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NEED OF CONSERVATION & MANAGEMENT OF ENDANGERED PLANT SPECIES OF NORTH WESTERN HIMALAYAS- A REVIEW

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ABSTRACT

North Western Himalayan forests are the most important source of medicinal plants and with useful species for the local people of Himachal Pradesh (HP), India. Maximum medicinal plants were reported in the altitudinal zone, 2000-2800 m and decreased with increasing altitude. The present analysis was carried out on the upper hilly regions of HP for the ecological status of endangered medicinal plants, causes of their extinction and their management. Out of the total 457 medicinal plant species of HP, 60 plant species fall in the category of endangered plants, out of which 3 were critically endangered, 44 endangered and 13 vulnerable. This study can serve as baseline information on medicinal plants and could be helpful to further strengthen the conservation of this important resource. Regular monitoring of populations and habitats of threatened medicinal plants, restricted harvesting and habitat protection are suggested. Further, the native communities need to be made aware regarding the sustainable use and conservation value of the species of different genus.

KEYWORDS: Endangered, diversity, critical, status, conservation and management.

INTRODUCTION

The Indian Himalayan Region is a mega hot spot of biological diversity. It comprises about 18% of India, is more than 2,800 km long and 220 to 300 km wide, with altitudes from 200–8000 m (Anonymous 1992). The flora includes about 8,000 species of angiosperm (40% endemic), 44 species of gymnosperm (16% endemic), 600 species of pteridophyte (25% endemic), 1737 species of bryophyte (33% endemic), 1,159 species of lichen (11% endemic) and 6,900 species of fungi (27% endemic) (Samant *et al*. 1998). These include some 1748

species of medicinal plant with various traditional and modern therapeutic uses, 675 species of wild edible plants (Samant and Dhar 1997). So the Indian Himalayas are rich reservoir of plant diversity and medicinal plant diversity is an important component of that. Medicinal plants are used in the Ayurvedic, Unani and other traditional systems of medicine and in plant-based pharmaceutical industries. The Tibetan system of medicine is also based on Himalayan species (Samant *et al*. 1998). Due to specific climate, favorable geophysical conditions and temperate, the alpine plants of the Himalaya offer greater possibilities of having novel molecules and even largest quantities of active compounds (Dhawan, 1997). Presently, the herbal medicines also find market as nutraceuticals whose current market is estimated at about $80-250b in USA and also in Europe. Plant derived drugs constitute important monographs in German and Russian Pharmacopoeias. According to the World Health Organization (WHO), as many as 80% of the world's people depend on traditional medicine to meet their primary health care needs (Azaizeh, 2003).

Over-Exploitation of Medicinal Plants

But this richest reservoir of the biological diversity in the world is undergoing irrational extraction of wild, medicinal herbs, thus endangering many of its high value gene stock. Recent years have seen a sudden rise in the demand of herbal products and plant based drugs across the world resulting in the heavy exploitation of medicinal plants. Habitat degradation, unsustainable harvesting and over-exploitation to meet the demands of the mostly illegal trade in medicinal plants have already led to the extinction of more than 150 plant species in the wild (Singh and Rawat, 2011). More than 90% of plant species used in the herbal industries are extracted from the wild and about 70% of the medicinal plants of Indian Himalaya are subject to destructive harvesting (Dhar *et al.*, 2000) and the majority of these plants stems from sub-alpine and alpine regions of the Himalaya (Singh and Dey, 2005). Excessive anthropogenic pressures have been identified as the main causes of decline in the population and availability of the medicinal plants in the Himalayan region (Samant *et al*. 1998). With increasing demand and renewed global interest in traditional ethnopharmacy, coupled with the increasing preference for natural substances in the healthcare system, the natural stock of medicinal plants of Himachal Pradesh is under tremendous pressure (Samant *et al*. 1998).

Endangered plant species

Himalayan Forest Research Institute (HFRI), Shimla, HP, India and Institute of Indian

Council of Forestry Research and Education (ICFRE), Dehradun, UK, India started their focused attention towards research and developmental activities in the Medicinal Plants Sector in North-Western Himalayas since last decade. They conducted survey in different areas of cold deserts in Pooh sub division of district Kinnaur, Rakchham- Chitkul Wildlife Sanctuary, district Kinnaur, Renuka and Simbalwara Wildlife Sanctuaries, Kalatop Khajjiar Wildlife Sanctuary and Miyar Valley of the district Lahaul & Spiti of Himachal Pradesh and revealed that out of 457 plant species, 60 plant species fall in the category of endangered plants, out of which 3 were critically endangered, 44 endangered and 13 vulnerable. Critically Endangered species include *Aconitum heterophyllum, Dactylorhiza hatagirea* and *Saussurea obvallata* whereas *Acer caesium, Angelica glauca, Betula utilis, Dioscorea deltoidea, Jurinea dolomiaea, Meconopsis aculeata, Picrorhiza kurrooa, Podohyllum hexandrum, Polygonatum cirrihifolium, Rheum austral, Taxus wallichiana, Cinnamonum tamala, Paris polyphylla, Polygonatum verticillatum, Arnebia euchroma, Betula utilis, Datisca cannabina, Ephedra gerardiana, Hyssopus officinalis, Hyoscyamus niger, Juniperus polycarpos, Rheum moorcroftianum, Saussurea gossypiphora, Saussurea obvallata* and *Zanthoxylum armatum* etc. fall in Endangered category and Vulnerable species include *Aconitum violaceum, Bergenia stracheyi, Heracleum lanatum, Hippophae rhamnoides, Ferula jaeschkeana, Polygonatum verticillatum, Polygonatum multiflorum, Rheum webbianum, Rhodiola heterodonata, Rhododendron anthopogon, R.campanulatum* and *R. lepidotum*.

Need of Conservation

As one amongst the top repositories of medicinal herbs the state of Himachal Pradesh in Himalaya is one of the major sources of raw material to the global market. Unsustainable extraction of medicinal herbs has led to the endangerment of its several high value taxa. Currently the conservation of plant biodiversity in the Indian Himalayan region has become a major concern and more detailed studies on population structure and regeneration rates are needed to plan conservation measures. The traditional knowledge of plant species as medicine is fading rapidly and traditional health care systems are disappearing and the oral transmission of knowledge is clearly decreasing. Therefore, the knowledge of indigenous uses of native plant species needs to be studied before it gets extinct (Kaul *et al.*, 1990).

CONCLUSION

With regards to the ecological importance and population status of important ethnomedicinal species, there should be the preparation of micro plans for each important medicinal species,

including data on best harvesting practice and quantity to be harvested. Most of this data is unknown for most medicinal plants. Propagation of plants using tissue culture techniques and conventional methods to allow for their transplantation into natural habitats and role areas of the species will be an important step towards their conservation. Additional ecological studies, including population assessments using standard ecological methods are needed to effectively plan the conservation and management for threatened, rare and endangered species. The development of agro-production techniques for certain species of North Western Himalaya can help to meet the requirement of raw material for commercial use and reduce the pressure on the existing populations in natural habitats. International agencies such as the World Wildlife Fund (WWF) and United Nations Educational, Scientific and Cultural Organization (UNESCO) have to come forward and take some suitable initiatives that can be practically implemented for promoting research on ethnobotanical knowledge and the integration of people's perceptions and practices in resource management at the local level and for the conservation of threatened plant species.

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