

Therapeutic Attributes of Garlic and Onion

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Introduction

India is well known in terms of “The Home of Spices”. Any Indian meal is not considered complete without the flavor of Indian spices, regionally termed as “Masala”. Food, as a cultural identity aspect, is an important portion of culture. Meanwhile, the role of healthy well-being in a culture also can disclose the norms of any community. Plants have been widely used for both as a food and medicine, and a healthy food is closely related to the culture of a society.

Garlic (*Allium sativum*) and onion (*Allium cepa*) are routinely used spices during food preparation and also the source of nutrients all around the world. Moreover these are best treatment of various diseases related to nutritional and metabolic processes. Over the history, garlic has always been taken to be at the intersection of food and medicinal plants. It is hard to dream of a food item that has been more frequently used than garlic. Now days the increase in research progress on healthy foods demonstrates the preferences to view nutritional quality science as a confirmation of past wisdom. For our immune system to become strong in order to adapt according to rapidly changing life styles, precise foods are approached with a specific interest and also the same are suggested as the medicine of the future. These special foods have been termed as “adaptogens” (Eksi *et. al.*, 2020).

A larger export potential exists in India for fresh and differently processed vegetables and their products. Among the various vegetables, onion provides the largest exportable product in India. India ranks third in fresh onion export which is next to Netherlands and Spain around the world. Major fresh onion importers from India are Gulf countries, Sri Lanka, Malaysia, Singapore, and Bangladesh. Also the garlic exporting from India for many years is mainly to the major importing countries like Qatar, Kuwait, Saudi Arabia, Bahrain, Zambia, Mauritius, Bangladesh and Sri Lanka and the export ranges between 2-3 % of the total domestic production. Garlic export quantum has been

fluctuating because of sudden change in the policy of garlic importing countries (Seth *et. al.*, 2018).

Onions are broadly used in all parts of the world in various types of food. In regards to traditional medical literature, onions are a source of numerous vitamins and are also useful in fever, dropsy, and chronic bronchitis. When mixed with the common salt, onions became a domestic remedy for colic and scurvy. Also the roasted onions mixed with cumin, and butter oil exhibit great benefit in piles. Onion juice is somewhat bactericidal due to the action of allicin-type compounds present in onion. J. B. Collip reported the hypoglycaemic action of onion extract for the first time just after the insulin discovery. Also the lipid-lowering effects of both the onion and garlic extracts were firstly reported by K. T. Augusti and P. T. Mathew. Ethanolic extract of onions showed the inhibitory effects on allergic skin reactions (Augusti, 2020).

Onions generally consist of approximately 11% carbohydrates, 1.2% protein, 0.1% fat, 0.6% minerals, 0.4% fibre, 47 mg calcium, 50 mg phosphorus, 0.7mg iron and 11 mg Vitamin C per 100 gm of bulbs, composition vary according to different type of onions (white, yellow and red onion), climatic conditions, culture practices and time of storage. Garlic also contains various enzymes, minerals, vitamins and 17 amino acids. Garlic consists of around 30-38 g of carbohydrates, 5-9 g of protein, 130-165 Kcal energy, 1.8-2.4 g dietary fiber, 1-2 mg iron, 22-30 mg magnesium, 150-200 mg calcium, 15-20 mg sodium and 350-450 mg potassium per 100 g of raw garlic. Both the onion and garlic are rich in organosulfur compounds and secondary metabolites which are responsible for their flavour, odour, pungency and medicinal values. The most abundant sulfur containing compound in garlic is alliin (S-allylcysteine sulfoxide) which is colour less, odour less, water soluble amino acid present in the intact cells of garlic. Allicin is the antibacterial component of garlic.

Medicinal uses of onion and garlic:

Various traditional practices and scientific researchers have critically demonstrated the beneficial effect of garlic and onion consumption on human health. Most of the health benefits are because of presence of secondary metabolites in them. Both have been widely used for healing internally as well as externally. There is numerous health benefits of onion and garlic, some of those are discussed here in brief.

➤ **Anticancer property**

Garlic and onion has major influence on prevention of cancer. Garlic performs various synergistic effects which are responsible possibly to fight or prevent cancer by stimulating the immune effector cells including T-cell and natural killer cells. Onion and its other components have negative impacts on every stage of cancer by the regulation of various biological processes. It was found in rat that onion extract having cytotoxic activity against the growing cancer cells thereby arrest the tumour growth. Further studies on human beings reported that consumption of onion and the stomach cancer have inverse relationship with one another. While garlic contains few anticancerous compounds like as allin, quercetin and ajoene which pay a role in preventing the effect of afltoxins and nitrosamine. It was believed that antioxidant effect of allicin help in reducing the development of cancer in the gastrointestinal tract.

➤ **Antioxidant activity**

Antioxidants are the enzymes that slow down or stop the oxidation of proteins, nucleic acids and lipids by eliminating oxidizing agents such as reactive oxygen and reactive nitrogen species. A great amount of these antioxidants is present plant based diets. Onions possess antioxidant activity due to its good nutritional composition which makes it a potential source of antioxidants. Further the antioxidants present in onion are responsible for scavenging of free radicals and oxidases inhibition. Garlic is well reported to scavenge harmful free radicals, increase antioxidant enzymes level and inhibit lipid peroxidation. Garlic extracts directly exhibit antioxidant capacity by increasing the level of catalase and glutathione peroxidase. The ability of whole garlic and garlic extracts to scavenge harmful free radicals also proven beneficial for cancer victims.

➤ **Antimicrobial activity**

Antibacterial effects of garlic juice were first determined by Louis Pasteur. Garlic is a well-known antimicrobial agent around the world, also nicknamed as “Russian penicillin”. Allicin possess antimicrobial activity by inhibiting thiol-containing enzymes in the microorganisms. Ajoene play role as a fungal agent. As compared to garlic, onion also has shown good antifungal and antibacterial effects. Onions contain an amount of volatile oil which is strongly fruitful against various gram positive bacteria, fungi. Onions also have been found to enhance the beneficial microorganisms as they contain fructo-oligosaccharide

(FOS), which are fermented by *Bifido bacterium* species and help to improve the gut microbiota health.

➤ **Cardiovascular property**

As onions are rich source of valuable flavonoids and the daily intake of diet rich with onion prevents atherosclerosis and various heart diseases. Quercetin, a flavonoid present in onion inhibits the low density lipoproteins (LDL) and decreases the risk of heart related diseases. Beneficial impacts of garlic on circulatory system of human beings were successfully described; it also lowers the LDL cholesterol which is harmful for human health. Garlic enhance the production of nitric oxide in blood vessels walls which further helpful in relaxing the blood vessels hence prevent arteriosclerosis and minimize the risk of heart attack.

Conclusion

The extracts of onion and garlic affect the diseases related with cardiovascular system by reducing the amount of plasma lipid levels. Also both the plant extracts are much beneficial as being antihypertensive, antithrombotic, antibiotic (antibacterial, antifungal etc.), anticancer and ant-diabetic. Further, both the plants had shown a significant role in stimulating the immune system so it is recommended to consume these plants and their products in daily diet. Onion is serviceable and safe to intake up to 50-80 g per day. However the adverse effects of onion may lead to skin irritation, tearing and stomach distress. According to Ayurveda, garlic is appraised as one of the best effective antimicrobial herbs. The side effect of garlic is linked to breath odour, generally when this herb is taken in a raw form.

References

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