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QUANTITATIVE ANALYSIS OF PRIMARY METABOLITES IN *MANGIFERA INDICA* (UNRIPE MANGO)

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ABSTRACT

The Subject of food science & Nutrition is an engrossing one. Based on this aspect the present study aims to analyze the Nutrients present in unripe mango (Mangifera Indica) and in the Seed. It was essential to compare the analytical data of nutrients present in ripe mango. In this study seven nutrients were analyzed.

Keywords: Mangifera Indica, Unripe mango, Ripe Mango.

INTRODUCTION

Known as the "king of fruit," the mango is an antioxidant-rich health booster. Low in calories and high in vitamins and minerals, mangoes make for a nutritious treat[1,5]. Mangoes offer many nutrients that boost health. Unlike many fruits, mangoes are rich in vitamin E. In addition, mangoes contain vitamins A (beta-carotene), B6, C, and K,potassium,calcium,phosphorus,magnesium,copper,iron,zinc,fiber[2,3].The sample chosen for this study as the most popular and the choicest fruit of India occupies and prominent place among the best fruits of the world that is mango. It was very essential to analyses the nutrients[4] in mango, so that it brings to the medicinal uses.

EXPERIMENTAL

Seed sample & unripe mango were taken for analysis. They were taken in a preweighed porcelain crucible. It was kept in an oven between 110 – 120^{0}C for analyzing the water content. Ash Content was measured by incinerating the sample in a Bunsen burner. Estimation of sugar content which includes reducing sugar, Non reducing sugar & total sugar were done using photoelectric colorimeter. [4]Protein content was determined by adding the samples with biuret assay reagent. The lipid value (saponification value & iodine value) were calculated by following the titrimetric procedures. In a similar way, Vitamin C was determined, whereas Vitamin A, B complex was estimated by using photoelectric colorimeter. Minerals like sodium & Potassium were calculated by preparing the standard Solutions & kept into the flame photometer. Calcium & Magnesium were analyzed by volumetric analysis. Phosphorous & Iron were determined by keeping the samples in photoelectric colorimeter.

RESULTS AND DISCUSSION

Water Content

The unripe mango and the seed were analyzed to have the water content in the range of 23.35% and 31.68% respectively. It was compared with the percentage water content of ripe mango (82.9%). This shows that the ripe mango has of highest moisture content than the green mango or the seed. The seed contains more water content than the unripe mango by 8.33%.(Table-1).

Ash Content

The unripe mango and the seed were analyzed to determine the amount of ash and the values are 0.23% and 1.44% respectively. It was observed that the ripe mango (1.2%) contains of higher ash content than

that of unripe mango. It was understood that the ripe mango contained more of carbonless substances in the ash than the unripe mango. The seed contains the carbonless ash content as much as the ripe fruit. (Table-1).

Carbohydrates The total sugar content in the unripe mango and the seed were secured by colorimetric method. The total sugar of unripe mango (5.83%) was higher than that of the seed (2.2%). But, this sugar content was less by 8.92% compared to the ripe mango. The non reducing sugar was more in amount (3.43%). than the reducing sugar (2.41%). It is given as 5.83%, 2.02%. This includes maximum constituent of Non-reducing Sugar 3.43% and minimum constituent of reducing sugar 2.41. It was compared with the values of ripe mango 14.75%. This shows that the ripe mango contains maximum of sugar content. (Table-1).

Proteins

The ninhydrin method was employed to find out the protein content in the unripe mango and the seed in the range of 0.83%, 0.05%. It was compared with the values or ripe mango 0.05%. This implies that unripe mango is rich in proteins. (Table-2).

Lipids Fat content was analyzed in the unripe mango and the seed in terms of Saponification value (15.10, 0.82) and Iodine values (0.49, 0.56). It was compared with the values or ripe mango 3.53, 17.23. This shows that the ripe mango consists of high value of fat content. The saponification value for the unripe mango (15.10) is higher than that of the seed (0.49) signifying most fat content in unripe mango. (Table-2).

Vitamins

Vitamins were estimated in the unripe mango and the seed by titrimetric and colorimetric methods. Vitamin C content in the unripe mango and the seeds given as 2.49%, 0.70%. Vitamin B content is in range of 0.09%, 0.12% (3.6.3). Vitamin A content is given as 7.7 x 10-5%, 9.5 x 10 -5. It was compared with the values of ripe mango such as 0.04 %, 0.13% and 39.4%. This implies that the unripe mango constitutes a rich source of Vitamin C and the ripe mango constitutes a rich source of Vitamin A. (Table-2).

Minerals

Minerals like sodium, potassium were analyzed in the unripe mango and the seed by flame photometer, the values are 0.19%, 0.12%; 2.32%, 0.12%.Calcium, Magnesium were analyzed by titrimetric method, the values are 32.02%, 2.5%; 28.79, 3.91.Phosphorous, Iron were analyzed by colorimetric method , the values are 20.79%, 3.91; 0.14%, 0.12%. It was compared with the values of ripe mango 3.44%. This implies that the unripe mango is rich in minerals. The above results obtained for the unripe mango and the seed is comparable with the standard values. (Table-2).

CONCLUSION

The results obtained for the unripe fruit were compared with that of the nutrients present in the ripe fruit. The amount of protein, Vitamin C were found to be high and the amount of water, ash, total sugar, lipid, vitamin A, Vitamin B-Complex were found to be less in the unripe fruit. So it is concluded that the unripe fruit is rich vitamin C and the ripe fruit is rich in total sugar and vitamin- A.

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Table-1

Sample	Water content	Ash content	Carbohydrates			Proteins	Saponification value
			Reducing Sugar	Non Reducing Sugar	Total Sugar		
Unripe mango	23.35	0.2407	2.409	3.425	5.828	0.826	15.51
Seed	31.68	1.4426	2.048	0.130	2.015	0.050	0.81

Table-2

Lipids value	Vitamins			Minerals					
	Vit. A	Vit. B Complex	Vit C	Na	K	Ca	Mg	Fe	P
0.489	7.7×10^{-5}	0.0884	2.493	0.1941	2.320	32.02	28.79	0.1426	6.414
0.558	9.5×10^{-5}	0.0798	0.703	0.1210	0.122	2.49	3.71	0.1190	5.631

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