Nardostachys jatamansi DC. is at risk in the Himalayan region

Nardostachys jatamansi DC. or ‘jatamansi’ is a small, perennial, dwarf, rhizomatous, herb and the most primitive species within the family Valerianaceae (tribe Patrinaeae; Figure 1). This high-value medicinally active plant is distributed in the Himalayas from Pakistan, India, Nepal, Tibet and China between 3300–5000 m asl. The plant grows to a height ranging from 10 to 60 cm and has stout and long woody root stocks. But owing to overexploitation it has been listed as an endangered species.

This species is traditionally employed in the treatment of disorders, including those of the nervous, digestive, circulatory, respiratory, urinary and reproductive systems as well as skin problems. All parts of N. jatamansi are used and are effective antipyretics, antiseptics, anticonvulsants, antispasmodics, antibacterial, antipyretics, antifungals, antiemetic and analgesics. Essential oil (Spikenard oil) from the rhizome possesses useful biological activity and is used in 26 Ayurvedic preparations.

Due to overexploitation of rhizomes for medicinal and aromatic uses, habitat degradation and other biotic interferences, the species has been declared critically endangered and survival of the herbs is at risk\(^1\). Using available information, it is assumed that the causes of degradation are largely overexploitation and low regeneration in the natural habitats.

A reconnaissance done by a research team working at the High Altitude Plant Physiology Research Centre (HAPPRC) at Srinagar-Garhwal, Uttarakhand in the area, including Dayara, Hari Ki Dun, Kunwari Pass, Panwali Kantha, Tungnath, The Valley of Flowers, Bedni Bugyal, Rudranath, Madmaheshwar and others parts of the Garhwal Himalayas, reveals that only a few pockets of N. jatamansi are present in these regions today. In fact, the remaining intact patches are also decreasing rapidly due to invasion by several biotic and abiotic factors. Steady increase in human population, overexploitation of natural resources, extensive clearing of forests and grazing have been responsible for the loss of natural habitat. The causes of failure in regeneration include lack of

Figure 1. Naturally growing Nardostachys jatamansi.
Does the tiny mite matter? Revisiting invasive pest problem under global climate change scenario

Red Palm Mite (RPM), Raoiella indica Hirst (Arachnida: Acari: Tenuipalpidae) is a pest of coconut, arecanut, date palm and many other ornamental as well as commercial palm species. The mite establishes colonies on the under sides of leaves (Figure 1), usually along the midrib and feed on cellular contents of the leaves accessed through the leaf stomata. Feeding causes localized yellowing of the leaves followed by tissue necrosis. Symptoms on coconut leaflets start as small yellow spots on the abaxial leaflet surface, which develop into larger chlorotic spots.

The mite was first reported from Tamil Nadu, India about eight decades ago. It attained economic significance when it was first reported as an invasive species in the Caribbean. Later, the mite has spread widely throughout the Caribbean islands and has now been reported in Florida, Venezuela, Mexico, Brazil and Colombia.

RPM has a wide host range in New World than the Old World. In India, infestation has been reported on arecanut and coconut. The host list of RPM is extensive; according to the literature, prior to its introduction in the Caribbean, the mite was reported on Areca catechu and Cocos nucifera in India, Mauritius and Sri Lanka. Infestations on date palms (Phoenix sp.) have also been reported across the Middle East. In the invasive range, the hosts reported for RPM include members of the families Musaceae, Heliconiaceae, Zingiberaceae and Sterlitziaceae. Numerous hosts of the family Arecaceae are also reported, including those reported in the Old World. Since the introduction of the mite, more than 60 host plants were recorded from the Caribbean region alone.

In Kerala, a collaborative research programme by the Kerala Forest Research Institute and CABI-Europe, UK is ongoing to trace the population dynamics and the host range of the mite and its natural enemy complex. Growing concern about the pest is due to its rapid range expansion in subtropical regions and its possible invasion to other regions of the western hemisphere. It seems that tropical and subtropical countries are prone to attack and till date, the mite has been recorded from 35 countries. In many countries like the Dominican Republic, Guadeloupe, Puerto Rico, Saint Martin, Trinidad and Tobago, the US Virgin Islands, Granada, Haiti and Jamaica, the pest is considered as invasive and has a large impact on agriculture and biodiversity.