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


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## Conservation of *Madhuca diplostemon*, a Critically Endangered tree endemic to the Western Ghats, India

*Madhuca diplostemon* (C.B.Clarke) P.Royen (Family Sapotaceae), a Critically Endangered tree endemic to the Western Ghats of India, was described by Robert Wight in 1848 and rediscovered after a hiatus of 184 years (Shailajakumari et al., 2020, *Rheedea*, 30, 383–387). It is known from a single mature individual in front of the Ayiravilli Sacred Grove temple near Paravur, Kollam district, Kerala, and < 30 saplings of 2–10 years of age within the Grove. As this species is not held in any ex situ conservation collections, Jawaharlal Nehru Tropical Botanic Garden and Research Institute, with financial support from the Kerala Forest Department, initiated a 2-year restoration programme for the species in November 2022.

The single mature tree faces several threats: the retaining wall and concrete paving tiles around the tree negatively affect its vigor, it displays early senescence of flowers as a result of heat stress, fruit set is low and fruits are predated by fruit bats *Pteropus giganteus* and birds. Furthermore,

as two deities are worshipped beneath the tree, the temple authorities do not allow collection of seeds directly. However, in 2020 we successfully raised seedlings from fallen fruits, of which one was planted on 5 June 2023 (World Environmental Day) by the Hon. Chief Minister of Kerala, Shri Pinarayi Vijayan, at the campus of the Government Model Higher Secondary School in Thiruvananthapuram as an initiative of the ex situ programme for the species. We are currently developing seed propagation techniques to safeguard this species. The seeds are recalcitrant but our germination studies show 70% success, and 80% following treatment with hot water.

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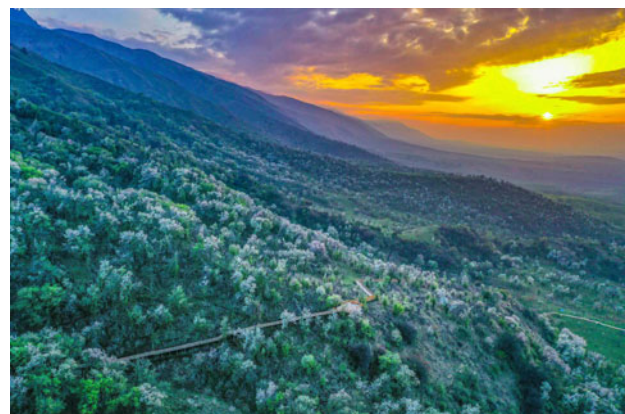
## Protection of degraded Wild Fruit Forest in Tianshan Mountains

Tianshan Wild Fruit Forest is a globally important gene bank of economic fruit tree resources such as apple, walnut, apricot and plum. These include National Key Protected Plants of China such as the Vulnerable *Malus sieversii* and Data Deficient *Prunus armeniaca*, *Prunus domestica* and *Prunus cerasifera*. Tianshan Wild Fruit Forest lies in Kazakhstan, Kyrgyzstan, and Xinjiang in China, the latter comprising c. 10,000 ha (40% of the total area of this Forest).

As a result of the impact of diseases and insect pests, climate change and human activities, Tianshan Wild Fruit Forest has experienced extensive degradation. To protect this important forest, the Ministry of Science and



*Madhuca diplostemon*, showing (a) habit of the single known mature tree, (b) fruiting twig, (c) seeds, (d) germinating seeds, (e) planting of seedling by the Hon. Chief Minister of Kerala, (f) seedlings, and (g, h) in vitro seed germination.



Restored Wild Fruit Forest landscape in Tianshan Mountains.

Technology of China granted funding for a National Key Programme (Ecological Conservation and Health Control Technology of Degraded Wild Fruit Forest on the North Slope of Tianshan Mountains) during 2016–2020, led by Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences, with the participation of 14 other organizations. This was followed by a SEE Foundation project (Conservation of Wild Apple in Tianshan Mountains) during 2021–2023.

In 7 years of research, the programme team has developed a system to artificially promote the wild apple population. As of May 2023, over 16,000 wild fruit tree seedlings have been successfully bred and planted in the Tianshan Wild Fruit Forest demonstration area. Currently, nearly 80% of the previously degraded wild fruit trees have begun to blossom and produce fruit, and the degraded wild fruit forest ecosystem has been extensively restored. In addition, this

programme has led to the construction of the Yili Botanical Garden and Biological Germplasm Resources Bank for arid areas, which will provide a home for development and utilization of wild fruit resources, and the establishment of a Transnational Germplasm Resources Conservation Area of Wild Fruit Forest in Central Asia.

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