Iodometric Technique as a Veritable Alternative in Determining Ascorbic-Acid Content in Fruits (Oranges and Pineapples)

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INTRODUCTION

Ascorbic acid (vitamin C) is widely found in many fruits and vegetables. It is vital for the growth and maintenance of healthy bones, teeth, gums, ligaments and blood vessels and; it is the primary water-soluble anti-oxidant which prevents free-radicals generation in the body and damage to tissues. Most adults fail to meet-up with the recommended dietary allowance (RDA) of vitamin C per day.

MATERIALS AND METHODS

This investigation aims to determine the ascorbic-acid content of orange and pineapple, by iodometric analysis. The technique is a relatively cheaper and more feasible alternative, as it is not dependent on electricity. Six oranges and two pineapples were purchased from a local fruits' vendor in Ilaro town, Ogun State. The fruits were equally divided into two groups each, where one group was left for seven days to naturally rot after being cut-open and exposed to initiate and hasten rotting; to obtain diseased fruit samples but the other group was not, hence, taken as healthy fruit samples. The healthy fruits were surface-disinfected with ethanol. The indicator; dichlorophenol indophenol, otherwise called vitamin C reagent, was used to qualitatively test for ascorbic acid in the oranges and pineapples (healthy and rotten). Distilled water served as a control. The amount of ascorbic acid in each sample was determined by iodometric titration, which is a redox reaction.

RESULTS AND DISCUSSION

The test showed that vitamin C is present in all the samples but absent in the distilled water. The healthy oranges showed a greater value of 115.4mg/100ml as compared to 75.8mg/100ml of the rotten oranges, also the healthy pineapple seemed to showed a greater value of 34.1mg/100ml as compared to 15.8mg/100ml of the rotten pineapple. From this investigation, the concentration of ascorbic acid in the healthy oranges was about one-quarter more than the one in the rotten ones while the concentration of ascorbic acid in the healthy pineapple was about double more than the one in the rotten one. After the research, it was discovered that the healthy fruits relatively contained more ascorbic acid than the diseased (rotten) ones. The relative margin could be perceived to be as a result of the presence of spoilage microorganisms in the rotten samples. Though, the iodometric technique has its limitations such as it being laborious and time-consuming, it is still a sure substitute in the absence of electricity.

CONCLUSION

It can be concluded that iodometry could be potentially utilized in the quantitative assay for ascorbic acid, though with standardization, in fruits as an alternative to spectrophotometry. There was a drastic reduction in the vitamin C concentration of the rotten fruit samples as compared to the healthy ones.

Keywords: Electricity, indicator, commonly-consumed, surface-disinfected, concentration