

Onion – Health Benefits

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Abstract

Onion is a part of allium family of vegetable and it has been cultivated for centuries for their flavors, characteristics and their medicinal properties. In past few years, onion production has increased by 25% with respect to current production and after tomatoes; it is second most important horticultural crop. Onions are versatile and used as main ingredient in Indian cooking recipes. Onions gives flavors to many varieties and has many benefits to human health. These are the rich source of nutrients, vitamins flavonoids and the many sulphur containing organic compounds. The two important flavonoids – anthocyanin, quercetin and its derivatives which are responsible for the yellow and brown skins of many other varieties. The other most important flavonoid - alk(en)yl cysteine sulphoxides (ACSOs) that is flavor precursor, which gives odour and taste of onion. Onion has a variety of health benefits which include anticarcinogenic properties, antiplatelet activity, antithrombotic activity, antiasthmatic and antibiotic effects. Here, we review the health benefits of the onion, and the chemical reaction occurs in onion when they cut or chopped.

Keywords: - Onions, onions health benefits, lachrymatory factor

1- INTRODUCTION

Onion (Bulb onion or common onion) [1] is a vegetable which provide flavor and other health benefits. It is the rich source of nutrients, proteins, vitamins (B, C and G) and other essential elements (such as – calcium, iron... etc). It is also a rich source of folic acid and dietary fiber. It contains no fat and has anti-inflammatory, anti-asthmatic, antibacterial, antifungal and anti-diabetic actions. It contains antioxidant compound (which inhibit oxidation) quercetin, a flavonoids (phenolic acid, ellagic, caggeic. Sinapic, p-coumeric, sterols, saponins) which help to damage the free radicals produced in the body. Onion also treats the cause of cardiovascular disorders which includes hyperglycemia, hyperlipidemia and hypertension. It inhibits platelet aggregation, low density lipoprotein

oxidation and also protect against skin and stomach cancer. It regenerates the vitamin E which is very powerful antioxidant and inactivates the harmful effects of chelate metal ions.

Onions are potent super foods and packed with valuable and useful nutrients. It is the most significant ingredient in Indian cooking recipes. All types of onions – Red, yellow, sweet and white are differ in terms of flavor, color, texture, shape and other health benefits but flavor depend on the season in which they are grown.

2- WHITE ONIONS



- White onions are super-healthy in both forms – raw as well as in cooked form. It has pungent flavor, thin white papery skin and all-white flesh. It is rich source of vitamin C, flavonoids and phytonutrients.
- They have a short shelf life due to the high concentration of sugar content.
- They have a power to keep your blood free of clots. So, it is very effective for heart problems.
- White onions are very helpful in increasing the immune system of the body. It lowers the risk of allergic reactions.
- White onions are very effective for proper digestion. It prevents from diarrhoea, gastric ulcers, cholera and plague.

3- RED ONION



- Red onions are generally used in raw form (salads, sandwich...etc). It has a deep purple layer of outer skin and reddish flesh.
- Red onions have a low concentration of sugar content.
- Red onions are the wealthy source of anti-oxidant agent quercetin, polyphenol anti-oxidant

anthocyanin, powerful anti-cancer agent that neutralizes cancer cell growth and reduces whole body inflammation.

- Recent Study has shown that red onions lower the risk of stomach, oral, laryngeal, esophageal and ovarian cancer. Some researchers have found that when we eat half an onion daily, the risk of stomach cancer was reduced by 50%.

4- YELLOW ONIONS



Yellow onions have a sharp, sweet, deep and astringent flavor, fist-sized, fairly tough and yellow-brown papery outer skin and meaty layers. When yellow onions are cooked, they lose their sharpness and become sweeter, which makes them perfect for caramelized onions. Yellow onions have a high sulphur content than white onions, which gives it a too strong, pungent and more complex flavor unless other ingredients balance the flavor.

5- SWEET ONIONS

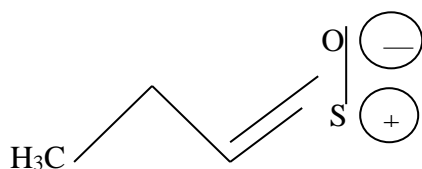


Sweet onions are not as flavorful or pungent as yellow onions. Commonly, these onions lack an astringent taste, are

relatively mild and crispy. These are called sweet onions because they have a low sulphur content and high concentration of sugar content. Sweet onions have high water content as compared to other varieties of onions.

6- WHY ONIONS MAKE US CRY?

When we cut, crush, chop or smash the onion, then a chemical reaction takes place in which an enzyme is released, called Allinase (a biological catalyst that produces the eye-irritating compound very promptly). Then this enzyme interacts with the amino acid sulfoxides of the onion, and creates sulfenic acid (flavor unstable



In your eyes, the cornea contains nerves that transmit information to the larger nerves which are responsible for touch, temperature, and pain detection. The nerves detect the presence of syn-propanethial-S-oxide and transmit the signal to the central nervous system which stimulates the lachrymal gland (also known as tear gland) of your eyes. This, in turn, the syn-propanethial-S-oxide reacts with water present on the surface of the cornea in your eyes, then the gas will dilute and become more potent and produce sulfuric acid. The effect of this acid is irritating, not harmful. These acids irritate our eyes and make us cry.

7- BENEFITS OF ONIONS

Onions are best known for their flavorful and excellent taste which transforms any meal into an aromatic experience. Onions are low in calories, carbohydrates but raise the level of glutathione in our body which is a potent anti-oxidant for the liver and aids detoxification. They have antibacterial properties that detoxify and cleanse our body. Onions contain more than 100 sulphur-containing compounds which cure heart diseases, diabetes, asthma and many other

When they are crushed, smashed or cut, they won't be able to cry due to a lack of sulphur content.

Out of all these varieties of onions, red onions are the healthier one because they have a high content of anti-oxidant compounds. These molecules give the onion its characteristic taste, which spontaneously rearrange to form syn-propanethial-S-oxide (a volatile sulphur compound gas which is also known as Lachrymatory factor (LF)). LF is the volatile chemical which means that once it's released, it promptly evaporates and diffuses into the air.

Syn-propanethial-S-oxide (Lachrymatory factor)

health diseases.

7.1- ASTHMA

Anti-oxidant compound –quercetin (that acts like anti-histamine) is present in onion and reduces allergic, inflammatory chemicals in the body. Quercetin inhibits the release of histamine in the body that prevents immune cells. So, overall it can be a promising asthma treatment.

7.2- CANCER

The combination of onion/turmeric and onion/garlic creates a synergistic effect that lowers the risk of cancer but they are most effective for the cure of breast and colon cancer. Actually, red onions have a high content of quercetin or anthocyanin which inhibits the growth of cancer cells and creates an unfavorable environment for them and encourages them to undergo death.

Anthocyanin is an anti-oxidant compound which provides color to the vegetables and fruits. Anthocyanin in red onion provides the darkest color in it. A high concentration of anthocyanin in red onion would have the most cancer-fighting power.

7.3- BLOOD SUGAR LEVEL

Onion and onion extract is used to lower the blood sugar level, total cholesterol level and improves the glucose level. Allyl propyl disulphide, a volatile substance contained in onion is used to lower the sugar level in body by releasing the insulin. It is the active hypoglycaemic substance which prevents the destruction of insulin. It is very beneficial for colic or shooting pains in stomach due to indigestion.

Experimental and clinical studies show that APDS (Allyl propyl disulphide) competing with insulin (also a disulphide molecule) to enter in liver. The sites in liver where the insulin is deactivated ADPS occupy all these sites and break it to increase the life span of insulin.

7.4- SKIN AND HAIR

The onion juice contains sulfur containing compounds that boosts collagen production which enhances hair growth, treat alopecia areata (sudden hair loss) condition and fight premature aging. Onion juice also makes the hair shinier. And onion having antimicrobial properties that can help to fight against scalp infections.

In recent study, the extract of onion had improved acne problems. This extract also reduces redness and inflammation. So, the onion extract can be used for the treatment of bacterial and fungal infections. You can also apply the onion juice on your face, leave it for 10-15 mins and wash your face with warm water. But the one most important thing – don't let the juice get into your eyes. And then you will get a healthy and shiny skin.

7.5- BONE DENSITY

It is the one among all the health benefits in which it can prevent age-related osteoporosis. White onions contain a compound, called GPCS which can reduce bone loss. Another study revealed that the onions also help to treat joint pains and increase the bone density. Women who regularly ate onions had 5 percent more bone density than those who ate less.

8- REFERENCES

- i. "Allium cepa L.". World Checklist of Selected Plant Families (WCSP). Royal Botanic Gardens, Kew – *via* The Plant List.
- ii. <https://www.stylecraze.com/articles/amazing-health-benefits-of-onions/#gref>.
- iii. <https://www.medicaldaily.com/health-benefits-onions-5-surprising-ways-onions-can-cleanse-your-body-eliminate-disease-295820>.
- iv. http://shodhganga.inflibnet.ac.in/bitstream/10603/7897/11/11_chapter%204.pdf.
- v. <https://www.livescience.com/45293onion-nutrition.html>.
- vi. <https://www.health.com/nutrition/health-benefits-onions>.
- vii. <https://www.loc.gov/rr/scitech/mysteries/onion.html>.
- viii. <https://www.medicalnewstoday.com/articles/318811.php>.
- ix. <http://steadyrun.com/healthtips/vegetables/health-benefits-of-onions/>.
- x. <https://noshon.it/tips/the-difference-between-white-yellow-red-and-sweet-onions/>.