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Formulation And Evaluation Of Orange RTS Integrated With Herbal Drink

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ABSTRACT:

This study aimed to formulate and evaluate a ready-to-serve (RTS) beverage byblending orange juice with nannari (Indian sarsaparilla) extract. Oranges are high in fiber and benefical vitamins like Vitamin C. They also contain antioxdiants which can have various health benefits, including supporting immune functions. Various formulations were developed by adjusting the proportions of orange juice and nannari extract to achieve desirable sensory attributes, nutritional content, and stability. The formulated beverages were evaluated for physicochemical properties, sensory characteristics, microbial quality, and shelf-life stability. Results indicated that the blended RTS beverage achieved a harmonious balance of flavors, with an acceptable level of sweetness, acidity, and overall liking. Additionally, the beverage exhibited favorable physicochemical properties, including pH, titratable acidity, total soluble solids, and vitamin C content. Microbial analysis confirmed the safety of the product within the stipulated shelf-life period. Overall, the formulated orange RTS blended with nannari drink offers a promising alternative beverage option with potential health benefits and consumer acceptance.

KEYWORDS: RTS beverage, Sensory perception, Nannari extract, Orange concentration.

INTRODUCTION

Fruit beverages such as ready-to-serve (RTS) are becoming increasingly popular in comparison to synthetic drinks, evidently because of their taste, flavor and nutritive value. They are in great demand in various public eating places like school canteens, cafeterias, snack bars as well as homes. Many of the beverages that are available in the market attract the consumers mainly because of their color and taste without providing nutrients apart from the empty calories in the form of sugar. However, the beverages based on fruit juice or pulp are easily digestible, appetizing, thirst quenching, highly refreshing and are nutritionally superior to many aerated and synthetic beverages. Since, these beverages are meant for direct consumption without further dilution thus provides the advantage of convenience of consumption. These beverages also serve as healthy alternative for the children and elderly people who have difficulties in handling the whole fruits.

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Demand products which are free from any chemical additives like color or flavors and are natural with assured safety and better shelf life. Thus, beverages based on fruit juices can be used to replace the artificial or synthetic beverages that are available in the market having no nutritional value.

Orange (Citrus aurantium) is a member of the family Rutaceae and has antiviral, antibacterial and antifungal properties (Braun and Cohen, 2007). Orange juice is more nutrient dense than many commonly consumed 100 percent fruit juices, such as apple, grape, pineapple and prune (Rampersaud, 2007). It is rich source of Vitamin C, foliate and flavonoids and improves blood lipid profiles in hyper medicines as a stimulant and appetite suppressant. The important medicinal crop, swallow root (Decalepis hamiltonii Wight & Arn.) commonly called as nannari or makaliberu in Kannada, is known to stimulate appetite, relive flatulence, demulcent, diaphoretic, diuretic and as a general tonic (Nayar et al., 1978). It is useful in the treatment of fever, skin disease, diarrhoea, nutrition disorders, blood purifier and has a characteristic flavouring principle (Anon, 1990).

MATERIALS AND METHODS

MATERIALS:

The Orange fruits and swallow root (nannari) were procured from the local market sorted to select ripe, disease and pest free, healthy and undamaged fruits and washed to remove any foreign matter and juices were extracted as per the procedure (Srivastava and Kumar, 1994).

METHOD:

Orange concentration preparation-

Orange fruits were peeled splitted into two halves, seeds were removed and the juice was extracted and strained. Transfer strained juice into bowl. Heat the juice over medium heat. Simmer the juice until the volume reduces by about half, around 20 minutes depending on the amount of juice and the size of the bowl. Collect the sample and the value was measured.

Nannari syrup preparation-

Nannari syrup is made by boiling nannari roots in water and reducing it in volume it in volume until all the flavours seeps in to the water, strained and the juice was collected and the value was measured. Chia seeds was cleaned and soaked in water for 2 to 4 hrs, strained the water and collected seeds and the value was measured. Sugar and Water was taken based on requirements.

FORMULATONS AND PREPARTION:

The fruit juices or pulp prepared were blended in different juice percentages such as 15 ml, 20 ml and 25 ml with different ratios viz., 15: 25: 180 :30 and 20: 30: 170: 30 and 25 :30: 160 : 35 of orange conc. and nannari by using either cane sugar or honey as per the respective treatment combinations. Totally there were 3 treatments and they were replicated three times, juice contents (10 ml,13 ml and 16 ml); juice proportions (15: 25: 180 :30 and 20 : 30: 170: 30 and 25:30: 160 : 35)and sugar source .The final volume of individual treatment was made up to 250 ml by addition of sugar syrup. Sodium benzoate at 70 ppm was used as preservative. RTS beverages were stored in 250 ml capacity glass bottles at ambient conditions and studied for their proximate analysis and keeping quality

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up to one month.

Sensory perception:

In sensory evaluation, the samples were subjected to seven-point hedonic scale test where score 1 is for ‒dislike very much‖ and 7 for ‒like very much‖ and the acceptability of samples was judged by 30 semi trained panelists to determine sensory preference. The sensory characteristics such as colour, taste, aroma, consistency and overall acceptability attributes of the RTS beverages werejudged by the panelists.

Physical and Chemical characterization of Beverage:

Brix:

Two drops of prepared drinks was taken in a refractometer plate and the total soluble solids of the drinks were read directly from the refractometer.

pH:

The pH of the juices was measured using an electronic digital pH meter.

Titratable acidity:

10 ml of sample was taken and final volume was made to 25ml and titrated against 1.1 Normal NaoH using phenolphthalein as indicator to a light pink color. It was expressed as per acidity.

Ascorbic Acid:

Estimation of Vitamin C was performed by Titrametric method.

Color Value:

The color parameters were measured using a benchtop colorimeter Chroma meter CR-5 (Konica Minolta; Chiyoda City, Tokyo, Japan). The top measurement port was adjusted to 8 mm. The evaluated color parameters were L* (lightness), a* (±red–green) and b* (±yellow–blue). Preliminary measurements using dark chamber cover and daylight illumination did not showa difference in the obtained color parameters; hence, all measurements were performed in natural daylight. The measurements were performed in triplicate, and the results are expressed as the means with the standard deviation.

Proximate analysis:

Moisture:

Moisture content was determined as per AOAC [10] method in case of soybeans. Weighed amount (5 g) of sample was in a clean, dried and weighed aluminium dish. The contents were dried in an oven at 130oC for 2 hours till a constant weight was obtained and cooled in desiccators. After cooling, the loss in weight was taken as moisture content and expressed in terms of percentage.

Total Ash:

Method of AOAC [10] was employed for determination of ash content of samples. 3-5 grams of sample was weighed in a silica dish, dried at 100°C. Weighed sample was charred till smoke ceases. The crucible was then transferred to muffle furnace and maintained at 550± 5°C for 5 – 6 hrs till white ash was obtained. Then the crucible was cooled in desiccators and weighed. The ash content was calculated in terms of %

Protein:

The protein estimation is done by Lowry method given by Lowry et al. [11]. Different dilutions of BSA solutions are prepared by mixing stock BSA solution (1 mg/ ml) and

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water in the test tube as given in the table. The final volume in each of the test tubes is 5 ml. The BSA range is 0.05 to 1 mg/ ml. From these different dilutions, pipette out 0.2 ml protein solution to different test tubes and add 2 ml of alkaline copper sulphate reagent (analytical reagent). Mix the solutions well. This solution is incubated at room temperature for 10 mins. Thenadd 0.2 ml of reagent Folin Ciocalteau solution (reagent solutions) to each tube and incubate for 30 min. Zero the colorimeter with blank and take the optical density (measure the absorbance) at 660 nm. Plot the absorbance against protein concentration to get a standard calibration curve. Check the absorbance of unknown sample and determine the concentration of the unknown sample using the standard curve.

Fat:

Extract 5 g of the ground material in a continuous extraction apparatus with ether for 18 hours. Remove the ether by distillation, followed by blowing with astream of air, with the flask on a boiling water bath and dry in an oven at 110 ± 1°C till the loss in mass between two successive weighing is less than 2 mg. Shake the residue with 2 to 3 ml of ether at room temperature, allow to settle and decant the ether. Repeat the extraction until no more of the residue dissolves. Dry the flask again until the loss in mass between two successive weighing is less than 2 mg. Record the final mass.

Total carbohydrates:

Total carbohydrate content of the samples was determined as total carbohydrate by difference that is by subtracting the measured protein, fat, ash and moisture from 100 phenol sulphuric acid method as given by AOAC (2005).

Microbial Analysis:

Total plate count, yeast and mould count, coliform count were analysed using methods employed in manual of microbiological testing of FSSAI (2012)

Storage studies:

The selected samples were stored at room temperature and the different assessing parameters were observed at a regular interval of ten days up to one month in glass bottles.

RESULTS AND DISCUSSION

Storage studies for orange nannari RTS beverages are comprehensive and multifaceted. They ensure that the beverage remains safe, nutritious, and appealing throughout its shelf life. By carefully monitoring chemical, microbial, and sensory attributes and storage under various storage period and using appropriate producers can optimize the stability and quality of their beverages.

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Sensory perception:

S.NO	Orange conc: Ninnari :Water:Sugar	Mean sensory scores
1.	15:25:180:30	8.71
2.	20:30:170:30	7.93
3.	25:30:160:35	7.51

Physical and chemical characterization of RTS beverage:

The juice were analyzed for TSS, acidity, PH, colour value

Table: Proximate Analysis

S.NO	**Parameters**	**Prepared sample**	**After one month of storage**
1.	Brix	20.9	30.6
2.	Acidity	0.40	0.70
3.	pH	3.21	3.78
4.	Colour value	86.673	86.673
5.	Ascorbic acid	6.53	6.4

Proximate analysis:

Analysis	**Value**
Moisture	85.3
Ash	0.5
Protein	0.6
Fat	0.3
carbohydrates	10.2
Total Energy	45

Microbial Count:

Microbial studies like standard plate count, yeast and mould count, coliform count were carried out to evaluate the safety and keeping quality of the selected sample. Standard plate count were absent. It may also due antimicrobial effect observed that there was less number of yeast and mould and coliform were absent because of proper maintenance of storage conditions.

Parameters	**Microbiological count**		
Days	**TPC(CFU/ml)**	**Yeast/Mold (CFU/ml)**	**Coliform (CFU/ml)**
Initial	0	0	0
Afterone month storage	3	0	0

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CONCLUSIO N

The RTS beverages prepared by using orange nannari RTS beverages are nutritious and also safe for consumption since there is no addition of artificial colour, flavour, and artificial preservative. Consumers expect the food products to be healthy, tasty and functional. It showed that the blending of vegetable and fruits juice was highly acceptable and the quality was also found to be good. Onthe basis of the results of this study it was concluded that formulation of mixed (blend) juice from Sour-orange and nannari is possible to satisfy consumer taste and preferences. It was accomplished that the blend with 25% of orange conc., 30% nannari, 160% of water and 35% sugar. sample 3 were most effective blended RTS Beverages with minimum change in TSS, pH, Titrable Acidity, Total Sugar and vitamin C. Sensory scores were also higher than other formulation (control) and RTS beverage of 15% of orange conc., 25% nannari, 180% of water and 30% sugar. sample 1 received highest score for overall acceptability. The selected sample were stored at refrigerator for one month without any significant loss in the quality characteristics.

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