Two New Records of Orchidaceae from China: A Postprint

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Date: 2021-04-02T00:00:00+00:00

Abstract

Investigation of orchid resources is fundamental for establishing regional baseline data of Orchidaceae and is of great significance for studying the geographical distribution and resource diversity of orchids. This paper reports new Chinese distribution records of Bulbophyllum Thou.: Bulbophyllum raskotii J. J. Verm., Schuit. & de Vogel from Motuo County, and Panisea (Lindl.) Steud.: Panisea panchaseensis Subedi from Bayi District, Tibet Autonomous Region, China. The two newly recorded species grow on tree trunks or rock walls in evergreen broad-leaved forests at an altitude of approximately 2,000 m. This paper provides morphological descriptions, color photographs, and other information for the two new records, along with a species key for the genus Panisea in China. This study expands the records of Chinese Orchidaceae and provides new data for research on orchid diversity and conservation in China.

Full Text

Two Newly Recorded Species of Orchidaceae from China

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Abstract

Orchidaceae resource surveys are fundamental for establishing regional species inventories and provide crucial data for studying the geographical distribution and diversity of orchids. This paper reports two new national records for China: *Bulbophyllum raskotii* J. J. Verm., Schuit. & de Vogel (section *Ione*) from the genus *Bulbophyllum* Thou., and *Panisea panchaseensis* Subedi from the genus

Panisea (Lindl.) Steud. Both species grow epiphytically on tree trunks or rock walls in evergreen broad-leaved forests at approximately 2,000 m elevation. We provide detailed morphological descriptions, color photographs, and an updated identification key to *Panisea* species in China. These discoveries expand the known distribution of Chinese orchids and contribute new data for biodiversity research and conservation efforts.

Keywords: Orchidaceae, *Bulbophyllum*, *Panisea*, new record, Tibet, China

Funding: This work was supported by the System of Modern Forestry Technology in Tibet (2018xz503118002) and the National Natural Science Foundation of China (31870183).

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Introduction

The orchid family (Orchidaceae) comprises approximately 736 genera and 28,000 species worldwide, with about 181 genera and over 1,600 species recorded in China (Chase et al., 2015; Zhou et al., 2016). The eastern Himalayas in southwestern China represent one of the country' s primary centers of orchid diversity, with the Tibet Autonomous Region hosting 336 orchid species, including 70 endemics (Wang et al., 2018). Recent field surveys and specialized studies have continuously uncovered new orchid records from Tibet, such as four new genera and 31 new species reported by Wang et al. (2018) and Gong et al. (2019), and newly described species including *Bulbophyllum reflexipetalum* (Ya et al., 2019), *B. yarluzangboense* (Li et al., 2019), and *B. gedangense* (Luo et al., 2020). These discoveries enhance our understanding of orchid biodiversity, inform conservation strategies, and underscore the need for continued research on Tibet's orchid flora.

Between June and October 2019, we conducted a botanical survey in the Yarlung Tsangpo Grand Canyon National Nature Reserve to document plant diversity in the region. During this expedition, we collected two flowering orchid specimens in Nyingchi, Tibet, initially identified as belonging to *Bulbophyllum* Thou. and *Panisea* (Lindl.) Steud. The *Bulbophyllum* specimen resembled *B. interpositum* and *B. candidum* in vegetative habit but showed distinct floral characteristics. After examining relevant literature and herbarium specimens, we confirmed its identity as *Bulbophyllum raskotii* J. J. Verm., Schuit. & de Vogel, previously known only from Nepal. The *Panisea* specimen showed floral similarity to *P. yunnanensis* but was determined to be *Panisea panchaseensis* Subedi, a species previously recorded from Nepal and India. Here we present detailed morphological descriptions based on original literature and our specimens.

1. *Bulbophyllum raskotii* J. J. Verm., Schuit. & de Vogel (New Record for China)

Plate I: A–C; Plate II: A

Bulbophyllum raskotii J. J. Verm., Schuit. & de Vogel, Phytotaxa 166(2): 101–113. 2014.
Sunipia nepalensis Raskoti & Ale in Phytotaxa 31: 55–58. 2011.
Type: Nepal: Daman, Simbhanjyang, Makawanpur District, 2,400 m, May 2008, Raskoti B. B. 270 (holotype, KATH; isotype, TUCH).

Morphological Description: Epiphytic herb. Rhizome stout, dark brown, ca. 4 mm thick, covered by overlapping tubular papery sheaths. Pseudobulbs obliquely ovoid, spaced 1–4 cm apart, 1.0–1.8 cm long, 2–3 cm in diameter. Each pseudobulb bears a single terminal leaf; leaf coriaceous, needle-like lanceolate, apex subacute, 3.0–8.5 cm × 0.7–1.5 cm. Inflorescence arising from the base of pseudobulb, laxly 1–4-flowered; peduncle 3.5–5.0 cm long, with three brown tubular sheaths. Floral bracts lanceolate, apex acute, purplish-brown, ca. 7 mm × 2 mm; pedicel terete, 10 mm long. Sepals and petals pale greenish-white; dorsal sepal ovate-lanceolate, ca. 7 mm × 2 mm, apex acute; lateral sepals ovate-lanceolate, ca. 9 mm × 4 mm, both dorsal and lateral sepals with 3–5 purple veins; petals broadly ovate, univeined, ca. 3 mm × 3 mm; labellum circular with a caudate tail, sometimes verrucose, apex subacute, 5–8 mm long, 3 mm wide above the base, base semi-concave, abruptly narrowed from middle to apex into a terete structure, 5-veined; a thickened keel running longitudinally from base to apex on the lip; column conical, white, ca. 3 mm long, with column foot 1.5 mm long; pollinia 4, oblong, 1 mm long, with two pairs of caudicles attaching independently to either side of the rostellum. Flowering period: May–June.

Bulbophyllum raskotii resembles *B. interpositum* and *B. candidum* in section *Ione* (Lindl.) J. J. Verm., Schuit. & de Vogel. All three species have ovoid pseudobulbs spaced about 2–3 cm apart on the rhizome, coriaceous and narrowly oblong leaves, and circular labella with caudate apices. However, *B. raskotii* differs from *B. candidum* by having an entire labellum margin (vs. toothed or fimbriate), and from *B. interpositum* by its ovate petals (vs. linear).

Habitat: Epiphytic on moss-covered rocks or tree trunks in evergreen broad-leaved forests.

Specimen Examined: China: Tibet Autonomous Region, Nyingchi, Medog County, Renqin Peng, 2,190 m, epiphytic on trees in evergreen broad-leaved forest, Deng Jianping et al. 2218 (HITBC!, TAAHUC!).

Distribution: China (new record); Nepal.

Conservation Status: Currently known only from two populations near Ren-

qin Peng, Medog County, Tibet, with 50–100 flowering individuals. According to IUCN Red List criteria (IUCN, 2012), *B. raskotii* should be assessed as Endangered (EN) in China.

Taxonomic Notes: This species was originally described as *Sunipia nepalensis* (Raskoti & Ale, 2011). Recent phylogenetic studies have subsumed *Sunipia* and approximately 50 other small genera into *Bulbophyllum*, reorganized into several sections (Gravendeel et al., 2014; Vermeulen et al., 2014). The former *Sunipia* and its allied genus *Ione* are now placed in section *Ione*. Since the epithet "nepalense" was already used for a different *Bulbophyllum* species described in 2013 (*B. nepalense* Raskoti & Ale), Vermeulen et al. (2014) renamed the species in honor of its original author, Raskoti, as *B. raskotii*. Section *Ione* currently comprises 25 species globally (Vermeulen et al., 2014), with 14 previously recorded from China (Zhou et al., 2016). The discovery of *B. raskotii* in Tibet extends its known distribution and adds a fifteenth species to China' s section *Ione* flora.

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2. *Panisea panchaseensis* Subedi (New Record for China)

Plate I: D–F; Plate II: B

Panisea panchaseensis Subedi in Nord. J. Bot. 29(3): 361–365. 2011.
Type: Nepal: Kaski district, Panchase forest, 2,200–2,450 m, 12 Nov 2007, Subedi A. 1780 (holotype, KATH; isotype, TUCH).

Morphological Description: Perennial epiphytic herb. Rhizome ca. 0.25 cm thick, young shoots covered by 6–10 sheaths. Pseudobulbs relatively dense, spaced 0.5–0.8 cm apart, narrowly ovoid to ovoid, 1.4–1.8 cm long, 0.8–1.1 cm in diameter, longitudinally wrinkled when mature. Each pseudobulb bears two terminal leaves; leaves subcoriaceous, elliptic or oblong-lanceolate, apex acute, 1.5–4.0 cm × 6–8 mm, petiole 1–3 mm long. Scape ca. 2 cm long, base covered by multiple dry membranous sheaths; inflorescence 1–5-flowered, flowers white. Floral bracts ovate, 5.5–6 mm × 2–2.5 mm; dorsal sepal ovate, 1.2–1.3 cm × 4–5 mm, apex obtuse, 5-veined; lateral sepals ovate to narrowly lanceolate, 1.20–1.25 cm × 4–4.5 mm, clawed, apex acuminate; petals narrowly elliptic or obovate, distinctly clawed, 1.1–1.2 cm × 3–3.5 mm, apex acuminate, 3-veined; labellum ca. 1.1 cm × 3 mm, white, arrow-shaped, apex acuminate, margin slightly undulate, with three conspicuous longitudinal lamellae; column white, 3.5–5 mm × 1.5 mm, wingless; pollinia two pairs, fused into a mass. Flowering and fruiting period: November–December.

Panisea panchaseensis shares similarities with Chinese species *P. moi* and *P. yunnanensis*, including white flowers and two leaves per pseudobulb. However, it differs from *P. moi* by lacking lateral lobes on the labellum (vs. one small lateral lobe on each side in *P. moi*), and from *P. yunnanensis* by its arrow-shaped labellum with three longitudinal lamellae (vs. rounded-spatulate and

without appendages).

Habitat: Epiphytic on moss-covered rocks and tree trunks in evergreen broad-leaved forests.

Specimens Examined: China: Tibet Autonomous Region, Nyingchi, Bayi District, Pailong Township, 2,000 m, epiphytic on mossy rocks under evergreen broad-leaved forest, LI Mengkai et al. 066 (HITBC!, TAAHUC!). India: Nagaland, Tuensang District, Waoshu Village, 2,200 m, N. Odyuo & R. Daimary 132844 (ASSAM).

Distribution: China (new record); Nepal; India.

Conservation Status: Currently known from over 50 populations in the Pailong–Tongmai area of Bayi District, Tibet, where it is a locally dominant orchid species. According to IUCN Red List criteria (IUCN, 2012), *P. panchaseensis* should be assessed as Vulnerable (VU) in China.

Taxonomic Notes: *Panisea* is a small genus within subtribe Coelogyninae, comprising only 11 species distributed from the Himalayas to Myanmar, Thailand, Vietnam, Laos, and Cambodia (Chase et al., 2015). China previously recorded seven *Panisea* species (Zhou et al., 2016); the discovery of *P. panchaseensis* in Tibet increases the national total to eight species, enriching our understanding of *Panisea* diversity in China.

Key to *Panisea* Species in China

1. Labellum arrow-shaped with lamellae·····*P. panchaseensis*

2. Pseudobulbs connected to each other, lower part prostrate, upper part curved upward·····*P. cavaleriei*

3. Pseudobulbs spaced along rhizome, nearly erect, not curved·····*P. tricallosa*

4. Two terminal leaves; labellum with lateral lobes·····*P. uniflora*

Plate Captions

Plate I. *Bulbophyllum raskotii* and *Panisea panchaseensis*. A–C. *Bulbophyllum raskotii*: A. Habit; B. Flower close-up; C. Dissected flower. D–F. *Panisea panchaseensis*: D. Habit; E. Habit with inflorescence; F. Dissected flower. ds. Dorsal sepal; p. Petal; ls. Lateral sepal; l. Labellum; c. Column; o. Ovary.

Plate II. Herbarium specimens of *Bulbophyllum raskotii* and *Panisea panchaseensis*. A. *Bulbophyllum raskotii*, Medog County, Tibet, China, Deng Jianping & Chen Zhe 2218 (HITBC). B. *Panisea panchaseensis*, Bayi District, Tibet, China, LI Mengkai 066 (HITBC).

Discussion

Both species were previously known only from the eastern Himalayas of Nepal and India. Their discovery in Tibet significantly enriches China' s orchid flora and demonstrates a Sino-Himalayan distribution pattern, providing valuable insights into orchid floristics and speciation. *Bulbophyllum raskotii*, previously recorded only from Nepal, now extends its range to Medog County, Tibet, establishing a foundation for floristic and phytogeographical studies of this taxon. *Panisea panchaseensis*, known from Nepal and India (Assam), shows a continuous distribution pattern with its discovery in Pailong, Tibet, offering a case study for understanding biogeographic patterns of Sino-Himalayan orchids. These findings suggest that additional orchid species currently known only from Nepal or India may occur in similar habitats across southern and southeastern Tibet, guiding future botanical surveys in the region.

Acknowledgments

We thank Mr. DENG Jianping from Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences for assistance with specimen identification and providing relevant literature, and Associate Professor WANG Wei from Tibet Agriculture & Animal Husbandry University for fieldwork support.

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Note: Figure translations are in progress. See original paper for figures.