

Chemical components and therapeutical importance of some medicinal plants

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Abstract

In Ancient India herbs have a long history as a medicinal plant with diverse therapeutic uses. India is one of those countries that are talented with the exceptional topographical elements essential for cultivation of potential medicinal plants. Medicinal herbs are moving from fringe to mainstream use with a large number of people seeking remedies and health approaches free from side effects, caused by synthetic chemicals. Due to negligible side effects, the herbal products are gaining popularity in world market. India perhaps is the largest producer of medicinal herbs. These herbal plants are of economic importance too. Herbal plants play a significant role in the economic development of a country. India does have inherent advantage in terms of knowledge base and a climate conducive to the growth of these medicinal plants. Over the last decade the productivity and availability of horticulture produce have increased unexpectedly. However much more needs to be due to improve the quality and competitiveness of the herbs and herbal products. We still operate in a scenario where clean water, clean surroundings and clean environment remain highly desirable goals and of course deserve top most priority. But there is also a need to increase health awareness among the people so as to reduce the problem of drug resistant strains. The future will depend on herbal medicines to play a major role in developing new Ayurvedic drugs for safe treatment of many diseases with no side effects.

Key Words: Herbal plants, chemical components, therapeutic uses, low cost, less toxicity, eco friendly.

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INTRODUCTION

Plants and plant products find extensive application for their therapeutic properties and for providing pioneer molecules for the development of new and better drugs. Global resurgence requires exploration of traditional Indian medicinal plants using modern scientific tools. The reason for greater acceptability of plant products in human body can be traced to the eco friendly relation between the animal and plant kingdoms. Obtaining drugs from plants has been a traditional way in the Indian system of medicine. Our country is endowed with an

envious wealth of medicinal plants with profound knowledge of their traditional use in the indigenous system of medicine, 'Ayurveda', 'Unani' and 'Sidhi'. Undoubtedly, India occupies the prime position in the use, consumption and export of herbal drugs. Recent years have witnessed the resurgence of interest in the traditional medicine and plant derived drugs all over the world. The reasons are not far to seek, the primary ones being ecological awareness and increased demand of non-classical therapies, many undesirable side effects, high cost of modern drugs and efficacy of a number of phyto-pharmaceuticals and herbal drugs and the need for naturally occurring drug intermediates. Herbs have their own significance as direct curatives. Many of these herbs are known since ancient times and the task is to discover new herbs. In 'Shastras' it is mentioned that every plant is a 'herb' and every word is a 'mantra'. The history of Indian System of Medicine in India can be traced to the remote past. The earliest mention of the medicinal plants is found in the 'Atharvaveda' and 'Rig-veda'. In 'Ayurveda', the properties of various herbs have been given in detail. 'Susruta Samhita' which was written around 1000 B.C. contains a comprehensive chapter on

therapeutics. 'Charak- Samhita' written about the same period gives a remarkable description of the materia medica as it was known to ancient people. Gradually the materia medica of the indigenous system of medicine has become extensive and heterogeneous in India. Information on the use of medicinal plants is scattered and most of them are found in books, periodicals and practices. The various type of herbs in the vedic and post vedic literature and their applications are of high value to humanity. These herbs are adopted for domestic uses as axles of chariots, boats, carts, furniture and therapeutic treatment. In fact a large part of the vedic literature and almost the whole of the 'Atharva-veda' is dedicated to the herbal plants. Based on herbs, 'Ayurved' is a sophisticated and sound system of medicine promoting human health and its presentation. The close association of the people with the herbal plants are obvious from the fact that they had studied their structure in detail and considered them also as living beings. They had classified them into several classes on the basis of their characteristics. They obtained fruits, flowers, saps and other things from them. Religious importance was also attached with them. These plants are also used in sacrifices and worships. It becomes clear that the herbal plants possess the medicinal ingredients, the sacrificial value and the economic importance. Of course many of the drugs first used in modern medicine are extracted from plants. But herbalists use whole plants and traditional physicians use purified ingredients derived from plants. Traditional physicians and scientists generally believe that, if a plant has any medicinal value at all, it is because it contains one active ingredient in form of chemical substance that must be isolated and purified. Here, we can say that the herbalist believe results are better when the whole herb is used, because different chemical components of the plants act synergistically. I think there were risks and benefits to both approaches, e.g. if an active ingredient is isolated, then it can be given in a more concentrated form which means that the effects, both therapeutic and toxic will be exaggerated. On the other hand, if the whole plant i.e. leaves, roots, banks, stems, flowers etc. is used, the concentration of the active ingredients may or may not be sufficient to produce the desired therapeutic result but the chances of toxicity are decreased.

THE CHEMICALS CONTAIN AND THERAPEUTIC IMPORTANCE OF SOME HERBS

The classification of herbal medicines is based on the plant organs from which the drug is obtained are as follows – (1) Drugs obtained from roots, (2) from underground stems (3) from bark, (4) from stem and

wood (5) from leaves (6) from flowers (7) from fruits (8) from seeds and (9) all five parts of the plants. The curative properties of drugs are due to the presence of chemical substances of varied composition in one or more parts of these plants. These plant metabolism, according to their composition are grouped as alkaloids, glycosides, corticosteroids, essential oils etc. Indian system of medical science which deals with the medicinal plants are known as pharmacology. Most of the plants are known and utilized by herbal therapists and Ayurvedic Vaidyas. But only a few herbal plants are cultivated in India. Most of the supply of drugs are obtained from wild plants growing in different parts of India specially in tropical and sub tropical regions. These plants are also known as 'Jari-butis' in India. The medicinal plants are collected and prepared in crude indigenous way. The medicinal value of these plants is due to presence of some chemical substances in the plant tissues which produce a definite physiological action on the human body. The most important chemical substances are – alkaloids, carbon compounds, hydrogen, oxygen, nitrogen, glycosides, essential oils, fatty oils, resin, mucilage, tannis and gum etc. 'Ayurved' believes in treating the individual rather than disease. The medication when administered has no side effect. In India, there are more than 2000 medicinal plants, out of which about 500 varieties are used in 'Ayurveda' 'Unani' and 'Sidhi' medicines. About 75% are from India's tropical forests and 25% are from temperate forests. Of these 30% are roots, 14% are barks, 16% are whole plants, 5% are flowers, 10% are fruits, 6% are leaves, 7% are seeds, 3% are wood, 4% are rhizomes and 6% are stems. The common chemical substances present in medicinal plants are, alkaloids, hydrogen, oxygen, nitrogen, glycosides, corticosteroids, essential oils, resin, mucilage, tannish gum etc. We have studied the chemical comparison and therapeutic application of some herbs/plants like alfalfa, amalka, ajmod, bilva, betel leaves, badra, curry patta, drumstick, ingudi, vamsa, ashoka, apamarg, brahmi, banyan, bhanga, ghrirkumari, heena, kalmegh, and sarpagnudha etc. Most of the plants contain vitamin A, B, D, E, G, C and K, calcium, magnesium, phosphorous, chlorine, sodium, potassium, silicon, protein, fats, carbohydrates and dietary fibre. The mineral contains are calcium, phosphorous, iron and vitamin contains are thiamine, riboflavin, niacin and carotene in different percentages. Alfa-alfa is useful in the treatment of heart diseases, lungs, stomach disorders, arthritis and b.p. roots and barks of Amalka is useful in arresting secretion or bleeding. It's fruits give relief in asthma, bronchitis and in developing immune system of the body. All parts of bilva (Ber) at all stages of maturity have medicinal use. It is prescribed in diarrhea, dysentery, ophthalmia etc. It is also uses in the treatment of diabetes

mellitus. Betal leaves are useful in the treatment of nervous pains, inflammation in arthritis, catarrh, night blindness etc. The application of leaves juice with oil is said to be useful in promoting secretion of milk when applied on the breast during lactation. Curry patta is useful in the treatment of diabetes. Ten fresh curry leaves taken in empty stomach every morning for three months prevent diabetes due to heredity factor. Similarly some plants like Ashoka, Aparajita, Apamarg, Brahmi, Banyan tree, Bhanga, Ghritakumari, Heena, Harsingar, Kalmegh and Sarpagandha etc. are the important herbs found in India. Its constituent chemicals are useful in the treatment of various diseases. The current trend in research is, then, undoubtedly on the development of drugs from natural products. Moreover, the impressive number of phytopharmaceuticals already in use in modern therapy amply testify that plants used in traditional medicine through centuries are more likely to yield bio-active compounds. The classical example is the development of pethidine by structural modification of the well known plant derived analgesic, morphine, minus its undesirable side effects. One has, therefore, to explore natural products for a possible source of new lead structures as well. In India, the Central Drug Research Laboratory, Lucknow, completed screening of around 4000 out of 30,000 indigenous medicinal plant species against a large battery of ailments. However, the largest screening so far done for only anticancer drugs is by the National Cancer Institute of USA for some 35,000 plant species since 1957 and 20,000 more tropical plants are slated to be screened in the near future. Plants being renewable resource, applications of biotechnology offer an unlimited scope to enhance the yield of bioactive agents and cultivation practices of medicinal plants. We still operate

in a scenario where clean water, clean surrounding and clean environment remain highly desirable goals and of course deserve top most priority. But there is a need to increase health awareness among the people, awareness about infections disease and the importance of following the prescribed medication course, so as to reduce the problem of drug resistant strains. The future also will depend on herbal drugs to play a major role in developing new drugs vaccines and rapid diagnostics for many diseases.

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