

Importance of plants in alternative medicine: A review

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Abstract

The association of man with plants has its origin since the beginning of life on earth. Plants provide food, shelter, oxygen and also medicine. Plants play an important role as medicine for the treatment of various diseases. They contain different types of substances and chemicals that have medicinal values. In India as well as throughout the world people have been using plants and their parts in traditional medicine practices. The importance of plants in medicine is known since prehistoric times and even nowadays also plants have medicinal importance in different systems of medicine. The interest in alternative medicine is growing rapidly as modern medicines besides being costly have increased side effects and adverse drug reactions. In the present study the importance of plants in alternative medicine since ancient times to recent has been reviewed.

Key Words: Plants, medicine, diseases, alternative medicine, modern medicine.

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INTRODUCTION

The use of plants and their parts in traditional or herbal medicines is known since prehistoric times. This knowledge about the traditional use of plants has been acquired from traditional or herbal healers and folklore in the course of many centuries. This traditional knowledge has been handed over from one generation to another. It is estimated that there are 350,000 species of existing plants which include seed plants, bryophytes and ferns. Among these 287,655 species have been identified (Pan *et al.*, 2014). According to World Health Organisation 35000 to 70000 plants have medicinal importance and are used for the treatment of many diseases (Tapsell *et al.*, 2006 and Lai and Roy, 2004). With the advent of western, modern or conventional medicines over the past century, these traditional medicines were challenged and there was a significant decrease in their use. Interestingly, in recent

years there has been a resurgence of the use of these medicines from plants due to the side effects of synthetic chemical medicines, lack of curative effects of modern therapies for several chronic diseases, microbial resistance and low cost (Palodun, 2010). The present paper deals with the survey and review of literature on the importance of plants in alternative medicines.

MATERIALS AND METHODS

The literature for the present work was collected by survey from primary sources that is books and research papers from standard journals. In this review a survey has been done to study the use of plants in alternative systems of medicine from the prehistoric times.

REVIEW OF LITERATURE

Plants have formed the basis of sophisticated traditional medicine practices that have been used for thousands of years by people in China, India and many other countries. The earliest historical records of plants are found almost 5000 year back from the Sumerian civilization, where hundreds of medicinal plants such as laurels, caraway, opium and thyme are found listed on clay tablets (Pan *et al.*, 2014). The Ebers Papyrus, in 1500 B.C., from ancient Egypt describes over 850 plants that are used as medicines such as garlic, juniperus, Cannabis, Aloe, etc. (Bajpai and Agarwal, 2015). The archaeological studies show that herbal medicine dates back as far as 60,000

years ago in Iraq and 8000 years ago in China (LeroiGourhan, 1975). The plants used in Chinese, Arabic and different systems of Indian medicine are discussed here.

Plants in Chinese Medicine: China between 1405 and 1433 exported a large number of herbs like rhubarb, angelica, velvet, pona, taurine, ginseng and cinnamon to other countries. In return over the past 2000 years 40 kinds of herbs were imported into China. These are kelp from Korea, turmeric and styrax from Southeast Asia and others such as borneol, clove, frankincense, myrrh, benzoin, senna and saffron (Xiao *et al*, 2001). In the 18th century, with reference to Chinese ginseng, *Panaxquinquefolium* (American ginseng) was discovered. It possesses neuroprotective, cardiovascular, antidiabetic antioxidant and anticancerous properties (Qi *et al*, 2011 and Kuhle *et al*, 2011). Other plants used in Chinese medicine are ginger for digestion, lungs, and to neutralize poisons in food, licorice for hepatitis, sore throat, inflammation and digestion, Ma-huang to stimulate perspiration, breathing passage and for central nervous system, peony to regulate blood, Salvia or Chinese sage plant for damage of body tissue in injury and Tang-kuei as blood nourishing agent. The plants are also used in combinations for effective treatment.

Plants in Arabian Medicine: Ancient Hippocratic Greek knowledge of medicine was adopted and improved by Arabian herbalists and physicians in the Middle Ages. Arabic medicine is also called Greco- Arab or Islamic medicine. There is scarcity of medicinal knowledge in Kuran, Arabs adapted ancient medical practices that originated from Mesopotamia, Greece, Rome, Persia and India and even China (Aziازه *et al*, 2010 and Saad *et al*, 2005). In this system plants used for anaesthesia are *Hyoscyamosaureus*, opium and *Cannabis sativa*. Other plants used as medicine are saffron, pomegranate, black pepper, clove, licorice, etc. (Sahranavard *et al*, 2014).

Plants in Indian Medicine: In India the history of using plants for treating diseases dates back to 6000 to 4000 BC that is the Buddhist period (Pan, 2014). Early origins of traditional medicine has its roots in ethnobotanical folklore, but today traditional medicine incorporates several well organized, distinct systems of diagnosis and cure. In India besides Allopathy there are many other alternative systems of traditional medicine such as Ayurvedic, Siddha, Unani and Homeopathic systems.

Plants in Ayurvedic system: The earliest references of the use of plants as medicine are found in Rig Veda which is an ancient Indian sacred collection of Vedic Sanskrit hymns and Atharvaveda the fourth and the last Veda of Hindu literature (Prasad, 2000). The Charak Samhita is the first recorded treatise of Ayurveda. In the Charak Samhita, the plant derived drugs are divided into

50 groups according to their therapeutic activity. The next landmark in Ayurveda was Sushruta Samhita. This has more emphasis on surgery but it also describes 395 medicinal plants (Singh and Vyas, 2012).

India possesses almost 8% of the estimated biodiversity of the world with around 126,000 species. There are about 400 families of flowering plants in the world and at least 315 are found in India. Currently 45000 species are found in the Indian subcontinent, out of these 3500 species are of plants of medicinal value and 500 plant species are used by Ayurvedic industries. Some of the plants used in Ayurvedic medicine are mentioned in Table-1.

Table 1: Plants used in Ayurvedic system of medicine

Sr. No.	Name of Plant species	Family
1	<i>Achyranthusaspera</i> L.	Amaranthaceae
2	<i>Boerhaaviadiffusa</i> L.	Nyctaginaceae
3	<i>Cassia fistula</i> Linn.	Fabaceae
4	<i>Curcuma longa</i> L.	Zingiberaceae
5	<i>Myristicafragrans</i> Houtt.	Myristicaceae
6.	<i>Ocimum sanctum</i> L.	Lamiaceae
7	<i>Psoreleacorylifolia</i> Linn.	Fabaceae
8	<i>Terminaliaarjuna</i> (Roxb.)W. and A.	Combretaceae
9	<i>Tinosporacordifolia</i> (Thunb.)Miers	Menispermaceae
10	<i>Withaniasomnifera</i> (L.)Dunal	Solanaceae

Plants in Siddha system: Siddha system of medicine is the oldest medical system in the world. Siddha is a Tamil word derived from siddhi, one who has attained perfection in life or heavenly bliss. Practitioners are called siddhars. According to this system man is made up of five elements earth, water, fire, air and ether space between the four. Plants used as medicine in siddha system are given in Table-2.

Table 2: Plants used in Siddha system of medicine

Sr. No.	Name of Plant species	Family
1	<i>Adhatodavasica</i> Nees.	Acanthaceae
2	<i>Andrographispaniculata</i> Nees.	Acanthaceae
3	<i>Calotropisgigantea</i> L.	Aclepiadaceae
4	<i>Citrulluscolocynthis</i> (Schard)	Cucurbitaceae
5	<i>Piper longum</i> L.	Piperaceae
6	<i>Piper nigrum</i> L.	Piperaceae
7	<i>Ricinuscommunis</i> Linn.	Euphorbiaceae
8	<i>Solanumxanthocarpum</i>	Solanaceae
9	<i>Zingiberofficinale</i> Roxb.	Zingiberaceae
10	<i>Zizyphus jujube</i> Lam.	Rhamnaceae

Plants used in Unani system: The term Unani is derived from Greek word Ionia which is the Greek name of the Asia Minor Coastline and from the Arabic word for Greece “ al-Yunaan”. Unani medicine is also called Unani-tibb, is a healing system given by HaleinIbnSina (Avicenna) 1025 CE based on the teachings of Hippocrates and Galens. More than 1000 plant species are used in Unani medicine (Pan, 2014 and Wakdikar, 2004). Some plants used in Unani medicines are listed in Table-3.

Table 3: Plants used in Unani system of medicine

Sr. No.	Name of the Plant species	Family
1	<i>Bauhinia variegata</i> (L.)Benth.	Fabaceae
2	<i>Crocus sativus</i> L.	Iridaceae
3	<i>Cuscutareflexa</i> Roxb.	Convolvulaceae
4	<i>Dalbergiasisso</i> Roxb.	Fabaceae
5	<i>Foeniculumvulgare</i> Mill.	Apiaceae
6	<i>Papaversomniferum</i> L.	Papaveraceae
7	<i>Rosa indica</i> L.	Rosaceae
8	<i>Solanumnigrum</i> L.	Solanaceae
9	<i>Tinosporacordifolia</i> (Thub.)Miers.	Menispermaceae
10	<i>Viola odorata</i> L.	Violaceae

Plants used in Homoeopathic system: This system of alternative medicine was developed in 1796. Many of the medicines used in this system are plant based. A very small part of the medicine is diluted with 90% of alcohol and potency is developed. Some of the plants used in this system is given in Table-4.

Table 4: Plants used in Homoeopathic system of Medicine

S. No.	Name of Plant species	Family
1	<i>Aconitum napellus</i> L.	Ranunculaceae
2	<i>Arnica montana</i> L.	Asteraceae
3	<i>Aropa belladonna</i> L.	Solanaceae
4	<i>Berberisaquifolium</i> Pursh.	Berberidaceae
5	<i>Calendula officinale</i> L.	Asteraceae
6	<i>Cannabis sativa</i> L.	Cannabinaceae
7	<i>Cinchona officinalis</i> L.	Rubiaceae
8	<i>Ruavolfiaserpentina</i> (L.)Benth.exKurze	Apocynaceae
9	<i>Rhustoxicodendron</i> Mill.	Anacardiaceae
10	<i>Strychnusnuxvomica</i> L.	Loganiaceae

Plants used in Modern medicine: The modern system of medicine called Allopathic system involves the use of synthetic chemical drugs for the treatment of human diseases. Many of these drugs have adverse side effects on human health and are also cost effective. Nowadays many drugs in modern medicine also are being prepared from plants and other natural sources. Plants can provide biologically active molecules with enhanced activity and reduced toxicity. About 120 drugs from approximately 90 species of flowering plants have been investigated. Some of the important drugs obtained from plants are vinblastine, vincristine, taxol, pilocarpine, capscicine, curcumin, aspirin, digioxigenin, morphine, codeine, atropine, ephedrine, etc. In some cases crude extract of plants is also used. All over the world more than 400 traditional plant or plant derived products have been used for management of type 2 diabetes. An excellent example of such discovery is galegine a substance produced by plant *Galegaofficinalis*. Galegine has provided the chemical basis of the discovery of met formin which is the foundation therapy of type 2 diabetes. Several plant deived anticancer agents such as taxol, vinblastine, vincristine, camphothecin, topotecan, etc. are in clinical

use all over the world. Some plants used for producing these modern medicines are listed in Table-5.

Table 5: Plants used in modern medicine

Sr. No.	Name of the plant species	Family	Drug
1	<i>Atropa belladonna</i> L.	Solanaceae	Atropine
2	<i>Capscicumfrutscens</i> L.	Solanaceae	Capscicin
3	<i>Catheranthuseus</i> (L.)Don	Apocynaceae	Vinblastine, Vincristine
4	<i>Curcuma longa</i> L.	Zingiberaceae	Curcumin
5	<i>Digitalis</i> species	Plantaginaceae	Digioxigenin
6	<i>Ephedra</i> species	Ephedraceae	Ephedrine
7	<i>Papaversomniferum</i> Linn.	Papaveraceae	Codeine, Morphine
8	<i>Pilocarpusmicrophyllus</i> (Stapf)	Rutaceae	Pilocarpine
9	<i>Spiraeaulmaria</i> L.	Rosaceae	Aspirin
10	<i>Taxusbaccata</i> L.	Taxaceae	Taxol

DISCUSSION

The present study reveals that plants are being used as medicines for the treatment and cure of diseases by man from thousands and thousands of years before Christ. Plants are used all over the world in almost all the medicine systems such as Chinese, Arabic and Indian medicines. India is a repository of medicinal plants due to which people in India have a vast knowledge about these plants. Various types of medicine systems are being practiced in India and besides the use of plants in the oldest Ayurvedic medicines, other systems, the Unani, Siddha, Homoeopathic and even modern, also use plantsas medicines. Ayurveda uses 2000, Siddha 1300, Unabi 1000, Homoeopathy 800, Tibetan 500, Modern 200 and folk 4500 plants as medicines (Pandey *et al*, 2013). Plants are important sources of medicine and have great importance as alternative medicine. They also provide biologically active molecules as drugs in modern medicine also.

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