

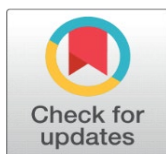
THREATS TO RHODODENDRON BIODIVERSITY IN INDIAN HIMALAYAN REGIONS

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ABSTRACT

The variety in biodiversity is a boon to human civilization by Mother Nature. Every aspect of this biodiversity from unicellular organisms to multicellular plants are important. India subcontinent being a land of diversity, has a rich resource of flora and fauna. The richness is also contributed by arising of great Himalayan Mountains. In this study, we are presenting a case where increasing human interference is affecting growth and development of a significant species called Rhododendron arboretum. The plant parts of Rhododendron arboretum is useful to mankind medicinally which is very well depicted in ancient and recent literatures.

Keywords: Biodiversity, Rhododendron Arboretum, IHR

1. INTRODUCTION

The Indian Himalayan Region (IHR) occupies a superior residence as a beautiful habitat for premier species of world. The ecosystem in IHR is composed of breakable regions but comprises of rich biological biodiversity not found anywhere in world. This rich biodiversity is a treasure and boon to humankind but due to many factors, it is facing a huge hazard. Himalayan region is the wealth of biodiversity and consists of diverse flora and fauna (One among hot spots of biodiversity). Around of the total

estimated out of assessed 8,000 species of diverse plants in region, around 3,160 are endemic and 450 species are endangered [Singh and Hajara \(1996\)](#)

One of the significant Himalayan species under threat is *Rhododendron arboretum*. The tree is established as State tree of Uttarakhand and Nagaland (Indian states in North and North-East regions). The genus *Rhododendron*, family Ericaceae, was founded by Linnaeus (1753). The genus has attractive and beautiful flowers and represented by 850 species in the world [Mabberley \(2008\)](#) *Rhododendrons* estimated with 1000 species globally, has widely grown ornamentals of great horticultural interest [Tiwari et al. \(2018\)](#) It has many superior characteristics for its wide acceptance as fuel, timber, fodder, and flowers. Leaves of plant possess anticephalalgic activity, while leaves and stem bark of plant has spasmolytic and lowers Blood pressure [Khare \(2007\)](#) Locals uses the preparation of leaf extract with bandage for treating high fever. Flowers are used in diarrhoea and dysentery [Khare \(2007\)](#) Juice from flowers is very common and a pleasant drink medicinal). *Rhododendron* sp. have been reported to capable conserve the water moisture at large amount in hill area maintains transpiration rate and humidity in regions with low rainfalls at higher altitudes [Chauhan et al. \(2017\)](#), [Bhattacharaya and Sanjappa \(2008\)](#) controls wind velocity, maintains slope of mountains [Bhattacharaya and Sanjappa \(2008\)](#) and are also beneficial in erosion control [Chauhan et al. \(2017\)](#)

The human race does not understand the threat, created by them for survival of this species. Their intrusion in the Himalayan region has reduced the natural population of the species. This is accompanied with actions like irresponsible harvesting heavily for fuel in regions of Northeast India [Paul et al. \(2018\)](#) The allelopathic effect of leaf or litter layer and other environmental condition (edaphic as well as climatic) are also responsible for poor regeneration of *rhododendron* species. Moreover, poor seed germination has also contributed to elimination of this lovely species [Singh et al. \(2008\)](#) The sapling of this plant is unable to overcome and survive in severe cold environments of mighty Himalayas. Though, these conditions are natural and cannot be succeeded by human intervention. This results in early death of saplings.

Some other factors contributing to early death of saplings are non-availability of sunlight on forest floor, closed canopy, and high litter accumulation rate [Facelli and Pickett \(1991\)](#), [Sundriyal and Sharma \(1996\)](#) These are major constraints for species development in a thick forest, where there are rare chances of sunlight reaching the forest floor. Hence, this removal of *Rhododendron* species during its reproductive cycles has been recognized as most prominent factor for its disturbed ratios. Thus, various human based, and human-induced factors have brought a paradigm of this overgrowing species to an endangered and rare category in IUCN Red data book.

Figure 1



Figure 1 Anthropogenic Disturbances Causing Habitat Degradation of Rhododendrons (a) Clear Felling and Logging and (b) Unsustainable Extraction for Fuel Wood

Source Paul et al. (2018).

CONFLICT OF INTERESTS

None.

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REFERENCES

- Bhattacharaya, D. Sanjappa, A. (2008). Rhododendron Habitats in India. J. American Rhododendron Society. 62(1), 14-18.
- Chauhan, D. S. Lal, P. Singh, D. (2017). Composition, Population Structure and Regeneration of Rhododendron arboreum Sm. Temperate Broad-Leaved

- Evergreen Forest in Garhwal Himalaya, Uttarakhand, India. *J Earth Sci Clim Change*, 430. <https://doi.org/10.4172/2157-7617.1000430>
- Facelli, J. M. Pickett, S. T. A. (1991). Plant litter : Its dynamics and effects on plant community structure. *Botanical Review*, 57(1), 1-32. <https://doi.org/10.1007/BF02858763>
- Khare, C. P. (2007). *Indian Medicinal Plants An Illustrated Dictionary*, Springerlink, Newyork, USA, 546. <https://doi.org/10.1007/978-0-387-70638-2>
- Mabberley, D. J. (2008). *Mabberley's Plant-Book. A Portable Dictionary of Plants, Their Classifications and Uses*, 2nd Edition, Cambridge University Press, Cambridge. 313-314.
- Paul, A. Khan, M. L. Das, A. K. (2018). Population structure and regeneration status of rhododendrons in temperate mixed broadleaved forests of western Arunachal Pradesh, India, *Geology, Ecology, and Landscapes*. <https://doi.org/10.1080/24749508.2018.1525671>
- Singh, D. K. Hajara, P. K. (1996). Floristic diversity. In *Biodiversity Status in the Himalaya* New Delhi : Britis Council. 23-38.
- Singh, K. K. Kumar, S. Pandey, A. (2008). Soil Treatments for Improving Seed Germination of Rare and Endangered Sikkim Himalayan Rhododendrons. *World J Agric Sci*. 4(3), 288-296.
- Sundriyal, R. C. Sharma, E. (1996). Anthropogenic pressure on tree structure and biomass in the temperate forest of Mamlay watershed in Sikkim. *Forest Ecology and Management*, 81(1-3), 113-134. [https://doi.org/10.1016/0378-1127\(95\)03657-1](https://doi.org/10.1016/0378-1127(95)03657-1)
- Tiwari, D. Sah, A. N. Bawari, S. (2018). Pharmacognostical Evaluation of *Rhododendron arboreum* Sm. From Uttarakhand. *Pharmacog J*. 10(3), 527-32. <https://doi.org/10.5530/pj.2018.3.86>