



Mini Review

Medicinal Values of Tomato (*Lycopersicon esculentum* Mill. –Solanaceae)

Pushpa Karna Mallick 

Tribhuvan University, Department of Botany, Tri-Chandra Multiple Campus, Kathmandu, Nepal

Article Information

Received: 28 June 2021

Revised version received: 14 September 2021

Accepted: 17 September 2021

Published: 29 September 2021

Cite this article as:

P.K. Mallick (2021) *Int. J. Appl. Sci. Biotechnol.* Vol 9(3): 166-168. DOI: [10.3126/ijasbt.v9i3.39789](https://doi.org/10.3126/ijasbt.v9i3.39789)

*Corresponding author

Pushpa Karna Mallick,

Tribhuvan University, Department of Botany, Tri-Chandra Multiple Campus, Kathmandu, Nepal.

Email: karnapushpa@yahoo.com

Peer reviewed under authority of IJASBT

© 2021 International Journal of Applied Sciences and Biotechnology

OPEN ACCESS



This is an open access article & it is licensed under a Creative Commons Attribution Non-Commercial 4.0 International (<https://creativecommons.org/licenses/by-nc/4.0/>)

Keywords: *Lycopersicon esculentum*; Solanaceae; Lycopene; Antioxidant; Detoxify; flavonoides

Abstract

Lycopersicon esculentum is a flowering plant of the family Solanaceae. The common name for this plant is tomato. Tomatoes are a good source of lycopene which is a main pigment found in it and responsible for red colour. The lycopene provides antioxidant properties and helps to prevent cell damage. Tomatoes also prevent the adverse effects of lead in the blood constituents. Tomatoes are used in different ways such as raw or cooked, in many dishes, sauces, salads, pickles, puree, paste, juice, sun-dried and drink. Tomato fruits content ninety four percent water, citric acid, malic acid, soluble sugars, vitamin, vitamin B1, B2, vitamin A, and many mineral salts etc. High levels of lycopene which contain in tomatoes are used in facial cleanser. Flavonoids like flavonols which is present in tomatoes are rich in antioxidant activity and can help our body ward off every day toxins. Flavonoides such as flavonols present in tomatoes are rich in antioxidant activity and can help our body ward off every day toxins. Flavonoides directly associated with human dietary ingredients, play a great role in diseases prevention and shows versatile health benefits.

Introduction

The tomato plant is flowering plants of the family Solanaceae, commonly called as tomato plant. Mostly it is cultivated for its edible red berry. It is uses as a vegetable for nutrition. Tomatoes are a good source of lycopene and are the main carotenoid found in tomato fruits which gives it its deep red colour. The major groups of pigments found in tomatoes are the chlorophyll and carotenoid. In green fruits the predominant pigment comprises a mixture of chlorophyll a and chlorophyll b. The lycopene biosynthesis increases during the ripening process as chloroplasts undergo transformation to chromoplasts (Kaur *et al.*, 2006).

The lycopene is also for human health as it provides antioxidant properties so it can neutralize free radicals and helps to prevent or repair cell damage (Mendez *et al.*, 2011). The tomato fruits when cooked are more effective. Tomato also prevents adverse effect of lead in blood constituents (Salawu, 2010). The origin of the tomato generally is in Western South America and Central America. *Lycopersicon esculentum* is widely grown throughout the warm temperate and tropical regions of the world next to potatoes. The major tomato producing countries are United States, Italy, Spain, Turkey Egypt and Greece. Tomatoes are also very popular

vegetables in Nepal. The Average production of tomato in Nepal is 13996kg/ha during fiscal year 2015/16 (Basyal *et al.*, 2019). The aim of present study is to give information about medicinal values of tomato plants and fruits in human life.

The tomato is a weak, stemmed, much branched; short lived perennial or annual under cultivation. The leaves are spirally arranged, imparipinnate compound with various lobed margins. The flowers are borne in clusters on the main axis and on lateral branches (Fig. 1). The fruits are fleshy berries and are hairy when young becoming smooth, juicy and shiny when ripe (Fig. 2). The plants of tomato generally grow to 1to3 meters in height. The size of the tomato varies with a range of 1–10 cm. in width.

The haploid chromosome number for this plant is $n=12$ (Kochhar, 1986).



Fig. 1: Tomato plant



Fig. 2: Fruits of tomato

The tomato fruits are consumed in different ways such as raw or cooked, in many dishes, sauces, salads, and drinks. Tomatoes are commonly used as a vegetable ingredient. The many varieties of the tomato plant are widely grown in temperate climate and tropical climate across the world, and also in green house condition which allow the production of tomatoes throughout all seasons of the year. The tomato crop is also used for products include canned tomatoes, tomato juice, puree, paste, and “sun-dried” tomatoes or dehydrated pulp. The plants of tomato prefer warm weather and more sunlight; it is grown chiefly in hothouses in cooler climates. The plants are affected by a number of pests and diseases, including bacterial wilt, early blight, mosaic virus, Fusarium wilt, nematodes, and tomato hornworms. Through crop rotation many of these problems can be controlled. Planting of resistant varieties and by the use of fungicides and pesticides also we can control diseases and pest.

Medicinal Values of Tomatoes

Tomatoes are medicinally very important as lycopene and flavonoides present in it which are responsible for cancer fighting agents.

(i) Lycopene

Lycopene deficiency in diet is one of the main causes of prostate cancer (Regular uses of tomato reduce the risk of cancer diseases such as lung, prostate, stomach, cervical, oral, breast esophageal, pancreatic, colorectal etc.

Tomatoes are also good for liver health. Tomatoes detoxify the body because of chlorine and sulfur present in it. Natural chlorine stimulates the liver and its function is filtering and detoxifying the body waste (Bhomik *et al.*, 2012). Sulfur protects the liver from cirrhosis. According to herbalists, tomatoes and its product can reduce the cardiovascular diseases as lycopene present in it. *Lycopene* is very powerful antioxidants which is present in red tomato and helps in prevent cancerous cell formation and other health disorders. Free radicals present in the body can be flushed out by lycopene present in tomato. The pulp of fruit is used as skin-wash for people with oily skin. The tomato fruits are used as an easy first aid treatment for burns, scalds and sunburn (Allardice, 1993). The strong smell of this plant is useful to repel insects from nearby plant. (Chiej, 1984). The decoction of the root is useful in the treatment of toothache (Duke, 1985). Tomatoes are used to cure scorpion sting and fresh fruit is used by Americans orally for kidney and liver problems (Dawid, 2016). Researchers of Israeli have found that lycopene is a powerful inhibitor of lung, breast, and endometrial cancer cells (Bhomik *et al.*, 2012).

High levels of lycopene which contain in tomatoes are used in facial cleanser.

Considerable amount of vitamin K and calcium are also present in tomato these nutrients are essential in strengthening and performing repairs on the bones and bone

tissues. Tomato also reduces the damage done by cigarettes smoking in the body. Vitamin A and Vitamin C present in great amount in tomato, these vitamins and beta-carotene work as antioxidants to neutralize harmful free radicals in the blood. Vitamin B and potassium are also present in tomatoes and they are effective in reducing cholesterol level in the body and lower the blood pressure. Vitamin A present in tomato is very helpful for shiny strong hair and vision improvement. Tomato without seeds in diet reduces the risk of kidney stones according to some studies. In addition, tomatoes are one of the best foods to prevent development of night blindness which is caused by deficiency of Vitamin A except those tomatoes are contained with chromium mineral which works effectively to control blood sugar in diabetic patient.

In tomatoes peels carotenoid are found in high concentration. The human intestinal cells absorb carotenoid greater than the paste enriched with tomato peels compared to tomato paste without peels. Tomatoes are enriched with calcium, magnesium and potassium that are why it also prevents Acidosis. Acidosis is the main cause of calcium deficiency, headaches, fatigue, sleeplessness, muscle aches, acne, hormonal imbalance, sexual dysfunctions etc. (Bhomik *et al.*, 2012).

Tomatoes also reduce the migraine attacks with help of riboflavin present in it.

Tomato juices help to fight against colds and flu. Tomatoes can help us manage urinary tract infection, improve digestion, stimulate blood circulation, improve fluid balance, prevent premature aging and reduce inflammation. Cooked tomatoes are good for breastfeeding mother as it increases the concentration of lycopene in breast milk.

(ii) **Flavonoids**

Flavonoids such as flavonols present in tomatoes are rich in antioxidant activity and can help our body ward off every day toxins. Flavonoids are compounds found naturally in many fruits and vegetables. Including more flavonoids in our diet is a great way to help our body stay healthy and potentially decrease our risk of some chronic health conditions. Flavonoids directly associated with human dietary ingredients, play a great role in disease prevention and show versatile health benefits (Tiwari and Husain, 2017). Flavonols also help to manage symptoms of cardiovascular disease.

The tomato fruits are largely content with water about 94 percent, moderate quantities of soluble sugars, many organic acids such as citric and malic acids, mineral salts and large quantities of vitamin C, vitamin A, vitamin B1 and vitamin B2 (Kochhar, 1986). The species is hermaphrodite and is pollinated by insects. The plant is self-fertile. Supply of the nutrient and environment mainly affect

the productivity of the crop. Many of these nutrients are supplied by soil and others are to be added from the external source in the form of organic and inorganic materials. The crop of tomato requires heavy manure and sufficient of fertilizer for more yields (Noor, 2012).

From the above information it is concluded that tomatoes are very important vegetable crop with antioxidant properties. As tomatoes are available in very low cost so its inclusion in daily diet is very useful for all age groups and also specially for growing children's.

Conflict of interest

The author declares that there is no conflict of interest with present publication.

References

- Allardice P (1993) *A-Z of Companion Planting*. Cassell Publishers Ltd, London, United Kingdom.
- Basyal K, Khanal K, Dhakal S (2019) Socio-Economic Study of Tomato Producing Farmers in Lamahi Dang. *Biomed J Sci & Tech Res* **20** (5) MS.ID.003521. DOI: [10.26717/BJSTR.2019.20.003521](https://doi.org/10.26717/BJSTR.2019.20.003521)
- Bhomik D, Sampath Kumar KP, Paswan S, Srivastava S (2012) Tomato-A Natural Medicine and its Health Benefits. *Journal of Pharmacognosy and Phytochemistry*. **1** (1):24-36.
- Chiej R (1984) *Encyclopaedia of Medicinal Plants*. MacDonald Publishers.
- Dawid J (2016) The Role of Tomato Products For Human Health. *Journal of Health, Medicine and Nursing* **33** p66-74.
- Duke JA and Ayensu ES (1985) *Medicinal Plants of China*. Reference Publications, Inc. DOI: [10.1126/science.4035343](https://doi.org/10.1126/science.4035343)
- Kaur D, Sharma R, Wani AA, Gill BS and Sogi DS (2006) Physicochemical Changes in Seven Tomato (*Lycopersicon esculentum*) Cultivars during Ripening. *International Journal of Food Properties*, **9** (4):747-757. DOI: [10.1080/10942910600575716](https://doi.org/10.1080/10942910600575716)
- Kochhar SL (1986) *Economic Botany in the Tropics*. Macmillan India Limited.
- Mendez I, Saura I, Vera G, Araceli M, Chavez S, Jose I, Carrillo R and Jose C (2011) Quality of fruits in Mexican Tomato (*Lycopersicon esculentum* Mill.) *Landraces Vitae*: **18**(1) p26-32.
- Noor M (2012) Response of Tomato (*Lycopersicon esculentum* Mill) Cultivars to Nitrogen Levels. *Pure Appl. Bio.*, **1**(3):63-67. DOI: [10.19045/bspab.2012.13003](https://doi.org/10.19045/bspab.2012.13003)
- Salawu E (2010) *Lycopersicon esculentum* (Tomato) Prevents Adverse Effects of Lead on Blood Constituents. *Malaysian Journal of Medical Sciences*. **17**(3):13-18.
- Tiwari S C and Husain N (2017) Biological activities and Role of Flavonoids in Human Health-A review. *Indian J Sci Res* **12**(2): 193-196.