Review

Urtica dioica (L): an undervalued, economically important plant.

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Abstract

Plants are rich source of many natural products, most of which have been extensively used for human welfare. Owing to rich medicinal properties, Urtica dioica (L.) commonly known as stinging nettle of family urticaceae has a long history of use in the home as an herbal remedy since ancient times. Various parts of the plant have been used in ayurvedic preparations by vaidyas for curing various ailments. As a useful first-aid remedy it is used in the treatment of ailments such as bites and stings, burns, hives and breast feeding problems. The two most prevalent active chemical agents found in the Stinging Nettle are formic acid (methanoic acid) and histamine (1H-Imidazole-4-ethanamine; 2-(4-Imidazolyl ethylamine; 4-(2-Aminoethyl)-1H-imidazole) which function as an anti-inflammatory agent. Nettle is not only a weed but an important medicinal herb and this present review deals with the different aspects of this medicinal herb.

Key Words: Nettle, Vaidyas, Formic acid, Histamine and Anti-inflammatory.

INTRODUCTION

Urtica dioica, nettle or stinging nettle belongs to family Urticaceae. It occurs as a perennial plant in temperate zones of Asia, America and Europe. It is of great medicinal value but the plant is undervalued by almost all of us. The plant has great economic potential due to its multi-utilitarian nature. It is commonly found growing in rich soils in forest clearings, old fields and wasted places. It is adapted to a wide range of climatic conditions in Asia and Europe and is known by various vernacular names such as Nettle, big string nettle, common nettle, stinging nettle, gerais, isirgan, kazink, nabal al nar, ortiga, grande ortle, ortle, urtiga, chichicaste, brennessel, gross d’ortie, racine d’ortle.

Botanical description

Nettle is an annual growing to 0.6m.tall shrub which bears opposite, cordate, deeply serrate, pointed leaves which are downy underneath. Flowering and fruiting time is from June to October. Flowers are monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and are pollinated by Wind. The stem and leaves of the plant are covered with stinging trichomes. The fluid present in the trichomes is histamine, 5- hydroxytryptamine, acetylcholine, small amount of formic acid and leukotrienes which enter the skin and causes blistering. The plant prefers to grow on loose soil with organic matter rich in nitrogen and high phosphate levels for rapid growth. This plant can be propagated through seeds or vegetative by divisions. It is a relief that nettles can be established from cuttings so there is potential to cultivate both male and female forms.

Medicinal uses of U. dioica

Stinging nettle has great medicinal potential. It is believed
to be a galactogogue and a clinical trial has revealed that the juice of the plant is diuretic in patients suffering from congestive heart failure. The fresh juice or an infusion of the nettle plant has been used to stimulate the digestive system and to promote milk flow in nursing mothers. It is used to treat rheumatism, as it provides temporary relief from pain (Alfard, 2007). Extract of the plant is used in treating arthritis (Randall, 1999). The plant is also used for treating hay fever and in phytotherapy of hypertension and diabetes in Oriental Morocco (Ziyyat et al., 1997). It has antioxidant, antimicrobial, anti-ulcer and analgesic properties (Gulcin et al., 2004). Its extract shows in vitro inhibition of several key inflammatory events that cause the symptoms of seasonal allergies (Roscik et al., 2009).

The root extract of nettle has been extensively studied in human clinical trials as a treatment for symptoms of Benign Prostate Hyperplasia, BPH (Wilt et al., 2000). It has been used as alternative medicine in pediatric oncology patients as reported by Gozum et al., 2007. It helps to reduce menses flow and can also be used as a tincture for hypothyroid conditions to increase thyroid function. It helps in cleansing the digestive tract and helps with stomach problems. It functions much like a mild Cayenne by opening the vessels.

The herb is used as a tea for anemic children. Nettle is nutritionally high in vitamins A, C and D, also minerals iron, manganese, potassium and calcium. It is also beneficial during pregnancy. It is a mineral rich nutritive herb with vitamin K to guard against excessive bleeding. It improves kidney function and helps prevent hemorrhoids. Nettle aids with diarrhea and dysentery and is good for inflammatory skin conditions. It increases the flow of urine, shrinks inflamed tissues, helps blood circulation and purifies the blood. It is popularly cooked green in many areas due to its high protein contents.

**Indigenous uses**

Nettle has been used as ancient as well as modern system of medicine. Both the root and the leaves are traditionally prepared as infusions. Dosages depend on what one is taking it for;

**To maintain prostate health:** One-half cup of a root infusion 2-3 times weekly is recommended (2-3 ml of a root tincture or 2-3 g of powdered root in capsules or tablets can be substituted if desired).

**Natural remedy for BPH:** One-half cup of root infusion 2-3 times daily for 30-90 days. (2-3 ml of a root tincture or 2-3 g in capsules or tablets 2-3 times daily can be substituted if desired).

**For allergies, inflammation, and hypertension:** One cup of leaf infusion is taken twice daily. This also can be substituted by taking 3-4 g of leaf tablets/capsules twice daily.

**Commercial uses**

Nettle is used in hair shampoos to control dandruff, eczema and can bring back the natural color of hair. It helps to stimulate hair growth. Oil extracted from the seeds is used as an illuminant in lamps. It is also used in small-scale papermaking. In Scotland nettle was cultivated for making durable linen like cloth from the fibers of stalks. The very name Nettle comes from word meaning ‘textile plant’. Nettle has greatest potential for long fibre pulping and textile markets. It has properties similar to flax and hemp. Fibre from the nettle plant has cellulose content of 86.5%. High content of the crop can also be utilized in industrial application (Anon, 1998; Dreyer et al.; 1996). Nettle is currently used in the production of a silky fabric known as ‘ramic’. This fibre is currently available in some Italian fashion houses. Ropes, cloth and paper are also produced from the fibre of this plant.

It contains 21-23% crude protein and 9-21% crude fibre. At the vegetative stage plants contain 4% protein and fibre, 50 microg/g carotene, 4 microg/g riboflavin and 10 microg/g vitamin E. By incorporating nettle into poultry feed it is possible to increase protein intake by 15-20% and vitamin intake by 60-70%, also green feed requirements can be reduced by 30%.

**Review of research work on Urtica dioica**

In vitro and in vivo pharmacological work on the cardiovascular effects of U. dioica has been successfully investigated by Testai et al., (2002). Farzami et al., (2003) have reported the induction of insulin secretion by a component of U. dioica leave extract in perfused Islets of Langerhans and its in vivo effects in normal and streptozotocin diabetic rats. Antiviral activity in vitro of U. dioica combined with Parietaria diffusa and Sambucus nigra was observed by Maganelli et al., (2005). Lignans from the roots of U. dioica and their metabolites which bind to human sex hormone binding globulin (SHBG) has been worked by Schottnel et al., (1997). Saul et al., (2000) have observed crystal structure of U. dioica agglutinin (UDA), a superantigen presented by MHC molecules of class I and class II. Antifungal activity of nettle, colocynthis (Citrullus colocynthis L. Schrad), oleander (Nerium oleander L.) and konar (Ziziphus spinachristi L.) extracts on plants pathogenic fungi has been investigated by Hadizadeh et al., (2009).
Conclusion

The above mentioned uses of nettle make it a highly desired herb. As a result of degradation and destruction of its natural habitats, due to over growth of invasive plants like Ageratina adenophora, Eupatorium and their other related species this important plant needs conservation through plantation.

It is currently the subject of scientific interest and development in the countries through Europe, Austria, Germany, Finland and U.K. for producing natural fiber. Similarly the plant can be used as a source of fiber, pulp, medicine in India also. The plantation of this can help to restore the over- fertilized soils. The farmers can earn good money from cultivating this herb for production of fibers, small scale paper making and as a source of herbal medicine.

References
