

Buchanania barberi, a Tree on the Edge of Extinction

Anurag Dhyani^{a,b,c}, KC Abinlal^a, S Bindu^a, Vincy K Wilson^d, S Suresh^a, ES Santhosh Kumar^e, C Anilkumar^a, and Megan Barstow^{b,f}

^aDivision of Conservation Biology, Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Thiruvananthapuram, Kerala, India; ^bGlobal Tree Specialist Group, Species Survival Commission, International Union for Conservation of Nature, Gland, Switzerland; ^cSeed Conservation Specialist Group, Species Survival Commission, International Union for Conservation of Nature, Gland, Switzerland; ^dDepartment of Ecology and Environmental Sciences, School of Life Sciences, Pondicherry University, Puducherry, India; ^eDivision of Garden Management, Education, Information and Training, Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Thiruvananthapuram, Kerala, India; ^fBotanic Gardens Conservation International, Richmond, United Kingdom

© 2021 Elsevier Inc. All rights reserved.

Introduction	1
Habitat and distribution in India	2
<i>Buchanania barberi</i>	3
Botanical description	3
Distribution and ecology	3
Seed storage and artificial propagation	3
Conservation status	5
Threats	5
Conservation actions by Jawaharlal Nehru Tropical Botanic Garden and Research Institute	5
Conclusion	7
Recommendations	7
Acknowledgments	7
References	7

Abstract

Buchanania is a genus of 25 tree species, in the family Anacardiaceae that is mostly distributed across Southeast Asia, East Asia and Oceania. India, boasts a high diversity of *Buchanania* species being home to eight species and one variety, of which just under half are threatened with extinction in the wild according to the IUCN Red List of Threatened Species. Of particular concern is *Buchanania barberi* Gamble. This tree is a narrow endemic from Kerala and is currently only extant in the region of Palode. In Palode, fewer than five individuals of the tree remain in an area of less than 5 km². In this locality, the species is threatened by road development and predisposed biological traits, which cause continuing decline in population size. Consequently, the species is assessed as Critically Endangered. Several conservation projects over the last few decades have aimed to increase the number of trees of the species in the wild, propagate individuals in ex situ collections and raise awareness for the identification and protection of the tree within local communities. It is essential that these conservation efforts, predominantly led by Jawaharlal Nehru Tropical Botanic Garden and Research Institute, continue in particular developing propagation protocols and planting methodologies for the species to ensure the species does not become extinct. This species broadly illustrates the plight that many tree species face globally and will hopefully become a success story that can be followed for other threatened tree species in India.

Introduction

The genus *Buchanania* belongs to the family Anacardiaceae, comprising of 25 species (Mabberley, 2008). It is distributed from India to Indo-China, Taiwan, Thailand, Malaysia, Southern China, Australia and the Pacific regions (Sosef et al., 1998; Jessup, 1985; Chandrasekaran, 2005). The majority of *Buchanania* species in these regions are found in lowland forests between 600 and 1000 m above sea level (m a.s.l.). However, a few species have been reported from an altitude of 1500 m a.s.l. in lower montane forests of Papua New Guinea. *Buchanania* species grow in diverse habitats from lowland forest to freshwater swamps. For example, *B. arborescens* occurs in lowland forest including limestone forest and beach, often in riverbanks (Soepadmo et al., 1996). *Buchanania sessilifolia* likewise is found in wet locations including freshwater swamps (Sosef et al., 1998). On the other hand, *B. lanzan* is found growing in barren and degraded rocky areas including salt affected soil in tropical and subtropical climates (Prasad, 2020).

The species of genus *Buchanania* consist of small to medium sized evergreen trees, but in some cases, i.e., *B. lanceolata*, trees may attain a height of 35–50 m. The trunk shows a straight growth pattern and remains branchless up to a height of 20 m and girth of 100 cm. The bark may be smooth, pock-marked, pale white to gray-brown or reddish-brown and produces a colorless or pink or grayish gum. The leaves are arranged in spiral manner. Generally, they produce axillary panicle inflorescence with small pentamerous whitish flowers having lobed persistent calyx, sagittate anther and superior ovary. They have a cup shaped disc and 4–6 carpels with a single ovule in each of them. Interestingly out of six, only one of the carpels is fertile. The style is very short and the stigma is oblique and truncate. Normally, trees flower once in a year, with the flowering season varying for the same species in different