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Oreocharis repenticaulis (Gesneriaceae), a new species from western Guangxi, China

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Abstract

Oreocharis repenticaulis, a new species of Gesneriaceae from Guangxi, China, is described and illustrated. It is similar to *O. argyreia* Chun ex K.Y. Pan, but it differs from the latter by its leaf shape, umbrella inflorescence, corolla color, filament, phenology and some obvious characteristics of rhizomes. A detailed description, color photographs, distribution and habitat, as well as its morphological relationship with relevant similar species are also provided.

Keywords

Flora of Guangxi, new taxon, subtropic regions

Introduction

The newly-circumscribed *Oreocharis* Benth. (1876) has become a large and morphologically diverse genus in the subfamily Didymocarpoideae Arn., Gesneriaceae Rich. & Juss. (Möller et al. 2011; Weber et al. 2013). *Oreocharis* was previously a genus of ca. 28 species distributed mainly in southern China (Li 1996; Wang et al. 1998a), based on molecular data and a morphological evaluation, Möller et al. (2011) demonstrate that the traditionally defined *Oreocharis* was phylogenetically intertwined with ten small and sometimes monotypic Chinese genera: *Ancylostemon* W.G. Craib (1919), *Bournea* Oliv. (1893), *Dayaoshania* W.T. Wang (1983), *Deinocheilos* W.T. Wang (1986), *Isometrum* W.G. Craib (1919), *Opithandra* B.L. Burtt (1956), *Paraisometrum* W.T. Wang (1997), *Thamnocharis* W.T. Wang (1981), *Tremacron* W.G. Craib (1918) and *Briggsia* W.G. Craib (1919). According to molecular phylogenetic studies, made the additional palynological observation of *Bournea* to support the taxonomic reassessment of the genus *Bournea* in Gesneriaceae, and eventually *Bournea* were isolated (Chen et al. 2020). However, according to the molecular and morphological data, several new taxa of *Oreocharis* were described recently, the *Bournea* was restored, and *Oreocharis* comprises about 150 species at present (Wen et al. 2021), most of them are endemic to China, mainly distributed in south and southwest China, as well as in northern Vietnam, Myanmar, northeast India, Bhutan, Japan and Thailand (Möller et al. 2011, 2016; Jin et al. 2021).

We did the plant diversity survey in Cenwanglaoshan National Nature Reserve in Guangxi, in early November 2019. A species of Gesneriaceae was found in the back mountain of Badingtun, Tanghe Village, Langping Town, judging by its morphological characteristics, it may be a plant of the expanded genus *Oreocharis* s.l.. Most of its individuals have long rhizomes with internodes and leaf growth, and some individuals also have obvious above-ground stems. These

characteristics are very rare in other species of *Oreocharis*. We took photographs, collected specimens and introduce the living plants to the greenhouse of Guangxi Institute of Botany for careful cultivation. In early September 2020, we observed this species has blossomed in the greenhouse, after comprehensive morphological study, consulted the relevant literature (Wang 1987; Tan et al. 2013, 2014; Wei et al. 2016; Chen et al. 2017, 2018; Chen et al. 2020a, Chen et al. 2020b; Yang et al. 2019; Pan et al. 2019; Cai and Dao 2020), we concluded that this species belongs to *Oreocharis*, and is an undescribed species. Since then, we have conducted many field studies on it and collected materials for flowering and fruiting. Hence it is described here as a new species with detailed description, color photographs, distribution and habitat, as well as its morphological relationship with relevant similar species are also provided.

Material and methods

From November 2019 to September 2021, we examined all the specimens of *Oreocharis* in IBK on the field, and also examined specimens of *Oreocharis* in PE, KUN, IBSC, IBK, HITBC, etc. through CVH (<https://www.cvh.ac.cn/index.php>). Except for *Su-Yun Nong et al. CW0001*, *Chun-Lan Su & Lun-Ju Pan et al. CWB0356* and *Xue-Kui Huang & Lun-Ju Pan CWA1215* preserved in IBK, none of the specimens belong to *Oreocharis repenticaulis*. Photographs of plants and flowers were taken using Canon PowerShot G series. Morphological characters of the new species were measured with a ruler on living plants in the wild. The terminologies used to describe parts of the new species, such as cymes, corolla, rhizome, bracts, disc, stamens, staminodes, capsule, etc. come from Flora of China (Wang et al. 1998b).

Taxonomic Treatment

***Oreocharis repenticaulis* X.K. Huang, P. Yang & Yan Liu, sp. nov.**

Figures 1, 2

Diagnosis. *Oreocharis repenticaulis* is similar to *O. argyreia* Chun ex K.Y. Pan, but it differs from the latter mainly in its leaf elliptic or ovate elliptic (vs. narrow oval), unbranched cymes (vs. 2–3-branched), corolla orange-yellow (vs. blue-purple to pinkish white or greenish), filaments sparsely puberulent (vs. glabrous), leaf margin with irregular crenate (vs. near entire), obviously elongated rhizomes (vs. rootless stem), bracts narrowly triangular (vs. lanceolate), disc cup-shaped (vs. ring-shaped).

Type. CHINA. Guangxi, Baise city, Tianlin County, Cenwanglaoshan National Nature Reserve, on humus rich slopes under evergreen and deciduous broadleaved mixed forests. elev. ca. 1645 m, 4 September 2020, flowering, *Su-Yun Nong et al. CW0001* (**holotype**: IBK!, **isotypes**: IBK!, PE!).

Description. Perennial herb. Rhizome nearly cylindrical, 6.5–10.5 cm long, 3–5 mm in diameter. Sometimes with obvious repent ground stems, pubescent, internode 0.2–1.2 cm long, some leaves grow sporadically on its stem. Leaves alternate, clustered at the top of stem, with long petiole; leaf blade elliptic or ovate elliptic, 2.1–5.5 × 1.5–3.9 cm, apex acute, base oblique, subcordate or nearly rounded, margin with irregular crenate, densely white villous on both sides, lateral veins 5–7 on each side, slightly concave above, uplift below, densely villous; petiole 1–7 cm long, densely villous. Cymes unbranched, axillary, each inflorescence has 1–4 flowers; peduncles 6–18 cm long, densely white villous and glandular-pubescent; bracts 2, narrowly

triangular, ca. 2.5×0.5 mm, apex acuminate, entire, white villous outside, glabrous inside; pedicel 1–2 cm long, densely white villous and glandular-pubescent. Calyx 5-lobed to base, lobes almost equal, ovate triangle, 3–4 mm long, white villous outside, glabrous inside, entire. Corolla slender tubular, 1.5–3.3 cm long, ca. 6 mm in diameter, orange-yellow, glandular-pubescent outside; tube 1.2–2.6 cm long; 3–4 times the entablature; short entablature, ca. 6 mm long, slightly 2-lipped, upper lips 2-lipped to lower middle, lobes ovate, apex acute, 2–3 mm long; lower lips 3-lobed, lobes broad ovoid, apex round, 7–10 mm long. Fertile stamens 4, meristem, sparsely pubescent, two abdominal stamens ca. 1.2 cm long; two lateral stamens ca. 1.1 cm, anthers not fully developed; adnate to corolla tube ca. 1 cm long from base. staminode 1, ca. 3 mm long, adnate to corolla tube ca. 5 mm long from base. filaments sparsely pubescent, anther oblong, ca. 3 mm long, 2-loculed, dehiscent longitudinally. Disc cup-shaped, yellow green, ca. 3 mm high, entire or emarginate. Pistil glabrous, ca. 2.7 cm long, ovary linear oblongata, ca. 1.7 cm long, style ca. 1 cm long, bending to varying degrees near apex to upper lip, stigmas 1, oblate. Capsule oblanceolate-oblong, 2.5–5 cm long, glabrous.

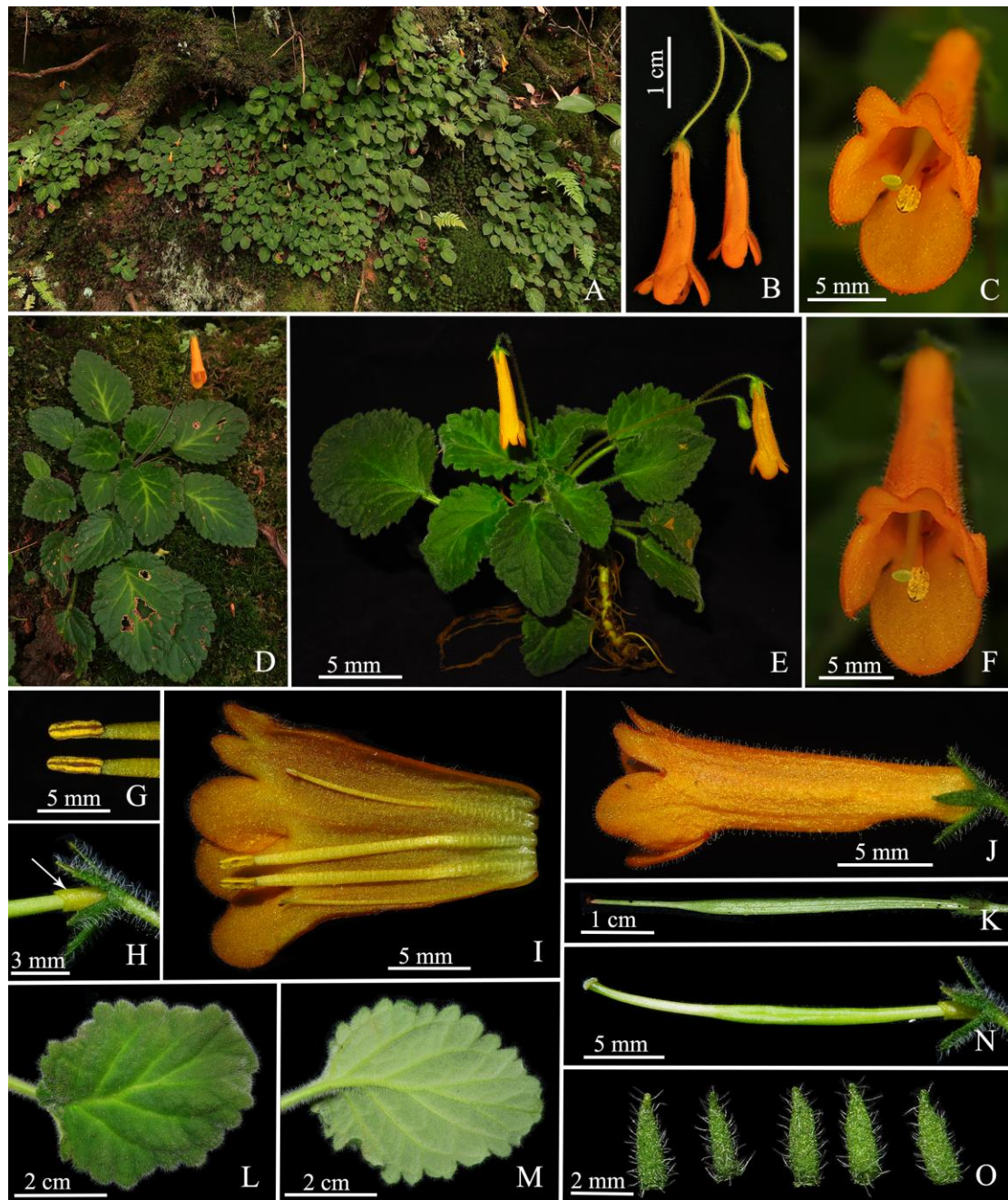


Figure 1. *Oreocharis repenticaulis* A habitat B cyme C flower in oblique view D, E flowering habitat F flower in face view G anther H calyx and disc I opened corolla showing stamens J flower in side view K capsule L leaf adaxial surface M leaf abaxial surface N pistil with disc and calyx O calyx. A–D & F photographys by Chun-Lan Su of Chun-Lan Su & Lun-Ju Pan et al. CWB0356 (paratype: IBK!); E & H–N by Xue-Kui Huang, G & O by Ying Qin of Su-Yun Nong et al. CW0001 (holotype: IBK!).

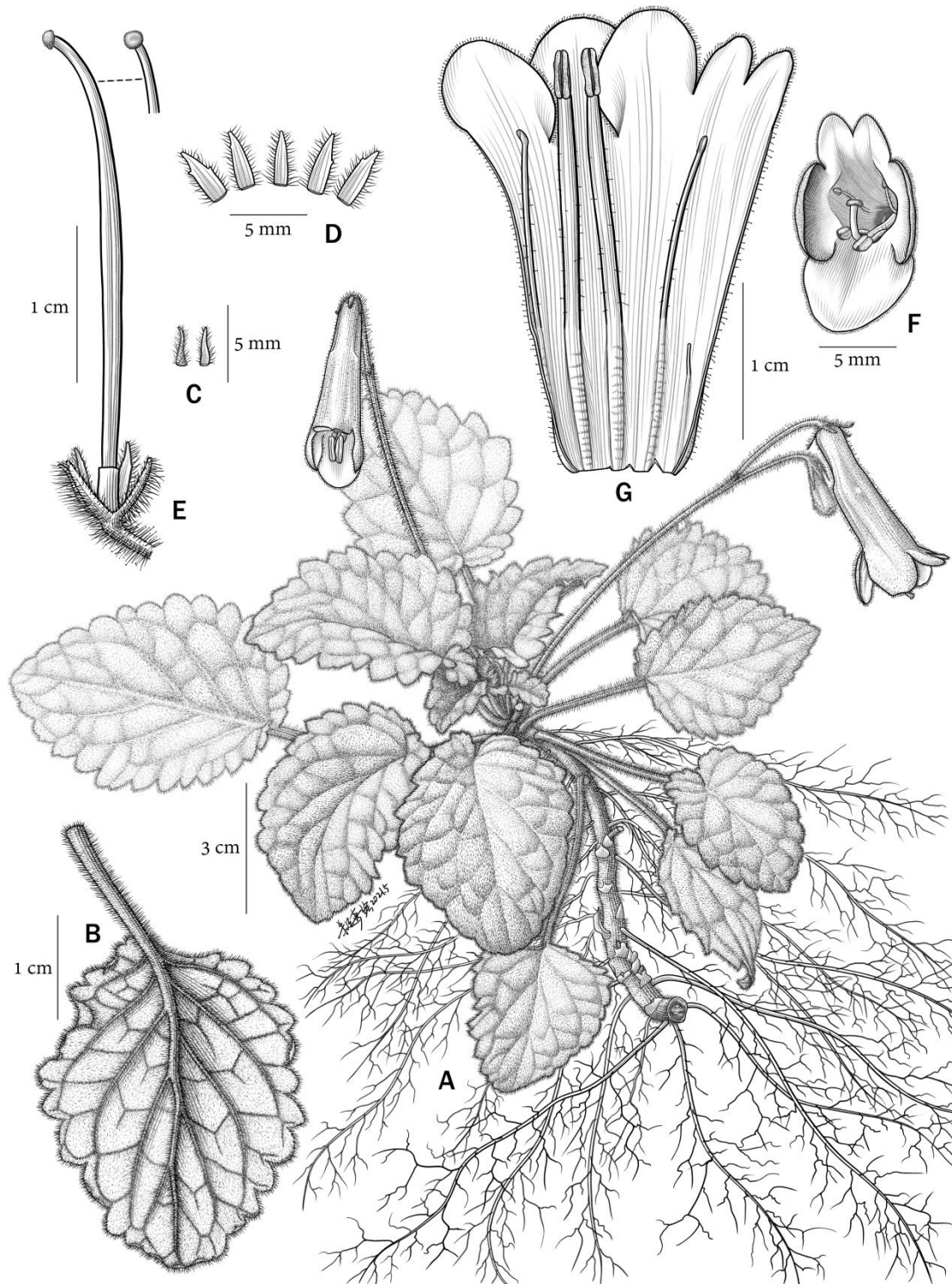


Figure 2. *Oreocharis repenticaulis* A habit B leaf abaxial surface C bract D internal surface of calyx E pistil with calyx F flower in front view G opened corolla. All drawings based on the holotype *Su-Yun Nong et al. CW0001* in IBK, drawn by Yun-Xi Zhu.



Figure 3. *Oreocharis argyreia* **A** flowering habit **B** cyme in top view **C** cyme in side view **D** flower in face view.

Distribution, habitat and ecology. *Oreocharis repenticaulis* is currently known from Cenwanglaoshan National Nature Reserve, Tianlin County, Baise City, Guangxi Province, China. It grows densely on humus-rich slopes under evergreen and deciduous broad-leaved mixed forests, at an elevation of ca. 1600–1800 m. The main companion species are: *Skimmia arborescens* T. Anderson ex Gamble, *Lithocarpus* Blume, *Elaeocarpus* L., *Fagus lucida* Rehder & E.H. Wilson, *Polyspora* Sweet, *Rhododendron* L., *Chimonobambusa marmorea* Makino, *Symplocos sumuntia* Buch.-Ham. ex D. Don, *Blastus pauciflorus* Guillaumin, *Phyllagathis impressinervia* Y.L. Su, Yan Liu & Ying Liu, *Plagiogyria euphlebia* (Kunze) Mett., *Asplenium normale* D. Don, etc.

Phenology. Flowering from July to September and fruiting from August to November.

Etymology. The specific epithet refers to the obvious elongation of the aboveground stem of this species.

Chinese name. 匍茎马铃薯苔 (Pú Jīng Mǎ Líng Jù Tái)

Distinguishing characters. *Oreocharis repenticaulis* is similar to *O. argyreia*. However, *O. repenticaulis* can be easily distinguished from the latter by its leaf elliptic or ovate elliptic, leaf base oblique, corolla orange-yellow, calyx ovate triangle, cymes unbranched, stamens sparsely pubescent, disc cup-shaped and distinctly elongated rhizomes. More detailed morphological comparison between *O. repenticaulis* and its related species are shown in Table 1.

Additional specimens examined (paratypes). **CHINA:** Guangxi: Baise city, Tianlin County, Cenwanglaoshan National Nature Reserve, elev. ca. 1650 m, 1 August 2021, flowering and fruiting, Chun-Lan Su & Lun-Ju Pan et al. CWB0356 (IBK!); Guangxi: Baise city, Tianlin County, Cenwanglaoshan National Nature Reserve, elev. ca. 1640 m, 18 september 2021, fruiting, Xue-Kui

Huang & Lun-Ju Pan CWA1215 (IBK!, PE!).

Table 1. Morphological comparison of *Oreocharis repenticaulis* sp.nov. and *O. argyreia*.

Characters	<i>O. repenticaulis</i> sp.nov.	<i>O. argyreia</i>
Leaf	elliptic or ovate elliptic, 2.1–5.5 × 1.5–3.9 cm, both surfaces densely white villous, margin with irregular crenate; base oblique, subcordate or nearly rounded	narrow oval, 5.5–13 × 2.7–6.5 cm long, both surfaces appressed pubescent, margin near entire; base narrowly cuneate
Petiole	1–7 cm long, densely white villous	2–7 mm long, densely appressed villous
Cymes	unbranched, 1–4-flowered	2–3-branched, 5–12-flowered
Pedicel	white villous and glandular-pubescent	villous
Bracts	narrowly triangular, ca. 2.5 × 0.5 mm	lanceolate, 0.8–1.3 cm × 1.5–2 mm
Calyx	ovate triangle, 3–4 mm long, white villous outside, glabrous inside	narrowly lanceolate to narrowly triangular, 6–8 mm long, outside villous, glabrous inside
Corolla	orange-yellow, 2.4–3.3 cm long	blue-purple to pinkish white or greenish, 2–2.3 cm long
Stamens	4; 2 abdominal stamens fertile, 2 lateral stamens abortion; filament sparsely pubescent	4; fertile; filament glabrous
Staminodes	1, sparsely pubescent, ca. 2.5 mm long	1, glabrous, ca. 1.2 mm long
Disc	cup-shaped, ca. 3 mm in height	ring-shaped, ca. 1.2 mm in height

Conservation status. *Oreocharis repenticaulis* is currently known from Cenwanglaoshan National Nature Reserve, Tianlin County, Baise City, Guangxi, China. During our field investigation in the reserve, we found only one population distribution point, it is distributed on the slope under the mixed evergreen and deciduous broad-leaved forest, elev. ca. 1600–1800 m, the population about 400 individuals were discovered. We did not conduct more surveys of its populations, so the number of other populations is unclear. According to the IUCN Red List Categories and Criteria (IUCN 2019), *O. repenticaulis* is currently considered as a data deficiency (DD) category.

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