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## 中国兰科植物研究杂记

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**摘要:** 西藏墨脱县位于东喜马拉雅和印缅交界地区, 是雅鲁藏布江大峡谷国家级自然保护区的核心区域, 是喜马拉雅生物多样性热点地区之一。通过对墨脱的科学考察, 报道了中国兰科植物 2 新纪录种, 西藏牛角兰(*Ceratostylis radiata*)和格当石豆兰(*Bulbophyllum psychoon*), 并提供描述和图片。西藏牛角兰花为纯白色, 花辐射对称, 唇瓣 3 裂, 茎长 2~2.5 cm 而明显区别于该属内其他种。格当石豆兰与齿瓣石豆兰(*Bulbophyllum levinei*)相似, 但不同之处在于花瓣卵形, 先端锐尖。凭证标本分别保存于西藏自治区高原生物研究所(XZ)和中国科学院植物研究所(PE)标本馆。2 个新纪录种原分布均在印度、缅甸和越南等地区, 在西藏的发现, 说明了墨脱的植物区系和原分布地有一定的关系, 同时也印证了墨脱属于亚热带地区, 且 2 个种的分布海拔也超出了原分布地范围, 开花的时间也相对推迟。新纪录种的发现对摸清本区植物种类和丰富中国西藏植物区系提供了更加详实的资料。

**关键词:** 新纪录, 兰科, 西藏牛角兰, 格当石豆兰, 西藏, 中国

## Additional notes on Orchidaceae from China

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**Abstract:** Medog County, Tibet is located at the junction of the Eastern Himalaya and Indo-Burma region, one of biodiversity hotspot in Himalaya areas, which is the core area of

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Yarlungzangbo Grand Canyon National Nature Reserve. The county has a mild subtropical climate. As the lowest area in Tibet Plateau, it is an ideal place in Tibet with the mildest climate, the most abundant rainfalls and the best preserved ecological environment. It is known as Tibet's Xishuangbanna, it is abundant with immense forests, alpine lakes and raging waterfalls. During our botanical survey in Medog county of southeastern Tibet. Two new records to flora of China, *Ceratostylis radiata* J.J.Sm. and *Bulbophyllum psychoon* Rchb.f. (Orchidaceae), are described and illustrated. *Ceratostylis radiata* has white flower, star-shaped without colored spot, with short stem 2–2.5 cm, lip 3-lobed. *Bulbophyllum psychoon* is similar to *B. levinei*, but this species was easily identified by its petals ovate, apex obtuse, flowering from November to December. Both of the voucher specimens were deposited in Herbarium of XZ and PE. Both of orchids are originally distributed in India, Myanmar and Vietnam. The discovery of the two new record species in Medog, enriches the plant species in the Southeast of Tibet in China, shows that there is a certain relationship between the flora of Medog and the original distribution areas, and it also confirms that Medog is a subtropical region and the species of distribution elevation above the original distribution range, flowering period also delayed. Over-collection and habitat destruction are the most threat to orchid species in this area. To deal with threats, we recommend the local government should prohibit illegal collection, strengthen the nature reserve scientific management, strictly restrict the number of tourists access to the core area and buffer zone of the Yarlungzangbo Grand Canyon National Nature Reserve to protect its fragile ecology. Discovery of this new record orchid species further highlights the value for biodiversity conservation of Southeastern of Tibet and calls for more comprehensive exploration on botanical surveys, studies, and conservation in this region.

**Key words:** new record, Orchidaceae, *Ceratostylis radiata*, *Bulbophyllum psychoon*, Tibet, China

Southeastern China is a global biodiversity hotspot located at the junction of the Eastern Himalaya and Indo-Burma region (Myers et al, 2000; Mittermeier et al, 2005). Medog is located in the southeast of the Tibet Autonomous Region and at the lower branch of Yarlungzangbo River. There is a subtropical warm humid climate caused by Indian ocean and South Asian monsoon, which brings moisture along the Yarlungzangbo river. The area consists of a diverse series of ecosystems from alluvial grasslands, subtropical broadleaf forests and rain forests to alpine meadows above the tree line at an altitudinal range of 150–6 000 m above sea level. In recent years, many new species have been discovered in Medog (e.g. for Orchidaceae; Lai & Jin, 2012; Huang et al, 2013; Wang et al, 2017) which indicates that the biodiversity survey in this region has space to carry out. During our botanical survey in Medog county of southeastern Tibet Autonomous Region, China, in November 2017, two new records of orchid species in China, *Ceratostylis radiata* J.J. Sm. and *Bulbophyllum psychoon* Rchb.f., were found and reported as below.

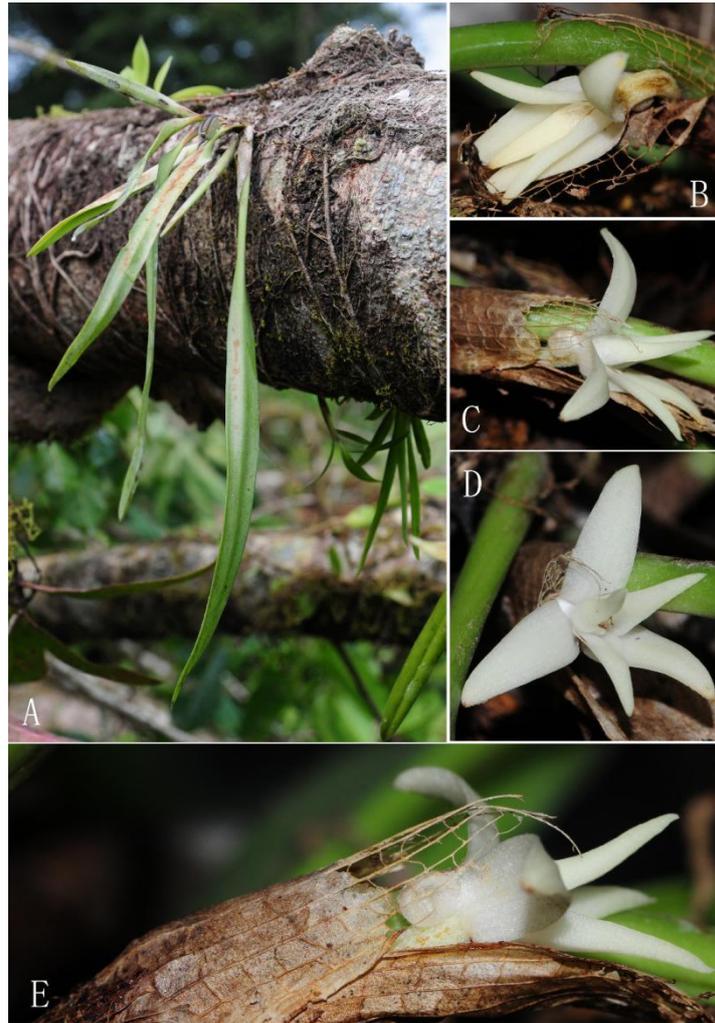
1. *Ceratostylis radiata* J.J. Sm., Fl. Buitenz. 6: 295. Fig. 225, 1905; Schechter, Beilb. Bot. Jahrb. 104. 45(3): 21. 1911; J.J. Sm., Fed. Repert. 32: 213. 1933; Baker & Bakhuizen, Fl. Java 310. 1968; Seidenf., Bot. Tidsskr. 65(1-2): 132. 1969; Op. Bot. 89: 115. 1986; *Ceratostylis linearifolia* Ridl., Fl. Malay Pen. 4: 110. 1924; Holttum, Orchids of Malaya, Fl. Malaya 495. 1957.

西藏牛角兰（新拟）（Fig. 1）

*Ceratostylis* Blume (1825) consists of 100 species distributed from tropical Asia (India, Indonesia) to New Guinea and the Pacific Islands (Pearce & Cribb, 2002). There are four species

*C. hainanensis*, *C. himalaica*, *C. siamensis* and *C. subulata* in China (Chen et al, 2009; Li et al., 2015).

Epiphytic herbs. **Stems** short, clustered, ca. 2–2.5 cm long, 5 mm thick, covered by 2 membranous sheaths, sheath tubular, 4–5 × 1–1.5 cm, apex acuminate. roots growing from base of stem. ca. 1 mm thick, 10 cm long. **Leaves** linear-lanceolate, elongated, 15–25 × 1.4–2.2 cm, apex acute, slightly asymmetry, mid-vein slightly concave above, slightly convex below, basally ca. 5 cm both sides sinuate upward to form a tube, petiole ca. 1 cm long, connected with stem by joints and resembles the extension of the stem. **Inflorescence** racemes growing from axillary of leaves, terminal with clustered scape, but at the same time only growing 1–2 racemes, each with 1 flower, scape with 3–4 sheaths at base, sheath triangular-ovate, 1.5–1.7 × 1 cm, apex acuminate. Peduncle 1–1.2 cm long, with 1 tubular sheath at base, ca. 4 × 4.5 mm, apex acuminate. **Flowers** white, star-shaped. Pedicel and ovary 9–10 mm long, densely hirsute. **floral bracts** triangular, 2–2.5 × 3–3.5 mm, apex acuminate. Sepals similar, lanceolate, hairy abaxially, base slightly densely, 12–13 × 4 mm, apex acute, 5-veined, lateral sepals slightly shorter, mentum ca. 3 mm deep, 4 mm in diam., apex bilobed; **Petals** 12–13 × 3 mm, linear lanceolate, narrowly acuminate towards apex, shorter than lateral sepals, 3-veined; **Lip** ca. 15 mm long, 3-lobed, side-lobes triangular ca. 3 × 1.2 mm, obtuse with finely hair margins; mid-lobe lanceolate with curved downwards, apex acute, disc with two ridges on the middle of side-lobes, base of the lip narrows into claws, claw ca. 5 mm long, bent and concealed in the mentum; **Column** ca. 1.2 mm long, **column foot** ca. 3 mm long, **stolidia** oblong, ca. 2 mm long, apex rounded; **anther cap** oblong; **pollinia** 8. **Capsule** ellipsoid, ca. 1.2 × 0.8 cm.



**Note:** A. Habitat (with capsule); B–E. Flower (with different view).

**Fig. 1.** *Ceratostylis radiata* J.J. Sm. (photographed by Li Jianwu)

**China. Tibet:** Medog County, Linzhi City. It is epiphytic on semi-green forest beside the Yarlungzangbo river, alt. 1077 m, November 2017. Flowering from November to December. Jin Xiaohua, Li Jianwu, Wang Xilong, Wang Chengwang 19116 (XZ!, PE!).

**Distribution:** China (Tibet), Vietnam, Myanmar, India, Thailand, Malaysia, Java, Sumatra.

**Key characteristics to *Ceratostylis***

- 1a. Leaves subterete, stem more than 20 cm, flowers yellow..... *C. subulata*
- 1b. Leaves linear to narrowly oblong; stem less than 10 cm, completely enclosed by sheaths.
  - 2a. Stem branching ..... *C. himalaica*
  - 2b. Stem unbranched
    - 3a. Leaves longer, 15–25 cm long, flowers white..... *C. radiata*
    - 3b. Leaves shorter, 2.5–6.0 cm long, flowers white with purple-red or purplish stripes.
      - 4a. Stem ca. 1 cm, flower white with purplish stripes near base.....*C. hainanensis*
      - 4b. Stem ca. 0.2 cm, flower white with purple-red spotted.....*C. siamensis*

*Ceratostylis radiata* was published on Die Orchideen from Java in 1905. The type specimen from Herbarium catalogue of Kew was collected from Langkawi of Malaysia. After that,

it was also be found in Vietnam, Myanmar, India and Thailand (Seidenfaden, 1986; Kuezwil & Lwin, 2012; Odyuo et al, 2013; Averyanov et al, 2016). This species was easy identified by its short stem 2–2.5 cm, pure white flower, lip 3-lobed, star-shaped without colored spot in the field.

**2 *Bulbophyllum psychoon* Rchb.f.**, Gard. Chron., n.s. 10: 170–171. 1878.

格当石豆兰（新拟）（Fig. 2）

*Bulbophyllum* Thouars (1822) is the largest genus in Orchidaceae (Chase et al, 2015). There are about 150 species in China (Zhou et al, 2016). We identified this species is *Bulbophyllum psychoon* which belongs to section *Desmosanthes*. There are three species, *B. levinei*, *B. eublepharum* and *B. insuloides*, distributing in China in this section (Chen et al, 1999).

Epiphytic herbs. **Rhizomes** creeping. **Roots** from rhizome nodes on base of pseudobulbs. **Pseudobulbs** subcylindric or bottle-shaped, 5–10 × 2–4 mm, with a terminal leaf. **Leaf** blade narrowly oblong or obovate-lanceolate, 3–4 × 0.5–0.7 cm, thinly leathery, base contracted into petiole, **Petiole** 3–4 mm. margin slightly undulate, apex subacute. **Scape** arising from base of pseudobulb, erect, 6–8 cm, longer than leaves, glabrous. **Inflorescence** erect, shortened, umbel-like, often 2–6-flowered; **peduncle** ca. 4 mm, sparsely with 2 or 3 tubular sheaths; floral bracts erect, narrowly lanceolate, 2–3.5 mm, apex acuminate. Pedicel and ovary longer than floral bracts. **Flowers** white tinged with purple. **Dorsal sepal** ovate-lanceolate, concave, 3–4 × 1.5–2 mm, abruptly contracted and thickened above middle, margin denticulate, apex acute; **lateral sepals** obliquely ovate-lanceolate, 3–5 × 1.5–2 mm, thickened above middle, base adnate to column foot forming a mentum, margins entire, apex cuspidate. **Petals** connivent to sepals, ovate, ca. 2–2.5 × 1.5–2 mm, margins denticulate, apex obtuse. **Lip** recurved, lanceolate in outline, 2–2.5 mm, nearly fleshy, basal half grooved, base attached to end of column foot, immobile, margin entire, apex subacute; **column** ca. 1.2 mm, **column foot** curved, ca. 1.5 mm, with free part ca. 0.5 mm, **stidia** filiform, ca. 0.5 mm; **anther cap** subglobose, apex narrowed and beaked, with a densely finely papillate ridge centrally.



**Note:** A. Habitat; B–C. Inflorescence.

**Fig. 2.** *Bulbophyllum psychoon* Rchb. f. (Phtographed by Li Jianwu)

**China. Tibet:** Medog County, Linzhi City. It is epiphytic on broadleaf-coniferous forest beside the road, alt. 1769 m, November 2017. Flowering from November to December. Jin Xiaohua, Li Jianwu, Wang Xilong, Wang Chengwang 19192 (XZ!, PE!).

**Distribution:** China (Tibet), Vietnam, Laos, India.

**Key characteristics to *B. psychoon*, *B. levinei*, *B. eublepharum* and *B. insulsoides* in section *Desmosanthes***

1a. Inflorescence umbellate

2a Petals ovate-lanceolate, apex long acuminate.....*B. levinei*

2b Petals ovate, apex obtuse .....*B. psychoon*

1b. Inflorescence racemose

3a. Lip 3.5–4 mm..... *B. eublepharum*

3b. Lip 2–2.8 mm.....*B. insulsoides*

*Bulbophyllum psychoon* Rchb.f. was first described and published on The Gardeners' Chronicle by Reichenbach & Heinrich Gustav in 1878. After that, it was also be found in Vietnam and Laos (Averyanov, 2007, 2013). *Bulbophyllum psychoon* is similar to *B. levinei*, but this

species was easily identified by its white tinged with purple flower, with shortened, umbel-like inflorescence with 2–6-flowered. Petals ovate, apex obtuse. Flowering from November to December.

*Ceratostylis radiata* and *Bulbophyllum psychoon* were collected in Medog county, Tibet, it is confirmed the flora characteristics of Medog belonging to the tropical monsoon forests. According to researchers, over-collection and habitat destruction are the most threat to orchid species. To deal with this threat, we recommend the local government should prohibit illegal collection and strengthen the scientific management, strictly limit human access to the core area and buffer zone by the Yarlungzangbo Grand Canyon National Nature Reserve. Protected areas are the cornerstone of in-situ conservation, protection of this rare and endangered orchids could be enhanced through the implementation of a management plan which included *In-situ* or *Ex-situ* conservation and artificial cultivation. Discovery of this new record species of Orchidaceae further highlights the high value for biodiversity conservation of Southeastern of Tibet and calls for more comprehensive investigation on ecological surveys, studies, and environmental protection in this area. This report is only a small part of our current work. With the deepening of field investigations and the completion of indoor specimen identification, it is believed that there will be more new discoveries.

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