Journal of Science and Research Innovations

Volume - 2, Issue - 1, 2024, ISSN: 2583-9004 (ONLINE)

Development of Instant Kodo idli mix

Neelu Vishwakarma,[1] Alpana Sharma[2], Alka Singh[3] and Anita Shukla[4]

[1] Krishi Vigyan Kendra , Jabalpur , JNKVV, Jabalpur
[2] Krishi Vigyan Kendra ,Shahdol , JNKVV, Jabalpur
[3] Krishi Vigyan Kendra ,Sidhi, JNKVV, Jabalpur
[4] Krishi Vigyan Kendra ,Khargone ,RVSKVV, Gwalior

***E-mail : neeluvishwakarma@rediffmail.com**

ABSTRACT:

A balanced diet and proper nutrition are crucial for promoting and maintaining good health. Globally, an estimated 150 million people suffer from diabetes, with India accounting for the highest number at around 35 million. Diabetes rates are on the rise in India, and the World Health Organization projects that the number of Indians with diabetes will reach 57.2 million by the year 2025. To improve the income of Kodo millet farmers, this study explored creating and marketing value-added products like Kodo millet idli mix. The mix was formulated by combining Kodo rice with other ingredients in specific proportions. The resulting idli mix was then evaluated by a 10-member semi-trained panel using a 9-point hedonic scale (described by Amerine et al., 1965). The panelists rated the idli mix made with 40% Kodo rice moderately to very much liked (scores: 7.60, 7.70, 7.90, 7.80, 7.70). These results suggest that Kodo millet has good potential for value addition, particularly for products aimed at diabetic and obese individuals.

KEYWORDS: Nutrition, Kodo, Machine Milling, Organoleptic

Received: 20-01-2024 **Revised**: 14-03-2024 **Accepted**: 20-05-2024

INTRODUCTION:

Dietary modification, weight control, and regular exercise are the main approaches in the management of diabetes, diet being the sheet anchor. Because the risk of developing long term complications can be dramatically reduced with appropriate glycemic control, food ingredients that can attenuate postprandial glucose in persons with diabetes would be useful. New research findings in this area indicate the potential value of diets in prevention of such disorders. In fact, the preventive role of corrective nutrition is an ever-evolving process.

Kodo millets (Paspalum scrobiculatum) are tiny powerhouses of nutrition. Unlike many grains that require specific conditions to flourish, *kodo* millets are remarkably resilient. They can thrive in poor soil fertility, with minimal rainfall, and under various weather extremes. This makes them a valuable crop for dryland agriculture.

Kodo millets aren't just tough, they're also packed with essential nutrients. They boast a good amount of protein, crucial for building and repairing tissues. They're also rich in calcium, which strengthens bones and teeth, and iron, which helps carry oxygen throughout the body. Additionally, *kodo* millets are a source of dietary fiber, which promotes gut health and feelings of fullness, aiding in weight management.

The versatility of *kodo* millets makes them a welcome addition to many dishes. *Kodo* millet flour can be used to create fermented favorites like dosa and Idli, staples in South Indian cuisine. The whole grain can be enjoyed in porridge for a comforting breakfast or cooked into pulao, a flavorful rice dish.

While research on the specific health benefits of *Kodo* millets is ongoing, some studies suggest promising results. The high potassium content may help alleviate cramps during menstruation. The fiber content may aid digestion and regulate bowel movements. Additionally, the presence of fiber and protein can promote feelings of satiety, contributing to weight management goals. Some studies even suggest that *Kodo* millets may improve gut health due to the presence of prebiotic fibers.

It's important to note that *Kodo* millets contain antinutrients, like phytic acid and polyphenols, which can reduce the absorption of certain minerals. Soaking *Kodo* millets before cooking helps break down these antinutrients, making the nutrients more bioavailable for our bodies.

Currently. *idli* is a traditional cereal/legume-based naturally fermented steamed product with a soft and spongy texture which is highly popular and widely consumed as a snack food item in India. The predominant fermentation microflora comprises lactic acid bacteria and yeasts and causes an improvement in the nutritional, textural and flavour characteristics of the final product. The main purpose of development of Kodo mix idli for addition of fiber or long-time consumable carbohydrates They reduce fillings of hungry for long time. The sensory attributes of *idlis* (final product) prepared from the Idli batter related well to the determined flavour profile. The present study was aimed with following objectives

- To study the efficacy of Kodo millet in the Fermented food as Idli.
- To explore value addition potential of Kodo millet as a convenience food

MATERIAL & METHODS:

The present study was carried out in the J.N.K.V.V, Krishi Vigyan Kendra Jabalpur. The study was aimed to explore value addition potentials, and evaluate efficacy of *Kodo* millet in the management of diabetes mellitus. The details of the material and methods used in the investigation are presented below.

Procurement of Kodo Rice: Kodo rice was produced by Machine milling.

Preparation and standardization of Kodo millet based idli: Investigated the suitability of *Kodo* millet flour as a substitute for rice in idli preparation. They replaced rice flour with varying levels of *Kodo* millet flour: 0%, 10%, 20%, 30%, 40%, and 50%. All ingredients were mixed, soaked, and then ground with water to create batter. Finally, Idli were prepared using this value-added batter.

In order to find the perfect idli recipe, with various combinations of fermented and dried *Kodo* millet flour and black gram flour. All the mixes contained the same amount of leavening agents (1 gram each of citric acid and sodium bicarbonate) and flavoring agents (2 grams each of salt and dry yeast) For easy preparation, 100g of instant *Kodo* millet Idli mix was combined with 120ml of distilled water. The batter was then allowed to rest for 10 minutes to facilitate fermentation.

ORGANOLEPTIC EVALUTION : In some fields, like food science and plant identification, a preliminary assessment is done through sensory evaluation. This method relies on our senses – sight, smell, taste, touch – to examine characteristics like color, odor, texture, size, and shape. By using these senses, we can often gain initial insights about the properties of a sample The developed value added idli was standardized using

organoleptic evaluation technique with help of 10 panel members using 9-point hedonic ranking scale as described by Amerine t al.,(1965).

RESULT AND DISCUSSION :

Organoleptic evaluation: Proportion of Kodo rice along with other ingredients are mixed and the idli mix is tested for the product Organoleptic evaluation was done on a 9-point Hedonic scale as described by Amerine t al., (1965), by semi trained panel of 10 member. Table 1 reveals that the calculated overall mean organoleptic scores for the control sample Kodo Idli range between 7.60,7.70,7.90,7.80.7.70 & very much liking for the product prepared from 40% of Kodo rice

Table 1. Descriptive characteristics of non-spiced cooked Kodo mix Idli

Attributes	**Kodo millet: rice (%)**				
	00:100	**20:80**	**30:70**	**40:60**	**50:50**
	I	**II**	**III**	**IV**	**V**
Appearance	Dull white grey	Dull white	Dull white	Light Dull white	Light Dull white
Texture	Slightly sticky but firm texture	Slightly sticky and firm	Non-sticky and slightly soft	Non-sticky Very soft	Non-sticky very Soft
Aroma	Not bad	Not bad	good	good	Good
Taste	Noticed millet flavour	Noticed millet flavour	Slightly sweet taste	Bland	Bland
Overall acceptability	Non Moderately acceptable	Non acceptable	Moderately acceptable	acceptable	Acceptable

Sensory quality evaluation of Kodo millet idli was carried out after cooking. Results of the organoleptic evaluation carried out by investigators are depicted in Table 2. The incorporation of increase formulation of Kodo results in positive change in the sensory quality of the idli. The dull white grey appearance of idli change to light dull white colour sticky but firm texture to non-sticky very soft texture. Thus, it enhances the acceptability.

Table 2. Mean organoleptic scores incorporation of Kodo millet.

Blend	**Colors and appearance**	**Texture**	**Test**	**Aroma**	**Overall acceptability**	**Mean Value**
40:60	7.60	7.70	7.90	7.70	6.18	6.18
50:50	7.60	7.70	7.80	7.67	6.15	6.15

Table 2. reveals that idli with 40 and 50 per cent incorporation of Kodo millet did not differ in sensory quality parameters from each other. The idli were non-sticky and very soft with good aroma and taste. The mean value of acceptability for 40:60 and 50:50 blend was 6.18 and 6.15 respectively.

Table 3. Nutrient composition of the value added Kodo millet based Idli.

Nutrient	**Quantity (per 100 g)**
Protein (g) *	16.9
Fat (g) *	1.9
Carbohydrate (g) *	92
Calorific value (kcal) *	470
Total minerals (g) *	3.83
Crude fibre (g) *	3.9
Iron (mg)	2.6

On the basis of table value*

Table 3 shows table values of nutrient composition of value added kodo millet based idli. It shows a low carbohydrate content and high minerals and crude fiber content. which justifies its therapeutic role.

CONCLUSION:

Analysis of the IV multigrain idli revealed a nutritional profile rich in fiber, protein, calcium, and iron. Additionally, it contained lower levels of carbohydrates and fat compared to other samples. These findings suggest that the IV recipe offers superior nutritional value. Thus, results indicate Kodo to be a good grain which could easily be value added and explore for the diabetic patient & obese person. Therefore, it can be concluded that Kodo millet is a potential grain among the millets with superior nutrient components and hence, could be a worthy addition to diabetic's diet.

REFERENCES:

Amerine, M.A., R.M. Pangborn, E.B. Roessler. (1965). Principles of sensory evaluation of food. *In*: Food Science and Technology Monographs,338-339. Academic Press, New York.

Arora and Srivastava, (2002), Suitability of millet-based food products for diabetics. *J. Food Sci.and Tech.*, 39 **(4)** : 423-428

Gopalan, C., Ramasastri, B.V., and Balasubramanian, S.C., (1989). *Nutritive value of Indian Foods.* National Institute of Nutrition, (ICMR), Hyderabad, 43- 47.

Soni, S.K. and Sandhu, D.K. (1989). Fermentation of idli: Effects of changes in raw materials and physico-chemical conditions. J. Cereal Sci., 10**(9)**:227-238.

Soni, S.K. and Sandhu, D.K. (1990). Indian fermented foods: Microbiological and biochemical aspects. Indian J. Microb., 30**(2)**:135-157.

a