

## Studies on the nutrient status of some fruit juices incorporated with powdered leaves of *Anona reticulata*

<https://doi.org/10.56343/STET.116.012.003.003><http://stetjournals.com>

V.Anitha and R.Kiruthika

Department of Nutrition and Dietetics, S.T.E.T Women's college ,Sundarakottai,Mannargudi, 614 016, Thiruvavur Dt., Tamil Nadu, India.

### Abstract

*Anona reticulata* (custard apple) is rich in antioxidants and minerals like calcium and potassium ,and has many health benefits.The leaves are equally nutritious. They are often used for medicinal purposes due to their quick healing capability.The leaves of custard apple helps to cure diarrhea and dermatological problems. The seeds,leaf and dried wood of custard apple also have tremendous range of medicinal properties.In the present study,three standardized recipes such as apple juice, grape juice and lemon juice were prepared and incorporated with 2%,4%,6% and 8% of powdered custard apple leaves separately and the acceptability of the consumers were assessed.The developed recipes were evaluated by using four point hedonic scale rating in the selected subjects to assess or identify the appearance ,colour,flavour,texture and taste of the standard and custard apple leaves incorporated recipes. Among the incorporated recipes ,lemon juice was accepted by the consumers when compared to apple juice and grape juice.Though the nutritive value of the lemon juice incorporated with powdered custard apple leaves at 8% level showed higher nutrient content compared to 2% level the 2% level of incorporation with lemon juice was highly acceptable by most of the consumers due to its taste and flavour.

**Key words:** Custard apple leaves Powder, Standardization,Incorporation, Consumer Acceptability.

Received : March 2018

Revised and Accepted : March 2019

### INTRODUCTION

Custard apple, *Anona reticulata* is a shrub or tropical branched tree which is native to the Amazon rain forest. It grows for about three meters to eight meters height. Its flowers are somewhat yellowish or greenish and its leaves are oblong and thin. It bears conical type of fruit and tastes very sweet. It can be used for sherbets, ice creams and milk shakes and also eaten as fresh. The fruit is creamy white, quite juicy and appears like a huge raspberry (Butani, 1976).

It helps to prevent hair fall, improves blood circulation in the scalp and this leads to the stimulation of follicles in order to support hair growth. Custard apple keeps the skin youthful and delay aging such as blemishes due to age. It serves as a natural remedy for scalp infections. Since custard apple contains antioxidants and vitamin C, it aids to regulate the sebum production in the scalp which minimizes flaky skin and dandruff, and this also helps to reduce pimples and acne (Alonso *et al.*, 2004).

In the same way, it combats food cravings, nausea, mood swings during conception as well as numbness. It is also a great alternative to milk. This only conveys that expecting women who are allergic to dairy products can have it as an alternative. It helps to eliminate the possibility of premature birth and minimizes the extent of labour pain in pregnant women and supports healthy pregnancy. For expecting and lactating women, this is also beneficial as it is believed to be efficient in increasing a woman's milk production. When custard apple is consumed regularly, this will help in a baby's brain development. Likewise, it also aids in the brain development of a fetus. The custard apple considerably slows down the absorption of glucose in the body, and minimizes the likelihood of type 2 diabetes ( Kamble and Soni, 2010).

It helps to combat gum pain and many other tooth-related complications. It promotes cardiovascular health. Custard apple increases the good cholesterol in the body and significantly lowers bad cholesterol. Since custard apple contains adequate amount of calcium, it helps to normalize the body's water balance and removes the acids which eventually lessens the symptoms of arthritis and rheumatism.

\*Corresponding Author :

email: [anithabalu15@gmail.com](mailto:anithabalu15@gmail.com)

This delicious fruit is actually an ideal dessert and snack for people who hope to put on some pounds. Custard apple stimulates appetite.

The mixture of custard apple leaves to bath water helps to ease rheumatic pains. The mixture may also be used to bring relief to fever, cold and dysentery (Annabelle *et al.*, 2006).

Leaf decoction is used in the treatment of cold, cough, intestinal infections and acidity condition. Bark decoction is used in diarrhea, roots are used in dysentery. Fruit is used in making of ice creams and milk beverages. Crushed leaves are used to cure internal and external wounds, boils and in gastritis.

The present article deals with the nutrient status of the fruit juices supplemented with powdered leaves of custard apple.

## MATERIALS AND METHODS

### Selection, collection and preparation of standardized recipes

The ingredients were procured from the local market of Lakshmangudi in Thiruvavur district. Samples were collected through purposive sampling method. The custard apple leaves powder was prepared in a hygienic way and added to apple juice, grape juice and lemon juice.

### Standardization of recipes through incorporation

A total of three recipes (Recipe I apple juice, Recipe II grape juice, Recipe III lemon juice) were selected and standardized, and 2 gm, 4 gm, 6gm and 8gm of custard apple leaves powder was incorporated in to each recipe separately.

### Assessing the consumer acceptability of standard and Custard apple leaves powder incorporated recipes

The quality of food product was assessed by means of human sensory organs. The evaluation is said to be sensory evaluation or organoleptic evaluation or Subjective evaluation (Srilakshmi, 2007). A Standard recipe refers to a particular standard of use of certain metrics in cooking standard sizes, time, temperature, amount, etc. This rule creates uniformity for kitchen produce whether or not it is tangible or intangible (Roth *et al.*, 1998). The developed recipes were evaluated by 30 consumers using five point hedonic rating.

Excellent	-	4
Very Good	-	3
Good	-	2
Fair	-	1

Poor - 0

The hedonic rating test was used to measure the consumer acceptability of food products and one to three samples were served to the panelist at one session.

### Estimation of nutrient content of the Standard and most acceptable custard apple leaves powder incorporated recipes

The nutrient of the standard and most acceptable 2% level (2 gm) of custard apple leaves powder incorporated lemon juice were analysed for nutrient content described using the following methods: Potassium, Sodium and Calcium (Williams and Twine, 1960), Magnesium (Mann and Yoe, 1956), Niacin (Mohan *et al.*, 1959), Thiamin (Ibitoye, 2005). Crude fiber (Sadasivam and Manickam, 1992).

### Ingredients and preparation of standard lemon juice

100 gm of lemon, 50 gm of sugar, 3 gm of salt and 50ml of water were collected

The lemons were washed and cut in to pieces. Water, salt and sugar were added with lemon extract.

**Table.1.** Ingredients needed for the preparation of custard apple leaves powder incorporated lemon juice at 2-8 percent level

S. No.	Ingredients	Level of Incorporation			
1	Lemon juice (ml)	50	50	50	50
2	Custard apple leaves powder (gm)	2	4	6	8
3	Sugar (gm)	25	25	25	25

The sample of lemon juice developed by incorporating with 2%, 4%, 6% and 8% level of custard apple leaves powder at 50ml.

The recipes such as apple juice, grape juice and lemon juice were selected for standardization. (Table 2)

**Table.2.** Methods of preparation and timings involved in the standardization of recipes through incorporation

S. No.	Name of the Recipe	Preparation Involved	Time in Minutes
1	Apple juice	Washing, cutting, grinding	15 minutes
2	Grape juice	Washing, grinding, stirring	20 minutes
3	Lemon juice	Washing, cutting, stirring	15 minutes

The apple juice, grape juice and lemon juice were prepared by washing, cutting, grinding and stirring. The time taken for the preparation of apple juice was 15 minutes, grape juice was 20 minutes and lemon juice was 15 minutes.

## RESULTS AND DISCUSSION

The acceptability of the 2-8 percent custard apple leaves powder incorporation are given in Table 3.

**Table.3.** Mean score and standard deviation of over all acceptability of incorporated custard apple leaves powder with Applejuice, Grape juice and Lemon juice (n=30).

S. No.	Custard apple leaves powder incorporated Juice varities	Over all acceptability			
		2%	4%	6%	8%
I.	Apple Juices	16.4±0.15	20.4±0.76	21.4±0.60	21.5±0.89
II.	Grapes Juices	17.6±0.75	20.7±0.45	22.6±0.75	18.8±0.85
III.	Lemon Juices	17.7±0.97	15.6±0.76	18.8±2.78	21.0±1.46

The mean score and standard deviation of custard apple leaves powder incorporated apple juice ranged from 16.4±0.15 to 21.5±0.89, that of custard apple leaves powder incorporated grape juice ranged from 17.6±0.75 to 18.8±0.85, and that of custard apple leaves powder incorporated lemon juice ranged from 17.7±0.97 to 21.0±1.46 (Table 3)..

**Table.4.** Mean schore and Standard Deviation of Custard Apple Leaves Powder Incorporated Lemon Juices at 2% level.

S. No.	Name of the product	Criteria	Mean ± Standard Deviation	Over all Acceptability
1	2percent custard apple leaves powder incorporated lemon juice	Appearance, Colour, Flavour, Taste	3.7±0.18 2.3±0.18 3.6±0.34 3.6±0.09	17.7±0.97

The mean score and standard deviation of custard apple leaves powder incorporated lemon juice at 2% level are given in table 4. The mean score and standard deviation of Appearance, Colour, Flavour and Taste of the 2% Custard Apple leaves powder incorporated lemon juice were 3.7±0.18, 2.3±0.18, 3.6±0.34 and 3.6±0.09, respectively. The overall acceptability of custard apple leaves powder incorporated lemon juice at 2% level was 17.7±0.97 .

**Table.5.** Nutrient content of the Standard and Custard apple leaves powder incorporated Lemon Juice.

Criteria	Fiber (g)	Sodium (mg)	Megnesium (mg)	Niacin (mg)	Thiamin (mg)	Calcium (mg)	Potassium (mg)
Standard Lemon juice(S1)	2.4	4.32	1.8	0.062	0.082	9.94	198.62
Custard apple leaves powder incorporated Lemon juice(S2)	10.3	26.24	15.01	2.5	1.08	30	382

Table 5 indicates that Custard leaves powder incorporated 2% lemon juice had a fibre content of 10.32mg, sodium content of 26.24mg, magnesium content of 15.01mg, niacin content of 2.5mg, thiamin content of 1.08mg, Calcium content of 30mg and potassium content of 382mg.

Custard apple leaves contain powerful antioxidant and anti-inflammatory properties. Hence it could be used for lowering the risk of cancer.

It has high nutritive value and it is a rich source of phosphorus, fiber, magnesium, niacin, thiamine, calcium and potassium.

Fiber helps in reducing cholesterol level and it is an important one for regulating the sugar level in the body. Calcium helps to prevent the risk of osteoporosis, bone deformities and hypertension. Among the three recipes, custard apple leaves powder incorporated lemon juice at 2% level scored higher consumer acceptability, when compared to apple juice and grape juice. The present study reveals that varieties of recipe could be prepared by incorporating the custard apple leaves powder. The custard apple leaves powder incorporation did not have any adverse effect on quality attributes like appearance, colour, flavor and taste of the products. Thus, as it has been reported that all the plant based food contain significant amount of micro nutrients which could provide health benefits (Chang *et al.*, 2010)

## REFERENCE

- Annabelle, L.K., Shun, S., Rik, Tykwinski, R. 2006. Synthesis of Naturally Occurring Polyynes. *Angew. Chem. Int. Ed. Engl.*, 45(7): 1034-1057. <https://doi.org/10.1002/anie.200502071> PMID:16447152
- Alonso, M.G., Pascual-Teresa, S.D., Santos-Buelga, Julian, C. and Rivas-Gonzalo, 2004. Evaluation of the antioxidant properties of fruits. *Food Chem.*, 84(1): 13-18.
- Butani, D.K. 1976. Insect pests of fruit crops and their control -Custard apple. *Pesticides*; 10(5): 27-28.

- Chang, W.H., AU, S.P., Huang, Y.F. and Ye, 2010. Effect of purple sweet potatoes consumption on exercise induced stress, and IL-6 and ASP72 level Physiology (2010) 109 (6):1710-5 PMID:20864555 <https://doi.org/10.1152/japplphysiol.00205.2010>
- Ibitoye, A.A., 2005. Laboratory manual on basic method of plant analysis. Practical Manual on Plant Analysis, P: 2-5
- Kamble, K.J. and Soni, S.B.2010. Effect of steam blanching on quality of custard apple pulp. *J. Hort. Forest.*, 2(5): 104-107.
- Mann, C. K. and Yoe, J. H. 1956. Spectrophotometric Determination of Magnesium with Sodium 1- Azo -2- hydroxy -3- (2, 4-dimethylcarboxanilido) - naphthalene-1'-(2-hydroxybenzene-5-sulfonate) *Anal. Chem.*, 28 (2): 202-205. <https://doi.org/10.1021/ac60110a016>
- Mohan, V. S., Reid, B. L. and Couch, J. R. 1959. Niacin Determination, Chemical Method for Estimation of Niacin in Poultry Feeds and Premixes. *J. Agri. Food Chem.*, 7 (1): 42-44. <https://doi.org/10.1021/jf60095a007>
- Roth, F.P., Hughes, J.D., Estep, P.W. and Church, G. M. 1998. Finding DNA regulatory motifs with in unaligned non-coding sequences clustered by whole - genome mRNA quantitation. *NAT Biotech.* 16:939-945. PMID:9788350 <https://doi.org/10.1038/nbt1098-939>
- Sadasivam, S. and Manickam, A. 1992. Biochemical methods for agricultural sciences. Wiley Eastern Ltd, Madras. P. 240.
- Srilakshmi, B. 2007. *Food science*, 4th Edition, NewAge International (p) ltd Publishers, New Delhi. P.170-174.
- Williams, V. and Twine, S. 1960. Flame Photometric Method for Sodium Potassium and Calcium. In: Peach, K. and Tracey, M.V., Eds., *Modern Methods of Plant Analysis*, Springer-Verlag, Berlin, 3-5.