



Efficacy Development and Physio Chemical Analysis of Pineapple Based Herbal RTS Beverage

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ABSTRACT

The medicinal herb basil (*Ocimum basilicum*), also known as tulasi, is well-known for its therapeutic properties. Individual extracts of pineapple fruit, basil leaves, and ginger, as well as sugar syrup, were prepared and mixed with the rations listed below. A physicochemical analysis as well as a sensory evaluation was performed. The final formulation was chosen based on sensory evaluation, with a rating of 7 overall acceptability. Basil extract, ginger, and sugar syrup were optimised and blended to create an RTS beverage that was pasteurised at 90 °C for 25 seconds, cooled, and stored at 5 °C for 20 days. A physicochemical and sensory analysis was carried out. There were minor changes in pH, total soluble solids, acidity, vitamin C, and antioxidant content. TSS increased during storage and was reported to have increased by 2.5° brix. The addition of basil extract and ginger to know juice significantly increased its antioxidant and vitamin C content. As storage time passed, vitamin C, pH, and as a result, acidity decreased. The ascorbic acid content of all RTS (Ready to Serve) beverages was reported to have decreased by 10-14 mg/100 gm. During storage, the antioxidant potential gradually decreased from 54.2 in 10 % RTS to 60.1 in 25% RTS. The mean overall acceptability scores of more than 8 for beverage samples containing up to 20 % basil extract incorporation indicated the commercial potential for producing good and nutritious RTS beverages that will also be beneficial in terms of antioxidant and nutraceutical to the consumer's potential Heat pasteurization (90 °C for 25 seconds) and basil and ginger extract were found to be more effective at inactivating microbial flora. The shelf life of the RTS, on the other hand, was established within 10 days, after which the acceptability decreased. It is recommended that children, adolescents, and the elderly use the product within 10 days.

Keywords: Pineapple; Basil; Ginger; RTS beverage; Physio chemical analysis

INTRODUCTION

The major fruits grown in India include mango, banana, papaya, orange, mosumbi, guava, apple, pineapple, sapota, pomegranate, strawberry, litchi etc. Consuming fruits and vegetables on a daily basis lowers the risk of cancer, heart disease, and premature ageing. Pineapple is low in fat and cholesterol, the bromelian enzyme present in pineapple starts relieving the gastrointestinal upset and improves circulation. Pineapple is rich in potassium, phosphorous, magnesium, calcium and vit-c [1].

Basil (*Ocimum sanctum*) is believed to have health benefits due to their anthelmintic activity and polyphenols [2]. Juice or infusion of the basil leaves used in the treatment of bronchitis, digestive complaints, arthritis, ringworms, hypertension, heart attack, cancer, viral hepatitis and diabetes. The leaves and seeds of basil are reported to have diuretic and laxative properties. Basil is rich in phosphorus, calcium, vit-c and iron. One of the most widely grown

medicinal herbs basil (*Ocimum sanctum*). The herb is used to treat a wide range of ailments, including the common cold, headaches, stomach disorders, heart disease, inflammation, malaria, and various forms of poisoning, as well as for spiritual and flavouring purposes. Due to its high concentration of eugeno, recent research suggests that holy basil, like many modern painkillers, may be a (cyclooxygenase-2) COX-2 inhibitor. One small study found that when combined with hypoglycemic drugs, it reduced blood glucose levels in type 2 diabetics. Because of its high antioxidant content, it has also been shown to be beneficial for lowering cholesterol and blood glucose levels as well as for radiation poisoning and cataracts.

Ginger, scientifically known as *Zingiber officinale* belongs to the family Zingiberaceae. Ginger is not recommended for people who have gallstones because it promotes the release of bile from the gallbladder [3]. Although studies on the comparison of vitamin C content in common fruits have been inconsistent, ginger may have blood thinning and cholesterol lowering properties that may make

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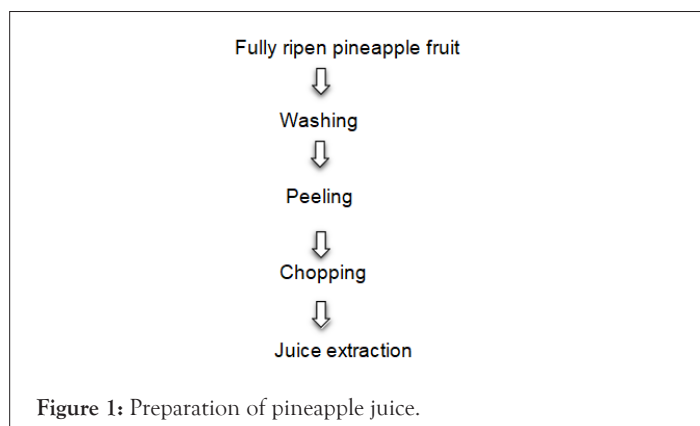
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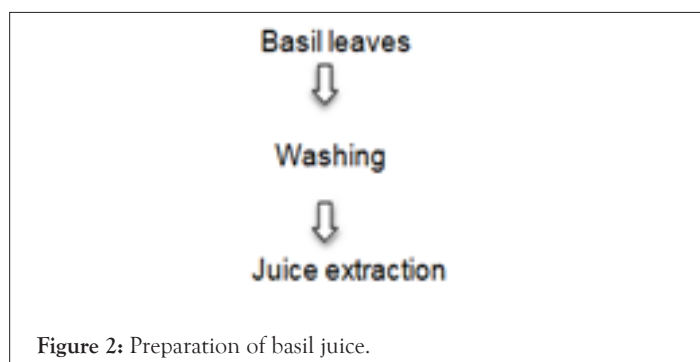
it useful for treating heart disease.

MATERIALS AND METHODS

Raw materials Pineapple, basil, ginger, sugar and water (Figure 1).

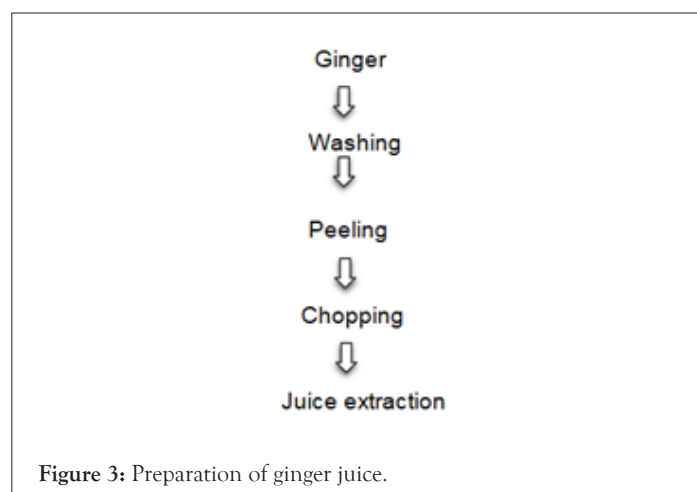


Fully ripe pineapple fruit is washed thoroughly to remove foreign particles, the outer layer is peeled and chopped into small pieces, the chopped pieces are blended with a kitchen blender, and the juice is extracted by straining the pulp with a strainer. Before peeling with a sterilized knife, pineapple fruits were washed with a 5 % HOCl solution and thoroughly rinsed with distilled water. The fruits are cut into 3-4 mm thick slices, and juice is extracted using a juice extractor. The pineapple juice was filtered through a clean transparent bowl using sterile muslin cloth folded into two layers. Prior to analysis, the juice was filled into an airtight screwed cap, pasteurised, and refrigerated at 4 °C (Figure 2).



The holy basil is thoroughly washed before being blended in a kitchen blender with a muslin cloth to extract the juice. Basil

juice was made by separating the leaves after removing the stem, buds, flowers, and soon. To remove impurities, the leaves were thoroughly washed with potable lukewarm water (35 °C -400 °C). To determine the best blanching temperature, the leaves were mixed with four times their weight in water and blanched for 5 minutes at four different temperatures: 60 °C, 65 °C, 70°C and 750 °C. Blanching leaves at higher temperatures, such as 70°C and 750 °C, resulted in excessive discoloration and darkening of the leaves. As a result, a blanching temperature of 650°C for 5 minutes was chosen. After draining, the blanched leaves were mixed with an equal amount of water (% w/w) and crushed at the highest speed for 2 minutes in a juice maker that had previously been cleaned and sanitised. To obtain basil juice (5% TS), it was filtered through a clean, sanitized fine double layered muslin cloth. 650 g basil leaves were needed to make 1 kg fresh basil juice. The juice was then immediately transferred into clean, dry amber-colored glass bottles and refrigerated (710 °C) until used (Figure 3) [4].



Ginger is washed under clean running tap water, peeled, and then cut into smaller pieces before being blended and supplemented with small amounts of clean/filtered water to ease friction during blending. The juice pulp was then filtered through a sterile muslin cloth to obtain the juice, which was then refrigerated at 4 °C until needed [5].

Preparation of sugar syrup

Sugar syrup is prepared by heating 500 g of sugar in 2.5 liters of water and heated up to 45° brix (Tables 1-3).

Table 1: Basil taste is dominating (Trail 1).

Ginger (ml)	Basil (ml)	Pineapple(ml)	Sugar(ml)
2	5	43	50
4	10	36	50
6	15	29	50
8	20	22	50
10	25	15	50

Table 2: Ginger taste is dominating (Trail 2).

Ginger (ml)	Basil (ml)	Pineapple (ml)	Sugar (ml)
10	1	39	50
10	2	38	50
10	3	37	50
10	4	36	50
10	5	35	50

Table 3: Finalized taste of both basil and ginger (Trail 3).

Ginger (ml)	Basil (ml)	Pineapple (ml)	Sugar syrup (ml)
5	2	43	50
5	4	41	50
5	6	39	50
5	8	37	50
5	10	35	50

Table 4: Determination of soluble solid by using refractrometer.

Concentrations	PH	Titrateable Acidity	TSS
2	3.88	0.3	26° brix
4	3.88	0.33	26° brix
6	3.85	0.38	26° brix
8	3.83	0.4	26° brix
10	3.8	0.42	26° brix

Table 5: The evaluation of beverage sample for the attributes.

Concentrations	Color	Appearance	Flavor	Taste	Turbidity	Over all acceptance
2	7.33 ± 0.335	7.3 ± 0.144	7.1 ± 0.432	7 ± 0.084	6.8 ± 0.056	7.3 ± 0.243
4	7 ± 0.065	6.8 ± 0.082	7 ± 0.544	6.8 ± 0.043	6.6 ± 0.076	7.1 ± 0.256
6	7.1 ± 0.024	7.1 ± 0.145	7.5 ± 0.127	7.3 ± 0.022	6.6 ± 0.132	7.3 ± 0.376
8	7.91 ± 0.321	6.8 ± 0.075	7.3 ± 0.063	6.6 ± 0.032	6.5 ± 0.058	7.2 ± 0.302
10	7.1 ± 0.364	6.5 ± 0.025	7 ± 0.075	6.3 ± 0.042	6.1 ± 0.276	6.5 ± 0.453

Note: Evaluated by 6 members

RESULTS AND DISCUSSION

pH: Calculated by using pH meter.

Titrateable acidity: According to AOAC method the herbal beverage is titrated against 0.1 N of NaOH.

Total soluble solids: The total soluble solids were determined using a digital refractrometer (Rudolph, USA). Fruit pulp was extracted and passed through muslin cloth before a drop of filtrate was placed on a refractrometer prism and TSS was measured in degrees Brix (Table 4).

Chemical analysis

Determination of Iron content: Beverage sample was taken for ashing in the muffle furnace. Total ash was collected. It was extracted in 5 ml. of concentrated hydrochloric acid, filtered quantitatively in volumetric flask and volume was made up with water. An aliquot of extract was taken and hydroxylamine hydrochloride solution was added [6]. After 5 minutes, 10 ml acetate buffer solution and 10 ml orthophenanthroline were added. Volume was made up with water and mixed thoroughly. After standing for 30 mins absorbance was measured in spectrophotometer at 510 nm. A standard calibration curve was plotted using standard Mohr salt solution [7,8].

Determination of vitamin-C content: A specific aliquot of beverage sample was dissolved in 100 mL of 5% Meta phosphoric acid. 5 ml of dye solution was used to titrate the sample. The result was expressed in terms of I.U. of vitamin C per 100 ml of sample. To determine the amount of vitamin C present, tiny amounts of acidified starch (dubbed "reaction mix") are added, followed by droplets of iodine until the mixture turns purple. Any vitamin C will "neutralize" the iodine, preventing the formation of the purple colour. In accordance with this, iodine solution (0.1 M) was made with 10 g of KI, and starch solution was made with 0.25 g of starch

powder. To activate the vitamin C, a blank solution (25 mL) was prepared from the sample, and 10 drops of starch solution were added. The mixture was titrated with iodine solution until the first black blue colour appeared which lasted 20 seconds. Titration of blended juice samples (25 mL) was performed in the same manner as the standard solution. At the end points, the initial and final volumes of iodine solution required to produce the colour change were recorded. Following that, the vitamin C concentration was determined.

Sensory evaluation: Sensory analysis was done on a 9 point hedonic scale. The developmental beverage samples were evaluated for the attributes of color, appearance, flavor, taste, turbidity (Table 5).

CONCLUSION

It was concluded from the study that RTS beverage with 20% basil extract was acceptable, with the ratios of basil, ginger, and sugar syrup being 20:5:45, respectively Vit-c content present in the RTS is 22 mg and iron content is 3.12 mg for 100 ml of RTS. Physicochemical parameters did not change significantly, but the antioxidant and nutraceutical potential of Kinnow juice was increased by the addition of holy basil and ginger. Based on the findings of this study, it is possible to conclude that the formulation of a mixed blend juice beverage is capable of satisfying consumer taste and preferences. Utilization of medicinal plants in diet or incorporation and optimization of their use in fruit beverages provides all health benefits while also lowering the risk of serious diseases such as diabetes, as well as other cardiovascular diseases.

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