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A Review on Medicinal Botany (Ayurvedic Herbs) and its Significance

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ABSTRACT

The usage of plants in the medical systems is of great significance in almost all countries and the medicinal plants became part of many modern medicines. There are many phytochemicals and metabolites isolated from plants including steroids, terpenoids, carotenoids, flavonoids, alkaloids, tannins and cardiac glycosides. Plants that are used as medicines have been referred to as "herbs" Originally, the term "herb" only applied to non-woody plants.

Today, "herb" refers to any part of any plant used for aroma, flavoring or medicine, including those that come from trees and shrubs. An "herb" may be a fruit, a bark, a flower, a leaf, or a root, as well as a non-woody plant. Although the term "herb" can also be used with food spices, it is generally used in reference to any plant, or any part of a plant, having nutritional and/or medicinal values. Most of the Ayurvedic herbs, thus formulated, are free of side effects or reactions. This is the reason why Ayurveda is growing in popularity across the globe. The Ayurvedic herbs that have medicinal quality provide rational means for the treatment of many internal diseases, which are otherwise considered incurable in other systems of medicine. Go through the following lines to learn all about the importance of herbs in order to lead a healthy, peaceful and disease-free life.

I. INTRODUCTION

Ayurveda is the traditional medicinal form, prevalent in India since 2000 B.C. The Ayurvedic treatment is entirely based on herbs, which have certain medicinal value or property. In the ancient times, the Indian sages believed that Ayurvedic herbs are one-stop solutions to cure a number of health related problems and diseases. They conducted thorough study about the same, experimented with herbs to arrive at accurate conclusions about the efficacy of different plants and herbs that have medical value.

A spice is a vegetative substance used in nutritionally insignificant quantities as a food additive for flavor, color, or as a preservative that kills harmful bacteria or prevents their growth. It may be used to flavor a dish or to hide other flavors. In the kitchen, spices are distinguished from culinary herbs, which are leafy, green plant parts used for flavoring or as garnish. Many spices are used for other purposes, such as medicine, religious rituals, cosmetics, perfumery, or for eating as vegetables. For example, turmeric is also used as a preservative; licorice as a medicine; garlic as a vegetable. All plants produce chemical compounds as part of their normal metabolic activities. These are divided into primary metabolites, such as sugars and fats, found in all plants, and

secondary metabolites, compounds not essential for basic function found in a smaller range of plants, some useful ones found only in a particular genus or species. The functions of secondary metabolites are varied. For example, some secondary metabolites are toxins used to deter predation, and others are pheromones used to attract insects for pollination. Pigments harvest light, protect the organism from radiation and display colors to attract pollinators. Phytoalexins protect against bacterial and fungal attacks. Allelochemicals inhibit rival plants that are competing for soil and light

II. IMPORTANCE AND SCOPE

Herbs are staging a comeback and herbal 'renaissance' is happening all over the globe. The herbal products today symbolise safety in contrast to the synthetics that are regarded as unsafe to human and environment. Although herbs had been priced for their medicinal, flavouring and aromatic qualities for centuries, the synthetic products of the modern age surpassed their importance, for a while. However, the blind dependence on synthetics is over and people are returning to the naturals with hope of safety and security. It has been estimated that in developed countries such as United States, plant drugs constitute as much as 25% of the total drugs, while in fast developing countries such as China and India, the contribution is as much as 80%.

Thus, the economic importance of medicinal plants is much more to countries such as India than to rest of the world. These countries provide two third of the plants used in modern system of medicine. Traditional systems of medicine continue to be widely practised on many accounts. Population rise, inadequate supply of drugs, prohibitive cost of treatments, side effects of several allopathic drugs and development of resistance to currently used drugs for infectious diseases have led to increased emphasis on the use of plant materials as a source of medicines for a wide variety of human ailments. Global estimates indicate that 80% of about 4 billion population can not afford the products of the Western Pharmaceutical Industry and have to rely upon the use of traditional medicines which are mainly derived from plant material. This fact is well documented in the inventory of medicinal plants, listing over 20,000 species. In spite of the overwhelming influences and our dependence on modern medicine and tremendous advances in synthetic drugs, a large segment of the world population still like drugs from plants. In many of the developing countries the use of plant drugs is increasing because modern life saving drugs are beyond the reach of three quarters of the third world's population although many such countries spend 40-50% of their total wealth on drugs and health care. As a part of the strategy to reduce the financial burden on developing countries, it is obvious that an increased use of plant drugs will be followed in the future.

III. CLASSIFICATION OF MEDICINAL PLANTS

Of the 2,50,000 higher plant species on earth, more than 80,000 species are reported to have at least some medicinal value and around 5000 species have specific therapeutic value. They are classified according to the part used, habit, habitat, therapeutic value etc, besides the usual botanical classification

1. **Based on part used**

i) Whole plant: Boerhaavia diffusa, Phyllanthus neruri
ii) Root: Dasamula
iii) Stem: Tinospora cordifolia, Acorus calamus
iv) Bark: Saraca asoca

v) Leaf: Indigofera tinctoria, Lawsonia inermis, Aloe vera
vi) Flower: Biophytum sensityvum, Mimusops elenji
vii) Fruit: Solanum species
viii) Seed: Datura stramonium

Based on habit:

i) Grasses: Cynodon dactylon
ii) Sedges: Cyperus rotundus
iii) Herbs : Vernonia cineria
iv) Shrubs: Solanum species
v) Climbers: Asparagus racemosus

2. Based on Ayurvedic formulations in which used

a) The ten roots of the Dasamoola (Dasamoolam)
i) Desmodium gangeticum (Orila)
ii) Uraria lagopoides (Cheria orila)
iii) Solanum jacquinii (Kantakari)
iv) Solanum indicum (Cheruchunda)
v) Tribulus terrestris (Njerinjil)
vi) Aegle marmelos (Koovalam)

b) The ten flowers of the Dasapushpa (Dasapushpam)
i) Biophytum sensitivum (Mukkutti)
ii) Ipomea maxima (Thiruthali)
iii) Eclipta prostrata (Kayyuniam)
iv) Vernonia cineria (Poovamkurunnil)
v) Evolvulus alsinoides (Vishnukranthi)

c) The four trees of the Nalpamara (Nalpamaram)
i) Ficus racemosa (Athi)
ii) Ficus microcarpa (Ithi)
iii) Ficus relegiosa (Arayal)
iv) Ficus benghalensis (Peral)

d) The three fruits of the Triphala (Thriphalam)
i) Phyllanthus emblica (Nellikka)
ii) Terminalia bellerica (Thannikka)
iii) Terminalia chebula (Kadukka)

Ginseng

Synonyms: Ninjin, Pannag, Panax.

Biological source: Ginseng is the dried root of various species of panax like Panax ginseng

family: Araliaceae

Family: Solanaceae.

IV. CULTIVATION OF MEDICINAL PLANTS

Most of medicinal plants, even today, are collected from wild. The continued commercial exploitation of these plants has resulted in receding the population of many species in their natural habitat. Vacuum is likely to occur in the supply of raw plant materials that are used extensively by the pharmaceutical industry as well as

the traditional practitioners. Consequently, cultivation of these plants is urgently needed to ensure their availability to the industry as well as to people associated with traditional system of medicine. If timely steps are not taken for their conservation, cultivation and mass propagation, they may be lost from the natural vegetation for ever. In situ conservation of these resources alone cannot meet the ever increasing demand of pharmaceutical industry. It is, therefore, inevitable to develop cultural practices and propagate these plants in suitable agroclimatic regions. Commercial cultivation will put a check on the continued exploitation from wild sources and serve as an effective means to conserve the rare floristic wealth and genetic diversity It is necessary to initiate systematic cultivation of medicinal plants in order to conserve biodiversity and protect endangered species. In the pharmaceutical industry, where the active medicinal principle cannot be synthesised economically, the product must be obtained from the cultivation of plants. Systematic conservation and large scale cultivation of the concerned medicinal plants are thus of great importance. Efforts are also required to suggest appropriate cropping patterns for the incorporation of these plants into the conventional agricultural and forestry cropping systems. Cultivation of this type of plants could only be promoted if there is a continuous demand for the raw materials. There are at least 35 major medicinal plants that can be cultivated in India and have established demand for their raw material or active principles in the international trade

V. PROCESSING AND UTILIZATION

Medicinal principles are present in different parts of the plant like root, stem, bark, heartwood, leaf, flower, fruit or plant exudates. These medicinal principles are separated by different processes; the most common being extraction. Extraction is the separation of the required constituents from plant materials using a solvent. In the case of medicinal plants, the extraction procedure falls into two categories (Paroda, 1993). a) Where it is sufficient to achieve within set limits equilibrium of concentration between drug components and the solution. Eg. Tinctures, decoction, teas, etc. b) Where it is necessary to extract the drug to exhaustion, ie., until all solvent extractables are removed by the solvent. Both the methods are employed depending on the requirement although in industry the latter method is mostly used. In all industrial procedures, the raw material is pre-treated with solvent outside the extractor before changing the latter. This prevents sudden bulk volume changes (which are the main cause of channelling during extraction) and facilitates the breaking up of the cell walls to release the extractables. To facilitate the extraction, the solvent should diffuse inside the cell and the substance must be sufficiently soluble in the solvent. The ideal solvent for complete extraction is one that is most selective, has the best capacity for extraction and is compatible with the properties of the material to be extracted. These parameters are predetermined experimentally. The cost and availability of the solvent are also taken into account. Alcohol, though widely used, because of its great extractive power it is often the least selective, in that it extracts all soluble constituents. Alcohol in various ratios is used to minimise selectivity. The ideal alcohol ratio for woody or bark material is 75%. For leafy material, it is often less than 50% thus avoiding extraction of the chlorophyll which makes purification difficult

Formulation and Industrial Utilisation Medicinal plants are used as raw materials for extraction of active constituents in pure form (eg. alkaloids like quinine and quinidine from cinchona bark, emetine from ipecacuanha root, glycosides from digitalis leaves, sennosides from senna leaves), as precursors for synthetic vitamins or steroids, and as preparations for herbal and indigenous medicines. Products such as ginseng, valerian and liquorice roots are part of the herbal and health food market, as well as the food flavours, fragrance and cosmetic industries. Certain plant products are industrially exploited like liquorice in

confectionery and tobacco, papaine as meat tenderiser, quinine as soft drink tonic and cinchona as wine flavour. A large quantity of medicinal plant material is used in the preparation of herbal and medicinal teas, eg. chamomile. These herbal and food uses are of great importance, also to the exporters from developing countries. Hundreds of medicinal plants are items of commerce, however relatively small countries are used in formulated herbal remedies. Several formulations like herbal teas, extracts, decoctions, infusions, tinctures, etc are prepared from medicinal plants (Kraisintu, 1997).

1. **Herbal teas, Herbal remedies:** herbal tea or infusion mixtures are mixture of unground or suitably ground medicinal plants to which drug plant extracts, ethereal oils or medicinal substances can be added. Infusion mixtures should be as homogenous as possible.
2. **Drug extracts:** They are preparations obtained by extracting drugs of a certain particle size with suitable extraction agents (menstrua). The extract obtained after separation of the liquid from the drug residue is called miscella. It may already represent the final liquid dose form eg. as a so called fluid extract, or be used as an intermediary product which is to be further processed as quickly as possible.
3. **Aqueous drug extracts:** The following degrees of comminution are used for the extract depending on the type of plant parts. Leaves, flowers and herbs shredded (4000mm); woods, barks and roots shredded (2800mm); fruits and seeds (2000mm). Alkaloid containing drugs powdered (700mm).

VI. CONCLUSION

From the work cited in the work it can be concluded that herbals/botanicals have usefulness in the treatment of disease like immunomodulator or which may develops to other immune disorders.Ayurvedic drugs have promising profile as far as drug development from natural source is concerned. One can expect herbal to acts as lead compound for development of economical ,effective and nontoxic immunomodulatory agent. The Ayurvedic system of medicines not only provides that alternative, but also scores over the side effects and cost factor of allopathic medicine Immunomodulators are becoming very popular

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