



Conservation of Critically Endangered *Nardostachys jatamansi* DC



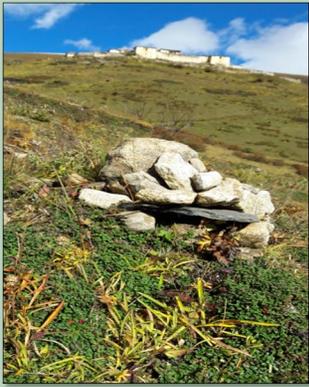
Recommendation

Further effective conservation, management and recovery of such critically endangered species requires deliberation through variability analysis as jatamansi showed variability within its habitat range (larger appearance on shrubland to smaller on grassland and smaller being favoured for intense smell). Sustainable harvest and grazing limit has to be estimated and understand the impact of current harvest protocol by periodic grazing and harvest destruction quantification. Non-destructive harvesting needs to be made aware to local people. Trade will have to be carefully examined subsequently as in recent years there has been a sudden influx of tourism in the meadows. This aspect is very critical, not only for their sustainable regeneration of the key resource in the long run, but also for the ecological stability of the ecosystem and propagation.

Urgent need is felt for national policy, law and regulation formulation owing to the fact that nearly 80% of the wild population has declined over the last decade in Himalayan region; and inclusion of the species in Schedule I of totally protected plant species is deemed necessary.

Acknowledgement

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Narostachys jatamansi DC in the backdrop of Lingzhi Dzong.

Common Name: Spikenard/ Jatamansi/ Pangpoe

Scientific Name: *Nardostachys jatamansi* DC

Distribution: Endemic to the Alpine Himalayas of Bhutan, South west China, India, Myanmar and Nepal. Known to occur in Thimphu, Haa, Paro, Bumthang, Chukha, Gasa, Samtse, Trashigang, Tashiyantse, Wangdue and Tsirang districts

Population Status: Critically endangered with more than 80 % of wild population in Himalayan region has declined over the last 10 years.

Habitat and Ecology: Steep rocky cliffs and grassy slopes, wet, moist and shady meadows. Random growth of the plant is seen in rock crevices, moist- shady places, steep undisturbed grassy slopes or on stones having coarse sandy loam soil, 40- 70° slope and elevation between 3000 and 5000 m amsl. Frequent on the western aspects.

Previous data from Lingzhi:

Widespread, 3824- 4664 m amsl., slopes of variable aspect, NE facing, Loam & sandy clay, medium pH, high to very high levels of organic matter, medium to high Ca & K, and variable levels of N.

Densities: 2.7 to 23.4 clumps/m²

Associates: *Bistorta macrophylla*, *Dactylorhiza hatagirea*, *Morina nepalensis*, *Onosma hookeri*, *Pedicularis flagellaris*, *Pterocephalus hookeri* & *Rhododendron anthopogon*.

Conservation Status: It is classified as critically endangered medicinal and aromatic herb by IUCN and included in CITES Appendix II, yet no such inclusion in Schedule I of Forest and Nature Conservation Act of 1995.

Conservation Need in Bhutan: *N. jatamansi* has wide range of uses owing to its several medicinal and aromatic properties, nevertheless overexploitation and grazing made the plant status crucial for immediate management intervention. Proper updated information regarding the species is lacking in Bhutan, especially with regard to ecological and habitat information, thereby creating huge lacuna in knowledge base. Such qualitative and quantitative inventory of the species is explicitly important for evolving long term conservation of the plant species.



Pangpoe on a slope

Current Research Findings of Habitat and Ecology of *Nardostachys jatamansi* DC. in Lingzhi

Associates: *Allium wallichii*, *Aster flaccidus*, *Bistorta macrophylla*, *Cassiope fastigiata*, *Cotoneaster microphyllus*, *Cyananthus lobatus*, *Dactylorhiza hatagirea*, *Gentiana urnula*, *Leontopodium jacotianum*, *Morina nepalensis*, *Onosma hookeri*, *Pedicularis punctate*, *Phlomis bracteosa*, *Potentilla flagellaris*, *Pterocephalus hookeri*, *Rhododendron anthopogon*, *R. setosum*, *Saxifraga moorcroftia*, *Selinum wallichianum*.

N. jatamansi showed the increasing trend of frequency as the progression of transects and altitude, randomly spreaded across its small prime habitat of altitudinal range of 3871 m to 4864 m amsl., mean density of 11.78 plants/m². The plant requires soil of higher moisture content, water holding capacity and nitrogen, acidic medium, SOC, slightly low to low P and K, sandy loam soil.

Average height of plants: 11.1 cm- 27.1 cm; taller the *N. jatamansi* more is length of rhizome and higher the number of shoot components; more the plant height and rhizome length, more is below ground biomass and above ground biomass; above ground biomass is generally lower than the corresponding below ground biomass, total biomass decreased up the elevation.

The slope of the suitable habitat for *N. jatamansi* escalated from 40° to 68° , the occurrence of the plant was on moist, open grassland and moist shrub land (dwarf rhododendron). The plant grows well in SE facing slope and the mixed vegetation of alpine shrub and grass with relatively moist area having moderate shade. Density is positively correlated to altitude, slope, aspect and vegetation type showing significance with slope.

Extensive grazing by yaks and horse along with the consequent human intrusion for plant harvest exhibited more pronounced habitat destruction.



Field photos