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Medicinal Plants - Therapeutic Potential in Today's Context

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A B S T R A C T

Medicinal plants are the gift of nature to mankind. Since the dawn of human civilization, medicinal plants are being used for treating different ailments of human being in traditional and recognized system of health care. Though medicinal plants secured an important position for their therapeutic, fragrance and flavoring qualities for generations, but the discovery of synthetic drugs overshadowed it for a while. Due to increase in awareness about health and hygiene, people are found to be more inclined towards herbal products especially those derived from plants. Therefore, the systematic conservation, multiplication and large scale cultivation of medicinal plants became a global concern. The present study is based on the literature analysis of various scientific publications (books, research papers, short notes) and provides a widespread knowledge about the usage of plants and their parts for the treatment of various diseases in India.

Introduction

India is bestowed with diversified medicinal and aromatic plants. Medicinal plants are the plants that contain secondary metabolites as an active substance with biological activity.

WHO (2001) defines medicinal plant as herbal preparations produced by subjecting plant materials to extraction, fractionation, purification, concentration or other physical or biological processes which may be produced for immediate consumption or as a basis for herbal products. Medicinal plants produce bioactive compounds used mainly for medicinal purposes. These compounds either act on different systems of animals including man, and/or act through interfering in the metabolism of microbes infecting them. The microbes may be pathogenic or symbiotic. In either way the bioactive compounds from medicinal plants play a determining role in regulating host-microbe interaction in favor of the host.

So the identification of bioactive compound in plants, their isolation, purification and characterization of active ingredients in crude extracts by various analytical methods is important. The medicinal properties of plants could be based on the antioxidant, antimicrobial, antipyretic effects of the

phytochemicals in them (Samal *et al.,* 2017; Cowman, 1999; Adesokan *et al.,* 2008). India is the world's richest source of medicinal plants and is called the botanical garden of the world. In India there are about 45,000 medicinal plant species, with concentrated spots in the region of Eastern Himalayas, Western Ghats and Andaman & Nicobar Island. Traditional practitioners use more than 6000 medicinal plants but only 3000 plants are officially documented. (Patro, 2016)

Distribution of medicinal plants

Usage of medicinal plant-flash from the past

Use of plants as medicine always remains a significant part in human history. The study of archeological evidences indicates that, during Paleolithic era human were using medicinal plants to cure different ailments. (Sumner, Judith, 2000). Ayurveda system is based on the earliest documents of Rig-Veda and the Atharvaveda which detailed the medicinal knowledge (Aggarwal *et al.,* 2007). In 6th Century the Sushruta describes 700 medicinal plants (Bajpai *et al.,* 2015). In middle age, in England and Europe it was found that Monasteries were the Primary sources of medical Knowledge (Arsdall and Anne, 2002). Ibn-al-Baitar described more than 1400 different plants food and drugs (Boulanger, 2002). In 13th century the experimental scientific methods were introduced which evolve the science of pharmacology (Huff and Toby, 2003)

Medicinal plant and human health

Since, time immemorial medicinal plants are used by human beings for treating different ailments.75-80% of world's population, mainly in the tribal and rural areas of developing countries depend on herbal drugs for primary health care needs because of better compatibility with the human body, affordable cost and lesser side effect (Kamraj, 2000). Natural products have been used since ancient times and in folklore for the treatment of many diseases and illnesses (Dias *et al.,* 2012). But the emergence of synthetic drugs surpassed it for a period of time. Some way or other, with the adoption of western culture and change in life style, we made ourselves prone to some inevitable health problems. In long run the habitual use of chemical based medicine causes a number of side effects. Synthetic drugs are palliative but not curative. In the other hand, the cost required for medical treatment by synthetic drugs is very expensive which is unaffordable by many people. The use of medicinal plants plays a vital role in minimizing the cost and maintains proper health.

The increase in awareness among the people about health, hygiene and side effects of synthetic drugs lead to the resurgence of interest in medicinal and aromatic plants. People are found to be more inclined towards herbal products especially which are derived from plants.

Today the herbal products epitomize safety and cost effective in contrast to synthetic drugs which are found to be unsafe and unaffordable by many people. Medicinal plants still remain the mainstay of most of the rural population for curing various ailments (Samant *et al.,* 2007). Herbal drugs obtained from plants are believed to be much safer; this has been proved in the treatment of various ailments (Mitalaya *et al.,* 2003).

Medicinal plant plays an imperative role in different drug industries. Medicinal plant drug discovery continues to provide new and important leads against various pharmacological tar-gets including cancer, malaria, cardiovascular diseases and neurological disorders (Ramawat *et al.,* 2009).

Fig.1. Drumstick
Moringa oleifera

Fig.2. Bishalya karani
Tridax procumbens

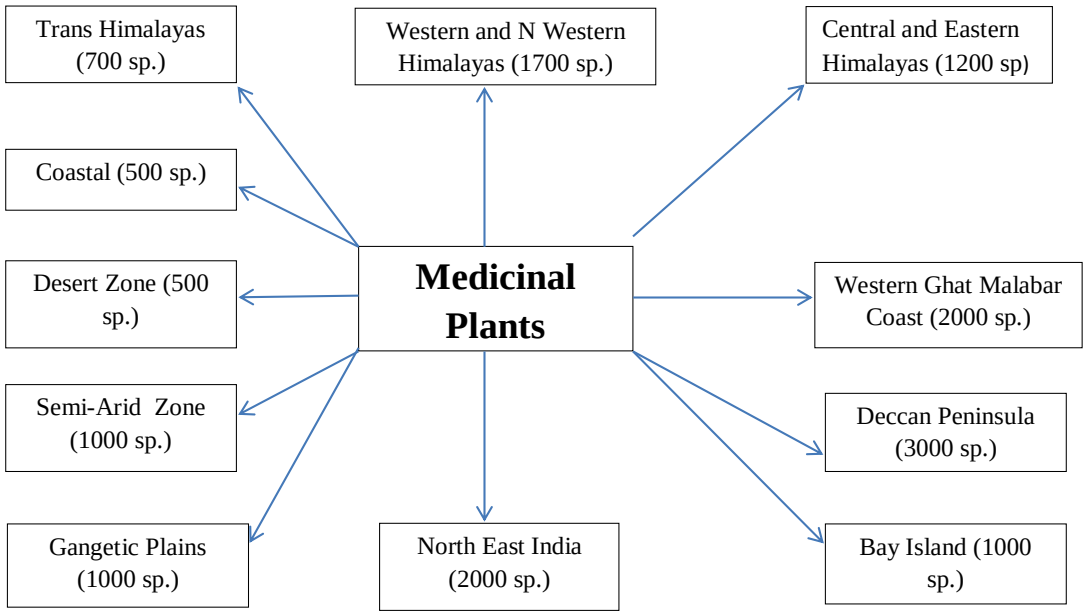

Fig.3. Bio-geographical Distribution of Medicinal Plants
(Sources: shodhganga.inflibnet.ac.in)

Fig.4. Papaya
Carica papaya

Fig.5. Sada Bahar
Catharanthus roseus

Fig.6. Chaya
Cnidoscolus aconitifolius

Fig.7. Neem
Azardirachta indica

Fig.8. Tulsi
Ocimum tenuiflorum

Fig.9. Sarpagandha
Rauvolfia serpentina

Fig.10. Bael
Aegle marmelos

Fig.11. Ghritkumari
Aloe vera

Table.1 Commonly Used Medicinal Plants (Sources - Odisha Forest Development Corporation Ltd.)

Sl.no.	Common Name	Botanical Name	Parts Used	Medicinal Use
1.	Amla	*Emblica officinalis*	Fruit	Vitamin –C, cough, diabetes, cold, laxative, hyperacidity.
2.	Aswagandha	*Withania somnifera*	Root, Leafs	Restorative Tonic, stress, nerves disorder, aphrodisiac
3.	Ashok	*Saraca asoca*	Bark Flower	Menstrual Pain, uterine disorder, diabetes.
4.	Anantmool	*Hemidesmus indicus*	Root/ Leaf	Appetizer, carminative, aphrodisiac,
5.	Bhumi Amla	*Phyllanthus niruri*	Whole Plant	Anemic, jaundice, dropsy.
6.	Bael	*Aegle marmelos*	Fruit, Bark	Diarrrhoea, dysentery, constipation.
7.	Bahada	*Terminalia bellirica*	Seed, Bark	Cough, insomnia, dropsy, vomiting, ulcer, trifala.
8.	Benachar / Khus khus	*Vetiveria zizanioides*	Root	Hyperdisia, Burning, ulcer, skin, vomiting.
9.	Brahmi	*Bacopa monnieri*	Whole plant	Nervous, memory enhancer, mental disorder.
10.	Chiraita	*Swertia chirayaita*	Whole Plant	Skin disease, burning, sensation, fever.
11.	Dalchini	*Cinnamomum verum*	Bark	Bronchitis, asthma, Cardiac disorder, fever.
12.	Guluchi	*Tinospora cordifolia*	Stem	Gout, pile, general debility, fever, Jaundice.
13.	Gudmar	*Gymnema sylvestre*	Leaves	Diabetes, hydrocele, asthma.
15.	Guggul	*Commiphora wightii*	Gum resin	Rheumatoid arthritis, paralysis, laxative.
16.	Gokhru /Puncture Vine	*Tribulus terrestris*	Whole Plant	Sweet cooling, aphrodisiac, appetizer, digestive, Urinary.
17.	Harida	*Terminalia chebula*	Seed	Trifala, wound, ulcer, leprosy, inflammation, cough.
18.	Kalmegh	*Andrographis paniculata*	Whole Plant	Fever, weakness, Release of gas.
19.	Kochila	*Strychinos nuxvomica*	Seed	Nervous, paralysis, healing wound.
20.	Kaincha/Creeper Baidanka	*Mucuna pruriens*	Root, Hair, Seed, Leaf	Nervous, disorder, dropsy constipation, nephropathy,.
21.	Kurai	*Holarrhena antidysentrica*	Bark, Seed	Scabies, antipyretic, amoebic dysentery.
22.	Long peeper	*Piper longum*	Fruit, Root	Appetizer, enlarged spleen, bronchitis, cold, antidote.
23.	Makoi	*Solanum nigrum*	Fruit/whole plant	Dropsy, general debility, diuretic, anti-dysenteric.
24.	Mandukparni	*Centella asiatica*	Whole plant	Anti-inflammatory, Jaundice, Diuretic,3845ysenter.
25.	Nageswar/ Nag Champa	*Mesua ferrea*	Bark, Leaf, Flower	Asthma, skin burning, vomiting, 3845ysentery, piles.
27.	Neem	*Azardirachta indica*	Rhizome	Sedative, analgesic, epilepsy,

				hypertensive.
28.	Pashanbheda	*Bergenia ligulata*	Root	Kidney stone, calculus.
29.	Rakta Chitrak	*Plumbago indica*	Root, Root bar	Arthritis, colic inflammation, cough.
30.	Sarpagandha	*Rauvolfia serpentina*	Root	Hyper tension, insomnia.
31.	Sandal Wood	*Santalum album*	Heart wood, oil	Skin disorder, burning sensation, jaundice, cough.
32.	Satavari	*Asparagus racemosus*	Tuber, root	Enhance lactation, general weakness, fatigue, cough.
33.	Senna	*Cassia angustifolia*	Dry Tubers	Rheumatism, general debility tonic, aphrodisiac.
34.	Sweet Flag	*Acorus calamus*	Rhizome	Sedative, analgesic, epilepsy, hypertensive.
35.	Sada Bahar/ Periwinkle	*Catharanthus roseus*	Whole Plant	Leukemia,hypotensive, Anti-spasmodic, antidote.
36.	Swet chitrak	*Plumbago zeylanica*	Root, Root bar	Appetizer, antibacterial, anticancer
37.	Tulsi	*Ocimum tenuiflorum*	Leaves/Seed	Cough, cold, bronchitis
38.	Vai Vidanka	*Embelia ribes*	Root, Fruit, Leaves	Skin disease, snake Bite, helminthiasis.
39.	Vasa	*Adhatoda vasica*	Whole Plant	Antispasmodic, Respiratory stimulant.
40.	Vringraj	*Eclipta alba*	Seed/whole	Anti-inflammatory, digestive, hair tonic.
41.	Peppermint	*Mentha pipertia*	Leaves, Flower, Oil	digestive, pain killer.
42.	Henna/Mehdi	*Lawsonia inermis*	Leaf,Flower, Seed	Burning, anti-Inflammatory.
43.	Ghritkumari	*Aloe vera*	Leaves	Laxative, wound healing, skin burns & care, ulcer.
44.	Drumstick	*Moringa oleifera*	Leaves, Fruit	Anti-oxidant, help lower blood pressure, wound healing and can reduce clotting time
45.	Bishalya karani	*Tridax procumbens*	Whole plant	anticoagulant, antifungal, and insect repellent, infectious skin diseases
46.	Haldi	*Curcuma longa*	Root	Reduce inflammation, Antibacterial, infectious skin diseases
47.	Lemon Grass	*Cymbopogon citratus*	Leaves	anti-bacterial, anti-fungal and anti-microbial, anti-hyperlipidemic and anti-hypercholesterolemic
48.	Big-sage	*Lantana camara*	Leaves, flower & Fruit	Astringent, fast-acting antiseptic and antimicrobial, pulmonary disorders
49.	Chaya	*Cnidoscolus aconitifolius*	Leaves	Antioxidants, Protects against Hepatic Damage, anti-diabetics
50.	Papaya	*Carica papaya*	Fruit, Leaves	Anthelmintic, wound healing, Antifertility Properties, Antifungal Activity, Antimalarial Activity, Antimicrobial Activity

The increase in demand for the medicinal plants by the drug industries, overexploitation, depletion of natural habitat, indiscriminate use, environmental change and slow growth rate of some species lead to the vulnerability of some species. Over exploitation and habitat degradation leads to reduction in population of most of the economically important species (Rana and Samant, 2011). So, proper documentation, systematic conservation and large scale cultivation has become a global concern.

Since time immemorial, medicinal plants serve as the store house of bioactive compounds which are used for treatment of different diseases. Effective qualities of medicinal plants like easy availability, lack of side effects, affordable cost, non-narcotic nature etc. in contrast to allopathic drugs increased the demand of medicinal plants in pharmaceutical industries. The blind dependence on synthetics is over and people are returning to the naturals with hope of safety and security. Even today, most of the medicinal plants are collected from wild source. So, to ensure sustained availability of raw material to the pharmaceutical industries, conserve biodiversity and protect endangered species, it is high time for proper isolation, documentation, systematic large scale cultivation with proper cultivation techniques and mass propagation. Detailed screening of medicinal plants by researchers and clinicians is required for the discovery of novel bioactive agents that would help in curing todays dreaded diseases. Along with it public education on medicinal plants as a potential source of modern medicine should be promoted in schools and tertiary institutions of learning for safe and healthy future.

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