

Medicinal and Aromatic Plants Biodiversity in India and Their Future Prospects

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Abstract:

India has a unique environmental conditions, covering an extensive area rich in medicinal and aromatic biodiversities. It is defined as the region of high plant diversity and endemism due to its geographical position, its physical features, the flora and other types of vegetation existing in the past. Humans have found that diarrhoea can be cured by the plant which is astringent in taste, vomiting can be controlled by the plant which is acidic in taste, and the aromatic plant can arrest nausea. Medicinal and aromatic plants have qualitative and quantitative advantages therefore plays a vital role in country's development. This review discuss about the current state of Medicinal and Aromatic Plant cultivation in India. Some medicinal plants and aromatic plants along with their commercial application are also discussed in this review.

Keywords: Medicinal Plants, Aromatic Plants, Plant Biodiversity

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Introduction

Awareness of the importance of culture and across the world, herbaceous plants are used as an essential and significant components for the dsily life and culture. These plants are more significant in the field of pharmaceuticals, cosmetics, cooking and as an antioxidants in food technology. In Greek, these plants can be best cultivated as the flora of Greece is rich in herbs and the climate and the soil condition of Greece favours the cultivation of the medicinal or herbaceous plants. In developing countries, the use of medicinal plants started thousands of years ago. The traditional healthcare systems are being used for primary healthcare by the 70-80% of the population of Africa, India and other developing countries. These plants would be soon valuable for the early huamns because of their unique chemical profiles which provides cure and flavors (WHO report).

Distribution of Medicinal and Aromatic Plants

With respect to the deep study of distribution of medicinal and aromatic plants in nature, it has been formulated that there is about 70% of medicinal and aromatic plants found in tropical

forests of Western and Eastern ghats, the Vindhya, Chotta Nagpur plateau, Aravalis and the Himalayas. It has been also found that most of the known medicinal and aromatic plants are found in dry and moist deciduous area other than the evergreen and temperate area.

Medicinal, Aromatic Plants and their Uses

The biochemical products produced by the green plants are extractable which can be used as a raw material for the purpose of scientific investigation. There are many secondary metabolites of the plants which can be commercially used in variety of pharmaceuticals compounds. Plants which are useful in Ayurveda, metabolically and biologically active molecules are used for the synthesis of modified derivatives having enhanced activity and are less toxic. About 120 therapeutic drugs are yielded by the flowering plants which includes Andrographolide, Sennosides, Ajmalicin, Reserpine, Withanoids, Asiaticoside, Bacosides, Vinblastine, Vincristine, Taxol, Podophyllotoxin, Camptothecin, Digitoxigenin, Gitoxigenin etc. There are few important medicinal and aromatic plants are listed below in table.

Table 1: Medicinal and Aromatic Plants

BOTANICAL NAME	FAMILY	USES
<i>Abelmoschus moschatus</i>	Malvaceae	Eye disorders, Vomiting, Carminative, Gastric
<i>Adhatoda vesica</i>	Acanthaceae	Cough, cold, bleeding, menstrual problems
<i>Andrographis paniculata</i>	Scanthaceae	Fevers, jaundice, diabetes
<i>Asparagus racemosus</i>	Liliaceae	Strength, acidity and liver complaints, Diabetes
<i>Bacopa monnieri</i>	Plantaginaceae	Mental clarity and longevity, Ulcers, tumors, asthma
<i>Cassia angustifolia</i>	Fabaceae	Laxative, Indigestion, jaundice, Anaemia
<i>Centella asiatica</i>	Apiaceae	Memory enhancer, Neurosis, Physical strength

<i>Costus speciosus</i>	Costaceae	Fever, cough, Diabetes, Digestive, Stimulant
<i>Clitoria ternatea</i>	Fabaceae	Diuretic, Ulcer, Visceralgia
<i>Commiphora mukul</i>	Burseraceae	Arthritis, Gout, Fever, Facial paralysis
<i>Cymbopogon flexuosus</i>	Poaceae	Skin Disorders & Perfumes
<i>Cymbopogon martini</i>	Poaceae	Cardio tonic, leprosy & perfumes
<i>Cymbopogon winterianus</i>	Poaceae	Antiseptic, Bactericidal, Mosquito repellent
<i>Eclipta alba</i>	Asteraceae	Hair, skin, Intestinal worms
<i>Ocimum bacilicum</i>	Lamiaceae	Perfumery, Cosmetic industries
<i>Ocimum sanctum</i>	Lamiaceae	Fever, Cold, cough and skin diseases
<i>Ocimum gratissimum</i>	Lamiaceae	Skin diseases, bakery, Icecream
<i>Plectranthus amboinicus</i>	Lamiaceae	Coughs, sore throats and nasal congestion
<i>Plumbago zeylanica</i>	Plumbaginaceae	Anaemia, Fever, Skin diseases
<i>Tinospora cardifolia</i>	Menispermaceae	Jaundice, Fever, Diabetes, Respiratory disorders
<i>Vetiveria zizanioides</i>	Poaceae	Vetiver root is cooling, Stimulant and tonic
<i>Vitex negundo</i>	Lamiaceae	Ulcer, Eye & ear diseases, Pain
<i>Withania somnifera</i>	Solanaceae	Immunity, Skin diseases, Depression, Strength

Essential Oils

An odorous, volatile, hydrophobic and highly concentrated compound owned by the aromatic plants is called Essential Oils. These oils are usually extracted from one or more than one plant parts which may be flowers (rose, jasmine, carnation), leaves (mint, *Oscimum* sps., lemongrass, jamrosa), leaves and stems (geranium, patchouli, petitgrain, verbena, cinnamon), bark (cinnamon, cassia, canella), wood (cedar, sandal, pine), root (angelica, sassafras, vetiver, saussaurea, valerian), rhizomes (ginger, calamus, curcuma, orris) and gums or oleoresin exudations (balsam of Peru, balsam of Tolu, storax, myrrh, benzoin). It can be obtained

through the distillation process of aromatic plant materials and the volatile isolates can be obtained by the solvent extraction and can be utilized as varieties of goods like detergents, soaps, toilet products, cosmetics, pharmaceuticals, perfumes, etc.

Significance of Medicinal and Aromatic Plants and Sustainable Agriculture Practice in India

There is approximately one billion population of the India which is a land of various climatic, ethnic, cultural and linguistic zones. India is rich and well aware of the conservation and economical use of natural resources of medicinal plants in this growing national and international markets. Medicinal plants

are much beneficial for the socio cultural, health care and spiritual ground of the rural people of India. The collection of the medicinal and aromatic plants can be easily done from the forest or uncultivated wild sources, but a number of species are becoming endangered or threatened due to the increased abiotic and biotic pressures on natural habitat.

Future Prospects

- Medicinal plants plays a vital role in therapeutic uses than the advanced chemical technologies because product obtained by the synthesis may be toxic or may have different therapeutic effect than the found in nature.
- Drugs obtain from the medicinal plants are the cheapest than that of the synthetic drugs. For example, the reserpine drug costs approximately Rs. 1.25/g whereas it costs only RS. 0.75/g as per the extraction from the medicinal plants.
- Phytopharmaceutical medicinal herbs and drugs of Indian origin are great in demand along with the increase in household urge for raw materials which are used for perfume making industries, pharmaceutical industries and biopesticidal industries. Because of the harmful effects of synthetic chemical drugs and due to the expansion of pharmacies manufacturing natural drug formulations, the rapid need for the conventional herbal drugs also is shooting up day by day.
- India is rich in cheap labor and skilled manpower which adopts technological changes very fast.

Review of Literature

Rao, Palada and Becker, (2004) studied about these plants in according to agroforestry, and said the medicinal and aromatic plants as very significant plants. It is suggested that the most useful species therefore require research attention on some topics like propagation methods for harvesting, processing techniques, and germplasm collection.

Sultan, Wani and Nawchoo, (2013) presented an overview of on the current status of pharmacognosy and its place in the future of man and said that the conservation of gemplasm is one of the most

important and urgent tasks facing plant scientists today and said the need is greatest in North West Himalaya.

Phondani et al., (2015) discussed about the development of approaches in order to encourage the cultivation of medicinal and aromatic plants situated in Champawat district of Uttarakhand in India. They analyzed the thinking of the people and revealed that farmers were entirely dependent upon wild collected MAPs before the establishment of the National Agriculture Innovation project.

Das, Jain and Malhotra, (2016) discussed on the review on the basis of study of affect of climate change on medicinal and aromatic plants and said that the current evidence suggested that climatic uncertainty and changes pose an impact on medicinal and aromatic plants which are the matter of concern.

Solomou et al., (2016) elaborated a review study on diversity of these plants in Greece and their future and aimed to profile the current state of medicinal and aromatic plants cultivation in Greece along with the future prospects.

Joshi, Satyal and Setzer, (2016) worked on aromatic medicinal plants: A review on their ethnopharmacology, volatile phytochemistry and biological activities.

Conclusion

Most of the developing countries depends on the conventional medicines on plant drugs for their therapeutic uses. These herbal drugs and Indian medicinal plants have the rich source of befcial compounds which includes antioxidants and components used in functional foods, aromatic crops used in perfumery and cosmetic industry which gives livelihood and employment to many people. There is a need of all manufacturers in India to be set up world standard laboratory in quality control, R&D facility with the help of State and Central Governments which would facilitate and help exporters to maintain quality assurance of drug exported from India. There is also need to study the conservation status of all species in trade.



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