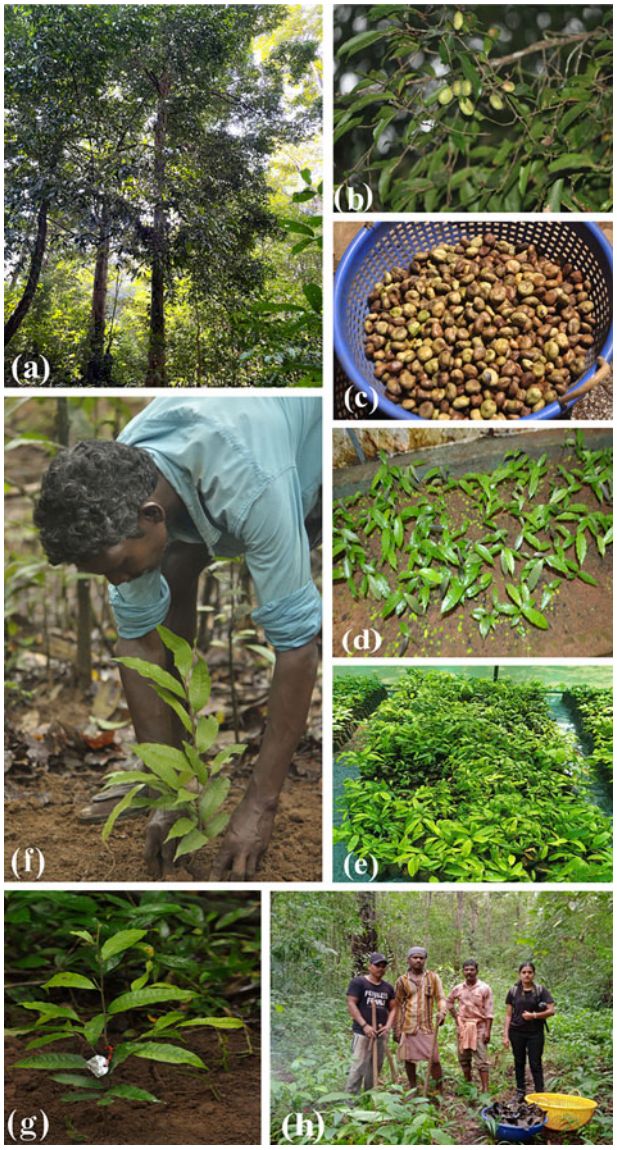
[3]*Monumento Natural da Serra das Torres, Mimoso do Sul, Brazil*

Conservation through restoration: the Endangered tree *Atuna travancorica* in the southern Western Ghats, Kerala, India

Conservation of threatened plants through restoration aims to re-establish or rehabilitate a species to a level at which it is no longer in danger of extinction. The tree *Atuna travancorica* (Bedd.) Kosterm. (family Chrysobalanaceae), known locally as Kallankaimaram, grows to 25 m in height and is endemic to the evergreen forests of the southern Western Ghats of Kerala and Tamil Nadu, India, at c. 400 m altitude. The fruits are consumed by mammals such as the palm civet *Paradoxurus hermaphroditus*, giant squirrel *Ratufa indica* and the Endangered lion-tailed macaque *Macaca silenus*, and birds such as the Vulnerable Malabar grey hornbill *Ocyceros griseus*. The tree flowers irregularly and has poor fruit set, seed predation is high and there are additional ecological constraints such as low population size, small extent of occurrence and poor natural regeneration. Because of its long dormancy period and poor seed germination, the species, which is categorized as Endangered on the IUCN Red List, is a challenge to cultivate.



Atuna travancorica: (a) habit, (b) fruiting branch, (c) harvested fruits, (d) germinated seedlings, (e) planting stock, (f–h) planting activities. Photos: S. Praveena.

We therefore developed protocols for seed propagation and seedling cultivation, including standardization of the optimum period for fruit harvest. Mature fruits were collected from Vazhachal forest in Thrissur District, Kerala, and seed germination experiments were conducted at the Campus nursery of the Kerala Forest Research Institute, Peechi. The seedlings produced as the result of the propagation and multiplication study were maintained in polythene bags, to be used as planting stock for restoration.

We were able to overcome dormancy by soaking seeds in a 1% hydrogen peroxide solution for 24 h. Nearly 1,000 seedlings were subsequently produced, 500 of which were transplanted in five forest locations (Vazhachal Forest, Sholayar, Kulathupuzha and Thamarassery Ranges, and Chimmony Wildlife Sanctuary) during the north-east monsoon months of October–November 2023. Monitoring of seedling survival is in progress.

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Rediscovery of *Swertia wattii*, a micro-endemic species of India, after 138 years

The genus *Swertia* L. is represented by nearly 168 species occurring mainly in temperate and alpine regions. In India, the genus is represented by 36 species, mainly distributed in the Himalayan region, and with few a species occurring in the Western Ghats. Nine species are endemic to India and have been recorded in only a few locations or have a restricted range.

Swertia wattii C.B. Clarke is a micro-endemic species reported from only a single locality. It was described by C.B. Clarke in 1889 on the basis of collections in October 1885 from Jakpho hill (also known as Mount

Swertia wattii flowering on Japfu hill in the Naga hills of Nagaland state. Photo: A. Srivastava.

Japfu) in the Naga hills of Nagaland state. Because of the lack of details available for this species it has sometimes been erroneously merged with the closely related *Swertia paniculata* Wall.

While working on the revision of genus *Swertia* L. in India, author AS surveyed localities in the Naga hills lying in Manipur and Nagaland states during 19 September–3 October 2023. On Japfu hill AS located a small population of *S. wattii* (LWG 119225) on a hill top at 3,024 m and on the adjoining slopes of Dzukou valley at 2,600 m. This is the first record of the species since 1885. The species is locally common on open hill slopes where it grows amidst the native dwarf bamboo *Sinarundinaria rolloana* (Gamble) C.S.Chao & Renvoize. We recorded the species in a total of 11 locations on Japfu hill and the adjoining Dzukou hills.

The main threat to the species is seasonal forest fires caused by anthropogenic factors, but it is also exploited for medicinal use, with the decoction used as a febrifuge. Our observations indicate that *S. wattii* is endemic to a narrow geographical area. A single stochastic event or any change in land use could result in a major depletion of the population.

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Conserving *Camellia mingii*, the golden-flower camellia endemic to Yunnan province in south-west China

The golden-flower camellias of the family Theaceae are threatened by overcollection of the flowers for making tea, digging up of the whole plant for use in landscaping, and habitat destruction. *Camellia mingii*, known only from Funing County, south-eastern Yunnan province in south-west China, was described in 2019. It is categorized as Endangered on the China Biodiversity Red List–Higher Plants of 2020 but has not yet been assessed for the IUCN Red List. The species is one of the second-ranked National Key Protected Wild Plants and one of the 101 target species in the Yunnan Provincial Conservation Action Plan for Plant Species with Extremely Small Populations (2021–2030).

From October 2020 to December 2023, we carried out field surveys in the type locality of *C. mingii* and in adjacent areas. We recorded a total of c. 500 mature individuals in three populations, none of which are within a protected area, and the habitat of one population has been degraded by cropping of the economically valuable spice *Amomum villosum*. With a narrow distribution range, limited number of individuals and a high risk of extinction as a result of anthropogenic activities, *C. mingii* requires urgent conservation attention.

We collected seeds of *C. mingii* in October 2021, and 125 seedlings have been propagated in Kunming Botanical Garden. The average height of these young plants is c. 45 cm, and we are now also trying to propagate the species by tissue culture. Our additional investigations show that the associated plant community of *C. mingii* includes 222 species and that *C. mingii* has low genetic diversity and a high inbreeding coefficient.

Camellia mingii blooming in the wild. Photo: Lei Cai.