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# Rediscovery and conformation of *Oreocharis rhytidophylla* (Gesneriaceae) with supplementary description of flowers

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**Abstract:** Flower morphology is a key trait for sub-division and inter-species definition of genus *Oreocharis*. *O. rhytidophylla* C. Y. Wu ex H. W. Li was last collected in 1956 and published in 1983, and the species has no relevant collection records for the next 60 years. Due to the lack of flower morphology, there are doubts in *Flora of Reipublicae Popularis Sinicae*, *Plants of Gesneriaceae in China* and *Flora of China*. After years of follow-up investigation, *Oreocharis rhytidophylla* C. Y. Wu ex H. W. Li was rediscovered in 2017 in its type locality. Due to the availability of the flowers during the rediscovery, we confirmed that the species should be considered as a natural species instead of doubtful one. The floral morphology of *O. rhytidophylla* C. Y. Wu ex H. W. Li was supplemented based on the recent collections and photos. Its rediscovery provides an opportunity to explore its systematic position in the context of phylogeny in the future.

**Key words:** supplementary description, flower morphology, *Oreocharis*, Wuliangshan National Nature Reserve

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## 网叶马铃苣苔(苦苣苔科)的重新发现以及花的补充描述

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**摘要:** 花部形态是马铃苣苔属属下划分和种间界定的关键性状, 缺乏花器官的描述直接导致了一些存疑物种的存在。网叶马铃苣苔(*Oreocharis rhytidophylla* C. Y. Wu ex H. W. Li)自1956年最后被采集到并于1983年发表, 由于没有花的特征, 在《中国植物志》《中国苦苣苔科植物》和 *Flora of China* 均存疑, 但该种在随后的60余年间再无相关的采集记录。作者经过多年的跟踪调查, 于2017年在其模式产地重新发现并采集了带花的凭证标本。该文作者根据已经采集到的具花标本, 确定这个种是个自然种, 并基于新收集到的材料, 补充描述了花的形态特征。网叶马铃苣苔的重新发现, 为探索其系统位置提供了重要的依据。

**关键词:** 补充描述, 花形态, 网叶马铃苣苔属, 无量山国家级自然保护区

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## 1 Introduction

The classification systems for *Oreocharis* Benth. were mainly based on flower morphological characters. The flower morphological characters of the genus are remarkably diverse and include the symmetry of corolla, the color of corolla, the shape of corolla, the number of stamens and staminodes (Wang et al., 1990, 1998; Li & Wang, 2004). In the genus, it is very common that species share similar flowers but totally different leaves or share similar leaves but completely different flowers (Wang et al., 1990, 1998; Li & Wang, 2004). For example, *Oreocharis parviflora* Lei Cai & Z. K. Wu is the most closely related to *O. henryana* Oliv. which shares flower morphology, but the leaves are completely different (Cai et al., 2017). *O. purpurata* B. Pan, M. Q. Han & Yan Liu is similar to *O. pinnatilobata* (K. Y. Pan) Mich. Möller & A. Weber in leaf, but different in flower morphology (Han et al., 2017).

## 2 Materials and Methods

*Oreocharis rhytidophylla* C. Y. Wu ex H. W. Li had been doubtful in taxonomic treatment until the availability of its flowers in the field. The species was firstly described based on the type specimens without flowers and obviously diagnostic by the reticulate nerves on both sides of the rugose leaves (Li, 1983). Subsequently, it was excluded in the Chinese list of the genus *Oreocharis* in the publications and mentioned with a brief note of the above gap of flower morphology (Pan, 1987; Wang et al., 1990, 1998; Li & Wang, 2004). We had been to the type locality many times and contacted the staff of Wuliangshan National Nature Reserve in order to find it in the field since 2008, but we did not find until 2017, we collected the specimens with flowers in our survey to the type locality (Jingdong County, Yunnan Province, China). In the sight of the

conservation, the species is very rare for its rediscovery after the last discovery in 1956 indicated by the specimen (*P. Y. Qiu* 53376) (Li, 1983). Here, we supplementarily describe its floral characters and suggest to confirm its taxonomic position as a natural species in the expanded genus.

***Oreocharis rhytidophylla*** C. Y. Wu ex H. W. Li in Bull. Bot. Res. 3(2): 9, photo 5. 1983; K. Y. Pan in Acta Phytotax. Sin. 25(4): 290. 1987.

**Type** CHINA. Yunnan: Jingdong County, Wuliangshan Mt., Modaohe Village, the foot of Jiaoding mountain, 2 November 1956, *P. Y. Qiu* 53376 ( **holotype**, KUN0484429!; isotype, KUN0548908!, PE00030857-60! ).

## 3 Result and Analysis

### 3.1 Supplementary description of flowers

Inflorescences axillary, cymes 2–4, 2–4-branched, 4–16-flowered; peduncle densely long brown lanate, up to 14 cm; bracts 3, verticillate, 12–15 × 2.5–3 mm, abaxially brown lanate, adaxial glabrous. Calyx 5-parted near to base, lobes equal, oblong-lanceolate, 10–12 × 1.1–1.2 mm, margin integrate, apex obtuse, adaxial glabrous, abaxial brown lanate. Corolla yellow, 3.5–3.7 cm long, glabrous; corolla tube cylindric, 2.7–3 cm long, 5–6 mm in diam.; adaxial lip 2-lobed, lobes equal, lobes oblong, 5–6 × 3.6–4 mm, apex round or obtuse, abaxial lip 3-lobed, lobes oblong, lobes nearly equal, 6–8 × 3–5 mm, apex round; stamens 4, included, adaxial anthers coherent in pair, abaxial anthers free, adaxial stamens 1.7–2 cm long, adnate to corolla tube 8–9 mm from base, abaxial stamens 1.6–1.8 cm long, adnate to corolla tube 1.4–1.5 cm from base; filaments white, slender, linear, densely glandular-pubescent; anthers oblong, 2-loculed, dehiscing broadwise; staminode 1, clavate, 0.5 mm long, adnate to abaxial side of corolla tube near base. Pistil 2.7–3.0 cm long, glandular pubescent; ovary linear with ridges, 1.7–1.8 cm long, glabrous; style 1–1.2 cm long; stigma 1, disciform,

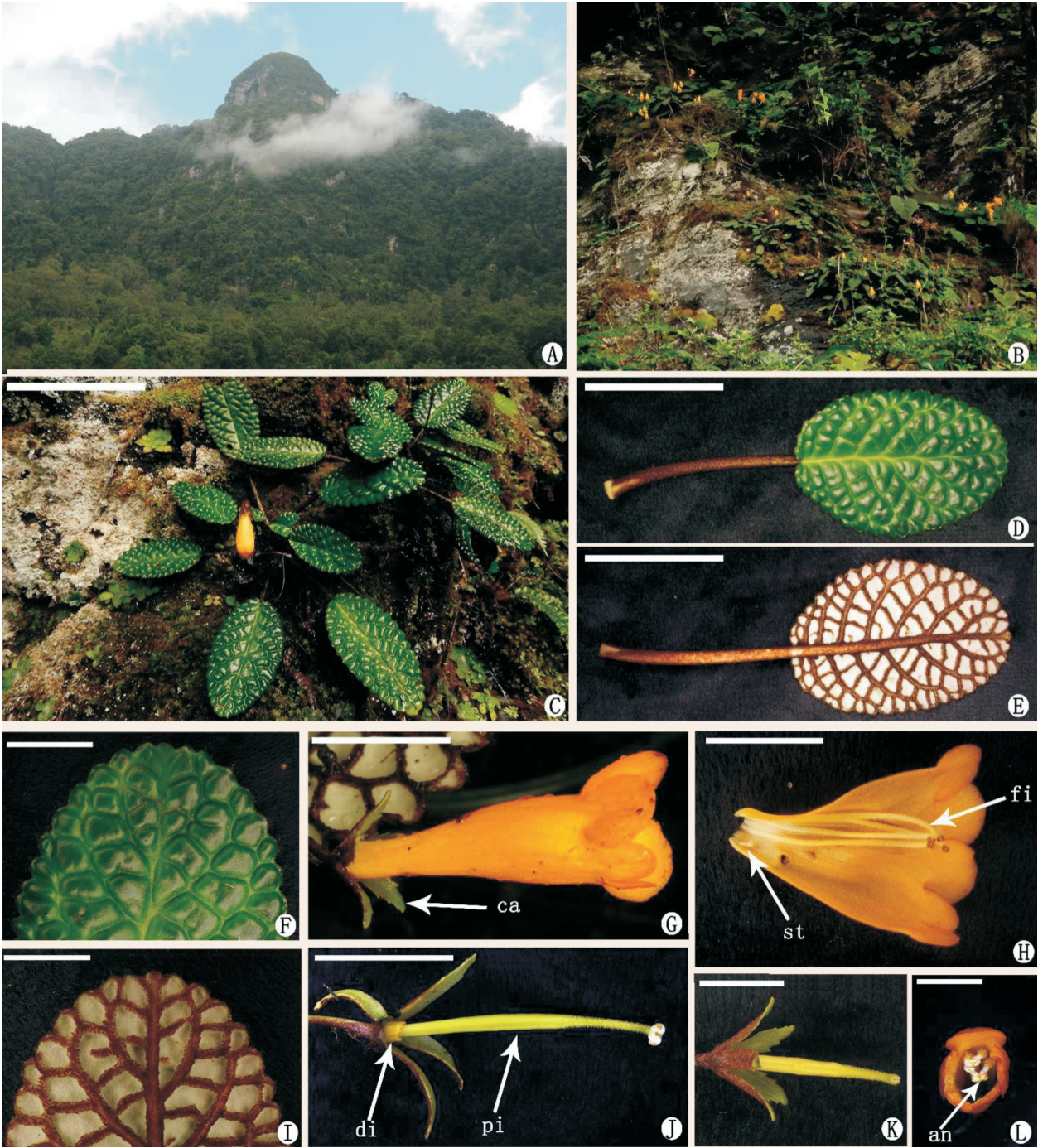


Plate I Holotype of *Oreocharis rhytidophylla* C. Y. Wu ex H. W. Li (KUN 0484429)

retuse. Disc ring-shaped, yellowish, 2–2.1 mm high, margin slightly undulate with 5 irregularly and shallow lobes.

3.2 Additional specimens examined

CHINA. Yunnan: Jingdong County, Lingjie Town, Modaohe Village, in broad-leaved forests,



Note: **A.** Landform; **B.** Habitat; **C.** Plant; **D.** Adaxial leaf; **E.** Abaxial leaf; **F.** Apex of adaxial leaf; **G.** Lateral view of corolla showing the glabrous surface and calyx; **H.** Bird view of opened corolla showing the interior surface of corolla tube, stamens, filaments, staminode, free anthers and connection anthers (**fi.** Filaments; **st.** Staminode); **I.** Apex of abaxial leaf; **J.** Pistil with disc (**pi.** Pistil; **di.** Disc); **K.** Young pistil; **L.** Front view of corolla showing the adaxial anthers free and abaxial anthers coherent in pairs (**an.** Anthers).  
(Scale bars: **D, E**=3 cm; **F, G, H, I, J**=2 cm; **K, L**=1 cm)

Plate II *Oreocharis rhytidophylla* C. Y. Wu ex H. W. Li (Photographed by Guo Shiwei )

24°24'57.17" N, 100° 38' 19.26" E, 2 331 m a. s. l., in flowers, 30 August 2017, S. W. Guo. B2017 -1083 ( KUN!). The same place, 2 200 m a.s.l., 12 January, 1939, M. K. Li 2936 ( KUN 0208330!,

KUN 075288!, KUN 075289!)).

### 3.3 Distribution, habitat and phenology

*Oreocharis rhytidophylla* C. Y. Wu ex H. W. Li (Li, 1983) is only known in South Yunnan and grows in evergreen and deciduous broad-leaved mixed forest, on moist rocks or cliffs at an elevation of ca. 2 331 m. Flowering from August to September and fruiting from September to October.

## 4 Discussion

*Oreocharis rhytidophylla* C. Y. Wu ex H. W. Li is similar to *O. benthamia* var. *reticulata* Dunn in netted venation of leaves, but it differs from the latter by its adaxial surface strongly bullate (Pan, 1987; Wang et al., 1990, 1998; Li & Wang, 2004). It is also similar to *O. hirsuta* Barnett and *O. yunnanensis* Rossini & J. Freitas in the corolla characters, but it differs from the latter by its anthers coherent in pairs and abaxial anthers free (Tan et al., 2013; Rossini & Freitas, 2014). It is also similar to *O. hekouensis* (Y. M. Shui & W. H. Chen) Mich. Möller & A. Weber in the elliptic leaf blade, but it differs from the latter in its obvious reticulate abaxial leaf surface (Chen & Shui, 2006; Möller et al., 2011).

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