



## Original Research Article

# Formulation, nutrient and microbial analysis of papaya leaves and guava incorporated RTS beverage

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## ABSTRACT

### Keywords

Papaya leaves and guava; peroxidation reaction; phyto-constituents  
Dengue fever

The main objective of the current study is to formulate a ready to serve beverage incorporate with papaya leaves and guava against Dengue fever. Papaya leaves contain various nutrients and phytoconstituents like saponins, tannins, cardiac glycosides and alkaloids. These constituents can act on the bone marrow, prevent its destruction and enhance its ability to produce platelets. The guava fruits are rich in vitamin C (ascorbic acid) content. The different phenolic phytochemicals in guava have been described to possess antioxidant action and able to inhibit peroxidation reaction in living system. It improves the immunity. However, it can be concluded that the supplementation of papaya leaves guava incorporated RTS beverage for dengue fever is safe and also induce the rapid increase in platelet count and immunity. It may play a valuable role in the management of dengue fever in the future.

## Introduction

Dengue is the most important emerging viral diseases of human that in recent decades has become a major international public health concern. Dengue is found in tropical and subtropical regions around the world predominantly in urban and semi urban area. Dengue is spread through the bite of an infected *Aedes aegypti* mosquito. The mosquito get virus by biting an infected person. Dengue infection produces a self limiting illness that is often characterized by sudden onset of fever, headache, fatigue, nausea, vomiting and rashes. An unusual increase

increase in the dengue fever in children . Papaya leaves have been successfully employed in folk medicine for the treatment of dengue infections with hemorrhagic manifestations. It belongs to the family *Caricaceae*. The nutrients in papaya leaf extract include the minerals calcium, magnesium, sodium, potassium, iron, amino acids and vitamins A, C and B. The potent antioxidant activity of papaya leaves is attributed to the array of phenolic compounds such as caffeic acid, chlorogenic acid, quercetin and kaempferol. Guava is a medicinal plant

belonging to the family *Myrtaceae*. It is a well known traditional medicinal plant used in various indigenous systems of medicine. It is widely distributed throughout India. Nutritional value of guava are often included among super fruits, being rich in dietary fibre, vitamin A and C, folic acid and dietary minerals, potassium, copper and manganese. Guavas contain both carotenoids and polyphenols the major classes of antioxidant pigments giving them relatively high potential antioxidant value among plant foods.

The demand for fruit beverages is increasing in India as well as in other countries due to increasing trend towards fast foods and also be eaten to the changing consumer taste. Fruit beverages have nutritional, medicinal and calorie values compared to synthetic beverages and these can be improved further by blending pulp/ juice of 2 or more fruits having excellent flavour, delicious taste and high nutritive and therapeutic values. Keeping all the above facts in view, the research work was planned to standardize appropriate combination of papaya leaves and guava juice for preparation of ready to serve beverage for the fast recovery of dengue fever and also to evaluate the nutrients and quality of beverages during storage.

### **Materials and Methods**

Papaya leaves and guava were collected from local areas of Coimbatore. The leaves of the papaya plant were collected and thoroughly washed with hot water. The leaves were grinded in fruit juice with water. As the taste of papaya leaves extract was very bitter and sugar syrup was added along with guava pulp. Guava fruits were washed in running water and cut into slices with a stainless knife. The slices were then passed through fruit pulper to obtain homogenous pulp.

### **Incorporation of papaya leaves and guava RTS beverage**

RTS beverage was prepared using the papaya leaves juice and guava pulp in different proportions. For the control 1:1 ratio of papaya juice used with sugar syrup. For experimental sample papaya leaves juice and guava pulp were used with proportions of T1-800:200, T2-700:300, T3-600:400 for each sample added with equal amount of sugar syrup. Then the juice and sugar syrup were mixed properly and filled in sterilised glass bottles and sealed properly.

### **Sensory evaluation of prepared rts beverage**

Sensory evaluation is a scientific tool that uses the human sense to examine the properties which influences the quality of the products. The beverages were evaluated for colour and appearance, flavour, taste, consistency and overall acceptability. The overall acceptability of the beverages were based on the mean scores obtained from sensory characters. The prepared beverage were adjudged by a panel of 25 semitrained members and sensory evaluation was carried out in a five point hedonic scale

### **Nutrient and physico-chemical analysis of prepared rts beverage**

Energy, carbohydrate, protein, fibre, calcium, sodium, B vitamins (Thiamine and Riboflavin) and vitamin C and total antioxidant activity were analysed prepared RTS beverage. Physico-chemical properties also to be analysed .

**Table.1** Organoleptic evaluation of prepared RTS Beverage

| Sl No. | Criteria                     | Control | T1       | T2      | T3      |
|--------|------------------------------|---------|----------|---------|---------|
| 1      | <b>Appearance</b>            | 7.4±1.2 | 6.5±1.08 | 6.5±0.9 | 7.9±0.7 |
| 2      | <b>Flavour</b>               | 7.4±1.0 | 6.5±1.2  | 6.5±0.8 | 7.7±0.7 |
| 3      | <b>Taste</b>                 | 7.3±1.2 | 6.1±1.2  | 6.2±0.7 | 7.7±0.8 |
| 4      | <b>Consistency</b>           | 7.8±1.0 | 6.8±1.1  | 6.6±0.9 | 7.8±0.7 |
| 5      | <b>Overall acceptability</b> | 7.7±0.9 | 6.3±1.2  | 6.1±1.1 | 7.8±0.9 |

**Table.2** Nutrient analysis of prepared RTS Beverage

| S. No | Parameter    | Control          | T3               |
|-------|--------------|------------------|------------------|
| 1     | Energy       | 17.53 ± 1.03kcal | 38.55 ± 4.05kcal |
| 2     | Protein      | 0.20 ± 0.07gm    | 0.33 ± 0.04gm    |
| 3     | Carbohydrate | 4.00 ± 1.02 gm   | 9.0 ± 1.03gm     |
| 4     | Calcium      | 860.00 ±30.09    | 988.00 ±45.07    |
| 5     | Sodium       | 160.00 ±10.13    | 36.00 ± 5.08mg   |
| 6     | Thiamine     | 1.20 ± 0.02mg    | 1.89 ± 0.09mg    |
| 7     | Riboflavin   | 0.40 ± 0.04mg    | 0.67 ± 0.07 mg   |

**Table.3** Physico – chemical constituents of prepared RTS Beverage

| Sl.No | Parameter      | Control | Variation |
|-------|----------------|---------|-----------|
| 1     | Acidity        | 1.20 %  | 0.60 %    |
| 2     | pH             | 3.5     | 3         |
| 3     | TSS            | 12° Bx  | 14° Bx    |
| 4     | Total sugar    | 20      | 23        |
| 5     | Reducing sugar | 10.9    | 9.8       |

**Table.4** Antioxidant activity of prepared RTS Beverage

| S.No | Antioxidants               | Control  | T3       |
|------|----------------------------|----------|----------|
| 1    | Ascorbic acid              | 18.0mg   | 98.0mg   |
| 2    | Total antioxidant activity | 320.0µgm | 698.0µgm |

## Results and Discussion

### Organoleptic evaluation of prepared rts beverage

The ready- to- serve beverage is prepared from papaya leaves and guava. The scores given by the panel members are given in the table.

It is clear that organoleptic scores of the test sample T3 had got highest mean score for all sensory attributes like appearance (7.9±0.7), flavour (7.7±0.7), taste (7.7±0.8), consistency (7.8±0.7) and overall acceptability (7.8±0.9) in compare with the other variations. In the test

sample T3 had got maximum score for all other samples.

## References

- Ahmad N, Fazal H, Ayaz M, Abbasi BH, and Mohammad I, Fazal L. Dengue fever treatment with *Carica papaya* leaves extracts. *Asian Pac J Trop Biomed.* 2011;1(4):330–3.
- Imungi, J.K., Scheffeldt, P. and Saint-Hilaire, P. 1980. Physico-chemical changes during extraction of clear guava juice. *Lebensm-Wiss. Technol.* 13: 248-251.
- Jimenez-Escrig, A., Rincom, M., Pulido, R. and Saura-Calixto, F. 2001. Guava fruit (*Psidium guajava* L.) as a new source of antioxidant dietary fiber. *J. Agr. Food Chem.* 49: 5489-5493.
- Krishna KL, Patel PM, Jagruti A. Review on nutritional, medicinal and pharmacological properties of Papaya (*Carica papaya* Linn.). *Natural product radiance*, Volume 7 (4), 2008, pp- 364-373.
- Krishna, K., M. Paridhavi, et al. (2008). "Review on nutritional, medicinal and pharmacological properties of papaya (*Carica papaya* Linn.)." *Nat Prod Radian*, 7: 364-373.
- Morens, Fauci, Brody JE. Mosquito thrives; so does dengue fever. Geneva, WHO :2008.
- Otsuki N, Dang NH, Kumagai E, Kondo A, Iwata S, Morimoto C. Aqueous extract of *Carica papaya* leaves exhibits anti-tumour activity and immune modulatory effects. *J Ethnopharmacol.* 2010 Feb 17; 127(3):760–7.
- Prasad, R.N and Mali, P.C. 2003, Changes in physico-chemical characteristics of squash during storage, *Prog. Hort.* 35 (2) : 170 – 172.
- Sandhu, K.S., M. Singh and P. Ahluwalia, 2001. Studies on processing of guava into pulp and guava leather. *J Food Sci. Technol.*, 38: 622-624.
- Wilson, C.W. 1980. Guava. In *Tropical and Subtropical Fruits: Composition, Properties and Uses*, 1st ed. (Nagy, S. and Shaw, P.E., eds.). p. 279-295. AVI Publishing. Connecticut.