

The Natural Healer: Rhododendron

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Abstract

Rhododendron is a shrub with a woody structure and leathery broad leaves that belongs to the Ericaceae family. Standing 30 meters tall, this tree has different color flowers depending on the species, such as pink, red, white, and yellow. The rhododendron inflorescence is made up of a septical capsule, a superior ovary, clumped pollens, and appendage-free stamens. Rhododendron, being a temperate flowering plant, thrives in the cold and temperate climate of the Himalayan region. Currently 1,024 species are recorded all over the world. Rhododendrons consist of minerals such as manganese, iron, zinc, *etc.* Different parts of the Rhododendron plant contain different bioactive compounds, making all parts usable. In the united nations sustainable development goals (SDGs), good health and well-being come in 3rd place. Rhododendron has many medicinal uses, from curing asthma and hypertension to curing cancer. It helps in maintaining people's health by keeping a person fit and energetic.

Introduction

Rhododendron (*Rhododendron sp.*) is a beautiful flowering plant in Himalayan region in India. Rhododendron is a shrub (evergreen or deciduous) with a woody structure and leathery broad leaves, belonging to the Ericaceae family. It is known for its bright colored flowers (red, pink mainly) which are present in clusters. This temperate flowering plant abundant availability in Himalayan region make it as a national flower of Nepal. Whereas, among Indian states also declared pink rhododendron (*Rhododendron campanulatum*) as state flower of Himachal Pradesh, red rhododendron (*Rhododendron arboretum*) as state flower of Nagaland and, state tree of Sikkim and Uttarakhand. Apart from having beautiful flower and ornamental values this plant is also known for its medicinal, aromatic, and flavoring properties. Due to its diverse uses it holds a significant commercial value.



White Rhododendron



Red Rhododendron

Botanical Description: Rhododendron (Chromosome number X=13) is a woody shrub which grow in a tree like form. The height of the trees varies from small species 10-100 cm tall to large species which can be tall up to 30 m. Leaves are spirally arranged and leaf size range from 1cm to over 50 cm. They can be either evergreen or deciduous in nature. The flowers are present in large clusters and they possess aroma in some species. Flowers can be of different colors depending upon the species such as red, pink, white and yellow. Inflorescence of rhododendron consists of dry bud, septicidal capsule a superior ovary, clumped pollens and stamens with no appendages.

Climatic conditions: Rhododendrons are temperate flowering plant. They thrive in cold and temperate climate of Himalayan region. They generally grow at altitude ranging from 1500 to 5000 meters above the sea level. In India they are found mainly in Himachal Pradesh, Uttarakhand, Sikkim, and Nagaland. Rhododendron needs a temperature of 15°C to 20°C to bloom in month of March and April. But due to disturbance in climate from last few years 'early blooming' has been observed in the rhododendron in the winter months. High annual rainfall of the range 200mm to 1800mm and average annual temperature of 12°C to 17°C is necessary for optimum growth. Highly humid climate is ideal condition for growth of rhododendron.

Species and distribution: There are more than 1,024 species of rhododendron all around the world. Most of the species are native to Himalayan region and eastern Asia but few of the species are also found in North America and Europe. Various species of rhododendron are spread all around the globe out of which 132 taxa which include 80 species, 25 subspecies and 27 varieties are present in India. Sikkim and Darjeeling contribute to one-third i.e., 34% of total rhododendron species found in India. Red and pink rhododendron is found in abundance in India. For the state wise distribution of rhododendron in India Arunachal Pradesh is on top with maximum number of species (67 species) followed by Sikkim (36 species), Darjeeling (19 species), Nagaland (7 species), Manipur (5 species), Mizoram (2 species), Meghalaya (2 species), Uttarakhand (6 species), Himachal Pradesh (4 species), Jammu Kashmir (1 species). From Kerala and Tamil Nadu one sub species of rhododendron has also been reported recently.

Propagation: Propagation of rhododendrons is done by cuttings, layerings, grafting and seeds also. Layering and cutting are easiest methods and most widely used.

Harvesting: Flower of rhododendrons are collected depending upon weather conditions, elevation, flowering patterns. Flowers are harvested from March to June depending upon different factors. Sustainable harvesting practices should be followed for conservation of rhododendron plants. For this purpose, 60% flower should be harvested and 40% should be left on the trees. Harvesting of rhododendron flowers is done by climbing on trees or cutting the branches. For cut flower single stems should be cut separately. The flowers should be harvested carefully by hands in bamboo baskets.

Chemical constituents of rhododendron: Rhododendrol is a naturally occurring ingredient present in many plants, such as the Rhododendron. Rhododendrol also called 4-[(3R)-3-hydroxybutyl]phenol, is an organic compound with the formula C₁₀H₁₄O₂. The essential oil of *Rhododendron anthopogon* was investigated by Gas chromatography-mass spectrometry



Red Rhododendron (*Rhododendron arboretum*) tree

(GC-MS), and seventeen compounds (representing approximately 98% of the oil) were identified. The major components of the aerial parts of the oil were the monoterpenes α -pinene, β -pinene, limonene and the sesquiterpene δ -cadinene.

Composition of rhododendron arboreum: Rhododendron contains minerals such as manganese, iron, zinc, copper, sodium, chromium, cobalt, cadmium, molybdenum, nickel, lead and arsenic. Minerals play a vital role in maintaining certain physicochemical processes which are essential for life. Manganese, copper, selenium, zinc, iron and molybdenum are important co-factors found in the structure of certain enzymes and are indispensable in numerous biochemical pathways. Sodium is important in maintaining the osmotic balance between cells and interstitial fluids of our system.

Table 1: Bioactive compounds of Rhododendron

Sr. No.	Part of plant	Compounds
1.	Bark	Triterpenoida Ursolic acid acetate Ursolic acid acetate Leuco - pelargonidin
2.	Leaves	Glucosids Ericolin Ursoloc acid Quercetin Hyperoside Flavone glycosides Flavonoids
3.	Flowers	Quercetin -3-rhamnoside phenolic compounds rutin Coumaric acid

Medicinal uses of rhododendron: Rhododendrons have been used as traditional medicine for a wide variety of treatments, and rhododendron remedies may have promise in addressing inflammatory and autoimmune diseases. The dried leaves of *Rhododendron dauricum* generally known "Man Shan Hong" have been traditionally applied as folk medicines to treat fever, copious phlegm, asthma, acute and chronic bronchitis, sore throat, dysentery, diabetes mellitus, cancer, and hypertension. Rhododendron has antibacterial and anti-inflammatory properties. Thus, it helps keep your skin healthy and clear. Rhododendron juice is very beneficiary for relieving inflammatory diseases. It's a 550 ml bottle of pure buransh flower juice. It is very good for heart and liver health. Rhododendron (Buransh) squash is beneficial in blood pressure and asthma too. *Rhododendron arboreum* nectar is brewed to make wine and is effective in diarrhoea and dysentery. Snuff made from the bark of the tree is excellent cold reliever. Young leaves can be processed into paste and applied on the forehead to alleviate headaches.

Flavonoids, isolated from the leaves of *Rhododendron arboreum* were found to have potent antioxidant property, the plant *Rhododendron arboreum* have been reported for anti-inflammatory. There are various medicinal properties of *R. arboretum* were reported.

Conclusion

Rhododendron is a natural healer, as its name suggests. It has several health benefits. From giving clear and healthy skin to curing cancer and diabetes mellitus. Each part of the rhododendron helps in curing either this or that disease. The juice and nectar of rhododendron is very beneficial. It not only helps young people but also the elderly and old people to live a healthy and fit lifestyle.

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