

*Rhododendrons  
from India*



## Introduction :

Rhododendron is a **genus** of spectacular ***dicotyledonous*** flowering plants distributed all over the world with the exception of north and south poles. The genus *Rhododendron* belongs to the family *Ericaceae* and was described by Carl Linnaeus in 1737 in *Genera Plantarum*. Most species have showy flowers, which bloom from late winter through to early summer. The rhododendron flowers have an enormous range of colour, shapes and size in their wild ranging forms and its horticultural values are internationally known.

## Diversity of Habit and Habitat :

The habitats of this plant are small shrub to very tall trees. It can be found in Terrestrial, lithophytic or epiphytic condition, mainly in tropical, temperate and subalpine zones. Most rhododendrons prefer acid soils with a pH of roughly 4.5 - 5.5. Rhododendrons prefer well-drained soils high in organic material.



In India the species of rhododendron is documented in the states of Arunachal Pradesh (61), Darjeeling Hills in West Bengal (12), Himachal Pradesh (1), Jammu and Kashmir (3), Manipur (5), Mizoram (3), Nagaland (2), Sikkim (36), Tamil Nadu (1), and Uttaranchal (3). In the Sikkim Himalaya Hills and Darjeeling Hills combined, ca. 10000 sq km) rhododendrons are found between upper temperate and sub-alpine zone (1600-3600 m msl).

## Hooker's Relation with Indian Rhododendrons :

Sir Joseph Dalton Hooker's tour of the Sikkim Himalaya between 1848 and 1850 unfold the rhododendron world of this area. Within the brief span that he travelled in Sikkim, he documented 34 new species and details of 43 species including varieties from the Indian region in his monograph entitled '*Rhododendron of Sikkim Himalaya*'. Since then many workers had added to the list and at present about 121 taxa have been recorded from India, out of which 117 (98%) taxa are distributed in the northeastern part of India.

## Diversity of Rhododendrons in Indian Region :

The genus *Rhododendron* occupies a very important place in the high altitude biodiversity in north-east India and comprises of almost 1024 species throughout the world mostly concentrated within a short area covering the highlands of Nepal, India and China (east of Yunnan and Sichuan) and Malaysia [1-3]. Based on literatures, field studies, herbarium collection, currently 121 taxa (73 species, 22 subspecies, and 25 varieties.) and 3 natural hybrids have been recorded from India, out of which 118 (98%, excluding 3 taxa, viz. *R. arboreum* subsp. *nilagiricum* South India, *R. colletianum* and *R. anthopogon* subsp. *Hypenanthum* from western Himalaya) are distributed in north-east India. The highest numbers of taxa is recorded from Arunachal Pradesh (106), followed by Sikkim (40), Manipur and

Nagaland (10), Mizoram (4) and Meghalaya (3). Twenty-one taxa are epiphytic (sometimes terrestrial), 28 taxa are medium size tree or shrub and the rest are small shrubs. The most widely distributed species in the region is *R. arboreum*.

### **Endemic Taxa :**

Endemism is a phenomenon of confinement of species to a small area beyond which their existence is not found. Endemic species indicates antiquity of its flora due to special condition of climate or microclimate in the ecosystem, and natural or geographical barriers around the area. Based on the recent study, 17 (13.8%) taxa of Indian *Rhododendron* are found to be endemic, out of which 16 (13%) taxa are endemic to northeast India. The maximum numbers of endemic taxa occurs in Arunachal Pradesh (9), followed by Manipur and Nagaland (with 6 taxa in each), and Mizoram, Meghalaya and Sikkim (with 2 in taxa each).

### **Major Threats :**

North-east India is inhabited by more than 200 tribes of different ethnic groups who live largely in the close vicinity of this rich biodiversity. Agriculture is the main occupation and many of these people practice 'jhum' or shifting cultivation to grow cereals, vegetables and fruits. In recent past, the rich floristic diversity of North-east India has been severely degraded. The increasing human population and the various anthropogenic activities couple with natural calamities are resulting to loss of habitats. The epiphytic (sometimes terrestrial) species with much less population in natural habitats is the most vulnerable group as the host trees are deforested rapidly in many areas. In the high altitude areas of Arunachal Pradesh, rhododendrons are indiscriminately cut for firewood by the local communities, military establishments and by the people constructing border road as it burns easily. These factors are contributing to the increasing rate of disappearance or extinction of rhododendrons from the natural habitat. The frequent forest fire during the dry season, particularly in Manipur and Nagaland, is another factor, which is threatening the species survival.

### **Rhododendrons and Their Use :**

Many of these rhododendron species have a major uses for the local people ranging from landscaping to making household goods, accent and woodland planting. The instance of country-made liquor from *R. arboreum* flowers may be encountered in the Singalila ridge in the Darjeeling Himalaya. The collection of *R. anthopogon* and *R. setosum* for incense purpose is an age-old custom. The tiny leaves of *R. nivale* have the fragrance that can be used for aesthetics.

*R. setosum* emits a strong aroma that causes painful headaches at high altitudes. The leaves could be distilled for aromatic oils with possible uses in perfumery and cosmetics. Apart from their aesthetic use worldwide, several species of Sikkim Himalayan Rhododendron have ethnic and ritual use. The leaves of *R. anthopogon* are mixed with those junipers to provide incense that is widely used in Buddhist monasteries.



*Rhododendron arboreum*

It is the national flower of Nepal where the flower is considered edible and enjoyed for its sour taste. The pickled flower can last for months and the flower juice is also marketed. The juice of rhododendron flower is used to make squash called burans (named after the flower) in the hilly regions of Uttarakhand. It is admired for its distinctive flavor and color.



*Rhododendron anthopogon*



*Rhododendron nuttallii*



*Rhododendron setosum*



*Rhododendron arunachalense*



*Rhododendron nilgircum*



*Rhododendron collettianum*

Rhododendron species are best known in floricultural industry worldwide for their beautiful flower and foliage. The species also have a great role in ecological stability of ecosystems, as indicators of forest health, and for their phonological sensitivity to climatic change.

In eastern Himalaya Rhododendron species concentration is found in Temperate to Sub alpine zones (1800-3500m MSL). Healthy population in this zone indicates their pollution free environment as well as less anthropogenic activity. So, it emanates as indicator of forest health. Sometimes long stretches of mountain slopes covered by Rhododendron scrub forests which prevent soil erosion, landslide etc. Due to annual snowfall and severe cold root systems are very well developed. So a stable habitat as well as retention of water by under growing mosses provide stable ecosystem in that particular area.

Particular temperature and day lengths trigger the flowering of Rhododendron plant. One can find the same species at lower altitude starts flowering little early in the year. When altitude increases the same species gives flower later period of the year. So due to climate change or destruction of forest the flowering and fruiting period of rhododendron species can be affected.



## Conservation of the Taxa :

Rhododendrons which are classified as rare, endangered and threatened may be wiped out in near future from the biota, if proper management and conservation initiatives are not taken up.

Considering the rich species diversity, economic potential and vulnerability, the genus *Rhododendron* requires urgent ***in situ*** and ***ex situ conservation***. *Creating public awareness of the importance of the species and establishing gene sanctuaries, national parks and biosphere reserves can bring about in situ conservation.* This can be achieved through local communities' involvement. Therefore, the involvement of the local population is very vital for any conservation measures as they are the people who use the forest in their localities. *Ex situ* conservation can be brought about by cultivating these species in gardens and parks under suitable climatic conditions in the region through seeds and vegetative cuttings or by *in vitro* tissue culture techniques.

Above all awareness campaign through school pedagogy and curriculum development with an emphasis on conservation and environmental ethics can go a long way in nurturing young minds toward eco consciousness and protection of trees.



Cover Page of Hooker's Book



*Rhododendron barbatum*



*Rhododendron hodgsoni*



*Rhododendron edgeworthi*



*Rhododendron barbatum*



*Rhododendron argenteum*

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