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Nutritional analysis of the fruit selenicereus costaricensis (F.A.C. Weber) S. Arias & N. Korotkova ex Hammel

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Abstract
People are eating more fruits around the world, which is good for breaking down sugars in the body, keeping the heart and blood healthy. Fruits also have calcium that helps make bones stronger, boost the immune system, help wounds heal faster, and reduce the risk of problems in the lungs and airways. fresh Dragon fruit pulp contains moisture concentration of more than 80%, Dragon fruit is a rich source of nutrients and minerals such as Fe, Vitamin –protein and Carbohydrates 14.63 g, Fat 0.34 mg and sugar 6.76 mg. The edible part of this fruit is 70 to 80%. *Selenicereus costaricensis* is rich source of carbohydrates 14.63g/100g of fruit pulp. The purpose of this work was to generate and confirm nutritional value. *Selenicereus costaricensis* fruit pulp showed different nutritional values. 0.71 mg Iron per 100g pulp, Protein per 100g of pulp is 1.21mg and 8.71 mg of Vitamin C per100gr pulp, carbohydrates 14.63 g per 100gr of pulp

Keywords: *Selenicereus costaricensis* fruit pulp, nutritional values, vitamins, carbohydrates, protein

Introduction

Dragon fruit, also known as pitaya or Selenicereus, a climbing cactus, is a tropical fruit native to Central America but grown in various parts of the world. It is one of the tropical fruits, belonging to the Cactaceae family. There are many varieties of Dragon fruit for commercial cultivation in the state of Telangana. *Selenicereus costaricensis* (Red pulp with red skin). The Dragon fruit plant has long, vining, and succulent -like stems that can grow up to several meters' length (Balenders and Bengoa 2019). These stems have aerial roots and require support, such as a trellis or study structure, to climb and grow (Pushpakumara et al. 2005). The stems are triangular, approximately 16-19 inches across clinging to tree trunks by many aerials' roots. The leaves tend to droop, which might result in wilting.

The flowers are very large, showy, nocturnal and bell-shaped and can be up to 14 inches long, 36cm wide. Flowers are typically white in colour; fruit flowers are tended to create dark pink in colour. After flowering the fruit will be produced 21 to 30 days, we can see different colour. Dragon fruits flowers are known as "QUEEN OF THE NIGHT" and moon flowers for their fleeting beauty.

Pollen and stigma morphology and the reproductive process it involves the interaction between pollen, stigma and pollen tube growth in red -fleshed Dragon fruit. Pollen growth can be taken by collecting pollen from the field it will be observed the growth of the pollen under scanning electron microscopy and fluorescence microscopy it is useful to the length of the pollen tube. The Dragon fruit is beneficial for carbohydrate metabolism, heart tissue, healthy blood and tissue formation strengthens bones due to its calcium content, improves the immune system, fast healing of cuts and wounds, respiratory tract infections and also as a mild laxative due to the significant fiber content. (Fungo and Kikafunda ,2010).

Fruit of *Selenicereus costaricensis*

Nutritional Analysis of *Selenicereus costaricensis* fruit pulp: Several species are included within the genus *Selenicereus*, but only a few are cultivated because their commercial and nutritional values of such as *Selenicereus costaricensis*.

Materials and Methods

Oxalic Acid (4%)

Dye Solution: Weigh 42mg sodium bicarbonate into a small volume of distilled water. Dissolve 52mg 2,6-dichlorophenol indophenol in it and make up to 200ml with distilled water.

Stock Standard Solution: Dissolve 100mg ascorbic acid in 100ml of 4% oxalic acid solution in a standard flask (1mg/ml).

Working Standard: Dilute 10ml of stock solution to 100ml with 4% oxalic acid. The concentration of working standard is 100ug/ml.

Principle

Ascorbic acid reduces the 2, 6-dichlorophenol indophenol dye to a colourless leuco-base. The ascorbic acid gets oxidized to dehydroascorbic acid. Though the dye is a blue-colored compound, the end point is the appearance of pink colour. The dye is pink colour in acidic medium. Oxalic acid is used as the titrating medium.

Procedure

Pipette out 5ml of the working standard solution into a 100ml of conical flask.

Add 10ml of 4% oxalic acid and titrate against the dye (V ml). End point is the 1 appearance of pink colour which persists for a few minutes. The amount of dye consumed is equivalent to the amount of ascorbic acid.

Extract the sample (0.5-5g depending on the sample) in 4% oxalic acid and make up to a known volume (100ml) and centrifuge.

Pipette out 5ml of this supernatant, add 10ml of 4% oxalic acid and titrate against the dye (V2ml).

Estimation of Carbohydrates Total Fat, Total Sugars and Protein.

Sample Name: *Selenicereus costaricensis* Fruit

Parameters: Carbohydrates, crude fiber, Total Fat, Total sugars, Protein

Method of Analysis:

AOAC 986.25, IS 10226(part-1):1982, AOAC 922.06, IS6287:1985, IS 7219:1973

Moisture: Empty dish (wt) (g): 25.9459(g) Dish + sample (wt) (g) (B):31.1090(g) Dish +sample (wt) (g) (A): 26.8091(g) % Moisture: 83.28%

Ash: Empty crucible (wt) (g): 64.5324(g) crucible + sample (wt) (g): 67.0545(g) crucible + residue(g): 64.5461(g) % Ash :0.54%

Fat: Empty Beaker (wt) (g): 98.5263(g) sample (wt) (g): 5.0241(g)

Beaker + residue (wt): 98.5434(g) % Fat: 0.34% dv: 0.44

Protein: sample (wt) (g): 0.5718(g) Nof Hcl :0.0987 Molarity of Nitrogen :1.4007 sample Tv (ml): 1.2ml B.tv(ml): 0.4ml factor: 6.25

% protein :1.021

dv :2.42

Crude fiber: Sample (wt) (g): 2.0386(g) wt of crucible after drying (g) :98.0103(g) wt of crucible after ashing(g): 37.9906(g) % cf: 0.97%.

Carbohydrates: 100 – (Moisture + Ash + Fat + Protein)

= 100-(83.28+ 0.54+ 0.34+ 1.21)

= 14.63% dv= 5.32

Total Sugars: Sample (wt) (g): 11.3669(g) made to :200 dil:200 dex. factor: 0.588

Rs. TV (ml): 15.4ml %Rs: 6.72% TB. Tv (ml): 61.2ml% TB: 6.76& % Sucrose: 0.04% % TOTAL SUGARS: 6.76.

Results and Discussion

Nutritional Analysis of *Selenicereus costaricensis fruit* pulp

S.no	Name of the species	Test Parameter	Unit of measurement	Test Result
1	*Selenicereus costaricensis*	Fe	100g	0.71mg
2	*Selenicereus costaricensis*	Mg	100g	21.8mg
3	*Selenicereus costaricensis*	Vitamin-c	100g	8.71mg
4	*Selenicereus costaricensis*	Protein	100g	1.21mg
5	*Selenicereus costaricensis*	Carbohydrates	100g	14.63g
6	*Selenicereus costaricensis*	Fat	100g	0.34
7	*Selenicereus costaricensis*	Sugar	100g	6.76mg

Several species are included in the genus *Selenicereus*, but only some are cultivated for their commercial and nutritional values such as *Selenicereus costaricensis* The Dragon fruit plant has long, vining and succulent like stems belonging to the family Cactaceae (Balenders and Bengoa,2019). The fruit is completely an important and Economic fruit species in the world for its nutritional value (Ibrahim et al. 2018). Several species are included in the genus *Selenicereus b*ut only some are cultivated for their commercial and Nutritional values such as *Selenicereus costaricensis*.

.100g of fresh Dragon fruit pulp with a moisture concentration of more than 80%, Dragon fruit is a rich source of nutrients and minerals such as Fe 0.71 mg, 21.8 mg, Vitamin –c 8.71 mg, protein 1.21 mg, Carbohydrates 14.63 g, Fat 0.34 mg and sugar 6.76 mg. The edible part of this fruit is 70 to 80%. *Selenicereus costaricensis* is rich source of carbohydrates 14.63g/100g of fruit pulp. The Dragon fruit is beneficial for carbohydrate metabolism, heart tissue, healthy blood and tissue formation strengthens bones due to its calcium content, improves the immune system, fast healing of cuts and wounds, respiratory tract infections and also as a mild laxative due to the significant fiber content.

Conclusion

The fruit is a good source of minerals like iron, magnesium, vitamin C, proteins, carbohydrates, fats, and sugar. All these parts of the dragon fruit help improve the body's immune system. Environmental factors play a direct role in how the dragon fruit flowers and produces fruit. The nutritional value of dragon fruit can vary based on the type of fruit, where it is grown, and when it is harvested.

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