

A NEW SPECIES OF *PINGUICULA* (LENTIBULARIACEAE) FROM WESTERN YUNNAN, CHINA

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Abstract

A new species of Lentibulariaceae, *Pinguicula gongshanensis*, is described and illustrated from western Yunnan, China. Morphologically, it is similar to *Pinguicula alpina* but differs from the latter by its corolla with 8–12 brown stripes on the tube and spur, yellow corolla lip, corolla tube with yellow pubescence inside, glandular pilose pedicel, and calyx.

Introduction

The genus *Pinguicula* L., Sp. Pl.: 17 (1753), includes about 55 species distributed in Europe, northern Asia, the Himalayas, Japan, and North America, most diverse in Central America (from Mexico to the Caribbean Islands), extending southward to Colombia, Ecuador, Chile, and Patagonia (Kadereit, 2004; Mabberley, 2008; Li *et al.*, 2020). Two species are distributed in China (Li and Cheek, 2011; Li *et al.*, 2018).

During a series of expeditions to western Yunnan conducted for six years for the project “The Second Tibetan Plateau Scientific Expedition and Research,” we collected some interesting specimens of *Pinguicula*, and after a thorough examination, we found that they differ from all other known species of *Pinguicula* in their morphological features. Based on a detailed morphological study, literature search (Casper, 1966; Tang, 1985; Li, 1986, 1990, 1994; Noltie, 2001; Li and Cheek, 2011; Niu and Sun, 2021), and examination of many other relevant specimens available in the KUN and PE herbaria, we concluded that these specimens of *Pinguicula* represent a new species. Its detailed taxonomic description with illustrations is presented below.

***Pinguicula gongshanensis* J. Sun, Y.L. Wen & R. Li sp. nov.**

(Fig. 1)

Type: CHINA. Yunnan: Nujiang Lisu people autonomous Prefecture, Gongshan County, Cikai township, Dongshaofang, E side of Gaoligong Mountains, coniferous-broad leaved mixed forest, on rocks in mountains, 3289 m, 27°41'37.7"N, 98°28'32.3"E, 21 May 2019, *Jun Sun 1246* (holotype KUN!).

Vernacular name: ‘贡山捕虫堇’ (Gong Shan Bu Chong Jin) in Chinese.

Herb, perennial, epilithic. Roots numerous, fibrous, ca. 0.2–1 mm thick. Leaves 4–9, basal rosette, sessile; leaf blade pale green, elliptic-oblong, 1–3 × 0.5–1 cm, margin entire and involute, apex obtuse to rounded, base broadly cuneate, adaxially with numerous viscid glands, abaxially glabrous. Scapes 1 to 3, single-flowered, from basal rosette. Pedicel 2–6 cm long, glandular pilose, apical part enlarged in fruit. Calyx split from base into 2 lips, outside glandular pilose; upper lip 3-

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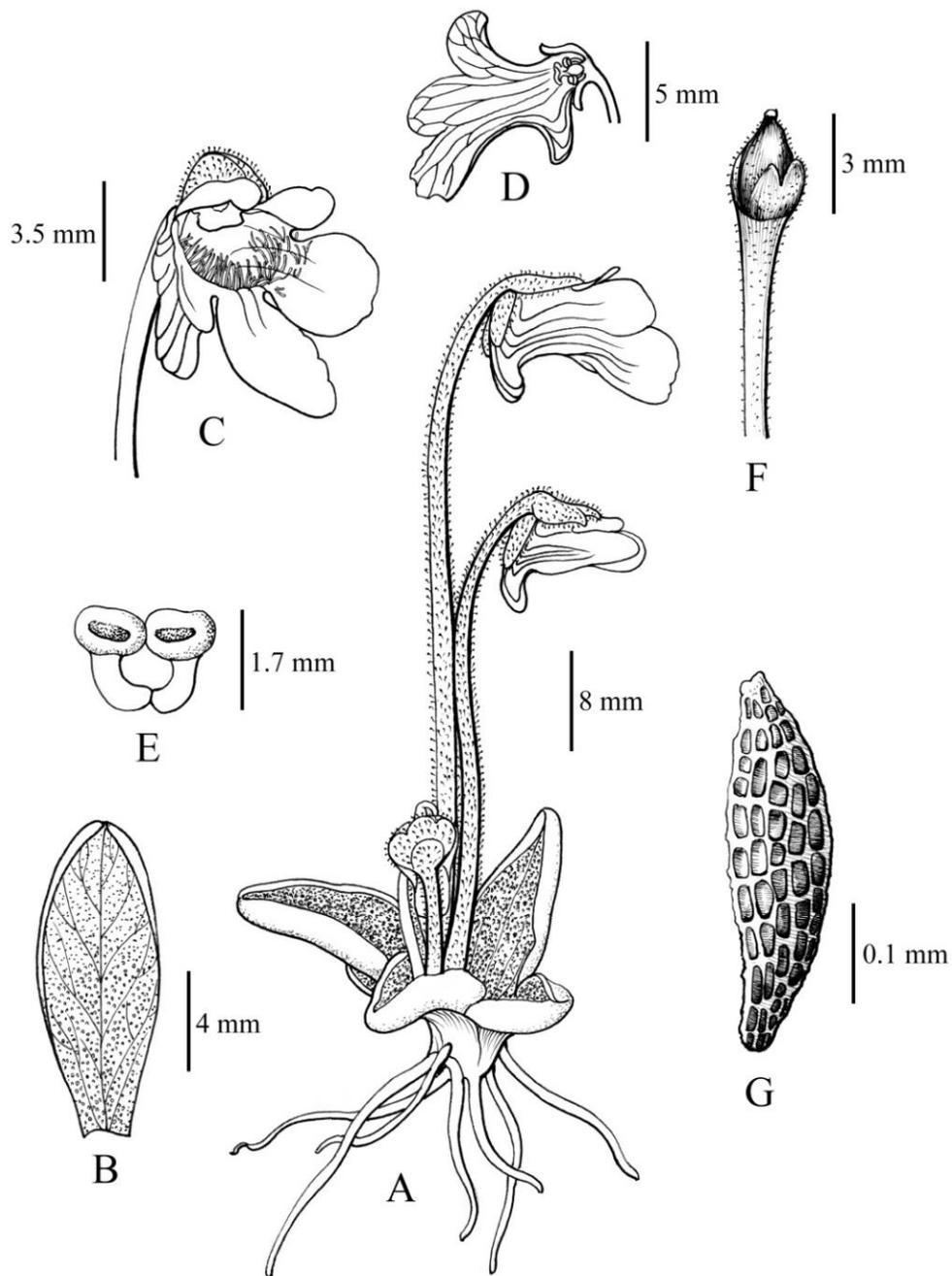


Fig. 1. *Pinguicula gongshanensis* sp. nov. A. Habit. B. Leaf, showing viscid glands. C. Flower (front view), showing inside pubescence. D. Flower (longitudinal view), showing corolla, stamens, and pistil. E. Stamen, showing filament and anther. F. Calyx and capsule. G. Seed. Illustration is created from the holotype by Ling Wang.

lobed, lobes ovate, ca. 2–4 × 0.8–2 mm; lower lip 2-lobed, lobes obovate, ca. 2–3 × 1–2 mm. Corolla open at throat, 1–2.5 cm long; upper lip yellow, 2-lobed, lobes broadly ovate to suborbicular, ca. 2–4 × 2–4 mm; lower lip yellow, 3-lobed, middle lobe larger, circular to broadly ovate, ca. 3–6 × 3–5 mm, lateral lobes broadly ovate, ca. 1.5–4 × 2–4 mm; tube white with 8–12 brown stripes extending to spur, funnel-shaped, ca. 2–3 mm long, inside yellow puberulent, outside glabrous; spur yellow, cylindrical, straight, ca. 2–4 mm long, apex rounded. Stamens 2, filaments curved, ca. 1–1.5 mm long, anther thecae confluent. Ovary globose, ca. 1 mm in diam, ovule numerous; style short, ca. 0.1–0.3 mm long; stigma ca. 0.8–1.5 mm wide. Capsule ovoid-oblong, glabrous. Seeds narrowly ellipsoid, ca. 200 µm long; seed coat with small prominent elongate reticulations.

Phenology: Flowering in *Pinguicula gongshanensis* occurs in May to June, and fruiting in June to July.

Etymology: The specific epithet of the new species refers to its type locality.

Distribution and ecology: *Pinguicula gongshanensis* is currently known only from four sites on the Gaoligong mountains in Gongshan County, Yunnan Province, China. It grows on rocks in mountains at 2900–3300 m elevation.

Conservation status: The species has been collected only from the type locality and is therefore assumed to be rare. According to guidelines for using the IUCN red list categories and criteria (IUCN Standards and Petitions Committee, 2022), it is considered as ‘Endangered’ (EN) using the criteria set out by IUCN as its known area of occupancy is less than 500 km² (criterion B2) and the total population size is estimated to be smaller than 2500 mature individuals (criterion C).

Pinguicula gongshanensis seems similar to *P. alpina* L. (1753: 17), but differs by its corolla with brown stripes on tube and spur (vs. yellow spots on throat), yellow (vs. white) corolla lip, corolla tube with yellow (vs. white) pubescence inside, glandular pilose (vs. glabrous) pedicel, and calyx (Table 1).

Table 1. Morphological comparison of *Pinguicula gongshanensis* sp. nov. and *P. alpina*.

Characters	<i>P. gongshanensis</i>	<i>P. alpina</i>
Corolla	brown stripes on tube and spur	yellow spots on throat
Corolla lip	yellow	white
Corolla tube	inside yellow puberulent	inside white puberulent
Pedicel and calyx	glandular pilose	glabrous

Notes: Morphologically, the new species is similar to *Pinguicula alpina* L. (1753: 17) by its resting bud in winter, margin entire and involute leaves, single-flowered scape, 2-lipped calyx and corolla, hair structure on corolla inside, large middle lobe in lower corolla lip, white corolla tube, and yellow spur, but differs by its corolla with 8–12 brown stripes on tube and spur, yellow corolla lip, corolla tube with yellow pubescence inside, glandular pilose pedicel and calyx.

Additional specimens examined (paratypes): CHINA. Yunnan: Nujiang Lisu people autonomous Prefecture, Gongshan County, Dulongjiang township, Dimagalong, W side of Gaoligong Mountains, coniferous-broad leaved mixed forest, on rocks in mountains, 2990 m, 27°50'31.4"N, 98°27'52.7"E, 14 May 2020, *Jun Sun 1371* (KUN!); Dulongjiang township, Dimagalong, W side of Gaoligong Mountains, coniferous-broad leaved mixed forest, on rocks in mountains, 2900 m, 27°48'26.6"N, 98°25'32.1"E, 22 June 2020, *Jun Sun 1406* (KUN!); Cikai

township, Dongshaofang, E side of Gaoligong Mountains, coniferous-broad leaved mixed forest, on rocks in mountains, 3300 m, 27°41'30.4"N, 98°28'29.7"E, 19 May 2021, *Jun Sun 1473* (KUN!); Dulongjiang township, Dimagalong, W side of Gaoligong Mountains, coniferous-broad leaved mixed forest, on rocks in mountains, 3120 m, 27°49'13.6"N, 98°27'23.1"E, 06 May 2022, *Jun Sun 1511* (KUN!).

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References

- Casper, S.J. 1966. Monographie der Gattung *Pinguicula* L. *Bibliotheca Botanica*, **127/128**: 1–209.
- IUCN Standards and Petitions Committee 2022. Guidelines for Using the IUCN Red List Categories and Criteria. Version 15.1. Prepared by the Standards and Petitions Committee. Available from: <https://www.iucnredlist.org/documents/RedListGuidelines.pdf> (accessed 15 August 2023)
- Kadereit, J.W. 2004. *Pinguicula* Linnaeus. In: Kubitzki, K. (ed.), The families and genera of vascular plants. Vol. 7. Springer-Verlag, Berlin. pp. 280–282.
- Li, D.Z., Chen, Z.D., Wang, H. and Lu, A.M. 2018. A dictionary of the families and genera of Chinese vascular plants. Science Press, Beijing.
- Li, D.Z., Chen, Z.D., Wang, H., Lu, A.M., Luo, Y. and Yu, W.B. 2020. The families and genera of Chinese vascular plants. Science Press, Beijing.
- Li, H. 1986. *Pinguicula* Linnaeus. In: Huo, S.H. (ed.), Flora Yunnanica. Vol. 4. Science Press, Beijing. pp. 737–738.
- Li, H. 1994. *Pinguicula* Linnaeus. In: Wang, W.C. (ed.), Vascular plants of the Hengduan mountains. Vol. 2. Science Press, Beijing. pp. 1868–1869.
- Li, Z.Y. and Cheek, M.R. 2011. *Pinguicula* Linnaeus. In: Wu, Z.Y., Raven, P.H. and Hong, D.Y. (eds.), Flora of China. Vol. 19. Science Press, Beijing and Missouri Botanical Garden Press, St. Louis. pp. 480–481.
- Li, Z.Y. 1990. *Pinguicula* Linnaeus. In: Wang, W.C. (ed.), Flora Reipublicae Popularis Sinicae. Vol. 69. Science Press, Beijing. pp. 583–586.
- Linnaeus, C. 1753. *Species Plantarum*. Salvius, Stockholm.
- Mabberley, D.J. 2008. *Mabberley's plant-book, a portable dictionary of plants, their classification and uses*. Cambridge University Press, New York.
- Niu, Y. and Sun, H. 2021. *Flowering plants of Hengduan mountains*. Yunnan Science and Technology Press, Kunming.
- Noltie, H.J. 2001. *Pinguicula* Linnaeus. In: Grierson, A.J.C. and Long, D.G. (eds), Flora of Bhutan. Vol. 2 (2). Royal Botanic Garden Edinburgh, Edinburgh. pp. 1334–1336.
- Tang, Y.C. 1985. *Pinguicula* Linnaeus. In: Wu, Z.Y. (ed.), Flora Xizangica. Vol. 4. Science Press, Beijing. pp. 406–408.

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