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## **Medicinal importance of *Allium Cepa* (Onions)**

Dr. Humaira Zafar

Assoc. Prof of Pathology, Consultant Microbiologist, Al Nafees Med College, Isra University, Islamabad Campus, Pakistan

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### **ABSTRACT**

In the era of advancements in modern science, there is easy availability of good allopathic management options. Besides the beneficial effects, these high potency medicines produce many side effects to other tissues of human body. Therefore the current review article was summarized to identify the medicinal values and importance of *Allium cepa* (onions) in light of available old and latest researches. Due to its easy availability at homes, it can well be used as a preventive one for many disorders. Raw form of onion when used in specific recommended daily dose, can prevent a human body from many cardiovascular, gastrointestinal, haematological and malignant disorders.

**Keywords:** *Allium cepa*, onion, anti-platelet effect, anti-thrombotic effect, anti-cancer

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**Address for Correspondence:** Dr. Humaira Zafar, Assoc. Prof of Pathology, Consultant Microbiologist, Al Nafees Med College, Isra University, Islamabad Campus, Pakistan; **Email;** [dr.humairazafar@yahoo.com](mailto:dr.humairazafar@yahoo.com)

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## INTRODUCTION

The word *ALIUM* is derived from a Latin word. The genus includes approximately 500 species. This includes the edible onions (*A. cepa*), garlics (*A. sativum*), chives (*A. schoenoprasum*), leeks (*A. porrum*) and shallots (*A. ascalonicum*). Garlics and onions are the oldest natives of central Asia. However Greece, Egypt, China, Rome, and India also gave therapeutic significance to *Allium* vegetables.<sup>[1]</sup>

Allium ceta (Onions), beans and herbs are the traditionally used diets harbouring certain important and high nutritional values. They can be used as flavouring purpose, food stuff, condiment and medicines in ancient times for treating many ailments.<sup>[2]</sup> The presence of phenolic phytochemicals, sulfur compounds and quercetin in onions are the ones making it beneficial for human health.<sup>[3-5]</sup>

They are considered to be a rich source of polynutrients, carbohydrates, iron, potassium, vitamin C, arginine, selenium and fiber.<sup>[6,7]</sup> The presence of these compounds are the reason for producing antiasthmatic, antithrombotic activity, antiplatelet activity, anticarcinogenic properties, and antibiotic effects.<sup>[8,9]</sup> When used in specific doses per day, they are beneficial for reducing risks of cardiovascular disorders, obesity, hypercholesterolemia, gastrointestinal tract pathologies, hypertension, type 2 diabetes, cataract and malignancies.<sup>[7]</sup>

A published study conducted on population of Japan recommends an average 16.2 and 15.5 mg day daily dose of quercetin to achieve desirable benefits.<sup>[10]</sup> Amongst the edible parts of onion, recommended daily dose is 10–50 mg per 100 g. The cultivated onion crop in Hokkaido was found to have 30–50 mg quercetin per 100 g of a fresh weight.<sup>11</sup> Thompson et al in 1985 identified the toxic effects of onions when exceed a dose of 50 mg/kg. Milder effects were observed on lung and liver. But exceeding a dose of 500 mg/kg resulted in 25% mortality rate.<sup>[12]</sup>

## DISCUSSION

The flavonoids including quercetin plays protective role against cardiovascular pathologies, malignancies and many chronic disorders.<sup>[13]</sup> Elaborating further anti-oxidant and anti-inflammatory properties are the main pathological pathways for achieving the said benefits. A protective role for liver and pancreatic pathologies was described by *Kobori M et al in 2011*. He narrated in his findings that this is because of reduction in oxidative stress and blockage of cyclin dependant kinase inhibitor.<sup>[14]</sup> *Peterson JJ et al in*

*2012* described the beneficial role of quercetin for treating hyperlipidemia, obesity, hyperinsulinemia, and hyperglycemia.<sup>[15,16]</sup>

*Effects on Blood Glycemic levels:* The published reports by *Azuma K et al in 2007*, *Demerdash EFM in 2005* and *Rigelsky JM et al in 2002* concluded that presence of phenolic phytochemicals compound in onion bears anti-oxidant properties and helps lowering the blood glucose levels.<sup>[5,17,18]</sup> *Rigelsky JM et al in 2002* also described that intake of quercetin lowers the risk of type 2 diabetes.<sup>[18]</sup>

*Effects on Blood Pressure:* *Edwards et al in 2007*, described that daily intake of 730 mg quercetin per day for 28 days helps reducing the blood pressure in patients of stage 1 hypertensive.<sup>[19]</sup> It was supplemented by *Egert et al in 2010*.<sup>[20]</sup> *Arai et al in 2000* disclosed that in Japanese women the dose of quercetin is inversely proportional to the concentrations of total cholesterol and low density lipoproteins (LDL).<sup>[21]</sup> *Egert S et al in 2009* indicated that quercetin when used in a daily dose of 150 mg day<sup>-1</sup> for 6 weeks reduces oxidized LDL in obese persons.<sup>[22]</sup>

*Anti-Platelet & Anti Thrombotic Effects:* *Cavagnaro PF in 2012* and *Hansen EA 2012*, described that quercetin harbours the anti-platelet and anti-thrombotic effects when used in a raw form. They described that these properties will be markedly reduced by over cooking the onions either by boiling or heating for <30minutes.<sup>[23,24]</sup>

*Wound Healing:* *Murray CK et al in 2008* described in his study that Colonial physicians used to place a piece of onion in a wound for early healing.<sup>[25]</sup>

*Infection Mangement:* The antibacterial effects of (onion) were first identified by *Louis Pasteur*. *Allium* vegetables (onions, garlic, leeks, shallots, and chives) exhibits a broad spectrum antibacterial activity against both the gram positive and gram negative bacteria.<sup>[26,27]</sup>

*Anti-Depressant Effects:* *Sakakibara H in 2008* described that a daily powered onions dose of 50mg/kg body weight for 14 days when given to rats, anti-depressant effects were seen afterwards. He identified the independent stimulation of hypothalamic-pituitary-adrenal axis. Moreover plasma corticosterone levels were also found elevated.<sup>[28]</sup>

*Gastrointestinal (GIT) Disorders:* The use of *prebiotics* is now replacing antibiotics for GIT infections. They usually act by stimulating the growth of GI flora and is beneficial for health.

They are found in form of inulin, lactulose, psyllium, and oligosaccharides. Onions, garlics, leeks, asparagus, tomatoes, bananas, oats, wheat, and soy beans. [29,30]

*Stomach Cancers:* Helicobacter pylori (H. pylori) is a most common cause of gastric ulcers and carcinoma. Sivam GP et al in 2001 described that the population having high intake of Allium vegetables are at lower risk for gastric ulcers and carcinomas. The sulfur compounds present in the onions are considered the ones responsible for reducing risk of cancers. It functions to decrease bioactivation of carcinogens, redox modification, antimicrobial activities and many other biological processes that can initiate malignancy. [26,27] It was exposed that H.pylori bacterial activity was inhibited by endogenous reduction of compounds especially the carcinogenic N-nitros. [31,32]

Zhou Y et al in 2011 concluded from a meta-analysis that consuming large amounts of Allium vegetables reduces a risk of gastric cancer. The findings were extracted by comparing the two groups i.e the one having less consumption and the other having more. [33]

Guercio V et al in 2014, described that 30–40% of cancers are preventable by certain modifications i.e physical activity, controlling body weight, appropriate food and nutrition. [1]

*Colorectal Cancer:* Zhu B et al in 2014 conducted a meta-analysis and discovered that there is no association of Allium vegetables with reducing a risk of colorectal cancer. [34] Rose P in 2005 supplemented the findings. [35]

*Liver & Pancreas:* Demerdash FM et al in 2005 presented an idea that besides harboring the antihyperglycemic and antioxidant effects, Allium cepa may produce toxic effects on liver and kidneys, if exceeds the specific dose. [36]

*Esophageal Cancer:* A study on Taiwanese men revealed that a group of population consuming raw onions/ garlics atleast once per week were to found to be a lower risk for esophageal cancer. [37] The Italian and Swiss studies in 2009 supported the findings. [38]

*Benign Prostatic Hyperplasia & Endometrial Cancer:* A published data for the years 2007 and 2009 by Galeone C et al concluded and inverse relationship between onion consumption and benign prostatic hypertrophy/ endometrial cancer. [39,40]

*Prostate Cancer:* Hsing et al conducted a study in Shanghai and concluded 53% reduced chances of CA prostate in population using Allium vegetables. [41]

*Lung Cancer Reduction:* Russo GL et al in 2007 identified that the population having increased used of onions in diet are at lower risk of lung cancer in Hawaii population. He identified quercetin and anti-oxidant properties of onions the main reason behind this effect. The plasma levels of quercetin were measured after onion rich diet. Which was compared with molecular level studies on blood and urine. It was observed that resistance to breakage in DNA strands was seen along with decreased urinary oxidative metabolites. [42]

*Limited data for breast cancers:* The data is limited regarding the effect of Allium cepa consumption and its relation with breast cancer. [43]

## CONCLUSION

Raw form of onion when used in specific recommended daily dose, can prevent a human body form many cardiovascular, gastrointestinal, haematological and malignant disorders. The onion extracts should be used for the pharmaceutical trials for discovering new medicines to manage the said disorders.

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