

in pastoral economies that support employment (especially for youth), offering an alternative to lucrative illegal activities, are lacking. The ministerial conference called for investment in pastoral mobility (schooling, pastoral infrastructure) and integration of this in territorial planning/cross-border law enforcement; the proposed investment plans amount to USD 500 million over the next 5 years.

We recommend that conservation organizations develop partnerships with pastoralists in support of integrated landscape management, promoting mobility of livestock and wildlife. Governments should include transhumant representatives in security consultations, taking the lead on territorial planning while ensuring measured representation of pastoralists, and the international community should strengthen coordination across conservation, security and development sectors and ensure continuity of integrated financial and technical assistance.

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### Empowering conservation of the Critically Endangered tree *Buchanania barberi* through an education campaign

The eight species of the genus *Buchanania* (family Anacardiaceae) occurring in India are valued for their fruits, timber and medicinal importance, but as a result of utilization and other anthropogenic pressures several species are categorized as threatened on the IUCN Red List. *Buchanania barberi*, known as *malamavu*, is a small tree endemic to the South Western Ghats. It was previously known from only two mature trees in the Palode region (Dhyani & Anilkumar, 2017, *Oryx*, 51, 584), but in recent surveys we have located two additional mature trees in a school campus in Nanniyodu in South Kerala. Because of limited seedling production and developmental activities, *B. barberi* is categorized as Critically Endangered.

Jawaharlal Nehru Tropical Botanic Garden and Research Institute has received funding from the Mohamed Bin Zayed Species Conservation Fund, UAE, to conserve *B. barberi*. In March 2022 and February 2023, we conducted education campaigns about the species, engaging key stakeholders such as the Forest Range Office in Palode, the Kerala Forest Department in Thiruvananthapuram, three schools (Government high school, Jawahar Colony; Upper primary school, Karimancode; Government lower primary school, Karimancode), and the local communities








Conservation and education campaign for *Buchanania barberi*: (a) poster, (b) water bottle and mug, (c) bag, (d) seedling planting, (e) painting by Reema Abraham, (f) school awareness campaign.

residing near the species' natural habitat. Additionally, we collected seeds and initiated germination for seedling production (following the method of Dhyani et al., 2023, *Plants People Planet*, 5, 502–507).

To raise awareness effectively, we developed educational materials, including a poster highlighting the species' status, threats and conservation actions, and created water bottles, mugs and bags with conservation messages. Our sessions attracted c. 200 students (90 boys and 110 girls) and 50 local community members. These sessions, conducted in Malayalam, educated participants about the importance of conserving *B. barberi*, its identification and conservation status, threats to the species, propagation and potential interventions.

We also organized quiz programmes, with winners receiving awareness posters, mugs, bags and bottles, and students and teachers planted c. 15 *B. barberi* seedlings in their school grounds. The awareness materials have been shared with staff of the Royal Botanic Gardens, Kew, Royal Botanic Garden, Edinburgh, Oxford Botanic Garden & Arboretum, and Botanic Gardens Conservation International. A painting of *B. barberi* by Reema Abraham featured in the art exhibition *The Endangered—Can Art Save Them* organized by Art Impact International, USA.

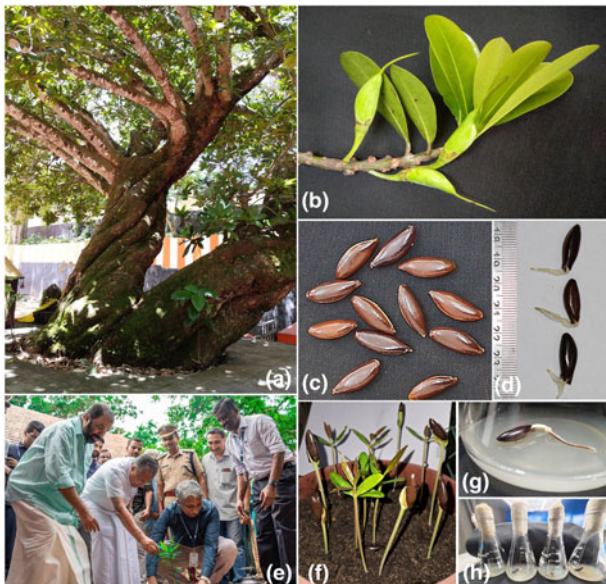
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## Conservation of *Madhuca diplostemon*, a Critically Endangered tree endemic to the Western Ghats, India







*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,



*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.

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



Restored Wild Fruit Forest landscape in Tianshan Mountains.