



P-ISSN: 2349-8528

E-ISSN: 2321-4902

IJCS 2018; 6(2): 2974-2976

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Received: 01-01-2018

Accepted: 02-02-2018

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Studies on development and organoleptic evaluation of beetroot-tamarind RTS beverage

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Abstract

The study was conducted to develop formulations of beetroot RTS beverage by mixing it with fresh tamarind juice with various proportions such as (90:10), (80:20) and (70:30) were used for T1, T2 and T3 respectively and evaluated with reference to beetroot RTS beverage alone (100:0) T0. T2 was found to be the most preferred variant with respect to the sensory quality such as colour, flavour, taste and overall acceptability. Overall, it can be concluded that tamarind juice upto 20% in preparation of beetroot RTS beverage with good sensory attributes and nutritional value can be prepared.

Keywords: Tamarind, sensory properties, beetroot and RTS

Introduction

The *Tamarindus indica* L. is a fruit tree belonging to the Magnoliophyta, Order Fabales, Family *Fabaceae* (subfamily *Caesalpinioideae*). It is native to tropical Africa and its cultivation was widespread, developing well in all tropical continents. The sweet and sour at the same time in the fruit is unique and it is used popularly in cooking. The fruit is a good source of calcium, phosphorus, iron and vitamins. (Archana and Laxman 2014) [3]. It also contains small amount of vitamin A and C. (Siddig *et al.* 2006) [9]. Tamarind which can be used traditionally in wound healing, snake bite, abdominal pain, colds, inflammations, diarrhea, helminth infections, and fever. (Aline 2016) [11]

Beta vulgaris (*Chenopodiaceae*) is generally known as beet root or garden beet. It is native to Mediterranean region. It is widely cultivated in America, Europe and throughout India. Beet root is most commonly dark red in colour. It is used in Indian traditional system of medicine, specifically for the treatment of fertility, cancer, hypertension and urinary tract disorders. It makes a wonderful dietary supplement being not only rich in nutrients, minerals, amino acids and vitamins but also has unique phyto-constituents, which have numerous medicinal properties such as anti-oxidant, anti-depressant, anti-microbial, anti-inflammatory, diuretic and expectorant. It is one of the natural food, which boosts the energy in athletes. It is used as natural food colour in dairy and meat products. Traditionally, beet root was consumed as food. It is now being recognized as a functional food. (Yadav *et al.* 2016) [11]

Beetroot juice contains a high level of biologically accessible antioxidants (Wootton *et al.* 2011) [10] as well as many other health promoting compounds such as potassium, magnesium, folic acid, iron, zinc, calcium, phosphorus, sodium, niacin, biotin, B6 and soluble fiber. Additionally, drinking beetroot juice provides a more convenient alternative to consuming the whole vegetable. The specific interest in beetroot juice has arisen because it is a rich source of a number of polyphenolic compounds (Kaur and Kapoor, 2002) [5]. Beetroot predominately contains pigments called betalains, a class of betalamic acid derivatives which are composed of betacyanins and betaxanthins (Pitalua *et al.* 2010) [7], and a number of phenolic compounds. The betalain and phenolic composition of red beetroot has been studied in detail by (Kujala *et al.* 2000) [6].

Materials and Methods**Materials**

The fresh beetroot and tamarind were obtained from local village market, Parbhani. The proposed research was carried out in Department of Food Engineering, College of Food Technology, VNMKV, Parbhani.

Methods

Preparation of fresh tamarind juice and beetroot juice

Freshly harvested beetroot were washed and cleaned by removing all the dirt and impurities. Then peeling was carried out for obtaining clear beetroot juice. After removing the peel, the beetroots were cut into small pieces for the extraction of juice through juice extractor. The obtained juice then filtered through muslin cloth to obtain clear juice.

Organoleptic evaluation of Beetroot-Tamarind RTS beverage

Organoleptic evaluation of Beetroot-Tamarind RTS beverage for colour and appearance, flavour, after taste and overall acceptability was carried out by using standard method of (Amerine *et. al.* 1965) [2]. For these 10 semi-trained judges were used and 1 to 9-point hedonic scale was used for rating the quality of the beetroot-tamarind RTS beverage. The mean of ten judges was considered for evaluating the quality.

Preparation of Beetroot-Tamarind RTS Beverage (Source: Emelike 2016) [4].

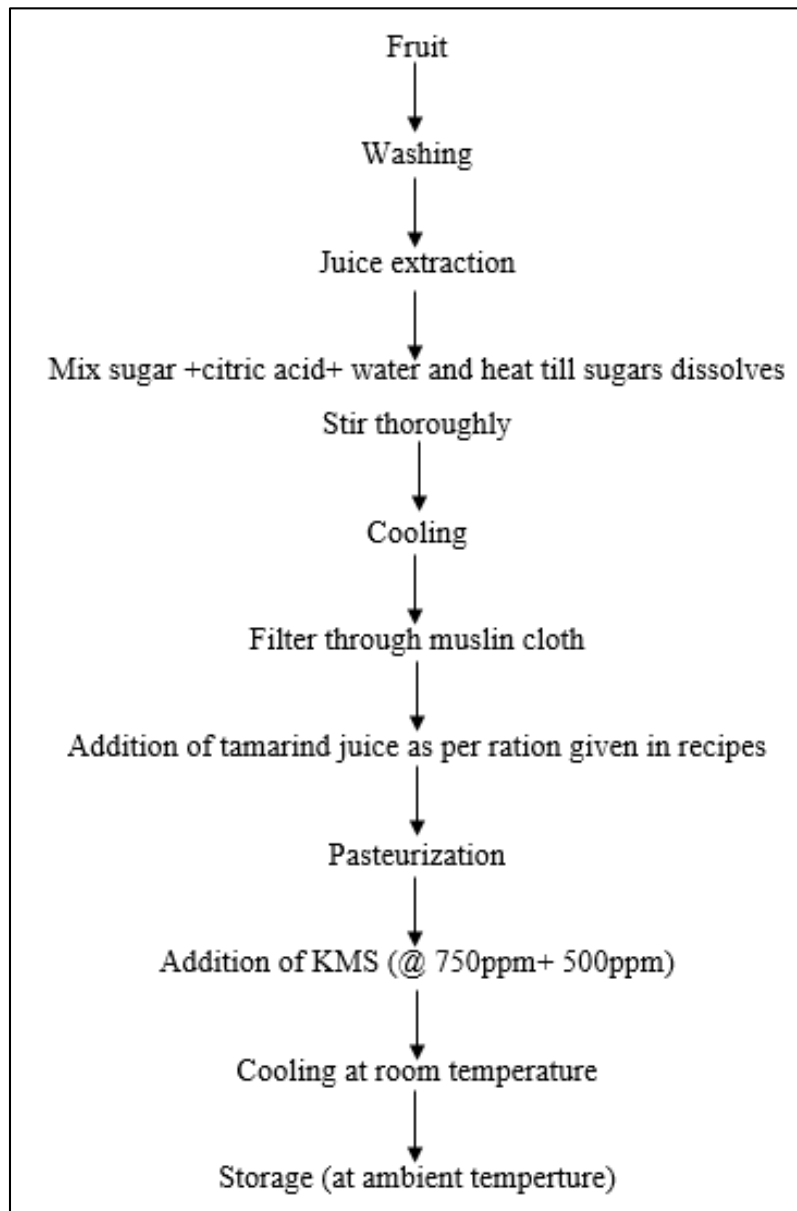


Fig 1: Process flowchart for preparation of beetroot-tamarind RTS beverage

After extraction of juice from all the fruits its total soluble solids (TSS) and acidity were measured. Then according to different recipe treatment, the quantity of juice, sugar, citric acid, preservative (KMS) and water were calculated. For the preparation of beetroot-tamarind RTS beverage of different recipe, syrup of sugar, water and citric acid was prepared. The beetroot-tamarind RTS beverage filled in clean sterilized plastics bottle of 200 ml capacity. Prepared beetroot-tamarind RTS beverage bottle were stored in dry place at ambient temperature.

Results and Discussions

Sensory evaluation of turmeric based orange RTS beverage

Data pertaining to sensory evaluation of beetroot-tamarind RTS beverage with respect to appearance, colour, flavour, taste and overall acceptability were carried out. Accordingly, results obtained are depicted in table. 1.

Table 1: Mean sensory score values for the beetroot-tamarind RTS beverage

Samples	Appearance	Colour	Flavour	After Taste	Mouthfeel	Overall Acceptability
T0 (100:00)	8.7	9	8.5	9	9	8.8
T1 (90:10)	7.5	8.0	8.0	8.5	8.5	8.1
T2 (80:20)	8.5	8.7	8.5	9	8.5	8.6
T3 (70:30)	7.0	7.0	7.5	7.5	8.0	7.4
SE ±	0.154	0.152	0.179	0.114	0.218	0.114
CD at 5%	0.453	0.446	0.525	0.336	0.642	0.336

Data indicated in above table 1. showed that beetroot-tamarind RTS beverage with 80:20 orange to turmeric received highest sensory score (i.e., 8.6) in case of all sensory attributes followed by RTS having 95:5 scored (i.e., 8.1) compared to rest of the samples. Statistically, sample T1 was varied significantly over rest of treatments whereas T0 and T1 was statistically at par with each other.

The effect of blending on RTS was significantly affected by different recipe and treatment combinations. The results found close to that of (Raj *et al.* 2011) ^[8]

Conclusion

In present investigation efforts were made to develop beetroot-tamarind RTS beverage with various proportions of added fresh tamarind juice. The study revealed that the organoleptic characteristics of beetroot-tamarind RTS beverage viz., colour, flavor, taste, and overall acceptability were significantly influenced by different recipe treatments. It can be finally concluded that beetroot-tamarind RTS beverage with 80:20 (T2) beetroot to tamarind received highest sensory score (i.e., 8.6) in case of all sensory attributes.

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