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A Study of Cultivation and Marketing of Medicinal and Aromatic Plants in Telangana

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Abstract - Civilization has been using medicinal and aromatic plants from ancient time. Research workers often throw more light on the relationship between plants and man. Medicinal plants have been known for thousands of years and grew in natural environments also. Healing with plant extracts dates back right to the time of appearance of Homosapiens on our earth. About 80% of the world population trusts traditional medicines for its primary health care and the other 20% directly or indirectly continue to encounter an important role of the medicinal plants. Till recently united Andhra Pradesh has been in the forefront for cultivation of medicinal plants in South India in over 35,000 acres. Now the medicinal plant boards of Andhra Pradesh and Telangana States are striving hard to ameliorate cultivation of medicinal and aromatic plants as they yield significantly higher revenue than most commercial and traditional crops. The global trades of aromatic plants are across the world trillions of rupees. These plants earn revenue of up to the tune of Rs.40, 000 or more per acre. In this article, a critical review is presented as how the Telangana can catch up and improve over other regions in cultivation of medicinal and aromatic plants.

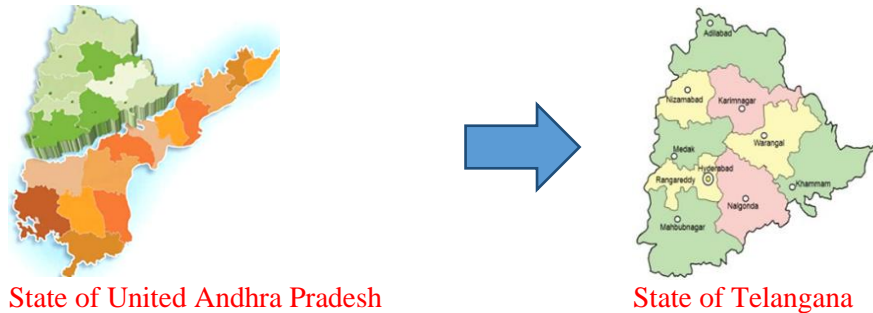
Keywords: *Cultivation and marketing, medicinal plants, Telangana.*

I. Introduction

Ethno-botany or folklore botany manifests are very high positive interrelation of plants and humans. Current trends of research in drug innovation are based on medicinal plants encompasses botanical, phytochemical and biological techniques and there is a focused significance of medicinal and aromatic plants in health systems and solving of the health care problems of the world. The study of ethno-botany manifests a direct recognizable role of detailed information of use of wild plants as well as plants cultivated by the people. The present shift towards drugs through medicinal plants affords new and significant leads against different pharmacological targets tackling cancer, HIV/AIDS, Alzheimer's and Malaria, TB, seasonal fevers and different types of pains including rheumatic strains. Many drugs from plant sources like Taxol, Podophyllotoxin, Camptothecin, Artether, Galantamine, Nitisinone, and Tiotropium have recorded wide usage. Exploration of medicinal and aromatic plants continues to provide new drug-leads but many challenges are encountered in procurement of plant materials, separation of active compounds, selection and functioning of suitable screening techniques, scale-up of active molecules etc.

Medicinal, aromatic plants play a significant role in the life of people and are present in innumerable forms. These plants are used as raw materials for medicines, cosmetics, perfumery, and insecticides and in the various industries. A number of medicinal plants are used in the production of essential drugs as well as for perfumery.

There is an immense need of reviewing the documented data on medicinal and aromatic plants in the recently formed Telangana State in South India. Little previous information is available with respect to medicinal and aromatic plants from this State.



II. Medicinal and Aromatic Plants Profile

Medicinal and aromatic plants have been used in India since ages for their medicinal properties. About 2,000+ native plant species have therapeutic properties and about 1100+ species specialize in aromatics. The Indian systems of plant medicines, known as Ayurveda, Yūnānī and Siddha medicines are of widespread practice in the country. India is a fortune house of precious medicinal and aromatic plant species. The Ministry of Environment and Forests, Government of India have recognized and documented over 10,000+ plant-species which are prominent in the drug designing industry. Among these, about 75 plants are in great demand in world market. India however produces only limited quantities of extracts of these. In terms of market share in production value, India holds only the 6th place with a meagre 7% share. In contrast to this scenario we are still importing about 10 types of essential oils to the tune of 6,000 tons per annum spending valuable foreign exchange.

III. Ecological Conditions of Study Area for Cultivation, Marketing of Medicinal and Aromatic Plants

Telangana is positioned on the Deccan plateau, in the central stretch of the eastern sea board of the Indian Peninsula and has coverage of about 114,800 square kilometers. The region is enriched by two major rivers, with about 79% of the Godavari River catchment area and about 69% of the Krishna River catchment area, but most of the land is arid. It also has several minor rivers such as the Bhima, the Manjira and the Musi. The annual rain fall from the south west monsoons ranges between 900 mm to 1500 mm in northern Telangana and between 700 mm to 900 mm in southern Telangana. Various soil types abound, including chalk, red sand soils, black cotton soil, and deep red loamy soils and very deep soils that facilitate commercial plantings like mangoes, oranges, etc., and flowers. About 45% of the forest area of earlier Andhra Pradesh State is located in five Telangana districts

Telangana is a semi-arid area and has a predominantly hot and dry climate. Summers start in March, and peak in May with average high temperature in the 42°C. The monsoon arrives in June and lasts until September with about 755 mm (29.7 inches) of precipitation. Winter is dry and mild spread

over November to early February with little humidity and average temperature in the range of 22°C - 23°C. Dry deciduous forests cover much of the State including Hyderabad. Woodlands of *Seemaruba* (Indian Lavender) and *Albiziaamara* characterize the regional vegetation. Over 80% of the original forest cover has been cleared for agriculture, timber harvesting, or cattle grazing, but large blocks of forest can be found in Nagarjunasagar-Srisailam Tiger Reserve forest and elsewhere. The Eastern Ghats in the eastern part of the State are covered by humid Eastern Highlands moist deciduous forests. Very good climate conditions like soil, water, atmosphere etc., prevail in the study area facilitating continued cultivation of medicinal and aromatic plants.

On the agricultural revenue front, cultivators of *Ocimumbasilicum* popularly known as Bhutulasi/Vibudipatri in most cases earn revenue in upwards of Rs. 60,000 per acre. Another medicinal plant-group namely *Aegle marmelos*, *Andrographispaniculata*, and *Asparagus recemosus* earns Rs. 700 per kilogram which is much higher than most of the conventional crops. Aromatic plants being productively grown include *Cinnamomum*, *cymbopogoncitratus*, *Jasminumsambac*, *Cymbopogon martini* (palmarosa) and *Eucalyptus citridora* (eucalyptus) fetching good revenues. The States of Andhra Pradesh and Telangana can play important roles as they are home to Eastern Ghats which have the required climatic and soil conditions for growing many medicinal plants like *Tinosporacordifolia* (TippaTheega), *Gymnemasyvestre* (Podapatri), *Clitoriaternatea* (Shankupushpam) and *Lawsoniainermis* (Gorintaku). But the available records are not adequate to properly estimate the extent of cultivation and marketing of medicinal and aromatic plants and plant-products in Telangana. United Andhra Pradesh stood first in cultivation of medical plants in South India in over 45,000 acres. The medicinal Plant Boards of both the states are vigorously pursuing spread of cultivation of medicinal and aromatic plants, as they yield much more revenue than many commercial and traditional crops. The most common medicinal and aromatic plants' marketing profile from study area of Telangana are shown in Tables 1 through 3.

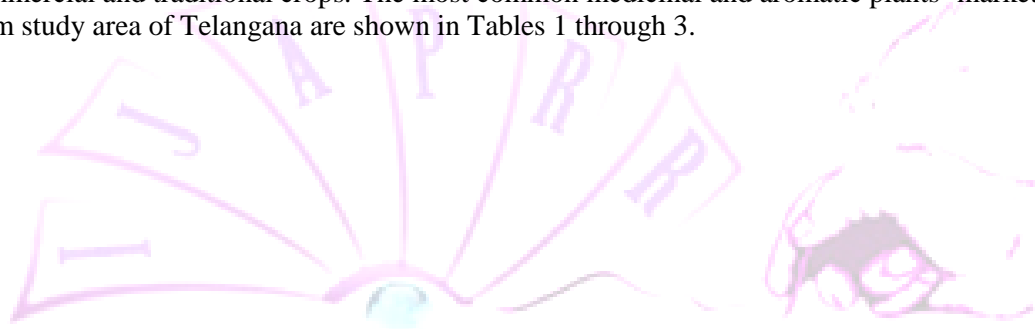


Table. 1: Availability in forest or wild collection

S.No	Botanical Name	Family	Vernacular Name	Noticed Place of Collection	Collection of Parts
1	<i>Abrus precatorius</i> Linn.	Fabaceae	Guruginja	Mahaboobnagar District	Seeds and Roots.
2	<i>Acacia nilitica</i> Linn.	Mimosaceae	Nallatamma	Mahaboobnagar and Nalagonda	Bark and Gum.
3	<i>Acacia sinuate</i> Merr.	Mimosaceae	Shikaya	Adilabad Districts	Pods.
4	<i>Achyranthes aspera</i> Linn.	Amaranthaceae	Uttareni	All districts of Telangana	Whole plant.
5	<i>Aervalanata</i> Linn.	Amaranthaceae	Pindikura	All districts of Telangana	Whole plant.
6	<i>Argemonemexicana</i> Linn.	Papavaraceae	Brahmadandi/Kusamapala	Warangal District	Seeds.
7	<i>Bacopamonnierii</i> Linn.	Scrophulariaceae	Sambranichettu	Adilabad District	Whole plant.
8	<i>Caesalpinia bonduca</i> Linn.	Caesalpinaceae	Gaccakaya	Adilabad District	Seeds/Nuts.
9	<i>Carissa carandas</i> Linn.	Apocynaceae	Wakkayalu	Adilabad, Warangal,	Fruits.
10	<i>Celosia argentea</i> Linn.	Amaranthaceae	Gunugu	All districts of Telangana	Whole plant.
11	<i>Daturametel</i> Linn.	Solaneceae	Ummetta	Adilabad and Warangal,	Fruits/seeds/leave
12	<i>Evolvulus alisinoide</i> Linn.	Convolvulaceae	Vishnukrantamu	Nizamabad and Warangal	Whole plant.
13	<i>Ficus recemasa</i> Linn.	Moraceae	Medi	Medak District	Fruits/Latex

Table. 2: Medicinal Plants by Cultivation.

S.No.	Botanical Name	Family	Vernacular Name	Collection of Plant Parts
1	<i>Aegle mormolos</i> Linn	Rutaceae	Bilvama/Maredu	Leaf, Fruits and Roots
2	<i>Aloe vera</i> Linn	Liliaceae	Kalabanda	Leaf
3	<i>Anacardium occidentale</i> Linn	Anacardiaceae	JidiMamidi	Fruits and Seeds
4	<i>Andrographis paniculata</i> Linn	Acanthaceae	Nelavemu	Whole plant
5	<i>Asparagus racemosus</i> Linn	Liliaceae	Satavari	Tuberous

Table. 3: Aromatic plants by Cultivation

S.No.	Botanical name	Family	Vernacular Name	Collection of Plant Parts
1	<i>Acoruscalamus</i> Linn	Araceae	Vasa	Rhizomes
2	<i>Cinnamomumcamphora</i> Linn	Lauraceae	PacchaKarpuramu	Leaves (oil extraction)
3	<i>Curcuma aromatica</i> Linn	Zingibaraceae	KasturiPasupu	Rhizomes
4	<i>Cymbopogamcitratus</i> Linn	Poaceae	NimmaGaddi	Leaves (oil extraction)
5	<i>Pelargonium graveolens</i> Linn	Geraniaceae	Geranium	Leaves (oil extraction)

Some popular medicinal plants – wild collection – are shown in Figures 1 through 8.

**Fig-1: *Abrusprecatorius*****Fig-2: *Acacia nilotica*****Fig-3: *Achyranthesaspera*****Fig-4: *Aervalaneta*****Fig-5: *Caesalpinia bonduc*****Fig-6: *Carissa***



Fig-7: *Evolvulus alsinoides*



Fig-8: *Ficus racemosa*

Some popular medicinal plants - cultivated are shown in Figures 9 through 12.



Fig-9: *Aloe Vera*



Fig-10: *Anacardium*



Fig-11: *Andrographis paniculata*



Fig-12: *Asparagus*

Some popular aromatic plants for cultivation are shown in Figures 13 through 16.



Fig-13: *Acorus calamus*



Fig-14: *Curcuma aromatica*



Fig-15: *Geranium*



Fig-16: *Lemon grass*

IV. Improvement Measures for Medicinal Plants in Telangana

Telangana has a rich floral diversity. Out of a total number of 2500 species estimated about 1500 species are found to be medicinal plants in Telangana. The Govt. of Telangana, realizing the rich potential and diversity of Medicinal plants, have initiated efforts not only to conserve the gene pool of Medicinal Plants occurring the forests. The steps taken by Telangana are as under:

- To conserve and improve the threatened/endangered/endemic species of medicinal plants in the wild through medicinal plants conservation areas (MPCAs) route and by arresting illicit removals through unscrupulous collectors. The following are the MPCAs identified as no-harvest zone prohibiting all activities such as grazing, lopping, felling etc.

S.No	Name of the MPCA	Name of the Forest Division	Range	Village	District	Area in Hectares
1	Mallur	Warangal (N)	Eturnagaram	Mallur	Warangal	197
2	Sukkamamidi	Bhadrachalam (S)	Mariguda	Sukammaidi	Khammam	200
Total						397

- Ethno-botanical gardens with about 400 species were established in the 2 Regional Research Centers (Mulugu near Hyderabad and Achuthapuram in Khammam District) to create awareness on medicinal plants among the officials and staff of the forest department and the general public. Sample

plots of different Medicinal plants are raised in these gardens. Steps are being taken to establish Arboretums with various tree species collected and planted basing on Bentham and Hooker's classification. The production of seed and seedlings of different species for utilization as planting material is also achieved in a small scale in these gardens.

- Field trials of different varieties have also been taken up to arrive at suitable variety for a given agro-climatic zone. For these species which respond well for vegetative propagation Clonal Multiplication Area (CMA) plots are raised in each of the Research Centers. Already production of large number of Grafts and Clonal plants of tree species of medicinal value for planting throughout the state as a prelude to cultivation of herbs, shrubs and climbers of medicinal value, particularly by involving Vana Samrakshana Samithi (VSS) is going on a large scale.

- Small areas ranging from 0.5 ha to 2.00 hectares are raised in many of the Forest Divisions of Telangana with various species of medicinal plants on a trial basis. Cultivation of such species has been successful and linkages with the local industries/traders had also been established for some species on a small scale. Measures to create awareness amongst the general public on the importance of medicinal plants and the Indian Systems of Medicine are implemented.

- The Department has published a number of brochures and books to popularize conservation of Medicinal Plants. Some of them are "A field guide on medicinal plants", "A profile on dye yielding plants" and "Cultivation of medicinal and aromatic plants".

- The Govt. of Telangana through the Forest Department has conducted Rapid Assessment Surveys (RAS) on occurrence of medicinal plants in the State followed by workshops at Warangal to discuss different medicinal plants identified and the ailments for which they are used and preparation of databank of Medicinal plants available in the State. As a result of Rapid Assessment Survey (RAS) data on The List of Medicinal Plants occurring in Nallamalai Hills in particular and in the districts of Mahabubnagar and Nalgonda in general has been compiled.

- To make Telangana plant products internationally recognized as per western standards.
- A forestation of degraded forests and encroached forest lands.
- To utilize information technology (IT) to improve the trade.

V. Trouble and Limitation for The Management of Medical and Aromatic Plants

- Deficiency of information on wild medicinal and aromatic plants and their geographical distribution in the review state and their proper utilization.

- Lack of information in the study area on the ways to enhance commercial exchange.

- The variation in the local names of the same plant across regions hampering synthesizing of helpful information.

- External dependence for the proper management of medicinal plant raw materials from collection to processing requiring the operation of researchers and technicians of several organizations and institutions.

- The deficiency of research in the development of techniques for propagation and regeneration of medicinal plants in their natural habitats due to some of poor transport facilities to the dry areas where they grow.

VI. Constraints for The Economic Expansion of Medicinal Plants

- Requirement of extensive field studies on the feasibility of cultivation of medicinal plants.
- Inadequate knowledge of the export companies and personnel with standard restrictions. This is an impediment resulting in low prices for medicinal herbs and drugs.
- Lack of cold storage facilities and requirements of logistic technologies for the management of medicinal plants and their supplies.
- Lack of readily available marketing information regarding the international organizations dealing with medicinal plants for capturing world market share.

VII. Conclusion

The dry and arid zones in Telangana can provide ideal terrain for cultivating some varieties of medicinal and aromatic plants. These plants require less water and can be grown in areas where there is lack of irrigation sources; Telangana's soil is suitable for cultivation of aromatic plants like lemon grass, palm rose and citronella. The oils extracted from these plants have both aromatic and medicinal value. These products have immense popularity and have a sizeable market in India and abroad. Apart from the dry regions, the state's black soil is also conducive for the Ashwagandha cultivation. The state is having favorable conditions for the cultivation of medicinal plants and also having very good transportations. So if the awareness and training programmes conducted to the interested farmers, in the results the farmer individual economy, state ultimately country will be strong.

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