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Estimation of Percentage of Ascorbic Acid Contents in Selected Trophical Fruits

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Estimation of Percentage of Ascorbic Acid Contents in Selected Trophical Fruits

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Abstract- Ascorbic acid content in *Citrus reticulata*, *Citrus sinensis*, and *Citrus limonum* were estimated. *Citrus reticulata* contained 30.60mg/100g, *Citrus sinensis* had 55.9 mg/100g, *Citrus limonum* ascorbic content was 57.5mg/100g.These values were higher than the literature values .The high ascorbic contents in the three samples showed that they are highly rich in vitamin C and they may be good for the prevention and treatment of scurvy.

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I. Introduction

A vitamin is an organic substance which is needed in trace quantity for normal cell functions. The vitamins that cannot be synthesized internally by an organism are called essential vitamins, in their absence in the external medium, the cells cannot survive. A typical example of this is ascorbic acid which has trade name of vitamin C. Ascorbic acid functions in a number of biochemical reactions, mostly involving oxidation. Thus, it is required to speed the conversion of certain proline residue in collagen to hydroxyproline in the course of collagen synthesis [1].Citrus fruits, which belong to the family of rutaceae are one of the main fruit tree crops grown throughout the world. Although sweet orange *(Citrus sinensis*) is the major fruit in this group accounting for about 70% of citrus output. The group also encompasses small citrus fruits such as tangerine tree (*Citrus reticulata*), grapefruit tree (*Citrus vitis*), lime tree (*Citrus aurantifulia*) and lemon tree (*Citrus limonum*) [2]. It is well known that citrus fruits contain a range of key nutrients including high levels of vitamin C and this necessitate the research article to find out the ascorbic acid contents of these citrus fruits obtained locally from a popular market.

II. Materials and Methods

a) Reagents

The analytical grade reagents used for this research work included; 2.6 dichlorophenbolindophenol (blue dye), 20% glacial acetic acid, standard L-ascorbic acid and distilled water.

b) Sample Collection and preparation

The samples namely; *Citrus limonum, Citrus reticulate, Citrus sinensis* were obtained from a local market called king's market in Ogbomosho, Nigeria on 10th, April, 2014. They were washed, pilled, blended using blender and sieved using sieve white cloth. The samples were stored in sterilized bottle and kept in a refrigerator for further use.10 ml of each filtrate was mixed with 20% glacial acetic acid in a 100 ml standard flask which was made up to 100 ml with distilled water.

c) Dye preparation

The standard dye solution was prepared by dissolving 50mg of blue dye in 50 ml of distilled water. The mixture was diluted to 200ml, filtered and kept.

d) Preparation of standard ascorbic acid solution

This was prepared by dissolving 100mg crystalline ascorbic acid in 50 ml of 20% glacial acetic acid and diluted to 100 ml with distilled water.

e) Titration Procedures

10 ml of the ascorbic acid solution was titrated with the dye solution. Each drop of the dye in contact with the solution turns pink. The end point was reached when the pink colour lasts for 10 seconds. Similarly, 10 ml of each sample prepared was in turn titrated with the due and the titre values were noted.

III. Results

Detailed estimations:

6.2 ml of the dye solution was needed to titrate 10 ml of the standard ascorbic acid solution which contained 1 mg of ascorbic acid per ml.

That is; 6.2ml ≡ 10mg

Therefore, 1ml = (10/6.2)= 1.613mg.

In the case of orange extract, the average ml of the dye used was 3.46ml.

That is; 3.46 ml ≡ 1.613 ×3.46= 5.581mg.

10 ml of the orange extract contained 5.58mg ascorbic acid.

Therefore, 100 ml of the juice extract contained 55.8mg of ascorbic acid. The same principle was applied to all the samples.

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Table 1.0 : showing the results

Samples	Average titre volume (ml)	Estimation of ascorbic acid (mg/10ml)	mg/100ml	mg/100g
Citrus sinensis	3.47	5.59	55.90	55.90
Citrus reticulata	16.13	3.06	30.60	30.60
Citrus limonum	3.57	5.75	57.50	57.50

Table 2.0 : showing comparism of results with literature values

Samples estimated ascorbic acid (mg/100g)	literature values(mg/100g)	(Holand*et al.*,)
Citrus sinensis	55.9	54
Citrus reticulata	30.6	30
Citrus limonum	57.5	58

IV. Discussion

This research work has indicated that the citrus fruits were widely varied in their ascorbic content. All the three samples; *Citrus limonum, Citrus reticulate, Citrus sinensis* compared favorably with the recommended values as seen in table 2.0. It is well known citrus fruits contain a range of key nutrients including high levels of vitamin C and significant amounts of dietary fibre. Citrus is the main source from which primate's device vitamin C [2].It has been reported that the ascorbic acid in the body aids in iron absorption from the intestines. It is important for connective metabolism especially the scar tissue, bones and teeth[3,4]. In addition to its physiological functions, it is necessary as an anti-stress and protector against cold, chills and damp[2]. It prevents muscle fatigue and scurvy that is characterized by skin hemorrhages, bleeding gums, fragile bones, anemia and pains in joints and defects in skeletal calcification [2]. The function of ascorbic acid also accounts for its requirement for normal wound healing[5, 6]. It acts also as antioxidants in the skin by scavenging and quenching free radical generated by ultra violet radiation stabilization. The production of collagens is also dependent on vitamin C. It helps in the promotion and restoration of skin and improvement of fine wrinkles[7].

V. Conclusion

The research work has significantly showed the richness of *Citrus limonum, Citrus reticulate, Citrus sinensis* in vitamin C content and also the dye method employed has relatively degree of accuracy and low cost.

References Références Referencias

1. J. D. Huise, SR. Elli, L. M. Harderson; 'carnitine biosynthesis'. *Journal of Bio. Chem., 253*,***(1978).***
2. D. E. Okwi and I. N. Emenike, 'Evaluation of the Phytonutrients and VitaminsContents of Citrus Fruits'. *International J. Molecular Medicine and Advance Sciences 2(1), 1-6,* ***(2006).***
3. D. E. Okwu, 'Investigation into the Medicinal and Nutritional Potentids of Garciniakola Heckel and Dennettia Tripetala G. Baker.' Ph. D Thesis Michael OkparaUniversity of Agriculture Umudike, Nigeria, pp. 20-31, **(2003).**
4. D. E. Okwu, 'Phytochemicals, Vitamins and Minerals Contents of Two NigerianMedicinal Plants'.*International J. Molecular Medicine and Advance Sciences, 1, 375-381* ***(2005).***
5. D. E. Okwu, 'Phytochemicals and Vitamins Content of Indigenous Spices of SouthEastern Nigeria'. *J. Sustainable Agriculture and Environment, 6(1), 30-37,****(2004).***
6. D. E. Okwu and M. E. Okwu, 'Chemical Composition of Spondices Monbin Linn Plant Parts'. *J. Sustainable Agriculture and the Environment, 6(2), 140-147,* ***(2004).***
7. G. D. P. Roger, Encyclopedia of Medicinal Plants (Vol. 1). Education and Health Library Editorial Safeliz S. L. Spsin, 265, 153-154 **(2002).**