




Manglietia ventii blooming in Kunming Botanical Garden.

and is endemic to Yunnan, China. It was categorized as Endangered on the IUCN Red List in 2012 and the China Red List of Biodiversity–Higher Plants in 2020, and listed as a second-ranked National Key Protected Wild Plant of China in 1999 and 2021, and by the Yunnan provincial government as a Plant Species with Extremely Small Populations in 2009. On 6 September 2023, in Kunming Botanical Garden in Yunnan, the ex situ population of 28 individuals, planted in 2015, bloomed for the first time.

The seedlings of *M. ventii* used to establish this ex situ population were propagated from wild-collected seeds. In 2015, the diameter of the planted seedlings at ground level was 1.2–1.4 cm. In 2019, average plant height was 3.8 m and average ground diameter 7.3 cm, and in 2023 these measurements were 8.3 m and 15.0 cm, respectively. Although the seedlings experienced frost damage, *M. ventii* has grown well and has adapted to the Botanical Garden's weather conditions. In situ conservation of *M. ventii* has included reinforcement and reintroduction of populations and establishment of mini-reserves, and as a result of these integrated conservation efforts *M. ventii* was not included in the 2021 list of Yunnan protected Plant Species with Extremely Small Populations.

In the wild, *M. ventii* blooms during April–May. This blooming in Kunming Botanical Garden in September suggests that studies of the species' conservation genomics and ex situ conservation biology are required.

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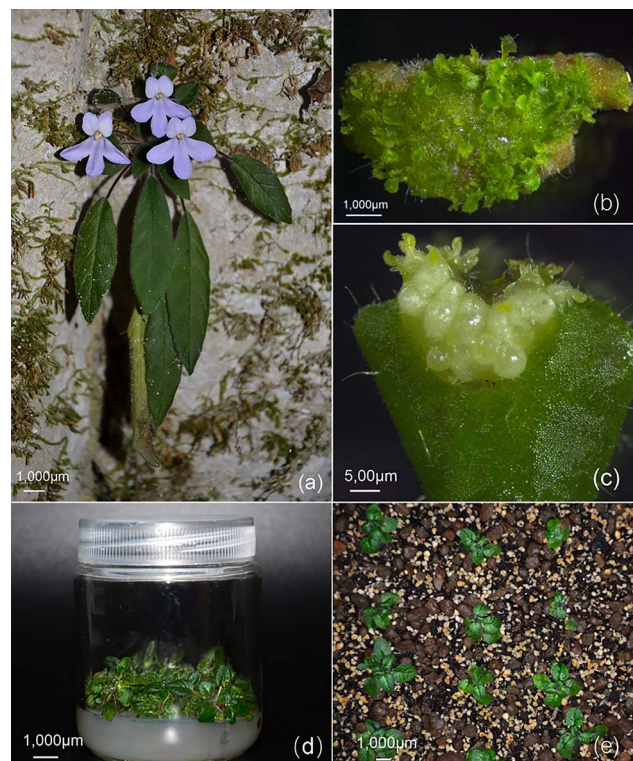
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Use of plant tissue culture to conserve the Critically Endangered *Petrocosmea grandiflora* in China

Petrocosmea grandiflora Hemsl. (Gesneriaceae) is a perennial herb endemic to China with large and beautiful bluish violet flowers of potential horticultural value. The first specimen of this species was collected in 1893 by British botanist Hancock in Mengzi County, Yunnan Province, and it was described by Hemsley in 1895, with the type specimen deposited at the Herbarium of the Royal Botanic Gardens, Kew, UK. For 121 years the species remained unseen until it was rediscovered in the wild in 2016. However, despite multiple field explorations only three populations have so far been found in the wild, with < 1,000 individuals in total. *Petrocosmea grandiflora* has been categorized as a Yunnan Key Protected Wild Plant, as a Plant Species with Extremely Small Populations in Yunnan Province, and as a Threatened Species of Higher Plants in China, and it should be categorized as Critically Endangered according to the IUCN Red List assessment criteria.

During September 2022–December 2023, with the support of a conservation programme (2021SJ14X-06) of Yunnan Forestry and Grassland Bureau, we successfully established an in vitro regeneration protocol using direct somatic embryogenesis and shoot organogenesis from leaf



(a) *Petrocosmea grandiflora* flowering in the wild; (b) adventitious shoot formation induced from one leaf explant; (c) somatic embryogenesis from one leaf explant; (d) seedlings growing on medium; (e) regenerated plantlets 3 months after transplanting.

explants of *P. grandiflora*. The explants were surface sterilized and inoculated on induction media. After 8 weeks, the regeneration rate of adventitious shoots was 98%, and the induction rate of somatic embryos was 53%. Three months after transplanting rooted plantlets, the survival rate was > 90%.

The successful regeneration of *P. grandiflora* using plant tissue culture opens up possibilities for restoring wild populations, although protection of the three known populations is also required. We plan to model the future trend of these populations to guide conservation efforts, and to use *P. grandiflora* as a germplasm source to study and cultivate new flower varieties for social and economic benefits.

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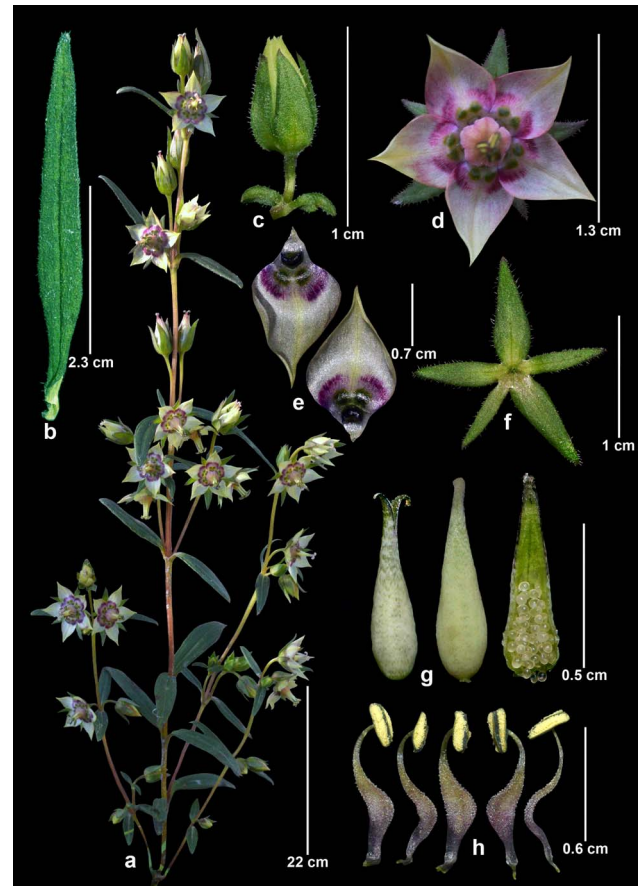
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Rediscovery of *Swertia dilatata* var. *pilosa* after 140 years

In India, the genus *Swertia* L. of the family Gentianaceae is represented by 36 species and 10 varieties, distributed mainly in temperate and alpine Himalayan regions but with a few species in the Western Ghats. The genus is highly valued for its medicinal importance and most of the species are known by the common names *chirayita* or *chiroto*. *Swertia chirayita* is a highly exploited species facing severe threats. With similar morphological appearance in their vegetative state, most of the allied species are also exploited from the wild and are thus threatened. Because of their complex taxonomy, limited data are available on the distribution of allied species, and only eight have been assessed for the IUCN Red List.





Swertia dilatata, which is closely allied to *Swertia purpurascens* and *Swertia paniculata*, is differentiated mainly on the basis of dilated stamen filaments. It was first described by C.B. Clarke from Nepal in 1883 along with a variety, *S. dilatata* var. *pilosa*. The two varieties can be differentiated by the greenish yellow corolla and glabrous leaf and calyx of *S. dilatata* var. *dilatata* and pale to purplish pink corolla and hairy leaf and calyx of *S. dilatata* var. *pilosa*. Variety *dilatata* is common, reported from the eastern Himalayas of India, Nepal, China and Myanmar, but variety *pilosa* has not been recorded since the type collection.



Swertia dilatata var. *pilosa*, showing (a) habit, (b) leaf, (c) flower bud, (d) flower, (e) corolla, (f) calyx, (g) stigma and (h) stamen.

In October 2023, during a field trip to the East Pindar range in Badrinath Forest division of Chamoli district, Uttarakhand, India, we collected a specimen of *Swertia* from the Deval region. We identified it as *S. dilatata* var. *pilosa*, the first record of this variety after 140 years and the first record in India. The specimen has been deposited in the herbarium of HNB Garhwal University, Srinagar (GUH).

We observed that unlike other species of the genus, *S. dilatata* var. *pilosa* is uncommon. We found only a few individuals, growing in semi-shaded localities of evergreen forest of *Cupressus torulosa* D. Don ex Lamb. We currently consider this variety to be Data Deficient but we are working on a full assessment for the IUCN Red List.

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