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Acceptability of traditional savories made using puffed amaranth seeds

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Abstract

Snacks are defined as foods or drinks consumed between regular meals. Consumption of snacks in addition to regular meals helps in providing good quantity of calories. Snacks also contribute to protein and fat content. Amaranth grain is also known as Rajgeera contain protein, fat and calories. The present study was planned to standardize acceptable traditional savories using puffed amaranth seeds. The standardized recipes include murukulu, namakpara, khakhra and chuduwa. Sensory analysis was conducted by 20 semi-trained panel members using nine -point hedonic scale to test for the preference of recipes in terms of appearance, colour, taste, texture, flavor and overall acceptability. Results showed that all the four products that were prepared using puffed amaranth seeds were well accepted, of all products namakpara got high overall acceptability (8.30). From the present study it can be concluded that flour prepared from puffed amaranth seeds can be incorporated as an ingredient in preparation of traditional Indian savories.

Keywords: amaranth, puffing, savories, sensory analysis

Introduction

Snacks were defined as foods or drinks taken in slighter quantities between regular meals. The snacks provide good amounts of calories, fat and protein. Snack items are eaten during leisure time for pleasure. In India traditional snacks are prepared at home occasionally for festivals and rituals. Those snacks include murukulu, chekodilu, chekralu, sakinalu, janthikal, aaku pakodi, chekkalu, mixture or boondhi etc.

Frying makes the food more palatable, improves shelf life and enables preparation of a number of varieties of foods. Mihela *et al.*, (2010) stated that fried foods have unique sensory properties, making them highly acceptable and attractive for the consumers.

In India amaranth seeds are well-known as Rajgeera seeds. They have unique composition of proteins, fats, carbohydrates and minerals. Amaranth seeds can be eaten in the form of gruel or can also subjected to some of the processing techniques like puffing, germination and fermentation. Those processed seeds can be made into flour with which a few snacks, savories or breakfast items can be prepared. In Mexico the amaranth seeds are consumed as common sweet known as "Algaría". In India amaranth seeds are mostly consumed as laddoo, a sweet recipe along with ingredients such as Bengal gram flour, sugar or jaggery, ghee, cashew nuts and flavored with cardamom.

Amaranth seeds have more protein when compared to other cereals. The amino acid lysine is seen in higher amounts in amaranth seeds. Presence of greater lysine content in amaranth seeds makes them highly appropriate for blending with other foods. Preparation of processed foods by adding amaranth seeds lead to increase in protein quality of foods, especially the Biological Value of foods (Pedersen *et al.*, 1987)^[5].

Amaranth seeds contain squalene, a terpenoid which helps in lowering the cholesterol levels in the body (Shin *et al.*, 2004)^[7]. Amaranth seeds also contain good amount of calcium, iron, magnesium, sodium, potassium and zinc (Becker *et al.*, 1981; Plate and Areas, 2002)^[1, 6].

Puffing is a process that is carried out under vapour pressure. The micropores present in the grain structure cause the vapour to expel out under high pressure due to which the kernels expand/puff. Puffing of the seeds results in porous structure and increases the flavour and aroma of the seeds, thus increasing the satisfactoriness. As the demand for ready-to-eat foods was increasing day by day (Nath *et al.* 2007)^[4], snacks with good amount of protein, fat and carbohydrate helps in improving the nutritional quality of diet. Increased consumption of amaranth seeds might lead to increased availability of these highly nutritious seeds.

Since the nutritional quality of the amaranth seeds was higher, the present study aimed at incorporation of puffed amaranth seeds as a major ingredient for preparing traditional savories.

Materials and methods

Location of the study

Puffing of amaranth seeds, development of traditional savories, sensory evaluation studies and storage of the of the traditional savories was carried out at Department of Foods and Nutrition, College of Community Science, Acharya N.G. Ranga Agricultural University, Lam, Guntur.

Procurement of raw material

Amaranth seeds were procured from the farmers of Isnapur village of Ranga Reddy District, Telangana State. Other ingredients like Bengal gram flour, wheat flour, Bengal gram dhal, groundnuts, cumin seeds, salt and red chilli powder were procured from the local markets of Guntur.

Puffing of amaranth seeds

Puffing of amaranth seeds was done after the cleaning, washing and drying of the amaranth seeds. Puffing of amaranth seeds was done by modifying the method prescribed by John *et al.* (2014)^[2].

Development of Traditional savories

Several trials were performed to standardize the products for acceptable appearance, colour, texture, taste, flavor and overall acceptance.

Sensory evaluation of the products

Sensory evaluation for the developed products was done by 20 trained panel members using 9 point hedonic scale. Scores were obtained for sensory attributes including appearance, colour, texture, taste, flavour and overall acceptability.

Statistical analysis

Sensory evaluation data of traditional savories was analyzed for mean and standard deviation.

Results and Discussion

Puffing of amaranth seeds

Amaranth seeds are puffed after cleaning, washing and drying of seeds followed by puffing. Amaranth seeds were puffed by heating on manual gas stove (Prestige Marvel, Glass Top GTMO2) using Blue fly aluminum pan. After heating the pan for 80 °C, a spoon full of amaranth seeds were spread evenly on pan.

The puffed amaranth seeds began to puff after 8-10 sec. The puffed seeds were passed through 1-mm mesh for separating the unpuffed seeds.

Development of Traditional Savories

Four traditional savories, namely, murukulu, namakpara, khakhra and chuduwa were prepared using puffed amaranth seeds as a major ingredient. Standardized ingredient proportions are presented in Table 1. Followed by the procedure involved.

Table 1: Standardized ingredient proportions for 100g of Traditional savories

Ingredients (g)/(ml)	Name of the recipe			
	Murukulu	Namakpara	Khakhra	Chuduwa
Puffed amaranth seeds	-	-	-	70
Puffed amaranth flour	50	30	50	-
Bengal gram flour	50	-	10	-
Wheat flour	-	70	40	-
Groundnuts	-	-	-	15
Bengal dhal	-	-	-	15
Curry leaves	-	-	-	For seasoning
Milk	-	-	-	-
Sugar	-	-	-	-
Oil	For deep frying	For deep frying	For smearing on top of pan	For seasoning
Cumin seeds	As required	As required	As required	-
Red chilli powder	As required	As required	As required	As required
Salt	As required	As required	As required	As required
Water	To make dough	To make dough	To make dough	-

Murukulu

Murukulu is a savory, crunchy snack originated from the Indian subcontinent. Murukulu is generally made from flours of rice and urad dhal. In this study, murukulu was prepared using puffed amaranth seeds flour as a major ingredient.

Procedure

Flour is prepared by grinding the puffed amaranth seeds and mixed with Bengal gram flour together by sieving. Other spices and oil were added. Smaller quantities of water is added to the mixture of flours and made into dough of desired consistency. The dough was placed into murukulu mould and pressed into pan containing hot oil and deep fried in oil till brown and crispy.

Namakpara

Namakpara or namkin is a crunchy savoury eaten in Indian

Subcontinent. It is ribbon-like strips of pastry made from refined flour, oil and water, appropriately seasoned with ajwain and cumin seeds for getting the characteristic flavour. In the present study namakpara was prepared using puffed amaranth seeds flour as a major ingredient.

Procedure

Flour is prepared by grinding the puffed amaranth seeds and mixed with wheat flour together by sieving. Other spices and oil were added. Smaller quantities of water is added to the mixture of flours and made into dough of desired consistency. The dough was pressed into thin sheet of 2mm thickness and cut in to diamond shaped pieces using a knife. The pieces were deep fried in oil till golden brown and crispy.

Khakhra

Khakhra is a thin cracker commonly used in Gujarati cuisine

of Western India. It is made from wheat flour, Bengal gram flour and oil. In this study khakhra was prepared using puffed amaranth seeds flour as a major ingredient.

Procedure

Flour is prepared by grinding the puffed amaranth seeds and mixed with wheat flour together by sieving. Other spices and oil were added. Smaller quantities of water is added to the mixture of flours and made into dough of desired consistency. The dough was pressed into thin sheet of 1mm thickness and shallow fried on both sides to get a crispy khakhra that can be broken easily.

Chuduwa

Chuduwa is a dish made from parched rice commonly used in Indian subcontinent. In addition to parched rice, grams like roasted Bengal gram and nuts like roasted groundnuts are

added to improve the flavour. In the present study chuduwa was made using puffed amaranth seed as a major ingredient.

Procedure

Ground nuts and Bengal gram dhal were roasted separately. For seasoning oil was heated and curry leaves and spices were added. Then the roasted ground nuts, Bengal gram and puffed amaranth seeds were added and mixed well.

Acceptability of Traditional savories

Standardized traditional savories conducted for sensory analysis and their acceptability was studied using 20 member's panel of judges by using nine - point hedonic scale. A least score 1 was assigned for extreme dislike and a highest score of 9 was assigned for extreme liking. Mean sensory scores of freshly prepared traditional savories are shown in the Table. 2 and Figure 1.

Table 2: Mean sensory scores of Traditional savories

Sensory attribute	Name of the recipe			
	Murukulu	Namakpara	Khakhra	Chuduwa
Appearance	6.95±1.39	8.05±0.51	7.05±1.09	8.35±0.58
Colour	6.90±1.20	7.60±0.94	6.70±1.30	8.30±0.80
Texture	7.45±1.09	8.35±0.58	6.80±0.95	7.80±1.15
Taste	7.55±1.09	8.40±0.59	6.75±0.91	8.15±1.13
Flavour	7.65±0.81	7.95±0.94	6.70±1.03	8.25±0.91
Overall acceptability	7.55±0.99	8.30±0.57	6.60±1.04	8.20±0.95

Mean scores ± Standard deviation

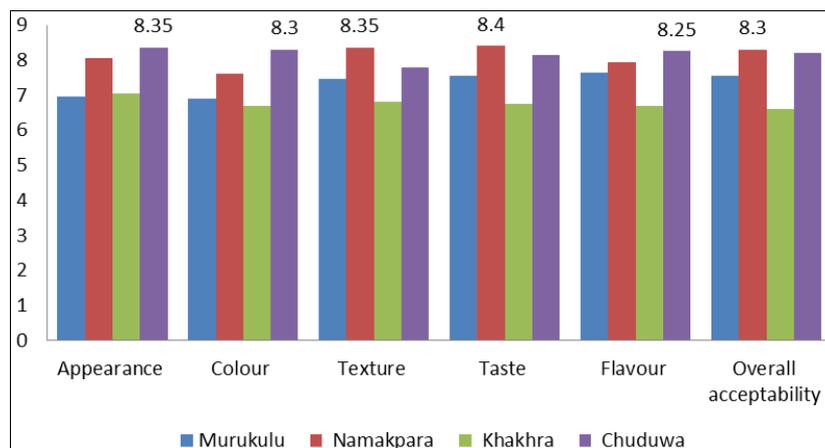


Fig 1: Mean sensory scores of fresh Traditional savories

The data presented in the Table 2. Presents the mean sensory scores of traditional savories. Mean scores for appearance of the traditional savories was from 6.95 to 8.35. Appearance of murukulu had low mean scores due to brown colour and high mean score of 8.35 for chuduwa is due to combination of ingredients like roasted groundnuts, roasted Bengal gram and curry leaves.

Colour of traditional savories was from 6.70 to 8.30. The scores for colour of the chuduwa were high because the chuduwa appeared colorful due to the presence of seasoning with ingredients such as chilli powder, curry leaves, roasted Bengal gram dhal and roasted ground nuts.

Texture of the namakpara was given a higher score (8.35) followed by chuduwa (7.80), murukulu (7.45) and khakhra (6.80). Namakpara had higher score for due to crispiness of the product. Tortoe *et al.* (2014)^[8] reported that crispiness and taste of the deep-fried items significantly increase their acceptance. Low scores given for taste of khakhra were

because, the khakhra were less crispier than the regular wheat flour based khakhra.

Mean scores for taste was from 6.75 to 8.40. Namakpara had high acceptance for taste which was indicated high suitability of puffed amaranth seeds for preparation of namakpara.

Mean scores for flavour of the traditional savories was from 6.70 to 8.25. Puffed amaranth chuduwa had high acceptance for flavour due to seasoning with ingredients such as curry leaves, roasted Bengal gram and roasted ground nuts.

Overall acceptance of fresh savories was from 6.60 (Like slightly) to 8.30 (like very much). Khakhra had low overall acceptance. The lower mean scores for khakhra was because of lack of crispiness and also because of darker colour and lack of characteristic flavour of khakhra.

Conclusion

Amaranth seeds contain good amount of proteins, fat and carbohydrates. The two important amino acids, squalene and

lysine are present in the amaranth seeds in considerable amounts. Sensory analysis of the savories found that namakpara made using puffed amaranth flour had high overall acceptability (8.30) followed by chuduwa (8.20), murukulu (7.55) and khakhra (6.60). It can be inferred that amaranth seeds can be puffed, floured and made into deep-fried snacks like namakpara with good acceptability. Incorporation of amaranth seeds in puffed form in traditional savories will help in increasing the nutritive value of the diet.

References

1. Becker B, Wheeler EL, Lorenz K, Stafford AE. A Compositional study of amaranth grain. *Journal of food science* 1981;46(4):1175-1180.
2. John HM, Andabati B, Geoffrey S. Effect of heat processing on selected grain amaranth physicochemical properties. *Food Science and Nutrition* 2014;2(1):9-16.
3. Mihela G, Mira T, George B. Hazards associated with fried fast food products. *Romania Biotechnological Letters* 2013;18(4):8391-8396.
4. Nath A, Chattopadhyay P, Majumdar G. High temperature short time air puffed ready-to-eat (RTE) potato snacks: process parameter optimization. *Journal of Food Engineering* 2007;80:770-780.
5. Pedersen B, Hallogren L, Eggum BO. The nutritive value of amaranth grain (*Amaranthus caudatus*). *Plant Foods for Human Nutrition* 1987;36(4):309-324.
6. Plate YA, Areas JAG. Cholesterol-lowering effect of extruded amaranth (*Amaranthus caudatus* L.) in hypercholesterolemic rabbits. *Food Chemistry* 2002;76(1):1-6.
7. Shin DH, Heo HJ, Lee YJ, Kim HK. Amaranth squalene reduces serum and liver lipid levels in rats fed a cholesterol diet. *British Journal of Biomedical Sciences* 2004;61(1):11-14.
8. Tortoe C, Papa T, Stephen N, Margaret O, Mary GA, Lynda H *et al.* Evaluation of the Sensory Characteristics and Consumer Acceptability of Deep-Fried Yam (*Dioscorea rotundata*) Crisps in the Accra Metropolitan Area. *Journal of Food and Nutrition Sciences* 2014;2(1):19-23.