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Short Communication

The Ash and Calcium Content of Common Fruit Grown in Latur District, MS, India

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Abstract

The total ash and calcium content of common fruits grown seasonally in latur district was determined by dry ash and EDTA titration method. The results of analysis of fruit Vitits Vinifera (Grapes) show 0.297 % ash and 18.25 mg / 100g of calcium. The analysis data of Syzgium camini (Jambul)show 0.488% ash and 14.99 mg / 100g of calcium. The ash content of both frait vitis Vinifera chrapes and syzgium camini (Jambul) are found to be same as that of literature values. The calcium content of Vitis Vinifera (Grapes) is found to be slightly lower and that of Syzgium Camini (Jambul) is found to be nearly same as compared to that of literature values.

Key words: Vitis Vinifera (grapes), Syzgium Camini (Jambul), calcium and ash content.

Introduction

The fruit is important to keep the human being alive and also to provide energy for carrying out various activities and keep oneself healthy. There are many references to fruit in ancient literature, it is believed that fruit from the base of food of gods and are the heavenly gift given to human because of their magic properties. The fruit have good medicinal effect. Some melo husks contained appreciable amounts of carbohydrate, protein and minerals, and could be useful as feed supplement for poultry[1]. Our body needs all nutrients in proper proportional by weight for maintaining good health but a single fruit cannot provide the entire nutrient in required proportions by weight for the proper growth. Therefore, the only alternative is to select a variety of fruit in our diet that can provide all the nutrients in proper proportion by weight[1]. A human being requires more than 45 different nutrients for its wellbeing.

Botanically, fruits are reproductive organ. A fruit is a mature ovary of a flower. The fleshy portion of the pericarp makes up the chief edible portion of the fruit. A fruit is the edible fleshy seed bearing part of plant or tree. Fruits are favored by all due to their attractive appearance, appearing flavor and pleasing odor. Apart from their nutritive value they are also appreciated for their appetizing effect and helps in bone development[2].

The fruit are source of vitamins, minerals, carbohydrates, organic acid and other constituents such as cellulose, woody fiber, gums, tannins, coloring matter and volatile oil[3]. And having antioxidant activity[4].The fruits are poor sources of protons and fats. The fruit of their low sodium level act as salt free diet.[5] Intake of fruit and its juice by a person particularly in dehydrated sick condition cause the hydration of person with an added advantage of supplying sugar and mineral at same time and having important perspect on environment[6].

Fruit are rich in water content amounting to 75-95% of the total weight. Fruit are sweet in taste. The sweetness of fruit is mainly due to sugar. Fruit contain large quantities of starch, an ripening, the starch is converted into fructose and glucose which are mainly responsible for sweetness of fruits. Fruit also contain fair amount of organic acid. The type of acids present in fruit differs from fruit to fruit. The principal acids present in fruits are citric acid, maleic acid and tartaric acid. The characteristics flavor of fruits is due to the presence of organic acid. Except grapes which contain tartaric acid, all other fruit contain citric and maleic acid. The acid content of fruit varies with type of fruit. Fruits have alkaline reaction with our body.[8] Fruits also contain enzymes. In ripe fruits carotenoid pigments are present in different forms which contribute to the pleasing color of fruits. The red, purple and blue shades of fruits are due to the presence anthocyanine pigments[9].

Taking significance of fruit in our diet and as a matter of scientific found worthwhile to determining the chemical composition with reference to the total calcium of few common fruit grown in Latur district[10].

Material and Methods

Determination of Ash Content: 170 g of Vitis Vinifera (grapes) and 125 g of Syzgium Camini (Jambul) weighed accurately in clean silica dish were first heated over a low

bursen burner flame to volatilize larger part of organic matter and then transferred to a temperature controlled muffne furnace maintained at 300^0C. The dry ash is confirmed till carbon in it has ceased to glow and then the temperature was raised to 450^0C. And the ignition was continued for 5 to 7 hours. The ash residue so obtained was then cooled indesiccators and weighed from the weight of ash residue. The percentage of ash was calculated by the formula given below.

Percentage of Ash in fruit sample =

$$\frac{\text{Weight of Dry ash residue (g)}}{\text{Weight of Vegetable sample (g)}} \text{ X 100} \quad (\%)$$

Determination of calcium content: 170g of Vitis Vinifera (Grapes) and 125g of Syzgium Camini (Jambul) were accurately weighed in a silica dish and after dry ash were 0.5 to 1gm of ash residue transferred to a clean beaker. After covering beaker with watch glass the ash residue moistened with little distilled water. The beaker was covered with watch glass and added 40 to 50 ml of dilate HCl with the help of pipette and content were further heated for 30 minutes at low flame after adding 10ml of hydrochloric acid to dehydrate silica and thon little water was added to dissolve soluble salts filtered in hot condition through Whatmann filter paper No. 41 and then washing were collecting along with filtrate into 100ml standard flask. The silica residue was rejected and filtrate along with washing collected in the 100 ml standard flask was then diluted up to mark of 100ml using distilled water and solution made homogeneous.

A 25ml aliquot of above solution of each fruit was transferred to a small beaker heated to boil and 5 to 1 gm solid Ammonium chloride was added and heating few minutes. Then to hot solution 1:1 ammonia was added slowly with constant stirring so as to precipitate $Fe+^3$ and $Al+^3$ ions as hydroxide. Whatmann filter paper 41 precipitate was then washed with cold distilled water for 3 to 4 times cold distilled water till free chloride ions.[11]

The precipitate along with the filter paper was transferred to beaker and then calcium oxalate monohydrate precipitate (CaC_2O_4, H_2O) was dissolved in minimum volume of Dil H_2SO_4 and transferred to clean dry conical flask. The solution was neutralized by adding 8 Msolution of potassium hydroxide (Tested by PH paper) Around 25 ml of distilled water 4ml of 8 M potassium hydroxide solution were added and allowed to stand for 3 to 5 minutes with occasional stirring them 30mg of hydroxyl ammonium chloride added and 50 mg of slide Patton and readers indicator was then and calcium ion in the solution was titrated against 0.01N EDTA till the color changes from red to blue. The volume of EDTA consumed was recorded.

Results and Discussion

The chemical characterization data for mineral content in fruits grapes and jambul grown in latur district and used for present investigation are presented in table- 1. The analytical data reveals that the mineral content in the fruit mentioned above was observed in the range (0.297-0.488%). The fruit syzgium camini (Jambul) found to contain highest percentage of ash and vitis vinifera (grapes) exihibed lowest level of mineral content. The calcium content in fruits of latur district were determined by complexometric titrimetry using EDTA (ethylene diamine tetra acetic acid) as titrant. The calcium content of fruits vitis vinifera (grapes) and syzgium Camini (Jambul) under study are given in table- 1. The range of calcium in the fruit grown in latur district was found to be (14.99-18.25 mg / 100 gm). The highest calcium content in fruit vitis vinifera (Grapes) and the syzgicamini (Jambul) were found to contain low calcium.

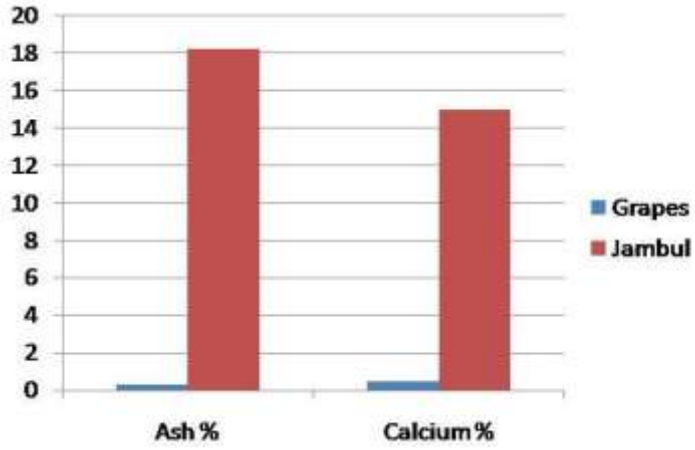
Table - 1
Analytical data for ash and calcium content of common fruits

Sr. No.	Name of Common fruit	Botanical Name	Actual Weight of fruit taken for ash (g)	Weight of ash obtained (g)	% of Ash (g)
1.	Grapes	Vitis Vinifera	170	0.505	0.297
2.	Jambul	Syzgium Camini	125	0.610	0.488

Table - 2
Chemical analysis data for Calcium (Ca) content in fruit

Sr. No.	Name of Common fruit	Weight of ash taken for analysis (g)	Total volume of ash solution prepare (ml)	volume of ash solution taken for analysis (ml)	volume of 0.01M EDTA consumed (ml)	% of Calcium (mg/100 mg)
1.	Grapes	0.5	100	25	4.8	18.25
2.	Jambul	0.5	100	25	2.4	14.99

that of Syzgium Camini (Jambul) is found to be 0.488 %. The Calcium Content of Vitis Vinifera (Grapes) and Syzgium Camini (Jambul) is observed as 18.25 and 14.99 mg /100 respectively. Between the the two fruit ash and calcium contains is compared in following figure.



Conclusion

On the basis of results of analysis of fruits Vitis Vinifera (Grapes) and Syzgium Camini (Jambul) for their ash and iron contents it is revealed that, the ash percentage of both fruits Vitis Vinifera (grapes) and Syzgium Camini (Jambul) is same as that of their corresponding literature values while the calcuilm content of Vits Vinifera (grapes) is slightly lower 18.25 (20.0) and that Syzgium camini (Jambul) is nearly same 14.99 (15.0) mg /100gm that of their corresponding literature values shown in paranthesis.

From the above discussion it may be concluded that the fruit syzgium camini (Jambul) grown in latur district found to contain rich ash and the vitis vinifera (Grapes) grown in latur district were found to contain rich calcium content may be recommended as best curative fruit for respective mineral deficiency diseases.

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