

Taxus wallichiana: Endangered Medicinal Plant of Seraj Valley in Himachal Pradesh

Kalpna Thakur¹, Jyoti Chaudhary² and Rimpika Thakur³

^{1,2,3} Assistant Professor, College of Horticulture and Forestry, Mandi

(Dr YSP University of Horticulture and Forestry, Solan)



The Himalayan region has been a rich source of medicinal plants. Seraj valley in the Mandi district of the Himachal Pradesh is located in the middle Himalayas and has a large reserve with approximately 150 medicinal plants growing in abundance. The indigenous people rely on medicinal herbs that are abundant in the area for a variety of purposes, including fuel, fodder, thatching and shelter, medicines and household items. *Taxus wallichiana* which is one of the medicinal plant found in Seraj valley and is locally called as 'Rakhal' or 'Thuner' or 'Thuno' or 'Himalayan Yew' or 'Thoon'. It is a gymnosperm that grows in the Himalayas and is a small to medium-sized evergreen tree that grows to a height of 10 to 28 metres and is mainly associated with oak (kharshu) and silver fir species, rarely with spruce, deodar cedar, and oak (mohru) in the western Himalaya, and mostly associated with hemlock-spruce and rhododendron in the eastern Himalaya. This evergreen tree flowers from March-April and seeds ripen from September to November.

Locals in the Himalayan region have traditionally and extensively using this plant to treat a variety of ailments primarily because of its 'Taxine' a precursor to the natural chemotherapy drug 'Taxol' (also known as 'Paclitaxel'). The bark, leaves, and twigs are harvested for the commercial production of Taxol. The tree was initially harvested for its bark, but demand later shifted to its leaves, as it is a source of taxine, which is regarded by oncologists for the treatment of ovarian cancer as it is one of the most effective anticarcinogenic agents.

The plant's aerial parts are traditionally used to treat central nervous system diseases such as epilepsy, hysteria and nervousness. It has also been used as analgesic, antipyretic, antifungal and antibacterial. In addition, this species is also a source of 'Zarnab', a popular unani drug which is known to have sedative and aphrodisiac properties. The bark and leaves are used to treat asthma, bronchitis and insect bites. Its leaves are also used to make traditional herbal tea, which is used to treat

cough, cold, fevers, headaches, epilepsy and gastrointestinal problems by the local people. The paste made by bark is applied externally to treat headaches, joint pain, muscle pain and rheumatism. The branches of the trees are used for festival decoration as well as thatching for animal enclosure roofs.

As this species is notable for its excellent timber, the hard wood which is very durable and is used for furniture, to make ploughs, digging tools, knife handles, liquid containers and utensils. It is the preferred wood for window and door frames and also makes good planks for suspension bridges.

The extensive over-exploitation of the species by the locals for various purposes has resulted in unregulated collection, illegal trade and unscientific harvesting of the plant species, eventually leading to population decline and severe fragmentation. As a result, the plant is listed as 'Endangered' on the IUCN red list, with a continuous decrease in population. The plant is also listed on CITES and the Indian government's negative list of exports.

The other factors that are responsible for its decline involve poor germination, poor regeneration and low seed production, which may indicate the species is facing high extinction rate. The continuous grazing and browsing has a negative impact on its natural regeneration. Also, the avalanches in the Himalayan region lead to the loss of existing habitat of the species. The decline is continuing, and while the causes are mostly understood, they will not be reversed in many areas. Furthermore, slow initial growth hinders establishment and development in natural habitats. Because the young plants require shelter and deep shade, they do not thrive in areas where forests have been cleared.

Also, the encroachment on forestlands has reached alarming proportions and resulted in a decline in medicinal plant wealth. That is why there is a dire need of hour to conserve this endangered species from extinction in future. This may be achieved by trade regulations, sustainable collection and habitat

management. This will certainly reduce the pressure on its natural populations. Also, the periodic monitoring and conducting surveys across known and unknown natural habitats may prove beneficial.

The species is harvested from the wild form their natural habitats and it is necessary to promote the multiplication and cultivation of this species. Scientific techniques as well as social actions can be used to conserve this medicinal plants species. In India, there are no separate policies or regulations in place to protect medicinal plants growing in forests. The following laws such as The Forest Act of 1927, The Wildlife Protection Act of 1972 and the Wildlife Protection Amendment Act of 1991, Forest (Conservation) Act 1980, Environment Protection Act 1986, National Forest Policy 1988, National Biodiversity Act, 2002 enacted by the Indian government to conserve the forests.

Furthermore, the most cost-effective method is 'in-situ' conservation, which involves protecting and preserving a wild species in its natural habitat on a long-term basis at the genetic, species, and ecosystem levels. It includes gene banks and gene sanctioning, as well as biosphere reserves, national parks, sacred sites, and sacred grooves. The concept of creating a protected area network has become central to all policy decisions concerning biodiversity conservation at the national, international, and global levels. The other complimentary method of conservation in the Himalayan region that remains covered with snow include zero energy input based concept of paraforest conservation.

Many indigenous people worship it as it is believed to have religious or spiritual significance and is found growing near a temple, inside sacred areas or monastery. They believe that removing sacred trees will harm their families and because of these religious and spiritual beliefs, the conservation of such endangered plant species may benefit greatly from this protection. Despite widespread

exploitation, individual trees at sacred sites serve as a valuable gene pool for future conservation efforts.

The third most important conservation method is 'ex-situ' conservation that can be achieved by cultivating and maintaining plants in botanical gardens, parks, and other suitable sites, as well as long-term preservation of plant propagules in gene banks (seed banks, pollen banks, DNA libraries, etc.) and plant tissue culture repositories, and by cryopreservation. This could help to reduce the pressure on natural population growing in the wild. It is necessary to develop the tissue culture protocols for this endangered medicinal plant species and then to develop the avenue for the production of artificial seeds by encapsulating highly meristematic zone. Moreover, some governmental initiative in close association with local communities could be initiated to conserve and protect this endangered species.



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