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Development of pineapple and carrot nectar fortified with mint

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Abstract
The present study was carried out to prepare Development of pineapple and carrot nectar fortified with mint by using pineapple, carrot and mint with the objective to assess the sensory acceptability of the product and chemical properties.. Experimental Treatments were prepared by the level of pineapple i.e. (100%), (60%), (50%) and (40%). Each treatment was replicated five times. Sensory Evaluation of the product was carried out under the criteria of 9 point Hedonic scale. The data obtained during the study was analyzed statistically using variance and critical difference techniques. These experiment have four different treatment combinations, T_0 (100% pineapple), T_1(60% pineapple and 40% carrot), T_2(50% pineapple and 50% carrot), T_3(40% pineapple and 60% carrot). The experiment T_2 may be taken as 60% pineapple and 40% carrot nectar for getting the best organoleptic quality product. It was found that among all treatments T_2 scored higher in sensory evaluation and was considered as optimized product. The developed pineapple and carrot nectar fortified with mint could be recommended for the large scale production at industrial level.

Keywords: development of pineapple and carrot nectar fortified with mint

1. Introduction

Nectars are a type of non-carbonated soft drink made by muddling the flesh of fruits. In some countries, the beverage industry distinguishes nectars from drinks labeled as "juice". In the United States and the United Kingdom, the term "fruit juice" is restricted to beverages that are 100% pure juice, whereas a "nectar" may be diluted (to a degree limited by regulations) with water and contain additives besides fruit juice, including natural and artificial sweeteners, and preservatives. In New Zealand, the usage is reversed, with "juice" denoting a sweetened fruit drink, whereas nectar refers to pure fruit. (The Code of Federal Regulations of the United States of America).

Fruit and vegetable nectars: Fruit and vegetable nectars are beverages produced from purees, juices, or concentrates of either, blended with water and sugar, honey, syrups, and/or sweeteners. Fruit-vegetable nectar blends are reported under their components.

Fruit nectar: Fruit nectar is the unfermented but fermentable product obtained by adding later with or without the addition of sugar, honey, syrups, and/or sweeteners to fruit juice, concentrated fruit juice, fruit purees or concentrated fruit purees, or a mixture of those products. Aromatic substances, volatile flavour components, pulp and cells, all of which must have been recovered from the same kind of fruit and obtained by suitable physical means, may be added. Products may be based on a single fruit or on fruit blends. Examples include: pear nectar and peach nectar.

Vegetable nectar: Product obtained by adding water with or without the addition of sugar, honey, syrups, and/or sweeteners to vegetable juice or concentrated vegetable juice, or a mixture of those products. Products may be based on a single vegetable or on a blend of vegetables.

The pineapple (*Ananas comosus*) is a tropical plant with an edible multiple fruit consisting of coalesced berries, also called pineapples, and the most economically significant plant in the family *Bromeliaceae*. Pineapple fruits have characteristics pleasant, flavour, distinct aroma, exquisite taste. It is a good source of carotene and ascorbic acids and is fairly rich in vitamin B and vitamin B2. It also contains phosphorus and minerals like calcium, magnesium, potassium and iron Rashmi *et al*.,(2005) [20].

Mentha (also known as mint, from Greek *míntha*, Linear B *mi-ta*) is a genus of plants in the family *Lamiaceae* (mint family). It is estimated that 13 to 18 species exist. Hybridization between some of the species occurs naturally. Many other hybrids, as well as numerous cultivars, are known. (Harley *et al*.,2004) [5]. Mint is a popular herb that can be used fresh or dried in many dishes and infusions. Mint has one of the highest antioxidant capacities of any food. Mint also help to cut down on sodium intake. Mint leaves are a great source of Vitamin C, A and E as well as beta carotene.

The carrot (*Daucus carota* subsp. *sativus*) is a root vegetable, usually orange and red in colour.. The domestic carrot has been selectively bred for its greatly enlarged, more palatable, less woody-textured taproot Sifferlin,(2018) [22, 23].

Carrot is a rich source of many vitamins like A, C,β-carotene, B1,B2 and B3 and minerals like calcium, potassium, phosphorus and sodium(Krinsky NI, Johmson EJ), good source of carotenoids, dietary fibers and phenols compounds(Bao B, Chang KC).

In the past decade carotenoids such as β-carotene have attracted considerable attention because of their possible protective effect against some types of cancers (Bast *et al*.

1996; Santo *et al*. 1996; Van 1996). In human system, the physiological activity of α- and β-carotene has been 50 and 100% of the provitamin A activity, respectively (Panalaks and Murray 1970; Simpson 1983). and one molecule of β-carotene yields two molecules of retinol in human system. Carotenoids have been linked with the enhancement of immune system and decreased risk of degenerative diseases such as cancer, cardiovascular disease, age related mascular degeneration and cataract formation (Mathews- Roth 1985;) [14] Carotenoids have been identified as a potential inhibitor of Alzheimer.

Table 1.1 Nutritional Composition of carrot

Nutrition	Amount(100g)
Carbohydrates	9.58g
Protein	0.93g
Total fat	0.24g
Dietary fiber	2.8g
Vitamin A	16706IU
Vitamin C	5.9mg
Vitamin K	13.2µg
Sodium	69mg
Potassium	320mg

Source: USDA (National Nutrient database)

Table 1.2 Pineapple Nutritional composition

Nutrition	Amount(100g)
Energy	52kj
Calcium	16mg
Carbohydrates	13.7gm
Phosphorus	11mg
Vitamin A	130IU
Vitamin B1	0.079mg
Vitamin B2	0.031mg
Water	87.3gm
Dietary fiber	1.4 gm
Protein	0.54 g

Source: USDA Data Base

Table 1.3 Mint Nutritional composition

Nutrition	AMOUNT(2tsp/11.4g)
Calories	5kcal
Protein	0.38gm
Carbohydrates	0.96gm
Fat	0.08gm
Total Dietary Fiber	0.8gm
Calcium	23mg
Iron	1.35mg
Vitamin B1	0.009mg
Vitamin A	23µg

***Source*:** USDA Data Base

Materials and Method

3.1 Experimental site

The experiment **"Development of pineapple and carrot nectar fortified with mint"** was carried out in research lab, Warner College of Dairy Technology, Sam Higginbottom University of Agriculture Technology and Sciences, Prayagraj-211007, U.P. (India).

3.2 Plan of work

3.2.1 Procurement and collection of ingredient:

Pineapple was purchased from local market of Prayagraj.
Carrot was purchased from local market of Prayagraj.
Mint was procured from local market of Prayagraj.

Table 3.3.Treatment Table

Treatment	Pineapple	Carrot
T_0	100	0
T_1	60	40
T_2	50	50
T_3	40	60

3.3.1 Treatment Combination

T_0 -Control prepared from pineapple and carrot (100:0:0)
T_1–Experimental sample prepared from pineapple,carrot and mint(60:40:2)
T_2– Experimental sample prepared from pineapple,carrot and mint(50:50:2)
T_3– Experimental sample prepared from pineapple, carrot and mint(40:60:2)

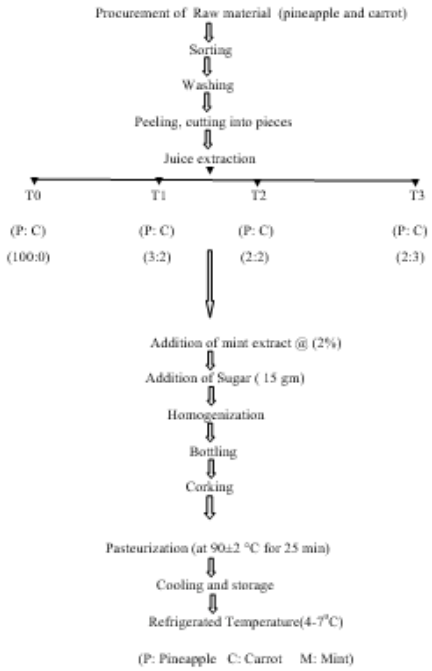

Fig. 3.1 Flow sheet for preparation of pineapple and carrot nectar fortified with mint

Result and Discussion

The data collected on the different aspects were tabulated and analyzed statistically using the method of analysis of variance and critical difference technique. The significant and non- significant differences observed have been analyzed critically within and between the treatment combination.

Table 4.1 - Average data for different parameters of sample of Development of pineapple and carrot nectar fortified with mint.

Particulars	T_0	T_1	T_2	T_3	CD(5%)
Physico-chemical analysis (%)					
Total Solids%	13.12	12.64	12.36	11.63	0.949
Moisture%	86.87	87.36	87.64	88.37	0.931
Fat%	0.07	0.15	0.13	0.13	0.012
Protein%	0.54	0.69	0.71	0.72	0.013
Carbohydrates%	11.44	10.60	10.18	9.45	1.016
Ash%	1.08	1.2	1.34	1.33	0.157
Acidity%	0.24	0.22	0.22	0.21	0.029
Ascorbic acid	0.23	0.31	0.33	0.35	0.030
Dietary fiber	1.094	1.97	2.10	2.23	0.117
Antioxidant	0.317	0.81	0.84	0.87	0.057

Physico-chemical analysis (%)

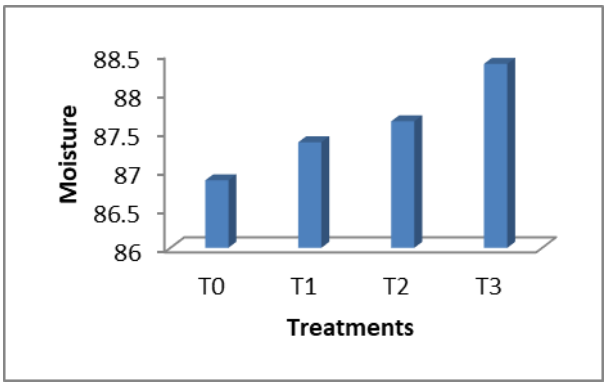

Fig 1: TS

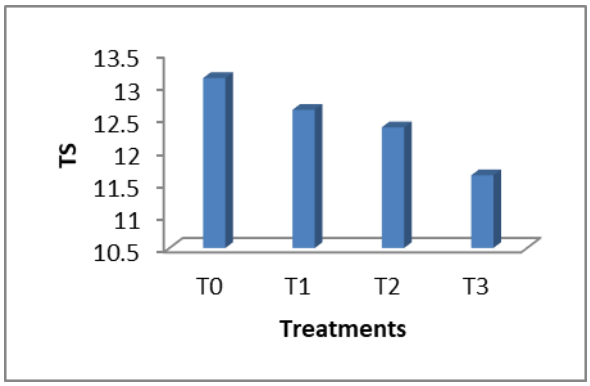

Fig 2: Moisture

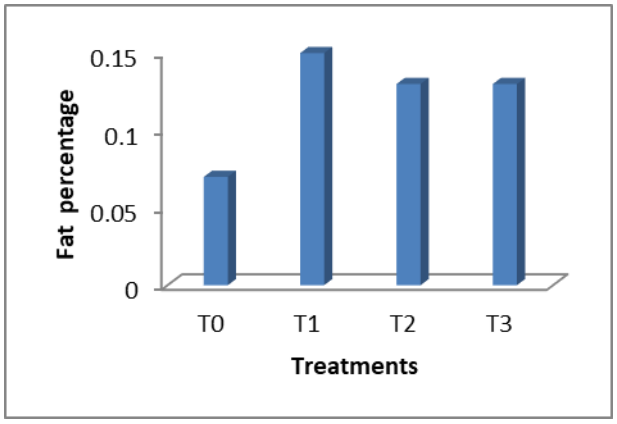

Fig 3: FAT

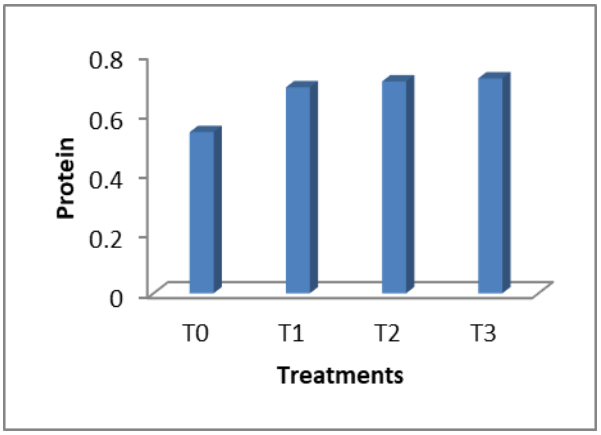

Fig 4: Protein

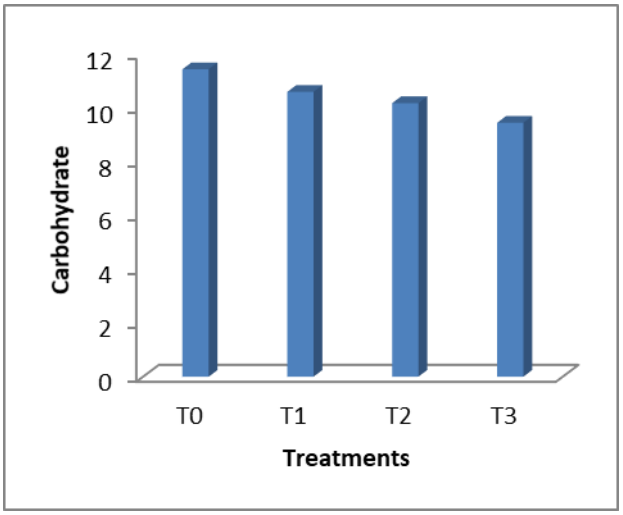

Fig 5: Carbohydrate

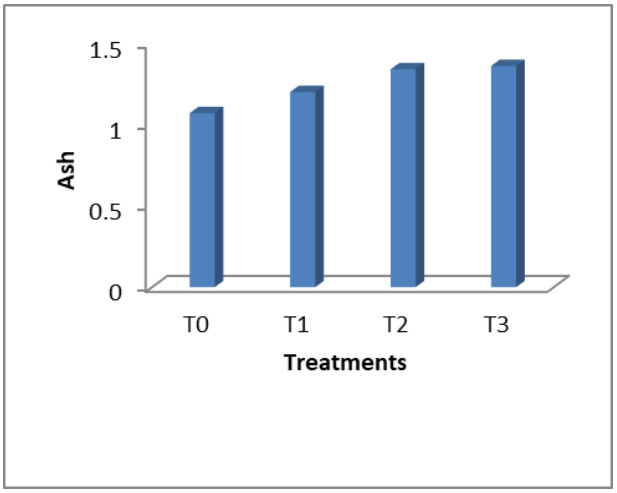

Fig 6: Ash

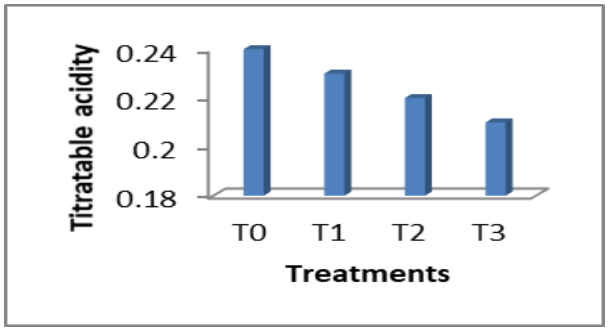

Fig 7: Titratable acidity

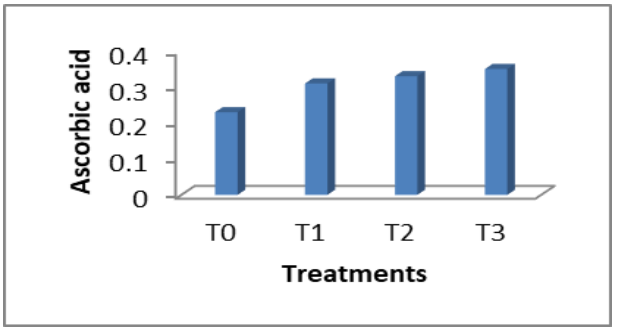

Fig 8: Ascorbic acid

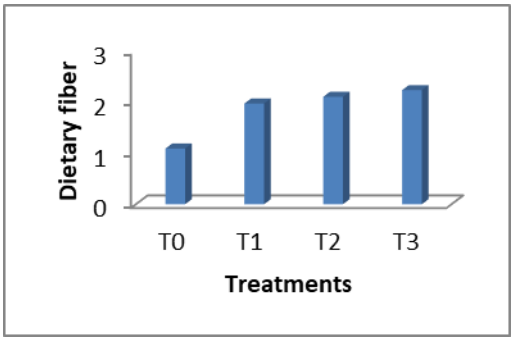

Fig 9: Dietary fiber

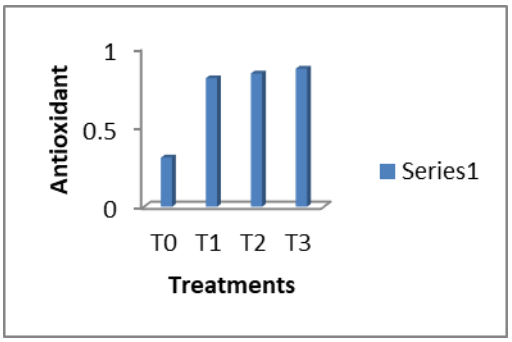

Fig 10: Antioxidant

Table 5: Organoleptic evaluation of Development of pineapple and carrot nectar fortified with mint.

Oraganoleptic Score					
	T_0	T_1	T_2	T_3	CD %
Colour and appearances	7.4	7.2	8.6	7.6	0.971
Consistency	7.6	6.8	8.4	7.6	1.081
Flavour and taste	7.8	7.2	8.4	7.2	0.924
Overall acceptability	7.6	7.2	8.2	7.8	0.821

Conclusion

The result obtained from "Development of pineapple and carrot nectar fortified with mint" following conclusions were drawn. The addition of pineapple, carrot and mint for the preparation of PINEAPPLE NECTAR proved to be useful. From present investigation it can be concluded that the pineapple & carrot can be very well utilized for preparation of palatable, energetic, nutritional and low cost beverage by using pineapple (50ml), carrot (50%) and mint (2%) on weight basis. As regard to sensory attributes, treatment T2 combination (50% of pineapple, 50% carrot) recorded highest score for overall acceptability in respect of colour, flavour, consistency, taste and significant superior over the treatment T0, T1 and T3.

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