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Development of pearl millet crackers infused with ridge gourd

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Abstract

A formulation of five variations "Development of Pearl Millet Crackers Infused with ridge gourd" was modified in different proportions. Five variations of pearl millet crackers are prepared using the steaming method. As part of the evaluation, twenty semi-trained panelists conducted an organoleptic test. VI = V2 variation was selected. After conducting a preference ranking test. Twenty semi-trained panelists were selected second variation. Selected variation which variation 222 is absorbed 21 days shelf life analysis. The nutrient analysis of a particular variation was chosen, called Variation-222. The formulated gluten-free crackers can be suggested as a healthy alternative snack for kids. The gluten content of the 100 grams of crackers was found 0.01 grams. The formulated crackers' nutrient content was calories, protein and fiber rich.

Keywords: Crackers, ridge gourd, pearl millet, gluten-free product

Introduction

Members of the family Cucurbitaceae have been farmed all over the world for their edible qualities, fiber, and traditional medicinal properties (Muthukumar *et al.*, 2016) [2]. The ridge gourd is a staple of the Indian diet and is widely consumed in Asian, African, and Arabic nations (Ananthan Padmashree *et al.*, 2012) [1]. Among the many health benefits of ridge gourd are its excellent blood-purifying and laxative qualities. Rich in dietary fiber, ridge gourd is beneficial for diabetes and can help with weight loss. It also has anti-inflammatory and antibiotic properties (Kerketta *et al.*, 2022) [3].

Pearl millet is a cereal classified as "high-energy" because it is high in calcium, iron, zinc, potassium, phosphorus, magnesium, zinc, copper, and manganese, as well as carbohydrates, protein, and fat. It is also rich in vitamins B and A. According to feeding trials carried out in India, pearl millet grains have a higher biological value of protein than wheat and are gluten-free (Upadhyaya *et al.* 2015) [4]. The high levels of thiamine (B1) and niacin (B3) found in pearl millet (*Pennisetum glaucum*) are well known (Borah *et al.*, 2023). Additionally, pearl millet is the least expensive source of protein, energy, iron, and zinc (Shivade *et al.*, 2022) [6]. Pearl millet aids diabetic patients in maintaining stable blood sugar levels over an extended period. Its relatively low glycemic index, which aids in containing and steadily digesting glucose at a slower rate than other foods, makes it beneficial for diabetics as well. Long-term blood sugar regulation will be aided by this. With celiac disease, a person's body is unable to process even trace amounts of gluten. Those with celiac disease benefit greatly from millet because it is gluten-free. For those with high cholesterol, pearl millet is highly advised. It contains a phytochemical called phytic acid, which is thought to affect how cholesterol is metabolized and balance the amount of cholesterol in the body (Umapathy *et al.*, 2022) [7].

Objectives

Hence the study "Development of Pearl Millet Crackers infused with ridge gourd" the above thesis was carried out with the following objectives.

Primary Objectives

Development of gluten-free Pearl millet crackers infused with Ridge gourd powder.

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Secondary Objectives

To formulate five variations of pearl millet crackers infused with ridge gourd. To evaluate the sensory attributes of pearl millet crackers infused with ridge gourd.

To determine the nutrient content of the developed pearl millet crackers infused with ridge gourd.

To perform the shelf life of the developed pearl millet crackers infused with ridge gourd.

Materials and Methods

A. Preparation of Ridge gourd powder

Collection of ridge gourd

Washing Taledge gourd

Cutting the gourd

Drying in tealry

Grind to Fiji powder

B. Preparation of pearl millet crackers infused with ridge gourd powder

Mixing together the dry ingredients

Add the Oland water

Divide and spa the dough I not a square

Roll out to the dough

Cu t the dough to crackers sized round shape

Transfer cricket backing sheet and prick with pork

Steaming for 12:15 minutes

Cool and store the crackers

C. Formulation of pearl millet crackers infused with ridge gourd

Five variations of Pearl millet crackers infused with Ridge gourd as given in Table-1.

Table 1: Formulation of pearl millet crackers infused with ridge gourd

Variation	Composition
Variation ILL (P:R=80:20)	80 grams pearl millet powder + 20 grams ridge gourd powder
Variation 222 (P:R=75:25)	75 grams pearl millet powder + 25 grams ridge gourd powder
Variation 333 (P:R=70:30)	70 grams pearl millet powder + 30 grams ridge gourd powder
Variation 444 (P:R=60:40)	60 grams pearl millet powder + 40 grams ridge gourd powder
Variation 555 (P:R=50:50)	50 grams pearl millet powder + 50 grams ridge gourd powder

D. Analysis of product quality

1. Organoleptic test

The cracker's composition was evaluated using 20 semi-trained panel members for organoleptic acceptability. Five samples of one of the formulated crackers were provided to each semi-trained panel member for sensory evaluation. For the standard cracker, millet crackers were chosen. Panelists who had received semi-training were asked to use a nine-point hedonic rating system, with a maximum acceptability score of 35-45 and a minimum score of 0-25, to rate the crackers formulated for appearance, taste, texture, color, and flavor. The formulation of crackers was deemed unacceptable (0-25), acceptable (25-35), and highly acceptable (35-45) based on the cumulative score.

2. Preference ranking test

A preference ranking test was also conducted by the semi-panel members to determine which crackers were the most favored. They were asked to all five varieties of crackers and rank them according to appearance, taste, texture, color, and flavor. As part of the evaluation, twenty semi-trained panelists conducted a ranking test after two out of five variants were selected during the preference test and the first two categories were matched. The choice was made for the second version. With a mean score ranging from 8.05±0.94 for variation 222 which was made with 75% pearl millet flour and 25% ridge gourd powder all of the cracker formulations were mostly

regarded as highly acceptable.

3. Shelf-life analysis

The semi-panel members analyzed the crackers' shelf life over 21 days. The prepared crackers were shielded from the sun and kept in an airtight container. Every day, the product's visual appeal, taste, texture, color, and flavor were noted. It was also put through tests to determine its overall acceptability as well as its appearance, texture, taste, flavor, rancidity, color, and light exposure.

4. Nutrient Analysis

In addition to the conventional pearl millet crackers, the nutrient analysis of a particular variation was chosen, called Variation-222, which was made with 75% pearl millet flour and 25% ridge gourd powder and had the highest mean acceptability score (8.05±0.94). The analysis of pearl millet crackers included moisture content, ash, fat, protein, carbohydrate, energy, fiber, calcium as CA, phosphorous asp, potassium as K, iron as Fe, and gluten.

Results and Discussion

The mean acceptability Score of prepared pearl millet crackers is given in Table 2 (Organoleptic test). The preference ranking test is given in Table 3. Nutrient analysis of crackers as given in Table 4.

Table 2: Organoleptic test

	Appearance	Taste	Texture	Color	Flavour	Overall Acceptability
Standard 000	7.9±0.78	8.05±0.75	8.1±0.78	7.7±0.92	8.05±0.88	8.45±0.60
Variation Ill	6.85±0.83	7.55±1.05	7.23±1.04	7.2±0.95	7.55±1.09	8.05±0.68
Variation 222	7.5±1.23	7.2±1.15	7.5±1.10	7.4±1.31	7.5±1.465	8.05±0.94
Variation 333	7.35±1.13	7.25±1.29	7.4±1.14	7.1±1.11	6.9±1.41	7.9±1.17
Variation 444	7.45±0.94	6.8±1.28	7.2±1.15	7.1±1.07	6.8±1.23	7.2±1.10
Variation 555	7.5±1.05	7.35±1.22	6.85±1.30	7.3±0.92	7.5±1.0	7.7±0.97

Table 3: Preference ranking test

Variation	Rank
Variation 111 (P:R-80:20)	2
Variation 222 (P:R-75:25)	1

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Table 4: Nutrients analysis of crackers

Nutrients (JOO gm)	Variation-(222)	
	JOO gm	50 gm (per serve)
Moisture (g)	5.62	2.81
Ash(g)	4.9	2.45
Protein (g)	5.69	3
Carbohydrate (g)	82.17	41.085
Energy (kcal/gm)	366.11	183
Fiber (g)	2.13	1.065
Calcium as Ca (mg)	9.13	5
Phosphorous as P (mg)	294.0	147
Potassium as K (mg)	203.0	101.5
Iron as Fe (mg)	2.13	1.065
Gluten %	OOJ	0.005

Conclusion

The snack products were developed to frame the study "development of pearl millet crackers infused with ridge gourd." Cracker formulation was done for the current study. Five different types of crackers were created by combining specific pearl millet flour and ridge gourd powder in varying proportions. Gluten-free crackers are a dependable choice for people with celiac disease or gluten sensitivity. They are safe to use as a snack because they have undergone extensive testing and have received gluten-free certification. These crackers have a delicious texture that brings something fun to your usual snacking experience. Nutrient analysis of pearl millet crackers infused with ridge gourd finally is concluded for protein and fiber, gluten-free products.

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