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Development and evaluation of turmeric: Ginger based pineapple drinks and food flavourings

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ABSTRACT

Turmeric and ginger were processed into flours, combined in the ratios 9:1, 4:6 and 7:3(w/w) and used as spice for preparing fried rice. Extracts of pineapple, turmeric and ginger were also made and blended in the ratios 13:6:1, 6:3:1 and 4:3:3(v/v) to prepare turmeric: ginger-flavoured pineapple drinks. The pH and total soluble solid contents of the drinks were determined and sensory evaluation of the drinks and fried rice samples were carried out. The drinks prepared from the turmeric, ginger and pineapple extracts in the ratios 6:3:1 and 4:3:3 were acceptable to the Taste Panelists and these drinks were found to be as good as the commercial pineapple drink used as standard. The acidity and total solids contents levels of the drinks also compared favourably with that of the standard drink. There were no significant differences (P>0.05) among the turmeric: ginger-spiced fried rice samples with respect to colour, taste, aroma and general acceptability, and they were found as acceptable as the curried sample used as control. A combination of turmeric and ginger in the right proportions is recommended as flavouring and preservative for pineapple fruit drinks and a suitable spice for fried rice and other cereal foods.

Key words: Turmeric, Ginger, Pineapple, rice, spice, flavouring.

INTRODUCTION

Turmeric (*Curcuma longa*) is an ancient spice and a native of South East Asia. It is used as a condiment and as a culinary dye. Turmeric is a rhizome resembling ginger. It is yellowish-brown with a dull orange interior and usually produces a bright yellow powder when ground [1]. Turmeric is used extensively in colouring many sweet dishes and spicing of meat especially lamb and vegetables due to its warm and aromatic flavour with a bitter undertone. However, its principal place is in curries and curry powders. Turmeric is not well absorbed when taken orally, hence the use of pineapple which contains bromelain, a protein-digesting enzyme that makes it easier for the body to absorb active compounds of turmeric [1]. This informs the use of pineapple in this work. Spices such as ginger and herbs have been historically used to improve colour and flavour of different foods and they also possess preservative quality. Since synthetic preservatives/flavourings have toxicological effects, there is need to search for effective preservatives from natural spices and herbs, hence the use of ginger in the drink.

MATERIALS AND METHODS

Source of materials: The turmeric variety used was collected from Sugar Beet and Other Root Crops Programme and the ginger was from Ginger Programme, both of National Root Crops Research Institute, Nigeria. The pineapple was bought from Umuahia main market in Abia State of Nigeria.

Preparation of the turmeric: ginger-flavoured pineapple drinks and turmeric:ginger-spiced fried rice: The unit operation employed in the preparations of flours from turmeric and ginger were peeling, washing, slicing, sun-drying and milling. Composites of the turmeric and ginger flours in the ratio 9:1, 4:6 and 7:3 were prepared and used as flavourings (spice) for fried rice.

Extracts of the pineapple, turmeric and ginger were made with water and blended in the ratio 13:6:1, and 4:3:3 (v/v) to produce the turmeric: ginger-flavoured pineapple drinks.

The methods of Beckett [2] was used for the preparation of the turmeric: ginger-spiced rice. The following ingredients were blended together for the preparation of the fried rice: one medium size onion, fresh tomatoes, four *maggi* cubes, crayfish, salt and fresh pepper. This mixture was divided into portions and curry was blended with one of these, and used as a control. Ninety millilitres of water and 250g of parboiled rice were put in each of the four pots containing the mixture of ingredients to cook the rice. The cooked rice was then fried with 45ml of vegetable oil.

Laboratory analysis: Standard methods were used to determine the total soluble solids (TSS) and pH of the turmeric-ginger-flavoured pineapple drinks. Data were analyzed statistically using ANOVA and LSD was used to compared the treatment means.

Sensory evaluation: Twenty semi-trained panelists were used for the sensory evaluation of the turmeric: ginger-flavoured pineapple drinks and the turmeric: ginger-spiced fried rice using a 7-point hedonic scale.

RESULTS AND DISCUSSION

There was no significant difference (P>0.05) in colour among the turmeric: ginger-flavoured pineapple drinks (Table 1). The drink (PTC_A) prepared with turmeric: ginger: pineapple in the ratio 13:6:1 was not acceptable to the panelists but the others PTG_B and PTG_C were acceptable to them and assessed as good as the commercial pineapple drink used as standard.
The pHs of the drinks ranged from 3:06 to 4.76 and were close in acidity to that of the commercial pineapple drink which was 4.90 (Table 2). Hence the drinks are not subject to ready microbial deterioration and can therefore enjoy prolonged shelf life. The total soluble solids of the drinks were high and also comparable to that of the commercial pineapple drink which is considered normal [5].

Table 1: *Sensory evaluation of Turmeric: Ginger-flavoured pineapple drinks

Sample	Colour	Taste	Aroma	General Acceptability
PTG_A**	5.06^a	3.17^b	4.24^b	4.07^b
PTG_B	5.76^a	4.88^a	5.65^a	5.32^a
PTG_C	5.76^a	5.76^a	5.76^a	5.59^a
Commercial Pineapple Drink (Standard)	5.75^a	5.75^a	5.74^a	5.60^a
LSD	0.87	1.16	1.17	1.15

**7-point hedonic scale: 1=dislike very much; 4=neither like nor dislike; 7=like very much.*
Values in a column with the same letter are not significantly different (P>0.05).
***PTG = Pineapple: Turmeric: Ginger composite extract.*
PTG_A = Pineapple: Turmeric: Ginger (13:6:1)
PTG_B = Pineapple: Turmeric: Ginger (6:3:1)
PTG_C = Pineapple: Turmeric: Ginger (4:3:3).

Table 2: pH and total soluble solids content of turmeric: ginger-flavoured pineapple drinks

Sample	pH	Total soluble solids
PTG_A	3.06	10.67
PTG_B	3.49	11.82
PTG_C	4.76	11.19
Commercial Pineapple Drink (Standard)	4.90	9.05

Table 3: *Sensory evaluation of fried rice spiced with turmeric: ginger composite flour

Sample	Colour	Taste	Aroma	General Acceptability
TG_A **	5.30^a	6.00^a	5.20^a	6.00^a
TG_B	5.00^a	5.20^a	5.00^a	6.80^a
TG_C	5.20^a	5.60^a	5.50^a	6.80^a
Curry flour (Control)	5.70^a	5.20^a	5.30^a	6.00^a
LSD	0.76	1.10	1.00	0.89

**7-point hedonic scale: 1=dislike very much; 4=neither like nor dislike; 7=like very much.*
Values in a column with the same letter are not significantly different (P>0.05).
*TG** = Turmeric: Ginger composite flour.*
TG_A = Turmeric: Ginger (9:1)
TG_B = Turmeric: Ginger (4:6)
TG_C = Turmeric: Ginger (7:3).

There were no significant differences (P>0.05) among the turmeric: ginger spiced fried rice with respect to colour, taste, aroma and general acceptability (Table 3). There were no significant differences between any of these fried rice preparations and that spiced with curry which is the control sample.

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