

Chapter 4

Medicinal Plants: A Potent Source of Diuretics and Antioxidants in Traditional Medicinal Systems

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ABSTRACT

Medicines of plant origin have been used for treating humans and animals without any adverse effects. New medicinal plants are searched to develop more effective and cheaper drugs in place of synthetic drugs. Plants represent a large natural source of compounds that might serve for the development of novel drugs. Currently medicinal herbs are researched for diuretic properties, and several medicinal herbs are used as diuretics. Currently various synthetic medicines are available for this purpose; however, natural resource medicines are still an important choice because of their higher efficiency and better safety. Further, some herbs are also important sources of antioxidants, which protect the body from the effects of free radicals produced in the body. Antioxidants are required by our body due to increase in the likely exposure of the body to harmful pollutants, radiation, UV lights, etc. These have the ability to delay the oxidation, and plant-derived products are of great interest due to the adverse effect of antibiotics.

INTRODUCTION

Currently, the usage and attention of people towards the treatment of diseases through natural plant remedies has diverted the attention of researchers and pharmacologists in investigating medicinal values of herbs and other plants. The foundation of traditional medicinal systems of India *viz.*, Siddha, Ayurveda, Unani and folk are primarily based on plants or their products. Natural drugs obtained from herbs are

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safe and cost-effective, and their applications in many therapies have established these facts. These plants synthesize various chemical compounds, which have medicinal properties and thus are used in drug development.

The practice of treating diseases by medicines of herbal origin has been increased enormously and two-thirds of the world's population use herbal medicinal products for primary healthcare. Many countries around the world have produced a variety of effective drugs to treat infections and their use all over world is increasing. Some medicinal plants are currently investigated for diuretic and antioxidant actions, and many have been known to have potent diuretic and antioxidant properties. Treatment of the diseases by employing synthetic drugs on one hand give relief to body, but simultaneously they lead to various side effects, and more chances of reemergence of the disease. Various medicinal plants have been observed to show diuretic and antioxidant assets and researches are continuing to find other plants having these potentials. This chapter highlights the diuretic and antioxidant properties of some medicinal herbs and their role in treating different ailments in the human body.

DIURETICS AND THEIR TYPES

Diuretics are drugs or any substances which have characteristic feature of increasing the output of urine in animals by slowing down the renal reabsorption of water. Diuretics possess a remarkable property of increasing the diuresis by inhibiting the Na⁺ reabsorption in the proximal and distal convoluted tubule of nephrons. Three basic processes are responsible for the increased urine excretion and electrolytes by the kidneys *viz.*, glomerular filtration, tubular reabsorption (active and passive) and tubular secretion and thus regulate the water and electrolyte balance in the body. Diuretics are liable for the increased excretion of fluids in the urine.

Diuretics are very effective in the treatment of cardiac oedema, specifically the one related with congestive heart failure. They are employed extensively in various types of disorders, for example, nephritic syndrome, diabetes insipidus, nutritional oedema, cirrhosis of the liver, influenza, water poisoning, hypertension, oedema of pregnancy and also to lower intraocular and cerebrospinal fluid pressure and certain kidney diseases (Barrar, 2003).

Diuretics show a significant role in the management of oedema and hypertension by increasing net negative water and solute balance. About 50-66% of fluid is reabsorbed by the proximal convoluted tubule of nephron via both active and passive processes. It has been observed that the thin descending limb of Henle's loop permits osmotic water abstraction as it is highly permeable to water and impermeable to solutes. Further from descending limb of loop of Henle, there is less water absorption which plays an important role in overall enhanced condition of diuresis. Finally, the thin ascending limb of loop of Henle is impermeable to water and highly permeable to chloride and sodium, therefore, diuretics show no effects on it (Kokko, 1984).

Types of Diuretics

Basically there are three types of diuretics currently in use: thiazide, loop and potassium-sparing. All the three diuretics are responsible for the increased excretion of solutes in urine. These diuretics specifically targets different parts of nephron, and thus, have different uses with different side effects and thus preliminary precautions must be taken before using them.

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