



## Two new species of *Gastrochilus* D. Don (Aeridinae, Vandeae, Epidendroideae, Orchidaceae) in China

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**ABSTRACT:** Two new species of genus *Gastrochilus*, namely *G. baoshanensis* and *G. motuoensis*, were collected respectively in Yunnan Province and Xizang Autonomous Region. Both of them belong to Section *Caespitosi*. *G. baoshanensis* is similar to *G. setosus* and *G. xizangensis*, but differs in leaves without awns, shorter ovary and pedicel, bilobed epichile, and the wings split at the apex. *G. motuoensis* is extremely similar to *G. platycalcaratus*, but the former has a 4 mm pedicel and ovary, ovate lateral sepals, and the hypochile is not compressed from the middle to the tip.

**KEY WORDS:** Classification, *Gastrochilus platycalcaratus*, *Gastrochilus setosus*, *Gastrochilus xizangensis*, Section *Caespitosi*.

### INTRODUCTION

*Gastrochilus* D. Don (1825: 32) (Don, 1825) was established in 1825. Over 70 species are distributed from Andaman, Sri Lanka, India and the Himalayas eastwards to southern China, Indochina and southern Japan and southwards to the Philippines and Indonesia (Chen *et al.*, 2009; Kumar *et al.*, 2014; Liu and Gao, 2018; Nguyen *et al.*, 2021). More than 40 species have been recorded in China (Li *et al.*, 2021; Govaerts *et al.*, 2022). In recent years, some new species and new record species have also been constantly reported (Rao *et al.*, 2019; Li *et al.*, 2021, 2023; Chen *et al.*, 2022; Zhang *et al.*, 2022; Liu *et al.*, 2023). *Gastrochilus* is characterized by having subumbellate or racemose inflorescences, with ovate sepals and petals of nearly equal length, the spur at the base of the lip that is enlarged and cystic, and pollinia 2, globose, porate, borne on a long narrow stipe and a viscidium (Christenson, 1985; Seidenfaden, 1988; Tsi, 1996; Pridgeon *et al.*, 2014).

During our field investigation of Orchidaceae in Yunnan Province and Xizang Autonomous Region, we discovered two flowering plants of *Gastrochilus*. By observing the characteristics of their flowers: the epichile densely covered with papillate hairs, it was determined that they both belong to the Section *Caespitosi* (Zhang *et al.*, 2022). Through comparison with their similar species, literature review (Averyanov, 1997; Tsi, 1999; Chen *et al.*, 2009; Kumar *et al.*, 2014; Averyanov *et al.*, 2018; Liu *et al.*, 2016; 2019; Rao *et al.*, 2019; Li *et al.*, 2021; Nguyen *et al.*, 2021; Zhang *et al.*, 2022), and specimen examination (K, PE, KUN, HITBC, XZ, VNM), it was

found that these two orchids are new species that have not been reported before. Thus, we describe them here.

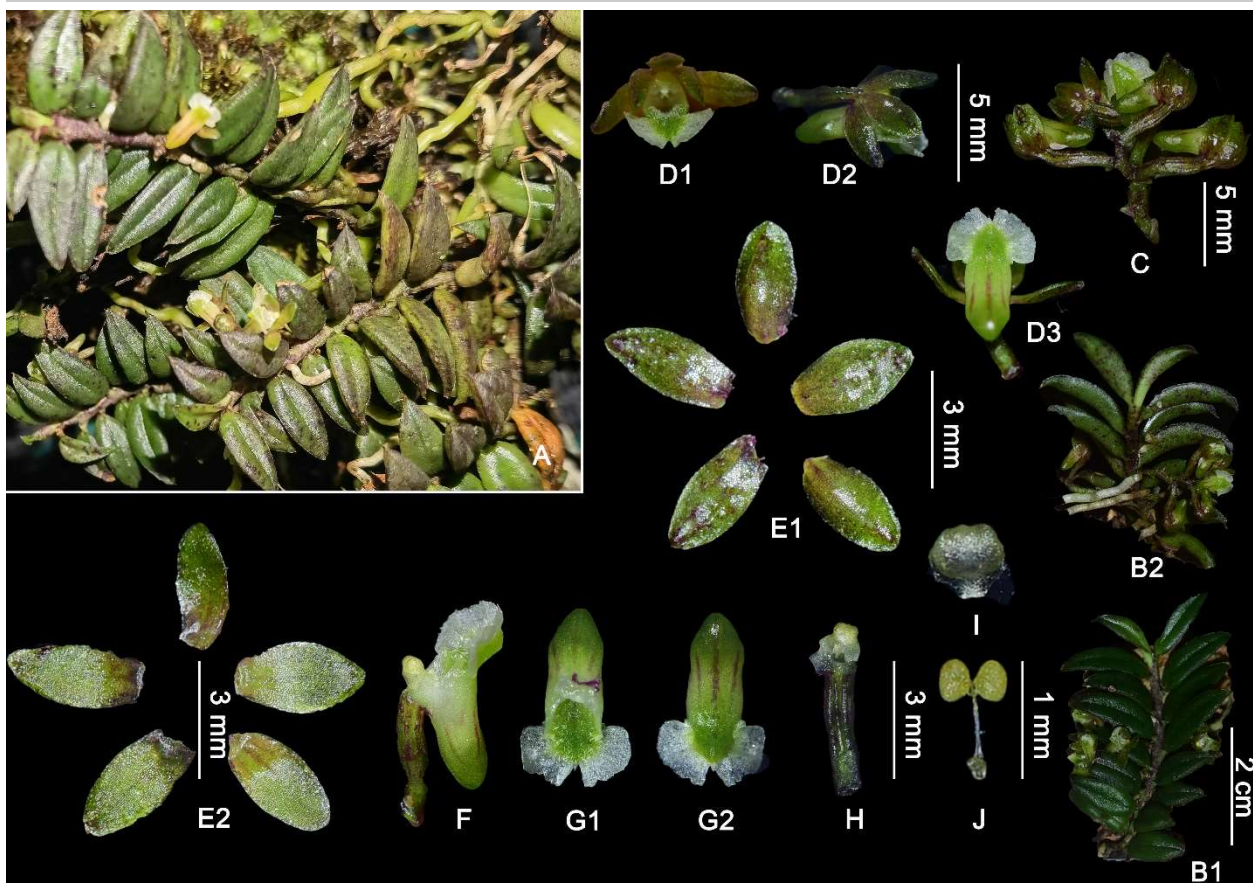
### TAXONOMIC TREATMENT

*Gastrochilus baoshanensis* M.K.Li, Hao X.Zheng & Y.C.Wei, *sp. nov.* **Fig. 1**

**Type:** CHINA. Yunnan, Baoshan County, Wama town, 1900 m, epiphytes on tree trunks in broadleaved mixed forest, 10 April 2024, M. K. Li, Y. C. Wei 2025032 (holotype: FAFU-Herbarium of Fujian Agriculture and Forestry University 007321!).

**Diagnosis:** *Gastrochilus baoshanensis* belongs to sect. *Caespitosi* and is most similar to *G. setosus* and *G. xizangensis*. They all have long stems, distichous leaves, very small flowers, and white hairs on the lips, but *G. baoshanensis* differs by having leaves without awns (vs. with awns), widely opening flowers (not widely opening), shorter ovary and pedicel 3.5–4 mm long (vs. 6–8 mm), a bilobed epichile, which is unique (vs. intact epichile) among the genus *Gastrochilus*, hair that occur only on the cushion (vs. hairs covering the entire lip), and wings that split at the apex (wings not split).

Epiphytic herbs. Stem pendulous, 2–3.5 cm long. Leaves distichous, closely arranged, narrowly elliptic to oblong, 1.3–1.5 × 0.5 cm, without awn, abaxially entire. Inflorescence lateral, ca. 1 cm long, subumbellate, 2–5 flowered; peduncle ca. 3 mm long, with 2 sterile bracts, 0.5 mm long; floral bracts triangular, 1 × 1 mm, apex acute; ovary and pedicel 3.5–4 mm long, with purple-red patches; Flowers opening, yellow-green with sparse purple-red speckles. Dorsal sepal narrowly elliptic, 3–3.2



**Fig. 1.** *Gastrochilus baoshanensis* M.K.Li, H.X.Zheng & Y.C.Wei **A.** plant and habitat; **B1-B2.** plant and inflorescence; **C.** inflorescence; **D1-D3.** flower; **E1-E2.** split flower; **F.** column, ovary and lip; **G1-G2.** close-up of lip; **H.** column and ovary; **I.** anther cap; **J.** pollinia. (Photos: A by Yu-Ci WEI in Baoshan, B-J by Meng-Kai LI).

× 1 mm, apex obtuse or rounded, 3-veined; lateral sepals oblong-elliptic, 3–3.2 × 1 mm, apex rounded, 3-veined; petals ovate, 3.5 × 1 mm, apex obtuse, 1-veined. Lip 5–6 × 2–2.2 mm, with a spreading epichile and a saccate hypochile; epichile bilobed, white, 3.2–3.5 × 2–2.2 mm, with a basal green cushion, cushion covered with white hairs, margin entire, the apex of the wing split; hypochile conical, with purple vertical stripes, ca. 2 mm long, apex slightly acute. Column stout, ca. 1.2 mm long; anther cap round, with 2 chambers, with a beak on the front that partly covers the stipe; pollinia 2, yellow, spherical, stipe elongate, ca. 0.5 mm.

**Distribution and habitat:** *Gastrochilus baoshanensis* is collected from Wama town of Longyang County, Baoshan City, Yunnan, China. It was found as an epiphyte on branches of small shrubs of evergreen broadleaved forest at an elevation range of 1900–2000 m.

**Phenology:** Flowering from March to May.

**Etymology:** The specific epithet “*baoshanensis*” refers to the type locality where the new species occurs, Baoshan City, Yunnan, China.

**Vernacular:** 保山盆距兰

**Preliminary conservation status:** We have only

discovered two populations of *Gastrochilus baoshanensis* in Wama Town of Baoshan City. The plants of these two populations were found in branches of small shrubs by the roadside. Exploitation of the roads may lead to extinction of these populations. However, we did not conduct a comprehensive population survey of Gaoligong Mountain (for example, sample square sampling), more surveys are needed to confirm the exact distribution range of this species. Hence, we assess this species based on the available information as Data Deficient following IUCN guidelines (IUCN, 2022).

**Additional specimens examined (paratypes):** CHINA. Yunnan, Longyang County, Wama Town, elev. 2000 m, epiphytes on tree trunks in subtropical evergreen broad-leaved forests, 20 April 2025, M. K. Li 20250283 (XTBG Herbarium).

**Notes:** Morphologically, *Gastrochilus baoshanensis* is similar to *G. setosus* and *G. xizangensis*. A comparative study of living plants and dried specimens showed that the habit and floral shape of the three species are quite similar, such as they all have long stems, distichous leaves, very small flowers, and white hairs on the lips, but *G. baoshanensis* has awnless leaves, widely opening flowers, shorter ovary and pedicel, and a flabellate lip (Fig. S1). We list the differences among the three related

**Table 1.** Morphological comparison of *Gastrochilus baoshanensis* and closely related species.

	<i>G. baoshanensis</i>	<i>G. setosus</i>	<i>G. xizangensis</i>
Leaf	oblong, 1.3-1.5×0.5 cm, without awn, abaxially entire	narrowly ovate, 1.4-2×0.5 cm, with 2 awns, abaxially short unguiculate seta	narrowly ovate, 1-1.2×0.5 cm, with 2-3 awns, abaxially entire
Inflorescence	ca. 10 mm long	15-30 mm long	15-30 mm long
Flowers	open widely, lip with purple vein	not open widely, lip without purple vein	not open widely, lip without purple vein
Dorsal sepal	narrowly elliptic, 3.2-3.5×1 mm	ovate, 3.5-4×2 mm	ovate, 2.8-3×2 mm
Petals	petals longer than sepals	petals longer than sepals	Sepals and petals subsimilar
Epichile	Flabellate, the green cushion in the center is triangular and extends to the middle, covered with hairs only on the cushion, margin entire, wings split	Wide triangular, the green cushion in the center is triangular and extends to the apex, covered with hair on the cushion and margin, wings not split	suborbicular, the green cushion in the center is circular and extends to the apex, the entire lip covered with white hair, wings not split
Hypochile	3.5 mm, apex slightly acute	2 mm, apex obtuse to round	2 mm, apex obtuse to round

species in Table 1. The most important difference among them is the structure of their lips, the epichile of *G. baoshanensis* is bilobed, but those of *G. setosus* and *G. xizangensis* are intact. The hairs on the lip of *G. baoshanensis* are restricted to the central cushion, whereas the hairs on the other two species are densely distributed over the entire lip.

***Gastrochilus motuoensis*** M.K.Li, Y.Luo & J.W.Zhai, *sp. nov.* **Fig. 2**

**Type:** CHINA. Xizang, Motuo County, Dexing Town, 1658 m, epiphytes on tree trunks of small shrubs in the tropical monsoon rainforest, 23 October 2023, *M.K.Li 2021736* (holotype: Herbarium of Fujian Agriculture and Forestry University 006456!).

*Gastrochilus platycalcaratus* auct. non (Rolfe) Schltr. In Gogoi *et al.*, *Pleione* 13(2): 407–410. 2019.

**Diagnosis:** *Gastrochilus motuoensis* also belongs to sect. *Caespitosi*, the plant morphology of *G. motuoensis* is extremely similar to *G. platycalcaratus*, but the flower morphology is quite different. *G. motuoensis* has a 4 mm pedicel and ovary (vs. 8 mm), and ovate lateral sepals (vs. narrowly ovate), a flabellate-shaped epichile that is slightly reflexed (vs. ovate-triangular, strongly reflexed), and the hypochile is not strongly compressed from the middle to the tip (vs. strongly dorsiventrally compressed from middle to tip).

Stem 1–2 cm long. Leaves 3–6, oblong, 3–5 × 0.7–1.0 cm, obtuse and unequally deep bilobed. Inflorescence racemose, up to 9-flowered; peduncle pale yellowish green, usually 1.5 cm, upper part enlarged; floral bracts ovate-triangular, obtuse; pedicel and ovary yellowish green with purple spots, ca. 4 mm. Flowers widely opening; sepals and petals yellowish green with purplish red spots; lip whitish, with greenish cushion on epichile. Dorsal sepal oblong, ca. 2.5 × 1.2 mm, apex obtuse; lateral sepals slightly oblique, oblong, ca. 2.5 × 1 mm, apex obtuse. Petals ovate-elliptic, ca. 2.5 × 1.2 mm, apex obtuse; lip with an epichile and a hypochile; epichile flabellate semi-circular, ca. 2 × 3 mm, adaxially hirsute but glabrous at the center of the cushion, slightly reflexed, rounded at apex; hypochile subconic, ca. 4 mm tall, ca. 1.8 mm in diam., not narrowed at middle, not dorsiventrally compressed from middle to tip, rounded

and slightly concave at tip. Column stout, cordiform, ca. 1 mm, purple; anther cap yellow; pollinia 2, yellow, spherical, stipe elongate, ca. 1.0 mm.

**Distribution and habitat:** *Gastrochilus motuoensis* is collected from Dexing, Motuo County, Linzhi City, Xizang, China. It was found as epiphytes on the trunks of *Rhododendron* L. at an elevation range of 1600–1800 m.

**Phenology:** Flowering from October to December.

**Etymology:** The specific epithet “*motuoensis*” refers to the typelocality where the new species occurs, Motuo County, Xizang, China.

**Vernacular name:** 墨脱盆距兰

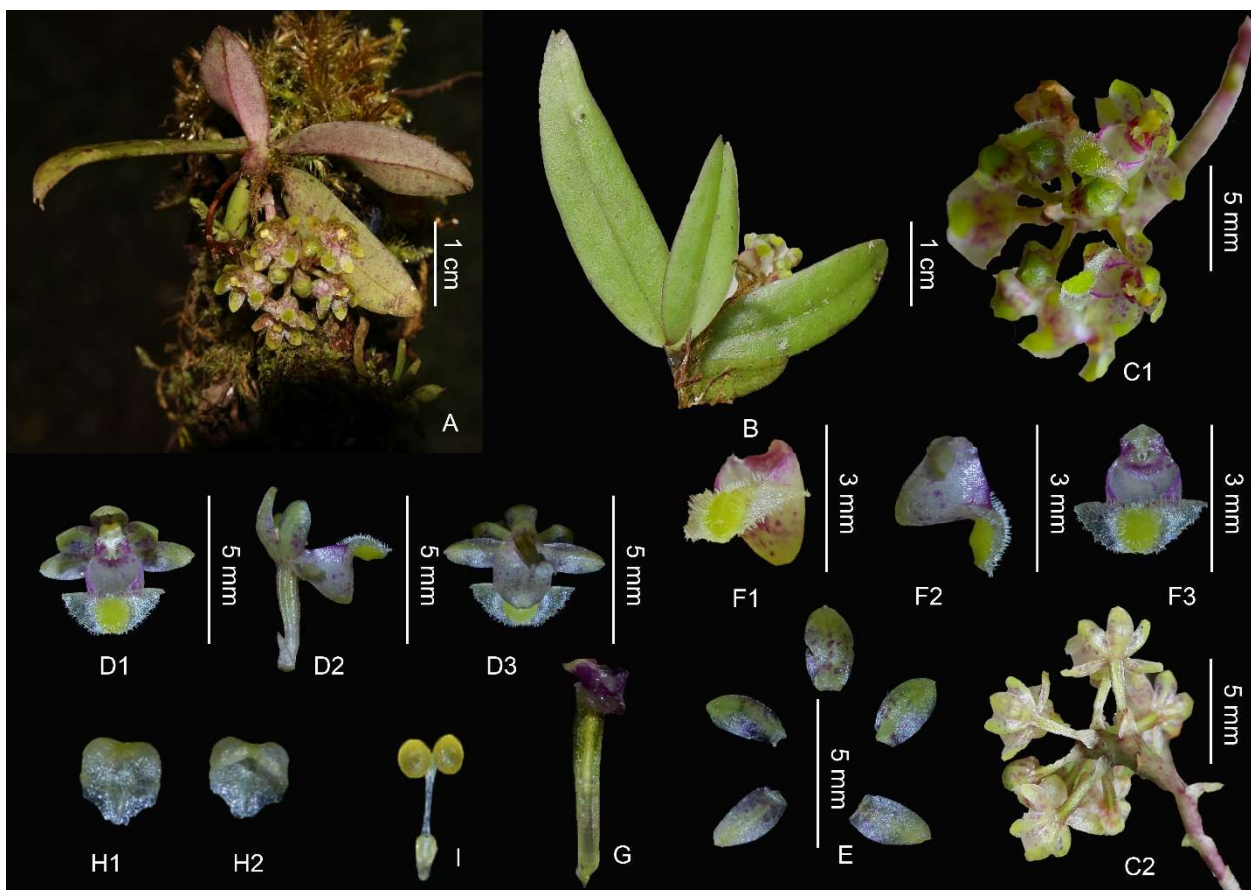
**Preliminary conservation status:** *Gastrochilus motuoensis* is only known from Motuo County. We have collected specimens in Dexing and Gedang town. Currently, we have not conducted in-depth investigations. It is possible that *Gastrochilus motuoensis* is more widely distributed in this area. In addition, according to literature records, this species also exists in the southern Xizang region of China (Gogoi *et al.*, 2019), but those authors mistook it for *G. platycalcaratus*. Hence, we assess this species based on the existing information as Data Deficient following IUCN guidelines (IUCN, 2022).

**Additional specimens examined (paratypes):** CHINA. Xizang, Motuo County, Gedang Town, elev. 1800 m, epiphytes on tree trunks in subtropical evergreen broad-leaved forests, 20 December 2024, *Y. Luo 7532* (XTBG Herbarium). CHINA. Xizang, Cuona County, Ziro valley, 15 October, 2019, *Gogoi 00805* (ASSAM, TOSEHIM).

**Notes:** Morphologically (Table 2), the plant form of *Gastrochilus motuoensis* is extremely similar to that of *G. platycalcaratus*, for instance, their leaves are oblong and flowers are widely open. However, the flowers of the two species are quite different. The pedicel and ovary of *G. motuoensis* are 4 mm long, while those of *G. platycalcaratus* are up to 8 mm long. *G. motuoensis* has ovate lateral sepals, while the lateral sepals of the latter are narrowly ovate. Visually, the most significant difference between them lies in the shape of the lip. The epichile of *G. motuoensis* is semicircular or flabellate and slightly reflexed, while the hypochile is not strongly compressed from the middle to the tip. In contrast, the epichile of *G. platycalcaratus* is ovate-triangular and strongly reflexed, while the hypochile is strongly dorsiventrally compressed from middle to tip (Fig. S2).

**Table 2.** Morphological comparison between *Gastrochilus motuoensis* and closely related species

	<i>G. motuoensis</i>	<i>G. platycalcaratus</i>
Stem	1-2 cm	ca. 5 cm
Leaf	oblong, acute and unequally deep bilobed	narrowly ovate, obtuse and unequally shallow bilobed
Pedice and ovary	ca. 4 mm	ca. 8 mm
Lateral sepals	ovate, 3x1.5 mm	narrowly elliptic, 3x1 mm
Epichile	Flabellate, slightly reflexed	triangular-ovate, strongly reflexed
Hypochile	subconic, not narrowed at middle, not dorsiventrally compressed from middle to tip, rounded and slightly concave at tip	strongly dorsiventrally compressed from middle to tip, subtruncate and concave at tip
Phenology	Flowering from October to December	Flowering from March to May

**Fig. 2.** *Gastrochilus motuoensis* M.K.Li, Y.Luo & J.W.Zhai **A.** plant and habitat; **B.** plant and inflorescence; **C1-C2.** inflorescence; **D1-D3.** flower; **E.** split flower; **F1-F3.** close-up of lip; **G.** column and ovary; **H1-H2.** anther cap; **I.** pollinia. (Photos: A-I by Meng-Kai Li).

It is worth mentioning that Indian scholars have also discovered this species in the southern Xizang region of China (Gogoi *et al.*, 2019). However, they identified it as *G. platycalcaratus*. Judging from its flower pedicel and ovary length of 4 mm, with the posterior lip not strongly compressed from middle to tip, this is clearly an identification error; it should be *G. motuoensis*. We hereby propose this correction and refer this specimen to this article.

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