

Plants: Treasure House for Pharmacologists

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Abstract—Allopathy is a well developed science. But traditional medicine is still preferred by people in developing countries including India and China. The significance of plant based medicines has been increasing all over the world and as a result numerous new drugs have been reported from medicinal plants. Although, the demand for medicines from plants is likely to remain very high but many of the active compounds present in medicinal plants cannot yet be prepared artificially. Since times immemorial, man has been searching for drugs in nature and medicinal herbs have played an important role in treatment of diseases such as cancer, dementia therapy, diabetes, and also for memory enhancing purposes. Herbal sources for these and many other diseases have been discovered in past few years. But the need of the hour is that the plants that have been used traditionally should be explored pharmacologically. There is a need of trained pharmacologists for collaborative studies with chemists and botanists to discover new drugs. Herbal medicine is an important method of complementary and alternative medicine (CAM). Nature has a cure for everything but we can reap the benefits only when we invest not only in R & D in pharmacology but also in medicinal plants.

Keywords: Herbal medicine, alternative medicine, active compounds, medicinal plants

1. INTRODUCTION

Drugs are obtained from six major sources i.e. plants, animals, minerals, microbes, semi-/synthetic and Recombinant DNA technology. Plant sources are the oldest. In ancient times these were the major source of medicines. All parts of plants are used i.e. leaves, stem, bark, fruit and roots. A large number of active principles obtained from natural sources are currently being tested through clinical and preclinical studies, as cardiovascular, anti-neoplastic, anti-diabetic, anti-malarial, anti-inflammatory, anti-obesity and anti-viral agents. Several of these compounds are obtained from leads of plant origin. The drugs derived from natural sources in spite of being used since times immemorial for treatment of many diseases, have been neglected with respect to the scientific records of their efficacy and safety. The reason for this may be the complex nature of plants as they have a large number of phytochemicals making a polyherbal formulation an easy alternative [1]. Biodiversity and drug discovery is a symbiotic relationship [2]. As new diseases are always emerging and several diseases are still without any treatment there is always a constant need for new drugs to be discovered.

2. MEDICINAL PLANTS

Plants are the potential sources for extraction of new medicines. The following examples clearly indicate the important role plants can play in the search of new effective drug molecules. Interestingly, the plants which have already been used in treatment of various ailments are being explored again for new bioactive compounds that can be put to medicinal use.

Alhagi species (Fabaceae):

Alhagi with species such as *A. pseudoalhagi*, *A. graceorum*, *A. sparsifolia*, *A. camelorum*, etc. have been explored for nutritional and medicinal properties. Many pharmacologically active compounds such as flavonoids, alkaloids (alhadidin, alhacin), steroids etc. *Alhagi* species have long been recognized in Unani and Ayurveda. Extracts of flowers, roots, stem, leaves and oil and seeds are used. They are used in treatment of ulcers of GI tract and haemorrhoids. Among the isolated phytochemicals are flavonoids, alkaloids, proanthocyanidins, etc. which are beneficial in cardiovascular diseases, antibacterial, antifungal activity, anti-ulcer, antioxidant, hepatoprotective, antipyretic activity [3].

Astragalus membranaceus (Fabaceae):

This herb is immune enhancing, increases phagocytosis and also aids red blood cell production in the bone marrow. Besides this, it also stimulates production of natural interferon in body as well as activity of pituitary and adrenal glands. It is being explored as a promising treatment for patients whose immune systems have been compromised by chemotherapy or radiation treatment [4].

Caesalpinia pluviosa (Fabaceae):

It is important to find new medicinal plants against malaria as the parasite becomes resistant. Also, the resistance against artemisinin is becoming increasingly common. The research has found that ethanol extract of *Caesalpinia pluviosa* (stem bark) effective against the two main strains of the malaria parasite. This plant has antimicrobial, antiviral, antioxidant and anti-inflammatory properties. Apparently, it also has anti-malarial activity [5].

***Silybum marianum* (Asteraceae) and *Picrorhiza kurroa* (Scrophulariaceae):**

The liver is said to be the hardest working organ of the body as it detoxifies the blood and removes excess hormones; it also is a reservoir for sugar and fat. Botanicals have been used worldwide for treatment of liver diseases. Clinical research has discovered therapeutic effects of many plants such as *Silybum marianum* (milk thistle) for treatment of hepatitis, fatty liver, cirrhosis. Another plant is *Picrorhiza kurroa* with similar active compounds. These are iridoid glycoside picrosides I, II, III and kutkoside, known collectively as kutkin [6].

Viron®:

It is being considered as a potentially safe herbal drug for the treatment of patients with chronic Hepatitis C Virus infection. The tablet is manufactured by European Egyptian Pharmaceutical Industries (Alexandria, Egypt). It is a mixture of herbs with known hepatoprotective and antiviral properties. These are *Tinospora cordifolia*, *Glycyrrhiza glabra*, *Elettaria cardamomum*, *E. alba*, *Curcuma longa*, and *Rumex crispus* [7].

***Allium sativum* (Garlic, Amaryllidaceae):**

It has myriad of medicinal uses. It was used by Russians for treating their soldiers' wounds during World War II when they ran out of antibiotics. It is called as Russian penicillin. It provides protection against blood clot formation due to its antioxidant activity and high sulphur content. The essential oils of garlic are active against bacteria and viruses as they move through the body particularly in digestive and respiratory tracts. It also has a positive effect on the cardiovascular system as it prevents the formation of plaques within artery walls along with lowering the blood pressure. Regular consumption of garlic prevents colon cancer [8].

***Ocimum sanctum* (Lamiaceae):**

Holy basil (Tulsi) is an important medicinal plant used in Ayurveda for the treatment of many diseases. Recently, the plant has been found to be very useful in the areas of liver protection and general anti-oxidant activity. It is also being considered as an adaptogen, an agent that lowers the effects of stress on the body. It is a good source of dietary Ursolic acid which may cause anti-fertility [9].

***Urtica dioica* (Urticaceae) or stinging nettle and *Juglans regia* (Juglandaceae) or walnut:**

Diabetes affects over 100 million people worldwide. Investigations have always been carried out on a large scale to find out compounds active against the disease. A recent study from Iran has demonstrated the antidiabetic potential of leaves of *U. dioica* and *J. regia* [10].

3. CONCLUSION

This article is an attempt to review the potential uses of medicinal plants for prevention and cure of many diseases. These drugs are preferred over allopathic medicines as there are no side effects of plant based medicines. The phytochemical exploration of active ingredients present in the herbs will lead to discovery of new and novel drugs. This will continue to be an important part of research but there are many challenges such as collection, selection and conservation of plants. Scientists have tested only a part of vast diversity of plants available for the presence of medicinally useful compounds. A collaborative team of botanists, chemists and pharmacologists is required for the discovery of new drugs. Investments should be made not only in pharmacology R & D but also in medicinal plants.

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