

Preparation and evaluation of functionally enriched squash from *Flacourtia montana*- An underutilized wild edible fruit for commercialization

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Abstract

➤ *Flacourtia montana* J. Graham (Salicaceae) - an underutilized wild edible fruit tree, endemic to Western Ghats, India.
➤ Three types of squash T_0 , T_1 and T_2
➤ Organoleptic evaluation and physico-chemical analysis done.
➤ Product acceptability was rated as $T_0 > T_1 > T_2$.
➤ Squash (T_0) is sufficiently enriched with Ascorbic acid, Protein, Crude fiber etc.
➤ Diet rich in these nutrients have much health lead.
➤ The processed product is promising for value addition.

Objectives

➤ Formulate & evaluate a processed product, squash from the ripened fruits of the target species for food security & sustainable development.
➤ To popularize and commercialize the underutilized fruit.
➤ To reduce the post harvest losses as the fruits has less shelf life period.

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Introduction

➤ Commonly known as Mountain Sweet Thorn.
➤ Red globose berry, sweet in taste & astringent in flavor.
➤ Enriched with nutrient contents (Mundaragi et al. 2015).
➤ Presence of potent phytochemicals- reduce the elevated blood glucose level (Sindhu et al. 2018).
➤ Nutritional qualities were proven, but yet to be popularized/ commercialized due to lack of research
➤ Fruits have a very short shelf life of few hours- leads post harvest loss.
➤ Value addition from the fruits act as a key for the objectives envisaged.

Materials and Methods

➤ Fully ripened, fresh fruits, free from pests and diseases, collected from Vazhachal Forest Division, Thrissur, Kerala.
➤ T_0 ---40% Pulp+500gms sugar
 T_1 ---40% Pulp+500gms sugar+ flavored lemon and ginger
 T_2 ---40% Pulp+500gms sugar+ flavored strawberry
➤ A panel of judges -9.0 point hedonic scale.
➤ 9 for like extremely to 1 dislike extremely
➤ Physico-chemical analysis of the most accepted squash (Ranganna 1977).
➤ Ascorbic acid, β carotene, Carbohydrate, Crude Fiber, Reducing sugar, Non-reducing sugar, Protein, Titrable acidity and Total sugars.
➤ Extraction of fruit juice ➡ 40% pulp ➡ 500gm of sugar diluted in 1000ml water ➡ blend 40% pulp with sugar syrup ➡ boiled & mix the solution (65-70°C) for 15 min ➡ homogenize the pulp and sugar ➡ mix solution – fruit squash hot filling at (55° -66°C) ➡ packed in glass bottle ➡ stored in refrigerator condition.

References

1. Mundaragi A, Thangadurai D (2015). Proximate composition, nutritive value and antioxidant activity of a wild fruit, *Flacourtia montana* J. Graham. (Salicaceae). *Vegetos* 28(4): 181-187.
2. Sindhu K, Sujith S, Shynu M, Suja Rani S, Sanis Juliet and Diwakaran Nair (2018). Anti-hyperglycemic activity of methanolic extract of *Flacourtia montana* in streptozotocin induced diabetic rats. *The Pharma Innovation Journal* 7(7):22-27.
3. Ranganna, S. (1977) Manual of Analysis of Fruit and Vegetable Products. Tata McGraw-Hill, New York.

Result and Discussion

➤ As per the organoleptic evaluation, the product acceptability was rated as $T_0 > T_1 > T_2$
➤ Organoleptic analysis :

Treat ment	Flavor & taste	Color & appearance	Consistence	Overall acceptability
T_0	8.429±0.756	8±0.877	7.643±0.497	8.714±0.469
T_1	6.357±1.985	6.857±1.292	7.643±0.497	7±0.877
T_2	3.714±2.525	6.071±0.997	7.643±0.497	3.286±1.939

➤ Physico-chemical analysis

Sl. no:	Parameters	Values
1	Ascorbic acid (mg/100g)	11.76
2	β carotene (mg/100g)	0.050
3	Carbohydrate (g/100g)	3.50
4	Crude Fiber (%)	2.50
5	Reducing sugar (%)	18.66
6	Non-reducing sugar (%)	28.0
7	Protein (%)	1.29
8	Titration acidity (%)	0.80
9	Total sugars (%)	46.66

Value addition from the commercially important cultivated species have been much popularized and reported. However, wild and underutilized species were little attended due to inadequate data. Present study serves as a model for domestication, popularization and commercialization of lesser known fruit resources from the western Ghats.

Conclusion

➤ T_0 is the most accepted and enriched squash.
➤ Work established projects the possibility of popularizing a nutritive product from an underutilized wild edible fruit with no added preservatives.
➤ Post-harvest losses could be avoided and supplement the food security and sustainable development