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### Wealth of medicinal flora in Andhra Pradesh: A comprehensive review on policy development for conservation and sustainable production

**Thanuja Sivaram G, K Giridhar, Sivarama Krishna VNP, Yuvaraj KM and Ramakrishna M**

#### Abstract

The state of Andhra Pradesh has a rich variety of habitats including agricultural areas (60%), forests (20%), wastelands (10%), water bodies and wetlands (7%). Out of the 32 medicinal plants prioritised by AYUSH, 21 medicinal plants growing in the state. However, 318 plants were reported to be in common use in various ethnomedicinal systems. *Aegle marmelos*, *Andrographispaniculata*, *Asparagus racemosus*, *Bacopa monnieri*, *Coleus barbatus*, *Commiphora wightii*, *Embeliaribes*, *Emblica officinalis*, *Garcinia indica*, *Gloriosa superba*, *Gymnema sylvestre*, *Ocimum sanctum*, *Phyllanthus amarus*, *Piper longum*, *Plantago ovata*, *Rauwolfia serpentina*, *Santalum album*, *Saracaasoca*, *Solanum nigrum*, *Tinospora cordifolia* and *Withania somnifera* are important medicinal plants that are grown in the state. Out of the 586 medicinal plants surveyed in Andhra Pradesh by FRLHT, 110 species are identified as threatened (19 % of the surveyed plants) and needs immediate measures for conservation and protection. Though, there is no comprehensive idea of the total medicinal flora of Andhra Pradesh and the information regarding species becoming extinct or on the verge of extinction in the state. Most of the medicinal plants raw material collection (nearly 90%) is through the practice of wild collection. The foremost strategy is to develop a comprehensive database of the medicinal species of the state with appropriate habitat, past and present distribution, climatic and soil requirements, ecology, taxonomy, botany and herbarium, commercial importance, window of collection and method of collection, practices of exploitation in the wild, phytosociology, conservation need and ethnomedicinal importance of the plant.

**Keywords:** conservation, flora, sacred, ethno medicinal

#### Introduction

Andhra with thirteen districts, i.e. East Godavari, Guntur, Krishna, Nellore, Prakasam, Srikakulam, Vizianagaram, Visakhapatnam and West Godavari, Anantapur, Chittoor, Cuddapah and Kurnool, is mostly blessed with favourable environmental conditions for the growth of medicinal plants wildly, several medicinal plants spread across the road ways naturally and about 90% of medicinal plant used by the industries are collected from the wild. While over 800 species are used in production by industry, less than 20 species of plants are under commercial cultivation. Out of a total number of 2586 species estimated about 1800 species are found to be medicinal plants in Andhra Pradesh They are of different habits i.e. herbs, shrubs and trees which are nothing but nature's gift to human beings. In Andhra Pradesh, vegetation cover occupies 23.03% of the total geographical area of 275, 068 sq. km (Reddy *et al.* 2008) [2]. The forests in the State are broadly classified into Dry deciduous, Moist deciduous and Semi-evergreen types. Besides, there are mangroves, other subsidiary and serial types spread over limited areas (Reddy, 2007) [1].

Continuation and strengthening of both AYUSH and folk systems of medicine is dependent on continuous availability of quality plant based raw material. Out of a total number of 2586 species estimated about 1800 species are found to be medicinal plants in Andhra Pradesh, they are of different habits i.e. herbs, shrubs and trees which are nothing but nature's gift to human beings (FRLHT, Bangalore).

Out of the 32 medicinal plants prioritised by AYUSH, 21 medicinal plants are growing in the state. However, 318 plants were reported to be in common use in various ethnomedicinal

systems. *Aegle marmelos*, *Andrographis paniculata*, *Asparagus racemosus*, *Bacopa monnieri*, *Coleus barbatus*, *Commiphora wightii*, *Embelia ribes*, *Embllica officinalis*, *Garcinia indica*, *Gloriosa superba*, *Gymnema sylvestre*, *Ocimum sanctum*, *Phyllanthus amarus*, *Piper longum*, *Plantago ovata*, *Rauvolfia serpentina*, *Santalum album*, *Saraca asoca*, *Solanum nigrum*, *Tinospora cordifolia* and *Withania somnifera* are important medicinal plants that are grown in the state. There are six Medicinal Plants Conservation Areas in Andhra Pradesh respectively in six districts promoted by FRLHT. Most of the medicinal plants raw material collection (nearly 90%) is through the practice of wild collection. Out of the 586 medicinal plants surveyed in Andhra Pradesh by FRLHT, 110 species are identified as threatened (19 % of the surveyed plants) and needs immediate measures for conservation and protection.

### Conservation of medicinal plants: A need...

#### a. Traditional conservation strategy

The concepts of sacred groves, sacred species and sacred landscape in India symbolize the traditional ways of safeguarding the important biological resources including medicinal plants (Sajwan and Kala, 2007) <sup>[3]</sup>. Several medicinal plant species are symbolized as sacred species. Many sacred medicinal plant species have low population size like, *Ficus benghalensis*, *Saussurea obvallata*, *Dactylorhiza hatagirea*, *Saussurea simpsoniana* and *Ocimum sanctum* etc. Some sacred groves have representative taxa that are known by the location *Pterocarpus santalinus*, and *Shorea tumbagaia* are found in the sacred groves of Chittoor district while *Decalepis hamiltonii*, *Indigofera barberi*, *Kaempferia rotunda* and *Zingiber roseum* are recorded from Kurnool district. Hence, there is a general fear in indigenous communities towards the over-exploitation of such medico-religious plant species. Such a traditional belief in the society is a way of conserving the useful natural resource for future generations.

#### b. Modern conservation strategy

##### i. Develop a comprehensive database of the medicinal species of the state.

This database of medicinal plants helps in building strategies for human adaptation of these crops under scientific management. A particular strategy of importance is the identification of agro-climatological zones and specific areas suitable for their cultivation as these are neophytes in cultivation. Huge effort is needed for collection and in-situ conservation of the germplasm to prevent genetic erosion of these species. Detailed documentation on biotic and abiotic factors is also needed for successful conservation efforts. It is also required to monitor and generate reports on collection to market chain to processing for understanding the demand and supply mechanism for each medicinal plant under exploitation. This will help prioritization of human adoption of new crops under cultivation. Regarding the threatened medicinal plants, there is an immediate need to develop repositories of germplasm under suitable habitats to preserve these plants for posterity.

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and to suggest policy measures for conservation and habitat preservation. The recent red list of medicinal plants from Andhra Pradesh was published in 2001, there was no information subsequently, thus new survey needs to be taken up to add the new species being threatened in to the list. Further, there is a need for development of precise materia medica for the medicinal flora is needed for ready reference. There is also a great need for popularizing the scientific cultivation of the crops already under adaptation.

#### ii. International treaties: CITES & CBD

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between governments, which ensure that international trade does not threaten the survival of wild animals and plant species. In India, 9 important medicinal plant species have been identified and placed in CITES list in order to prohibit their illegal trade across the borders. These species are *Aquilaria malaccensis*, *Dioscorea deltoidea*, *Nardostachys jatamansi*, *Picrorhiza kurrooa*, *Podophyllum hexandrum*, *Pterocarpus santalinus*, *Taxus wallichiana*, *Rauvolfia serpentina* and *Saussurea costus*. Identification of agro-climatological zones and specific areas suitable for their cultivation as these are neophytes in cultivation.

Convention on Biological Diversity (CBD) recognizes the contribution of local and indigenous communities to the conservation and sustainable utilization of biological resources and provides equitable sharing of benefits with such people arising from their traditional knowledge which includes knowledge on medicinal plants.

#### c. National policies

##### In-situ conservation and Ex-situ conservation

To conserve the medicinal plants biodiversity, in-situ and ex-situ conservation are more reliable and economical. Regarding the threatened medicinal plants, there is an immediate need to develop repositories of germplasm under suitable habitats to preserve these plants for posterity. A mandatory quinquennial survey should be initiated by the government under the aegis of State Agricultural Universities/other universities to monitor erosion of medicinal plants in their natural habitats, to update the IUCN Red list and to suggest policy measures for conservation and habitat preservation. The recent red list of medicinal plants from Andhra Pradesh was published in 2001, there was no information subsequently, thus new survey needs to be taken up to add the new species being threatened in to the list.

#### Suggestions for sustainable production

##### a. Farming strategies

Rare species banned for collection from the wild should be taken on priority for cultivation. Integrating shade tolerant medicinal plants as lower strata species in multistrata cropping system, Cultivating short cycle medicinal plants as intercrops in existing stands of perennial crops & growing medicinal trees as shade providers and boundary markers. Assured markets, profitable price levels, supportive govt policies etc need to be emphasised. Further, there is a need for development of precise materia medica for the medicinal flora is needed for ready reference (Kala, 2009) <sup>[4]</sup>.

##### b. Establishment of MPCA's

The establishment of Medicinal Plants Conservation Areas (MPCA) in various states could be a step forward in conserving medicinal plants and also in mitigating the

conflicts between conservationists and various user groups (Kala, 2000) <sup>[4]</sup>. The MPCA may ensure the autonomous development of a rural community by enhancing the people's income. This way they can decide themselves how to use their assets and resources, for which market they wish to produce, and by which services they need to achieve their goals. It also enables them to restore resources depleted by overuse, assume the long term supply of resources, regulate national and international trade by assuring a continuous supply of quality material, and ensure the conservation of not only the species concerned but also its associated species and ecosystems (Kala, 2006) <sup>[5]</sup>. The MPCA's identified in A.P.

MPCA	District	No. of medicinal plant species
Maredumilli	East Godavari	159
Coringa	West Godavari	21
Lankapakalu	Visakhapatnam	154
Peddacheruvu	Kurnool	186
K.Kuntlapalli	Anantapur	229
Talakona	Chittoor	176

### Discussion

Safe guarding of the gene pool of these rare, threatened and vulnerable species found should be done and their propagation should be done. Measures like preparing seed balls of rare plants and dispersing them in different areas, adopting stem cutting techniques, uprooting of huge trees which obstruct road ways and planting them in other regions, techniques like micro propagation etc. should be followed for their conservation. Afforestation should be encouraged in a wide range. Support should be given to the farmers who cultivate medicinal plants. It is the need of the hour to conserve these species.

### Conclusions

High priority to be accorded to in-situ conservation as well as resource augmentation of medicinal plant species in high volume trade, being obtained wholly or largely from the forests and the state forest departments be supported to undertake these tasks. Immediate assessment of the status of wild populations of medicinal plant species in high consumption, which are also of high conservation concern, and appropriate management interventions for building up populations of such species be worked out. A system of backward linkage of the raw material consumed by the herbal manufacturing units to their source of production be developed and put in place. The existing system of coding of botanicals in foreign trade (HS codes) be critically evaluated and improved to establish clear linkage of traded materials with their plant sources. Support the setting up of 1 national and 4-5 regional Repositories of Plant Raw Drugs in Trade to act as reference centres for authentication of raw drugs in trade and consumption. Review and rationalize current schemes for incentive based promotion of commercial cultivation so that the species of conservation concern and facing acute supply shortage could be accorded needed focus.

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