

Conservation of Rare and Endangered Plant Species for Medicinal Use

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Abstract: *The special significance of medicinal plants in conservation stems from the major cultural, livelihood or economic roles that they play in many people's lives. Uses of Medicinal Plants as a traditional medicine are followed by around 80% peoples in the world. This is nowhere more so than in those remoter parts of the world where cultural and biological diversity tend to be most concentrated, and where medicinal plants can assume high importance in cultures and for livelihoods. India is marked as mega biodiversity regions over the world. Conservation and developing agro technologies on rare and endangered medicinal plant generate employment opportunity and income to farmer.*

Keywords: Conservation, Medicinal, Rare and Endangered species

1. Introduction

Medicinal plants participating remarkable role in primary health care of the peoples over the world. Forest is a main source for collection of the traditional medicinal plants. Presence of plant species in certain ecological areas is related to several ecological factors like water, temperature, light, pH etc. and also by various biotic factors. Plants aroma concentration in the various parts of the specific plants also affected by plant age, local environmental conditions etc. and is regulated by their own genetic makeup. Aromatic plants are not only a source of aroma but also marked for treatment of many disorders. A therapy used for treatment of specific disorder by utilizing these aromatic plants is Aromatherapy and is as old as the human civilization. This region marked for rich biodiversity with presence of rich plant diversity. Out of them many of the plants are registered as MAPs valuable among the peoples of different localities. Increasing population pressure, over exploitation, introduction of the new species, fire etc. are leading factors for endangerment of the MAPs which required for proper protection and conservation. Conservation not only provides protection of the species in certain ecological areas but it is also significant for providing chances to reproduces their own individuals as their parental ones. Plants efficiently performing as a major component for their role in primary health care in rural areas of the country.

2. Need for Conservation

India has a rich resource base of medicinal plants, plush with about 8,000 different species. According to the Government of India (GoI), traditional medicines are the sole means of health care for about 65 percent of the population. The medicinal plants are basic raw material for the production of Ayurveda and Unani medicines. The bulk of the raw material (about 80% of the demand) is derived from the forests only. Hence, the forest areas have been over exploited in the past to meet the requirement of the pharmaceutical and allied industries. Consequently, many of the important plant species have been threatened and some of them are on the verge of extension due to unscientific collection by untrained persons. In recent years, medicinal plants have also been gaining immense popularity not only

in developing countries but also in developed countries due to various well-known reasons like side effects of synthetic drugs. Therefore, the demand for the basic raw material has been further increased and forest areas are hardly able to meet this increasing demand of industries. In view of the aforesaid reasons, there is an urgent need to conserve and to propagate some important medicinal plants species so as to save them from extinction and also to ensure greater availability of raw material.

3. Conservation of rare and endangered plants:

In situ conservation

Most medicinal plants are endemic species, and their medicinal properties are mainly because of the presence of secondary metabolites that respond to stimuli in natural environments, and that may not be expressed under culture conditions. *In situ* conservation of whole communities allows us to protect indigenous plants and maintain natural communities, along with their intricate network of relationships. Additionally, *in situ* conservation increases the amount of diversity that can be conserved and strengthens the link between resource conservation and sustainable use. *In situ* conservation efforts worldwide have focused on establishing protected areas and taking an approach that is ecosystem-oriented, rather than species-oriented. Successful *in situ* conservation depends on rules, regulations, and potential compliance of medicinal plants within growth habitats.

Ex situ conservation

Ex situ conservation is not always sharply separated from *in situ* conservation, but it is an effective complement to it, especially for those overexploited and endangered medicinal plants with slow growth, low abundance, and high susceptibility to replanting diseases. *Ex situ* conservation aims to cultivate and naturalize threatened species to ensure their continued survival and sometimes to produce large quantities of planting material used in the creation of drugs, and it is often an immediate action taken to sustain medicinal plant resources. Many species of previously wild medicinal plants cannot only retain high potency when grown in gardens far away from the habitats where they naturally occur, but can have their reproductive materials

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selected and stored in seed banks for future replanting. India has the rich sources of raw materials like Amalaki (Amla or Indian gooseberry), Ashwagandha, Sarapagandha, Alalekai, Piper longum, Amrutaballi, *Sida Cordifolia*, Brahmi, Glory lily, Andrographis, Tinospora cardifolia, Adathoda vasica, Brinjal, *Curcuma longa*, *solanum species*, Safed musli, Black musli (*Curculigo orchoides*), Cassia senna, Periwinkle and Arjuna etc., though India is rich in Biodiversity, we are failing in production of these crops in large scale due to lack of herbal material for their production of high quality drugs so it is high time to educate the farmer and create awareness regarding cultivation of medicinal plants in large scale is the immediate need.

4. Roles for medicinal plants in conservation

The need for co-ordinated conservation action, based on both in situ and ex situ strategies; inclusion of community and gender perspectives in the development of policies and programmes; the need for more information on the medicinal plant trade; the establishment of systems for inventorying and monitoring the status of medicinal plants; the development of sustainable harvesting practices; encouragement for microenterprise development by indigenous and rural communities; and the protection of traditional resource and intellectual property rights.

Because so many species of plants are medicinal, medicinal plant conservation is, in some ways, a microcosm of plant conservation as a whole. Similar questions arise concerning

identification of the most significant issues and most effective approaches. This is especially so given that, just because a species has been used somewhere medicinally, it does not follow that it is so used everywhere and at all times. In such cases, the challenges facing conservationists are similar to those encountered with other groups of plants singled out by 'plant conservationists' as special, for example because they have been classified by scientists as 'endangered', but which lack any special significance to other people.

Working effectively with communities requires conservationists to have an appreciation of the cultures, economies, social structures and dynamics of local societies, in addition to the knowledge that they need about the biology and ecology of the plants themselves. Similar 'lateral engagement' is also necessary for work with other classes of people involved with medicinal plants. For example, the main concerns of conservationists about manufacturers are likely to revolve around questions of the effects of their patterns of obtaining raw materials on the environment. However, manufacturers will often be more interested in other aspects of product quality than biological and ecological sustainability, especially those relating to quality control that involve species authentication, presence of active constituents, limitations to heavy metal content, and residues of pesticides and fertilisers. Conservationists working with manufacturers need to understand these facts of the business, just as they need to understand those of village life when working with communities.

Table 1: Importance of Medicinal Plants in tradition Medicine

Scientific name	Family	Bioactive Compounds And Medicinal Properties
<i>Acmella oleracea</i>	Asteraceae	Spilanthol, thoothpaste, snakebite, flu, diuretics, digestive, antifungals, antiscorbutic.
<i>Annona muricata</i>	Annonaceae	Anonaine, suppurative, febrifuge pain and pus from ulcer, Insecticidal, astringent, anticancer.
<i>Anisomeles malabarica</i>	Lamiaceae	Anisomelic acid, anisomeloloid, Anti-allergic, Anti-anaphyactic, Anti-bacterial, Anti-carcinogenic.
<i>Argyreia nervosa</i>	Convolvulaceae	Lysergamide alkaloids, Argyreioside, Anti-inflammatory activity, Appetitiser, Aphrodisiac, Cerebral disorder
<i>Aristolochia bracteata</i>	Aristolochiaceae	aristolochic acids and esters, aristolactams, Anti-Bacterial Properties, Anti-Fungal, Anthelmitic, Anti Pyretic Properties,
<i>Boerhaavia diffusa (white)</i>	Nyctaginaceae	glycosides, alkaloids, flavonoids, tannins, , anti-inflammatory, anti-oxidant properties, tones and balances the liver (hepatotonic).
<i>Caralluma fimbriata</i>	Apocynaceae	Glycosides, tannins, flavanoids, hepatoprotective, anti-inflammatory, antiobesic, anticancer, antioxidant antifungal and also used to check wounds healing.
<i>Centella asiatica</i>	Apiaceae	Saponins, antidepressant, antiepileptic, cognitive and antioxidant properties, antinociception and anti-inflammatory.
<i>Centratherum punctatum</i>	Asteraceae	Antimicrobial and antioxidant of possible use in medicine.
<i>Coccinia Indica</i>	Cucurbitaceae	Triterpenes; stimulation of glycogen synthetase activity Triterpenes; stimulation of glycogen synthetase activity Triterpens, stimulation of glycogen cynthetase activity.
<i>costus speciosus</i>	Costaceae	Tigogenin and diosgenin from rhizomes, Anticholinesterase, anthelmintic, antiinflammatory, analgesic and antipyretic activities.
<i>Cissus quadrangularis</i>	Vitaceae	Quadrangularin-ABC, Bone healing activity, Antioxidant and free radical scavenging activity, Analgesic and Central nervous system activity.
<i>Commiphora caudata</i>	Burseraceae	The bark and leaves yield a gum-resin which is used to prepare medicines in southern India. An extract of the stem bark has been found to possess antiviral properties.
<i>Curcuma longa</i>	Zingiberaceae	Curcumin, protects the liver, Anti-cancer, joint and muscular pain and Anti-disease.
<i>Dioscorea villosa</i>	Dioscoreaceae	Saponins, Insomnia, migraines, rheumatoid, arthritis, progesterone and liver ailments.
<i>Eriolaena hookeriana</i>	Sterculiaceae	Recovery from heat strokes during summer.
<i>Hemidesmus indicus</i>	Apocynaceae	Hemidesminine, coumarino, Antiarthritic, Antidiarrhoeal, Antileprotic, antisyphilitic, anti-leucorrhoeic, galactogenic Antioxidant, refrigerant and tonic action.
<i>Gloriosa superba</i>	Colchicaceae	Colchicine, gloriosine, Anti-arthritis, Anti-gout, Analgesic, Muscle relaxant, antispasmodic and Anti-periodic.

<i>Gymnema sylvestre</i>	Apocynaceae	Gymnemic acids, gymnemasaponins, Antidiabetic, Antiarthritic, Immunomodulation, antibiotic and antimicrobial.
<i>Lagerstroemia filosteginae</i>	Lythraceae	Lageracetal, ellagitannins ,hypoglycaemic activities, purgative, considered astringent, stimulant and febrifuge.
<i>Leonotis nepetifolia</i>	Lamiaceae	Leonurine, leonuride, Rheumatism, Hernia ,Diabetes and hepatitis and Antimalaria.
<i>Mortynia annua</i>	Martyniaceae	saponin, glycosides, anthocyanins, asthma, itch and aczema, respectively. Antiandrogenic/antifertility, Whitening agent and Alexiteric.
<i>Mimosa pudica</i>	Mimosaceae	Mimosine, regeneration of sciatic nerve, Antidepressant action, Anticonvulsant action, hyperglycemic effect, The juice is used in sinus, sores, piles, and fistula, paste is applied to glandular swellings and hydrocele.
<i>Oroxylum indicum</i>	Bignoniaceae	Chrysin, baicalein , antiinflammatory, antimicrobial, antioxidant, anticancer, antimutagenic, photocytotoxic, antiarthritic, immunostimulant, hepatoprotective, antiproliferative, bitter tonic and stomachic.
<i>Spilanthes acmella</i>	Asteraceae	Spilanthal, antimalarial, antiseptic, anti-bacterial, adaptogenic, toothpaste, lithotriptic, antiscorbutic and lagogine.
<i>Tylophora indica</i>	Asclepiadaceae	Tylophorine, Tylophorinine, asthma, jaundice and inflammation. It has antitumor, immunomodulatory, antioxidant, antiasthmatic and muscle relaxant.
<i>Urena lobata</i>	Malvaceae	Kaempferol , Urease, treat bowel complaints, especially colic, stomach-ache, diarrhea, dysentery, persistent fever from malaria, diuretic, emollient, refrigerant, styptic and vulnerary.
<i>Vitex negundo</i>	Lamiaceae	Casticin, isoorientin , rheumatism and inflammations of joints, expectorant, vermifuge, tonic, febrifuge, antifungal and antibacterial.
<i>Vitex peduncularis</i>	Lamiaceae	Vitexin, Infusion of leaves and bark used in malarial and black water fevers.

5. Conclusion

Present article deals with the conservation and importance of the rare and endangered medicinal plants. It is an effort for their rapid propagation as well as for their *ex-situ* conservation in Herbal Garden. Current study aimed for the collection/Propagation of the diverse Medicinal plants including underground Medicinal plants. Among the introduced Medicinal plants some are endangered need for urgent protection and conservation. Not only in India also all over in the World Medicinal Plants (MPs) are useful for treatment of various disorders and are prime sources of traditional medicine. Demands of Medicinal Plants (MPs) are increasing day by day due to rich capacity for treatment of certain disorders and also their less or no side effect. And also conservation and cultivation of rare and endangered medicinal crops can be treated as an alternative income generation source for the rural unemployed without hampering their ongoing income generating activities. Compared to other crops, medicinal crops cultivation requires less attention and expenditure and can be successfully adopted by the cultivators. By doing so, we will not only be able to conserve the precious wealth of medicinal plants but also we will achieve the goal of conserving the rare and endangered species, which are threatened, and at the verge of extinction. In this regard, CIMAP and ICAR institute play an important role in conserving rare and endangered medicinal species and developing agro technologies and market linkages to farmer in order to extend the area and generate income to the farmer.

References

[1] B.R. Rajeswara Rao (2016) Springer International Publishing Switzerland,), M.R. Ahuja and S.M. Jain (eds.), Genetic Diversity and erosion in plants, Sustainable Development and Biodiversity 8, pp 357-407.

- [2] Gepts P. 2006, Plant genetic resources conservation and utilization: the accomplishments and future of a societal insurance policy. Crop Sci. :46:2278–92.
- [3] Forest F, Grenyer R, Rouget M, Davies TJ, Cowling RM, Faith DP, Balmford A, Manning JC, Proche S, Bank M, Reeves G, Terry AJ, Savolainen V. 2007, Preserving the evolutionary potential of floras in biodiversity hotspots. Nature.;445:757–60.