Determination of Calcium Content in Rare Fruits Eugenia jambolina and Cordia Sebestina

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ABSTRACT: The calcium content of rare fruits grown in latur Dist. was determined by gravimetric estimation. The random samples of rare fruits selected are weighted and analyzed. The resulting oxalate precipitate is digested, filtered, washed, dried and ignited to de
definite temperature to constant weight. The present work is carried out for Eugenia Jambolina and cordia sebestina rare fruits seasonally grown in Latur Dist.

KEYWORDS: Calcium, fruits, gravimetric, precipitate, KMnO4, Ash, Eugenia jambolina and Cordial sebestina.

I. INTRODUCTION

The fruits with one or the other vitamin content exert a tonic effect in body when eaten in the fresh raw and ripe stake instead of in processed form. The mineral calcium is essential form strong bone and teeth. It is present in sufficient quantity in carrot, bitter gourd, onion and tomato. All the three nutrients fats, proteins and carbohydrates contributes to energy requirements thereby undergo oxidation by combining with oxygen to produce energy, 36 KJ per gram in case of fats, 16-20 KJ per gram in case proteins and 16 KJ per gram in case of carbohydrates upon complete combustion. On the other hand (sugar) carbohydrates which are readily soluble in water are the best sources of energy as their energy may be rapidly transported by the blood. The foods included under sugars are joggery, honey, cane sugar, invert sugar etc. are the concentrated sources of carbohydrates particularly sucrose, glucose and fructose. The fruits are excellent source of vitamins and enzymes and are easily digested causing a cleansing effect on the blood and digestive track. The intake of fruits or fruit juice cures dehydration1. The minerals potassium, magnesium and sodium content of fruits are responsible for dielectric effect of these foods. The fruits alkalize the fluids, promote intestinal elimination keep the body free from toxic waste creeping in the blood from overloaded and sluggish intestinal track.

The important function of calcium is oestification of bones. Nearly 99% of calcium in the body is present in the skeleton. About 850-950 gms of calcium is present in an average healthy man2. Calcium and vitamin D deficiency results in rickets and osteomalacia among children and adult respectively15. In osteoporosis serum calcium level is normal but body store is reduced. Osteoporosis causes because of calcium deficiency. In this condition nervous changes occurs and impairment of memory takes place. Depression, irritation, loss of hairs and nails, roughness of the skin etc. are the symptoms of these conditions.

Calcium is absorbed maximum From milk and milk products because of the presence of lysine and lactose in it. Ragi is the cheapest source of calcium, therefore it is known as 'poor man's milk

II. EXPERIMENTAL TECHNIQUE

Procedure: 100 gm of ammonium oxalate was dissolved in a 200 mL of glass distilled water and stirred, such that the undissolved ammonium oxalate is deposited at the bottom of ammonium oxalate solution in a beaker. 0.5 gm of methyl red was dissolved in 100 mL of 95% alcohol. 50 mL of concentrated acetic acid was mixed with 200 mL of glass.
distilled water. 10 mL concentrated ammonia solution was mixed with 40 mL distilled water. 100 mL concentrated Sulphuric acid was added slowly with constant stirring to 400 mL of glass distilled water and cooled. An accurately weighted 0.36 gm of potassium permanganate was dissolved in a small potion of glass distilled water in a beaker then diluted up to a mark of 100 mL using glass distilled water 100 mL standard flask. A 0.01 N potassium permanganate solution was then prepared by diluting 100 mL of 0.1 N Potassium permanganate solutions to one liter in a standard flask.

A 25 ml aliquot of the obtained ash solution was taken in a 250 mL beaker to which around 25 to 50 mL distilled water and two drops of methyl orange were added. The solution was then made slightly alkaline by the addition of dilute ammonia and then slightly acidic with the help of few drops of acetic acid until the colour is faint pink.(pH 5.0) The solution was then boiled for few minutes and precipitate of calcium oxalate (CaC₂O₄) was digested by just allowing to stand at room temperature for 5 hrs. The precipitate was then filtered through a Wattaman filter paper No. 42 and subsequently washed with small portions of distilled water till the filtrate is free from oxalate ion which is tested by use of very dilute acidic KMnO₄/CaCl₂ solution. The filtrate was also made free from chloride ion which is tested by AgNO₃ solution. The larger part of the precipitate in the filter funnel was taken into a 500 mL beaker through the hole made at the bottom of the filter funnel by glass rod using hot dilute H₂SO₄ (1:4). The filter was washed 2-3 times with small portion of hot water and washing were collected in the same beaker thereby the residual precipitate was collected together.

The contents of the beaker containing filtrate with oxalic acid was then heated to 70-80°C and then titrated in hot condition against 0.01 M KMnO₄ solution till permanent pink colour is obtained. The filter paper in the filter funnel was then transfer to the beaker and titration was continued to obtain the same permanent pink coloured end point.

The amount of calcium (mg/100g) in the fruit was then calculated by applying the formula given below.

1. Formula:

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\text{Calcium} = \frac{\text{titre} \times 0.2 \times \text{Total volume of Ash solution} \times 100}{\text{Volume taken for Ashing} \times \text{Weight of Sample Taken}}
\]

III. RESULTS AND DISCUSSION

Calcium is lacking in many Indian diet. Its deficiency causes rickets, pigeon chest, irritability, retarded growth and calcemalaria. It also works as a coordinator among the mineral elements and helps to correct portion of other elements if calcium is present in abundance much iron is not needed.

The analysis data for calcium content for rare fruits under study is given in table 1. The ash content of Jamun (Eugenia Jambolina) observed in the present study (1.63%) was found to be higher as compared to literature value of common fruits like fig (0.6%) Mango (0.4%) Banana (0.8%), Grapes (0.2%) and Indian Gooseberry (0.5%) except the ash content of data (2.1%) which is relatively high. The observed value of ash (1.63%) for Jamun was found to be high as compared to its literature value (0.4%) but lower with respect to value reported by other workers 22.32%. The calcium content in Eugenia jambolina and cordia sebastina rare fruits was found to be 15.12 and 16.80 mg/100g respectively.

The unique fruit rarely found in this region having property similar to berries and only familiar in the rural areas of Latur know as Shelwat used in the present study exhibits high nutritional value. The ash content of shalwat (cordial sebastina) rare fruit observed in the present study (3.15%) is extremely high as compared to range of ash content of common fruit like date, fig, Apple, Mango, Banana, Grapes and Indian gooseberry (0.2 to 2.1%).
The observed calcium content of Jamun (15.12 mg/100g) is relatively almost same as that of calcium content of common fruits mango (14mg/100mg) and banana (17 mg/100g). The observed value of calcium content of Jamun (15.12mg/100g) is also found to be same as that of literature value of Jamun (15.0mg/100g).

The calcium content of cordial sebastina rare fruit observed in present study (16.8mg/100mg) is comparable with that of calcium content of Mango (14.0mg/100g).

From the above conclusion it is also observed that the rare fruit cordial sabestina has very high nutritional value with respect to total minerals and is found to be equally rich in calcium as compared to common fruit.

Therefore force on the basis of conclusions drawn from the results of present investigation it may be suggest that the rare fruit Cordial sebestina are best recommendations as nutrient rich fruit source for treatment mineral deficiency also for good health.

REFERENCES