ALLIUM SATIVUM L. (GARLIC) - POTENTIAL ELIXIR OF LIFE

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Abstract : Garlic, botanically *Allium sativum* L. (family Alliaceae) is one of the oldest known horticultural crops. It is a multi-purpose herb relished as a flavouring agent around the world. No other herb has served as many culinary and medicinal purposes in as many cultures as garlic. Nature has also showered its benevolence on it by ingeniously packing a chemical factory in it. By virtue of these active principles, garlic seems to have the potential to cure almost every disease. This paper is an attempt to consolidate unsurpassed medicinal promises offered by garlic.

Keywords : *Allium sativum*, Chemical, Food, Health, Spice

INTRODUCTION

Used in folk-medicine since prehistoric times, *Allium sativum* L. is known throughout the world not only as spice or food but as a medicinal herb also (Khan and Hanif, 2006). Its popularity can be judged by the umpteen references to it in the legends of India and China. In Kashmir, the earliest known reference to this plant is found in Kalhana`s Rajatarangini-a political compilation of 12th century A.D. (Kaul, 1980). On the other hand, the oldest record of garlic cultivation found in Sumerian literature dates back to 2600-2100 B.C. Garlic found in the tomb of Tutankamen was also probably used by Israelis and finds mention in the Holy Bible (Harris *et al*., 2001). Put to use for cooking, embalming and to mend broken bones the ancient Egyptians inscribed the same on the walls of ancient places of worship and pyramids (Kumar and Berwal, 1998). Its strong flavour is reputed to have been disliked by the Romans who fed it to their laborers and soldiers to give them strength and courage (Kamenetsky, 2007).

It is often stressed that while one's food should have medicinal value and your medicine should be your food. Garlic is perhaps the quintessential medicinal food because its health benefits are varied and many. An important bioresource, it is a natural store house of innumerable chemicals. The most abundant class of chemical compounds in garlic bulbs is carbohydrates which account for ca. 77% of their dry weight with fresh ones containing about 65% water. These include non-structural as well as structural carbohydrates like glucose, fructose, sucrose, and a series of oligosaccharides, the fructans. The adult plant is equally rich in proteins, pectins, minerals, polyamines, saponins and selenium (Kamenetsky, 2007).

Many organo-sulfur compounds like diallyl di- and, tri-sulfides, methyl allyl trisulfide and propyl allyl disulfide are responsible for the characteristic flavour and potent biological health benefits of garlic (Edris and Fadel, 2002). In comparison to other plant species, it contains 3-100 times higher levels of sulphur compounds (Kamenetsky, 2007).

Medicinal importance of garlic has been ascribed to its potent antioxidative (Kim *et al*., 1997; Dhawan and Jain, 2005; Park *et al*., 2009), antithrombotic (Sata *et al*., 2001), anti-tuberculosis (Pooler and Simon, 1994), antidiabetic (Modak *et al*., 2007), antibronchial (Afzal *et al*., 1985), antigenotoxic (Park *et al*., 2009) and anti-inflammatory activities. When raw garlic bulb is crushed, alliin, S-allyl-L-cystein sulfoxide, is converted by alliinase into allicin, the flavour producing compound. According to Ueda *et al*. (1990) alliin enhances the effects of monosodium glutamate and disodium inosinate which together improve the taste of the food. In fact, it is the underlying principle responsible for imparting antibacterial and antifungal properties to garlic (Hayashi *et al*., 1993). However, it is rapidly converted to diallyl disulfide and other sulfur compounds because of its instability. One of the derivatives of allicin is Ajone. Chemically (E, Z)-4, 5, 9-trithiadodela-1, 6, 11-triene-9-oxide, it is a major sulfur-containing compound in oil-macerated extract. Ajone has been reported to have antimicrobial, antiviral, antiprotozoal, antimutagenic and anticancer activities (Nishikawa *et al*., 2002). It is also antithrombotic preventing platelet-aggregation and, exhibits strong hepato-protective effects (Hattori *et al*., 2001).

Numerous studies have demonstrated that compounds in garlic extract inhibited the nuclear factor kappa B (NF-k B) activation. NF-k B is a central transcription factor for pro-inflammatory gene expression. Its increased activity is known to be associated with an enhanced risk of many chronic ailments such as arthritis, atherosclerosis, cardiovascular diseases, Alzheimer's disease and cancer. S-allylcysteine, diallyl disulfide and allicin, the major sulfur compounds in garlic extract, inhibit the NF-k B activation induced by hydrogen peroxide in human cells (Youn *et al*., 2008). Having anticoagulant effect garlic acts as vasodilator and blocks the development of hypertension associated with atherosclerosis (Ganado *et al*., 2004). Similarly presence of higher polyunsaturated, fatty acids, arachidonate and eicosapentaenoate in its lipids reportedly control atherosclerosis by reducing

cholesterol level in the body (Afzal *et al*., 1985). Abdo and Al-Kafawi (1969) have demonstrated the stimulating effect of garlic extract on the uterus of pregnant guinea pig caused, in all probability by a thyroid-like biologically active principle in it. These authors have also recommended garlic juice for treating various forms of ulcers, in regulating menstrual cycle, as a rubefacient in skin diseases, as an antipyretic and lotion for washing the wounds and ulcers.

Traditionally, the fresh cloves, garlic tea, syrup, tincture, and other preparations have been used as an aphrodisiac, to treat colds, fever, flu symptoms, coughs, earache, headache, stomachache, pinworms, snake/insect bites and fungal infections, and for numerous other ailments, conditions, and applications.

CONCLUSION

Garlic is compelling and well appreciated medicinal plant. Over the past few years, it has earned reputation not just as a flavour enhancer, but also as a health food that the old adage about an apple a day should be recited "a clove a day keeps the doctor away". Recent scientific research has credited garlic with the ability to cure everything from common cold to coronary heart diseases. And given the fact that several hundred million people die each year from heart diseases alone, research on all aspects of garlic should be prioritized to harness its maximum potential.

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