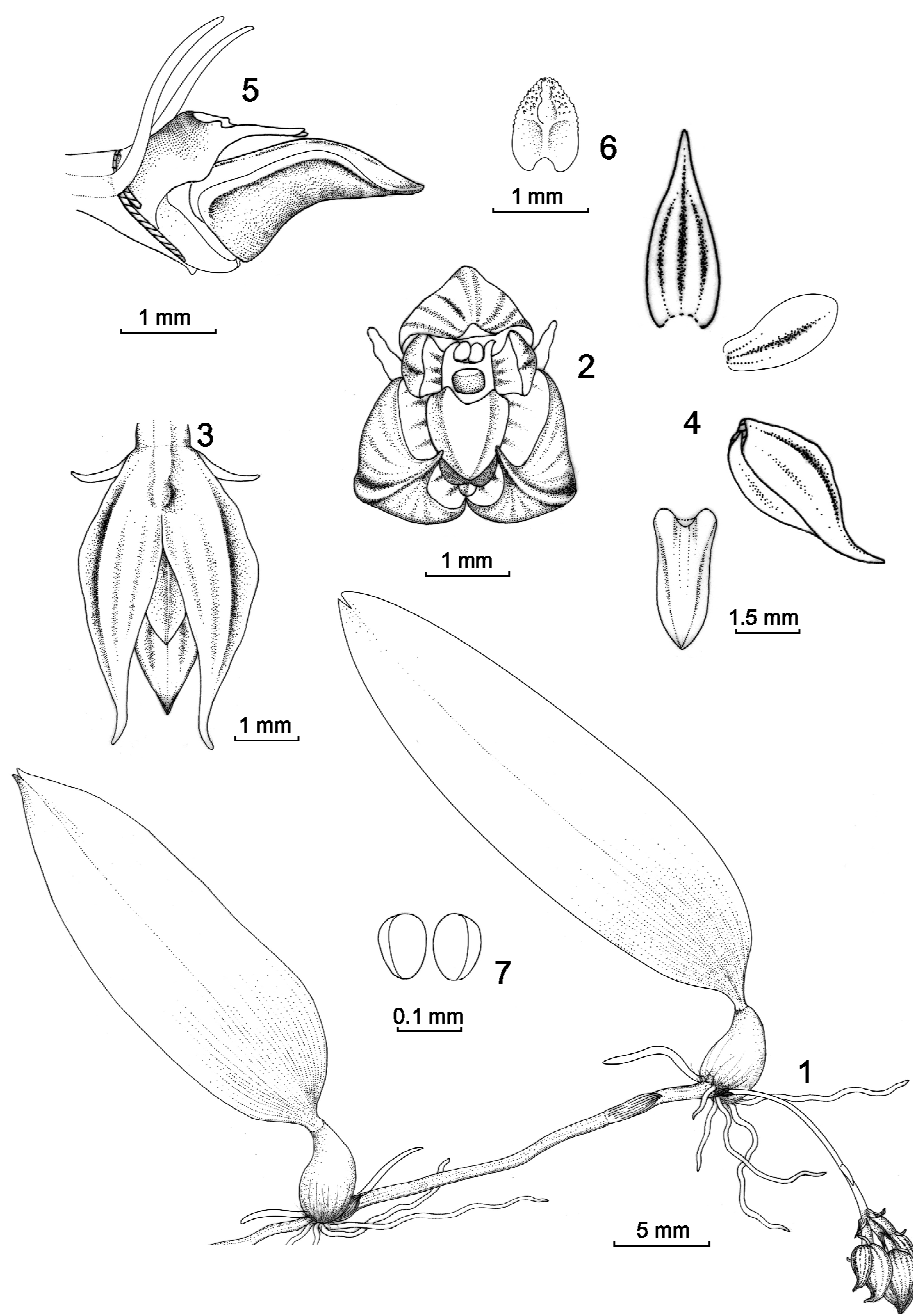
H. T. Chang. Common plants include *Machilus rufipes* H. W. Li, *Ficus hirta* Vahl var. *imberbis* Gagnep., *Swida oblonga* (Wall.) Sojak, *Luculia pinciana* Hook., *Zanthoxylum armatum* DC., *Brassaiopsis glomerulata* (Bl.) Regel, *Pilea howelliana* Hand.-Mazz, *P. glaberrima* (Bl.) Bl., *Rubus paniculatus* Smith, *Artemisia indica* Willd., *Galium asperuloides* Edgew. subsp. *hoffmeisteri* (Klotz.)

Hara, *Glaphyroidopsis erubescens* (Hook.) Ching and some orchids such as *Liparis delicatula* Hook. f. and *L. assamica* King & Pantl.

### 3 Taxonomic Treatment

#### 3.1 *Bulbophyllum malipoense* Z. J. Liu, L. J. Chen & W. H. Rao, sp. nov. Fig. 1

Type: China, Yunnan, Malipo county, Ma An



1. Flowering plant; 2. Flower, front view; 3. Flower, back view; 4. Dorsal sepal, petal, lateral sepal and lip; 5. Lip, column and calyces, side view, with sepals and petals removed; 6. Anther cap, from above; 7. Pollinia

Fig. 1 *Bulbophyllum malipoense*

Shan, on tree trunk in forest, alt. 1000 m, 27 Aug. 2008, Z. J. Liu 4145 (holotype, NOCC!).

Species nova *Bulbophyllum biseto* affinis, a quo folio bilobo ad apicem, labello glabro bene differt.

The new species is akin to *Bulbophyllum bisetum*, but differs sharply by having bilobed-tipped leaves and a glabrous lip.

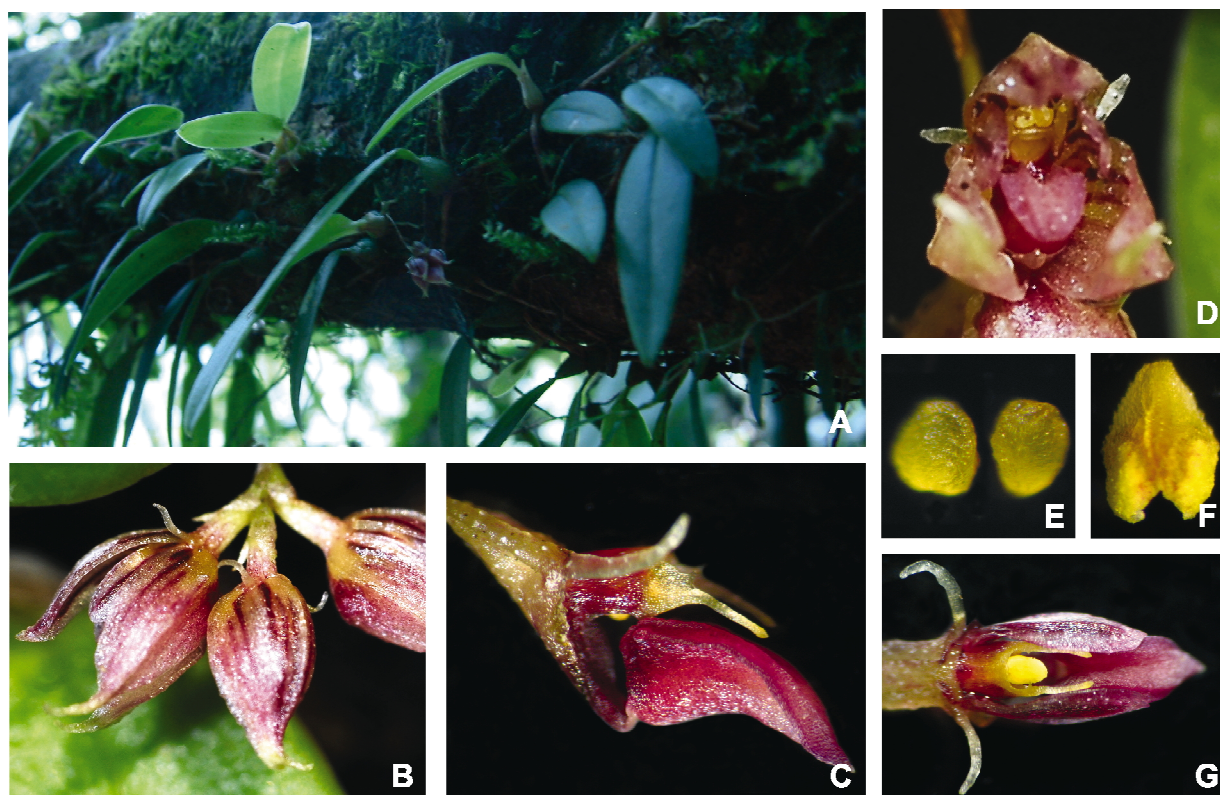
Rhizome creeping, often branched. Pseudobulbs 1–3.5 cm apart, ovoid, 5–8 mm long, 3–5 mm in diam., 1-leaved at apex. Leaves coriaceous, suboblong, 3–4.5 × 0.8–1.2 cm, apex obtuse-acuminate and bilobed, base shortly petioled. Scape 1.5–2.5 cm long; inflorescence shortened-racemose, with 2–4 flowers; bracts ovate, ca. 1.2 mm long; pedicel and ovary 2.5–3.2 mm long. Flowers not opening widely, calyculate; sepals yellow-whitish, veined and tinged with purple; petals white, with 2–3 purple-red veins; lip purple-

red; calyculs white; dorsal sepal ovate or ovate-lanceolate, 4.3–4.8 × 1.7–1.9 mm, concave, abaxially carinate, acuminate at apex; lateral sepals subovate, 4.5–5 × 2–2.3 mm, concave, acuminate-cuspidate at apex; petals subobovate-elliptic, 2.1–2.4 × 1.1–1.2 mm, obtuse at apex; lip fleshy, ligulate, 2.1–2.3 × 1.1–1.3 mm, basal half longitudinal-channeled, glabrous; calyculs 3; lateral ones free, bristle-like, ca. 1.8 mm long; central one adnate 2/3 of its length to the connate margins of the lateral sepals; column ca. 1.1 mm long, with two apical stelids ca. 1.1 mm long; column foot ca. 1.4 mm long, ca. 3/4 of its length joined by lateral sepals; anther cap irregularly denticulate apically (Fig. 2).

Flowering period: August and September.

Distribution: China, SE Yunnan, Malipo county, known only from type locality.

Habitat: On the trunk of a *Quercus* tree in a



A. Plants on tree trunk; B. Inflorescence; C. Lip, column and calycul, with sepals and petals removed; D. Flower, front view; E. Pollinia; F. Anther cap, from above; G. Flower, front view, with sepals removed, showing a pair of calyculs

Fig. 2 Photographs of *Bulbophyllum malipoense*



broad-leaved evergreen forest; alt. ca. 1000 m.

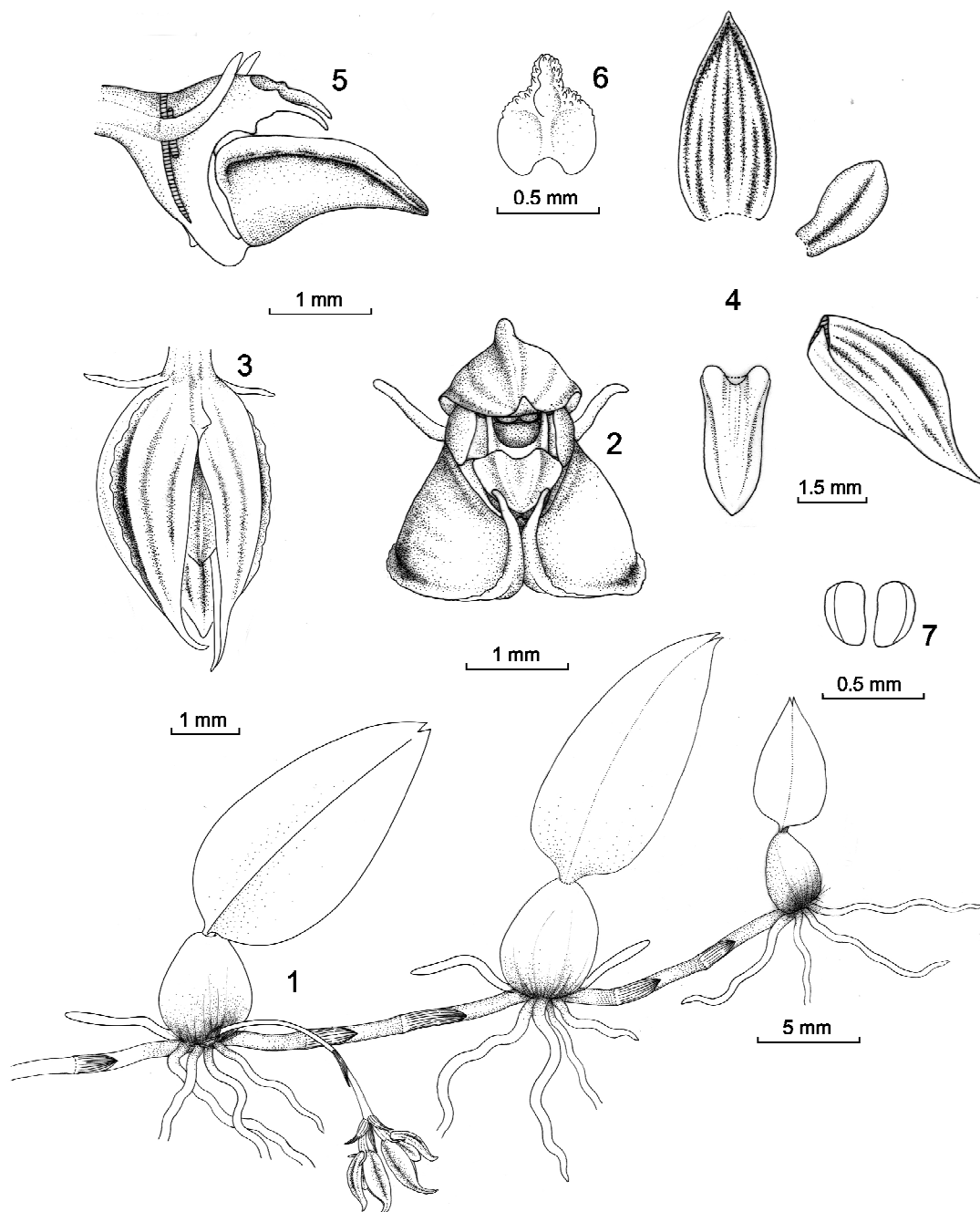
3.2 *Bulbophyllum minor* Z. J. Liu, L. J. Chen & W. H. Rao, sp. nov. Fig. 3

**Type:** China, Yunnan, Malipo county, Ma An Shan, on tree, alt. 1000 m, 27 Aug. 2008, Z. J. Liu 4147 (holotype, NOCC!).

Species nova *Bulbophyllo malipoeno* affinis, a

quo differt pseudobulbis ellipsoid-globosis, foliis ovato-ellipticis, 1.2 – 2 cm longis, calyculis lateralibus ca. 1 mm longis, eo centrali margines connatos sepalorum lateralium fere omnino adnato.

The new species is akin to *Bulbophyllum malipoense*, but differs by having ellipsoid-



1. Flowering plant; 2. Flower, front view; 3. Flower, back view; 4. Dorsal sepal, petal, lateral sepal and lip; 5. Lip, column and calyces, side view, with sepals and petals removed; 6. Anther cap, from above; 7. Pollinia

Fig. 3 *Bulbophyllum minor*

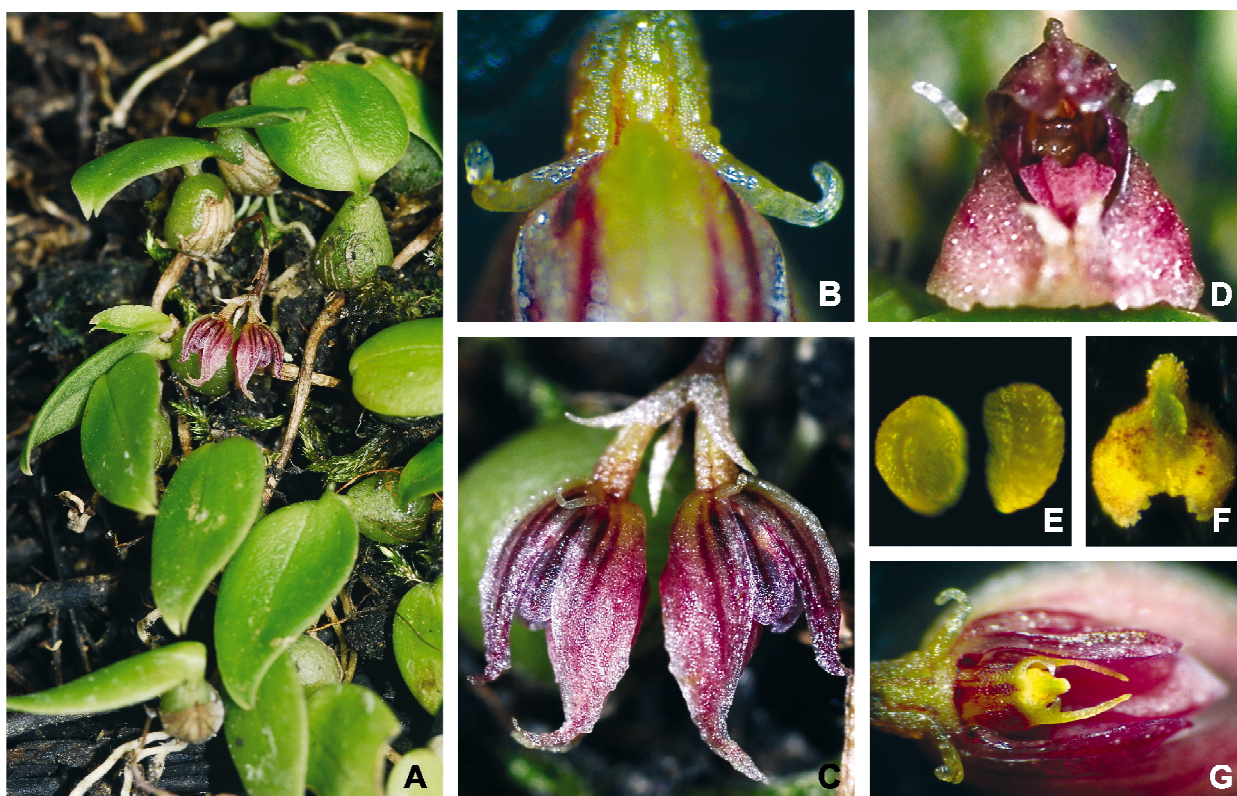
globose pseudobulbs, ovate-elliptic leaves 1.2 – 2 cm long, shorter lateral calyculs ca. 1 mm long, and central calycul almost adnate to the connate margins of the lateral sepals.

Rhizome creeping. Pseudobulbs 0.7 – 2 cm apart, ellipsoid-globose, 4 – 6 mm long, 3 – 5 mm in diam., 1-leaved apically. Leaves coriaceous, ovate-elliptic, 1.2 – 2 × 0.7 – 1 cm, apex short-acuminate and bilobed, base subsessile. Scape slender, pendulous, 1.3 – 1.8 cm long; inflorescence shortened-racemose, with 2 – 4 flowers; peduncle with 2 membranous sheaths; bracts ovate-lanceolate, 1 – 1.5 mm long; pedicel and ovary 2 – 3 mm long. Flowers small, not opening widely, calyculate; sepals yellow-whitish veined with purple; petals white, with a purple midrib; lip purple-red; calyculs white; dorsal sepal ovate, 4.5 – 5 × 1.8 – 2 mm,

acuminate at apex; lateral sepals ovate-lanceolate, 5 – 5.5 × 2 – 2.2 mm, acuminate-cuspidate at apex, base more or less connate to each other; petals somewhat spatulate, 2.2 – 2.5 × 1.1 – 1.2 mm, obtuse-acute at apex; lip ligulate, 2.1 – 2.3 × 1.1 – 1.2 mm, basal half longitudinal-channeled, 2-ridged adaxially; lateral calyculs free, bristle-like, ca. 1 mm long; central calycul almost entirely adnate to the connate margins of the lateral sepals except its tip; column ca. 1 mm long, with apical stelids ca. 1 mm long; columnfoot ca. 1.3 mm long, ca 2/3 of its length joined by the lateral sepals; anther cap contracted toward its apex and crested-papillose along apical sides (Fig. 4).

Flowering period: August and September.

Distribution: China, SE Yunnan, Malipo county,



A. Flowering plants on tree trunk; B. Basal part of flower, back view, with dorsal sepal removed, showing a pair of calyculs; C. Inflorescence; D. Flower, front view; E. Pollinia; F. Anther cap, from above; G. Flower, back view, with dorsal sepal removed, showing a pair of recurved calyculs

Fig. 4 Photographs of *Bulbophyllum minor*

known only from type locality.

**Habitat:** On tree trunk in a broad-leaved evergreen forest; alt. ca. 1000 m.

#### References:

- [1] Dressler R L. Phylogeny and Classification of the Orchid Family [M]. Cambridge: Cambridge University Press, 1993.
- [2] Tsi Z H, Chen S C, Luo Y B, Zhu G H. Flora Reipublicae Popularis Sinicae 19 [M]. Beijing: Science Press, 1999.
- [3] Liu Z J, Chen L J, Lei S P, Rao W H, Li L Q. Reproduction strategy of *Trias verrucosa* (Orchidaceae) from China[J]. *Acta Ecol Sini*, 2007, 27: 4460–4468.
- [4] Chen L J, Rao W H, Li L Q. *Bulbophyllum wendlandianum* (Krzl.) U. Dammer, a new record species of Orchidaceae from China[J]. *J Fairy Lake Bot Gard*, 2007, 6(2): 19–21.
- [5] Pearce N, Cribb P J, Renz J. Notes relating to the flora of Bhutan: XLIV. taxonomic notes, new taxa and additions to the Orchidaceae of Bhutan and Sikkim (India)[J]. *Edinb J Bot*, 2001, 58(1): 99–122.
- [6] Chen S C, Tsi Z H, Lang K Y, Zhu G H. Flora Reipublicae Popularis Sinicae 18 [M]. Beijing: Science Press, 1999.
- [7] Seidenfaden G. Orchid Genera in Thailand VIII *Bulbophyllum* Thou[J]. *Opera Bot*, 1979, 33(3): 1–240.
- [8] Seidenfaden G. The Orchids of Indochina[J]. *Opera Bot*, 1992, 114: 5–502.
- [9] Averyanov L. Identification Guide to Vietnamese Orchids [M]. St. Petersburg: World & Family Press, 1994.
- [10] Rolfe R A. *Bulbophyllum fallax* Rolfe, n. sp. [J]. *Gard Chron Ser 3*, 1889, 2: 558.
- [11] Liu Z J, Chen S C, Chen L J. *Ypsilorchis* and *Ypsilorchidinae*, a new genus and a new subtribe of Orchidaceae[J]. *J Syst Evol*, 2008, 46: 622–627.

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