RESEARCH REVIEW JOURNALS
Volume-03
Issue-10
October-2018

ISSN: 2455-3085 (Online)
RESEARCH REVIEW International Journal of Multidisciplinary
www.rrjournals.com [UGC Listed Journal]

Study of vitamin C content in some fruits and vegetables

Pavan M. Kadam

Assistant Prof., Dept of Chemistry, Shri Vyankatesh Arts, Commerce and Sciences College, Deulgaon Raja Maharashtra (India)

ARTICLE DETAILS

Article History
Published Online: 10 October 2018

Keywords
Vitamin C, fruits, vegetables

***Corresponding Author**

Email: pavankadam001[at]gmail.com

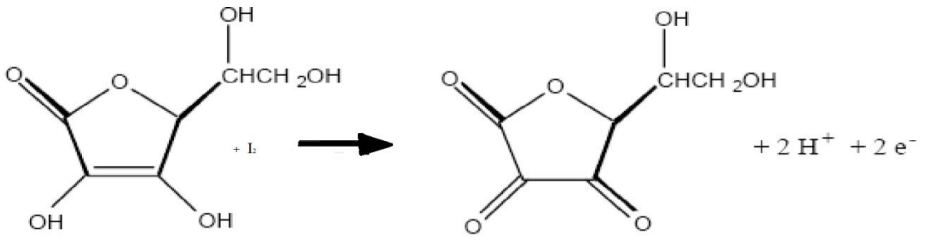
ABSTRACT

Among all vitamins, vitamin C plays a crucial role in maintaining good health. It is a powerful antioxidant naturally present in many foods, especially fruits and vegetables, which play an important role in the prevention of infectious diseases. Ascorbic acid content of some fruits and vegetables like lemon, orange, apple, strawberry, banana, tomato, cucumber, carrot, potato, pineapple, was determined. All fruits were collected from local market. Vitamin C content of the fruits was determined by using titration method using Iodine and sodiumthiosulphtae solutions.

1. Introduction

Vitamin C (Ascorbic acid) is the most important vitamin in fruits and vegetables. Vitamin C, or ascorbic acid, is a water soluble antioxidant that plays a vital role in protecting the body from infection and disease. It is not synthesised by the human body and therefore must be acquired from dietary sources – primarily fruits and vegetables. Vitamin C is helpful for the prevention of scurvy, gums bleeding, maintenance of healthy skin. It functions in collagen formation, absorption of inorganic iron, reduction of plasma cholesterol level, inhibition of nitrosoamine formation, enhancement of the immune system, and reaction with singlet oxygen and other free radicals. As an antioxidant, it reportedly reduces the risk of arteriosclerosis, cardiovascular diseases and some forms of cancer1-5.

Vitamin C is required for the biosynthesis of collagen, L-carnitine, and certain neurotransmitters; vitamin C is also involved in protein metabolism [6,7]. Collagen is an essential component of connective tissue, which plays a vital role in wound healing. Vitamin C is also an important physiological antioxidant [8] and has been shown to regenerate other antioxidants within the body, including alpha-tocopherol (vitamin E) [9]. In addition to its biosynthetic and antioxidant functions, vitamin C plays an important role in immune function [9] and improves the absorption of nonheme iron [10], the form of iron present in plant-based foods. Insufficient vitamin C intake causes scurvy, which is characterized by fatigue or lassitude, widespread connective tissue weakness, and capillary fragility [6,7,9]. Fruits and vegetables are best source of vitamin C. Common symptoms of vitamin C deficiency are are unexplained fatigue, purple or red dots on the skin, swelling of the gums, slow-healing wounds, joint pain and corkscrew hairs, anemia, losing teeth, bleeding gums, bruising, change in hair and skin conditions, development of depression, mood swings, weight Loss, infections, joint and muscle aches. As per the National Institute of Nutrition in India, The recommended requirement for Vitamin C in adults is 40 mg per day. So we have studied the amount of vitamin C present in different fruits available in local market.



ascorbic acid dehydroascorbic acid

2. Material and Methods

Sample Preparation

100 g of fruits sample were cut into small pieces. Place the sample into a blender or food processor, add 50ml distilled water and blend to a pulp. Strain the fruit or vegetable pulp through cheesecloth, washing the pulp with a few 10 ml portions of water and collecting all filtrate in a 250 ml beaker. The filtrate was poured in a 100 ml volumetric flask and diluted the solution to 100 ml with distilled water.

Titration

In this method the solution of fruit juice is oxidized by iodine solution and excess of iodine is then estimated by titration with standard sodium thiosulphate solution. Take 10 ml of fruit juice solution in conical flask and add 10 ml of 0.1 N iodine solution and 1 ml of freshly prepared starch solution. Shake the contents for 2 minutes and titrate the unreacted iodine against standard sodium thiosulphate solution till the solution becomes colourless. Blank titration is carried out by

titrating the 10 ml of iodine solution against sodium thiosulphate solution using starch as indicator till it becomes colourless. The difference in two readings will give the amount of vitamin C in given solution. Repeat the procedure for three readings and take the mean.

3. Result and Discussion

The contents of ascorbic acid in different fruits and vegetables were determined by titrimetric method and the results are given in Table 1. Results in table shows that highest concentration of vitamin C is in Lemon 58 mg/100 gm, followed by strawberry which has vitamin C 54.60 mg/ 100 gm and the lowest concentration of vitamin C is in carrot 5.68 mg / 100 gm and other samples have the concentration of vitamin C as Orange (45.22 mg/100 gm), Apple (6.15 mg/100gm), Banana (6.28 mg/100gm), Cucumber (6.10 mg/100 gm), Pineapple (38.20 mg/100 gm), Tomato (24.06 mg/100gm), Potato (25.55 mg/100gm). The vitamin C content in some fruit is high so they are good source of vitamin C and are easily available in local market. Fruits and vegetables having high concentration of vitamin C can be used in treatment of vitamin C deficiency diseases.

The amount of vitamin C observed in different fruits mg/100 ml is given in the table given below.

Table No. 1

Sr.No.	Name of Fruit	Vitamin C in mg/100 gm
1	Lemon	58.30
2	Orange	45.22
3	Apple	6.15
4	Strawberry	54.60
5	Banana	6.28
6	Cucumber	6.10
7	Pineapple	38.20
8	Tomato	24.06
9	Carrot	5.68
10	Potato	25.55

Acknowledgement

We are highly indebted to Principal Dr. G. B. Jadhav, of Shri Vyankatesh Arts Commerce and Science College, Deulgaon Raja for encouragement during this research work. We are also thankful to all the Teaching and non-teaching staff of Shri Vyankatesh Arts and Commerce College for helping us for this entire research work.

References

1. Rekha C., Poornima.G., Manasa M., Abhipsa V., Pavithra devi J., Vijay kumar H.T. and Prashith Kekuda
2. T. R.(2012). Ascorbic Acid, Total Phenol Content and Antioxidant Activity of Fresh Juices of Four Ripe and Unripe Citrus Fruits Chem Sci Trans. 1(2):303-310.
3. Choi Y., Jeong H.S. and Lee J. (2007). Food Chem. (103):130-138.
4. Kaviarasan S., Naik G H., Gangabagirathi R., Anuradha C.V. and Priyadarshini K.I. (2007). Food Chem.(103):31-37.
5. Yen G. C., Duh P. D. and Su H.J. (2005). Food Chem. (89):379-385.
6. Li Y, Schellhorn HE. New developments and novel therapeutic perspectives for vitamin C. J Nutr 2007;137:2171-84. [PubMed abstract]
7. Carr AC, Frei B. Toward a new recommended dietary allowance for vitamin C based on antioxidant and health effects in humans. Am J Clin Nutr 1999;69:1086-107. [PubMed abstract]
8. Frei B, England L, Ames BN. Ascorbate is an outstanding antioxidant in human blood plasma. Proc Natl Acad Sci U S A 1989;86:6377-81. [PubMed abstract]
9. Jacob RA, Sotoudeh G. Vitamin C function and status in chronic disease. Nutr Clin Care 2002;5:66-74. [PubMed abstract]
10. Gershoff SN. Vitamin C (ascorbic acid): new roles, new requirements? Nutr Rev 1993;51:313-26. [PubMed abstract]
11. Indian Food Composition Tables 2017 T. Longvah, R. Ananthan, K. Bhaskarachary and K.Venkaia

