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Medicinal and Aromatic Plants Biodiversity in India and Their Future Prospects

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Abstract:

India has different environmental conditions, covering an extensive area rich in medicinal and aromatic plants. It is defined as the region of high plant diversity and endemism by its geographical position, its geomorphology, the presence of flora of past geological eras and the coexistence and interplay of biotic and non biotic factors. 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 qualitativr 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. There are some medicinal plants and aromatic plants with their commercial uses are also discussed in this review.

Keywords: *Medicinal Plants, Aromatic Plants, Plant Biodiversity*

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Introduction

Awareness of the important role of culture and All over 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 Greek is rich in herbaceous plants and the climate and soil condition of Greek enhances the possible cultivation of the medicinal plants or herbaceous plants. In developing countries, the use of medicinal plants sterted for thousands of years. According to the World Health Organization (WHO), 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.

Distribution of Medicinal and Aromatic Plants

According to the analytical study of distribution of medicinal and aromatic plants in natural habitat, it has been found that there is about 70% of India's medicinal and aromatic plants are found in tropical forests of Western and Eastern ghats, the Vindhyas, 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 synthesis are extractable which can be used as chemical fees stock or as a raw material for the purpose of scientific investigation. Thre are many secondry metabolites of the plants which can be commercially used in variety of pharmaceuticals compounds. Plants which are useful In Ayurveda, provides biologically active molecules for the development of modified derevatives with enhanced activity and reduced toxicity. About 120 therapeutic drugs are yielded by the flowering plants which includes Andrographoloide, Sennosides, Ajmalicin, Resperine, Withonoids, Asiacoside, Bacosides, Vinblastine, Vincristine, Taxol, Podophyllotoxin, Camptothecin, Digitoxigenin, Gitoxigenin, Digoxigenin, Tubocurarine, Morphine, Codeine, Aspirin, Atropine, Pilocarpine, Capscicine, Allicin, Curcumin, Artimesinin and Ephedrine. There are few important medicinal and aromatic plants are listed below in table.

Table 1: Medicinal and Aromatic Plants

BOTANICAL NAME	FAMILY	USES
Abelmoschus moschatus	Malvaceae	Eye disorders, Vomiting, Carminative, Gastric
Adhatoda vesica	Acanthaceae	Cough, cold, bleeding, menstrual problems
Andrographis paniculata	Scanthaceae	Fevers, jaundice, diabetes
Asparagus racemosus	Liliaceae	Strength, acidity and liver complaints, Diabetes
Bacopa monnieri	Plantaginaceae	Mental clarity and longevity, Ulcers, tumors, asthma
Cassia angustifolia	Fabaceae	Laxative, Indigestion, jaundice, Anaemia
Centella asiatica	Apiaceae	Memory enhancer, Neurosis, Physical strength
Costus speciosus	Costaceae	Fever, cough, Diabetes, Digestive, Stimulant
Clitoria ternatea	Fabaceae	Diuretic, Ulcer, Visceralgia

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

Esssential Oils

An odorous, volatile, hydrophobic and highly concentrated compounds owned by the aromatic plants is called essential oils. Essential oils are usually derived from one or more plant parts such as flowers (rose, jasmine, carnation, clove, mimosa, rosemary, lavander), 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 used in various varieties of consumer goods like detergents, soaps, toilet products, cosmetics, pharmaceuticals, perfumes, confectionery food products, soft drinks, distilled alcoholic beverages and insecticides etc.

Importance of Medicinal and Aromatic Plants and Sustainable Agriculture 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.
- The demand of the phytopharmaceutical raw medicinal herbs and vegetable drugs of Indian origin from western nations is increasing along with the increase in domestic demands for raw materials which are used for perfumeries, pharmacies and biopesticidal untis. Because of the harmful effects of synthetic chemical drugs and due to the expansion of pharmacies manufacturing natural drug formulations, the demand for the traditional herbal drugs also rapidly increasing 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 the medicinal and aromatic plants in agroforestry systems, and said the medicinal and aromatic plants as very significant plants. It is suggested that the most useful species therefore require research attention of topics ranging from propagation methods to harvesting and 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 scientsts today and said the need is greatest in North West Himalaya.

Phondani *et al.*, (2015) discussed about the development of a participatory approaches to promote the cultivation of medicinal and aromatic plants in Champawat district of Uttarakhand in India. They analyze the people perception and revealed that farmers were dependent solely on wild collection MAPs before the initiation of the National Agriculture Innovation project.

Das, Jain and Malhotra, (2016) discussed on the review study on impact of climate change on medicinal and aromatic plants and said that the current evidence suggested that the phenopmenon are having an impact on medicinal and aromatic plants and there are some potential threats worthy of concern and discussion.

Solomou *et al.*, (2016) elaborated a review study on medicinal and aromatic plants diversity in Greece and their future prospects and aimed to profile the current state of medicinal and aromatic plants cultivation in Greece along with the future prospects. His review showed that the valuable uses are possible and medicinal and aromatic plants diversity represents attainable new environmentally and economically sustainable opportunities for agricultural areas.

Joshi, Satyal and Setzer, (2016) worked on Himalayan aromatic medicinal plants: A review on their ethnopharmacology, volatile phytochemistry and biological activities. This treview represents a summary of aromatic medicinal plants from the Indian Himalaya, Nepal, and Bhutan focusing on plant species for which volatile compositions and summarized 116 aromatic plant species distributed over 26 families.

Conclusion

Most of the population of a developing countries depends on the traditional medicines mostly on plant drugs fro their therapeutic uses. These herbal drugs and Indian medicinal plants have the rich source of beficial 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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