

RESEARCH ARTICLE

Evaluation and Role of Lycopene from the various Vegetables

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ABSTRACT

Lycopene is one of the most important and very much useful carotenoid traced in many fruits and vegetables. Lycopene is a potent antioxidant substance which plays critical role in cancer prevention, sun protection, asthma, atherosclerosis, high cholesterol and in maintenance of the immune system of the body. This study made for to assess the concentration and presence of lycopene in various vegetables which are included in our day to day diet. For this spectrophotometric analytical techniques were used and nutritionally important data is traced out from the experimentation.

Keywords: Lycopene, spectrophotometer, carotenoid, antioxidant.

INTRODUCTION

Lycopene is a bright red carotenoid pigment found in fruits and vegetables. It is an important intermediate in the biosynthesis of many carotenoids, including beta-carotene responsible for yellow, orange or red pigmentation lycopene belongs to the family of carotenoids and structure that consists of a long chain of conjugated double bonds, with two open end rings. The structure of lycopene is the longest of all carotenoid. Lycopene (C₄₀H₅₆) is an unsaturated hydrocarbon. Carotenoid contains 13 carbon-carbon double bonds, 11 of which are conjugated and arranged in a linear array. These conjugated double bonds are responsible for the vibrant red color of lycopene. It is a lipophilic compound that is insoluble in water, but soluble in organic solvents, and it has a quenching constant double that of beta-carotene and 10 times alpha tocopherol. It is an abundant carotenoid in human blood that is associated with antioxidant and most powerful antioxidant has received attention for potential role in preventing cardiovascular disease such as cancer in humans also plays role in the prevention of heart disease and to reduce the risk of developing cholesterol. The antioxidant properties of lycopene primarily responsible for beneficial effect to suggest other mechanism (Agarwal *et al.*, 2000). Lycopene to be great interest to the food and related industries or well to public health organization. An increase in serum lycopene after supplementation can reduce oxidative stress may play a role in endothelial function (Kim *et al.*, 2010). In present work analysis and evaluation of lycopene from various vegetables is done.

MATERIAL AND METHOD

Vegetables are the great source of antioxidants because almost vegetables contain one or more vitamins, carotene and having high antioxidant properties. Experimental vegetables were collected from various agricultural fields from different areas of Amravati district and analysed for Lycopene extraction.

Lycopene extraction:

1gm of each sample in 15ml acetone were crushed then acetone extracts transferred in to separating funnel containing 20ml petroleum ether mixed gently. Then added 10ml of 5% sodium sulphate solution, shaken well gently and reduced the volume of petroleum ether because of evaporation. Two phases formed upper petroleum ether phase and lower aqueous phase. Petroleum ether extract contains carotenoid. In it added 10gm of anhydrous sodium sulphate. Kept aside for 30 min. Decanted the extract, volume were makeup 50ml. UV-Vis spectral analysis has been done by using a spectrophotometer with micro processor and double beam. The wavelength range used were 503nm.

RESULT AND DISCUSSION

Lycopene is a carotenoid, which is a coloring pigment dominantly found in fruits and vegetables. Many studies confirm that lycopene is a carotenoid, phytonutrient and is the most potent antioxidant. Antioxidant provide an effective means to combat the

deleterious effects of highly reactive oxidant molecules generated endogenously through normal metabolic processes, lifestyle activity and the diets. Antioxidants have disease fighting properties that protect cells from damage by substances known as free radicals. Antioxidants like lycopene vitamin E, vitamin C worked by neutralizing free radicals that are formed when body cell burn oxygen for energy. Antioxidant also may help to keep immune system healthy and reduce the risk of cancers and other diseases. Also some studies shows correlation between skin roughness and lycopene concentration. The high levels of lycopene exhibits lower levels of skin roughness, so lycopene as well as other antioxidant substances may be able to reduce the formation of furrows and wrinkles also it assume that skin roughness depend not only an age but also on other factors. Lycopene possesses strong antioxidant capabilities. Lycopene is not produced into body so you can only obtain its benefits by eating fruits rich in lycopene or supplementing vitamins containing lycopene serum concentration of lycopene may decrease and increase proportionately to amount of lycopene in diet. There are various dietary sources of lycopene such as fruits and vegetables. Studies made in order to trace out the concentration of lycopene and it is observed that to fulfill daily need. According to national research council daily intake of lycopene should be 15mg. In order to fulfill above prescribed dose various fruits and vegetables can be consumed singly or in combinations. And one can have varietal and changed nutritive food supplement considering lycopene concentration. Various concentrations are shown in table and in graph.

Table 1: Various concentrations of Lycopene in different vegetables.

Sr. No.	Name of vegetables (sample)	Vernacular name	Weight of sample	Total Volume of extract	Volume taken for analysis	Absorbance (503nm)	Lycopene in 1gm of sample(mg)
1.	<i>Beta vulgaris L.</i>	Beet root	1gm	10ml	1ml	0.003	0.093
2.	<i>Brassica oleracea var.botrytis</i>	Cauliflower	1gm	10ml	1ml	0.004	0.124
3.	<i>Brassica oleracea L. var. capitata L.</i>	Cabbage	1gm	10ml	1ml	0.001	0.031
4.	<i>Capsicum annum L.</i>	Chilly	1gm	10ml	1ml	0.068	2.122
5.	<i>Cucumis sativum L.</i>	Cucumber	1gm	10ml	1ml	0.001	0.031
6.	<i>Cucurbita maxima Duch.ex. poir.</i>	Cucurbita	1gm	10ml	1ml	0.006	0.187
7.	<i>Daucus carota L.</i>	Carrot	1gm	10ml	1ml	0.033	1.029
8.	<i>Pisum sativum L.</i>	Pea	1gm	10ml	1ml	0.045	1.404
9.	<i>Lycopersicon esculentum Mill.</i>	Tomato	1gm	10ml	1ml	0.068	2.402
10.	<i>Solanum melongena L.</i>	Brinjal	1gm	10ml	1ml	0.003	0.093
11.	<i>Solanum tuberosum L.</i>	Potato	1gm	10ml	1ml	0.001	0.031
12.	<i>Spinacia oleracea L.</i>	Spinach	1gm	10ml	1ml	0.019	0.592

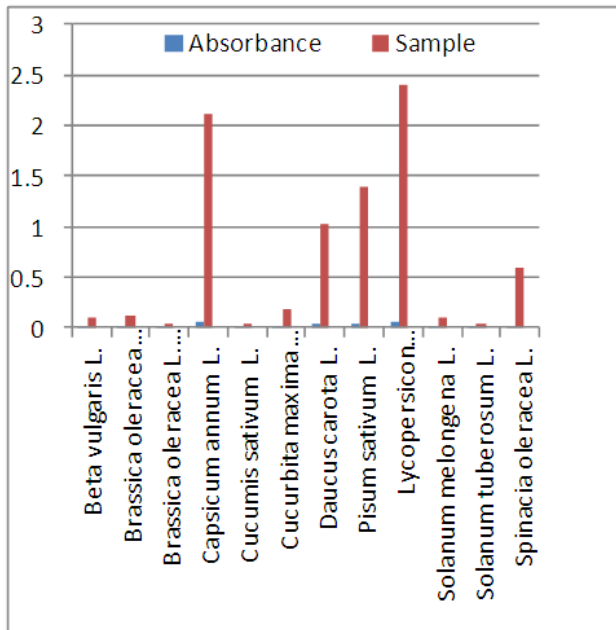


Fig 1: Showing various concentrations of Lycopene in different vegetables.

CONCLUSION

So it is confirmed that lycopene is very useful carotenoid found from food supplement and plays major role in human health and disease prevention.

REFERENCES

- Agarwal S and Rao AV (2000) Tomato lycopene and its role in human health and chronic diseases can, *Med Assoc J.*, 163:739-44
- Darvin ME *et al.* (2005) Determine of the carotenoids and lycopene concentration in the human skin using the Raman Spectroscopic Method, *J.Phys.D-Appl.Phys.*,38: 2696-2700.
- Food Sources of Lycopene (<http://nutrient.javalime.com/nutrient.php/337>)-Based on USDA (US Department of Agriculture)National Nutrient Database Release 21.
- Halliwell B (1994) Free radicals, antioxidants and human disease: Curiosity, Cause, *Lancet*, 344 : 721-4.
- Kim OY, Yoe HY, *et al.* (2010) Independent inverse relationship between serum lycopene concentration and arterial stiffness Atherosclerosis. 2010; 208: 581-6.
- Lycopene Nutrition Food and Supplement Source .2012; (mhtml:file://H:\Lycopene%20nutrition%20Heart%Health%20supplements.mht).
- Rao AV and Agarwal S (1999) Role of lycopene as antioxidant carotenoid in the prevention of chronic diseases: a review, *Nutr Res.*, 1999; 19:305-23.
- Sandmann G (1994) *Euro J Biochem.*, 223,7-24.
- Thimnaiah SR (1999) Standard method of Biochemical analysis 1999; Kalyani Publication new delhi. 304-306.
- Thamburaj S and Singh N (2003) Textbook of Vegetables, Tubercrops and spices, Indian Council of Agricultural Research (ICAR) Krishi Anusandhan Bhavan Pusa New Delhi.