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Development and standardization of instant browntop millet dosa mix

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Abstract

Browntop millet is an introduced annual grass that originated in South-East Asia. It is grown in Africa, Arabia, China and Australia. The browntop millet, called *korale* in Kannada, is specially grown in rainfed tracts of Tumakuru, Chitradurga and Chikkaballapura districts of Karnataka state. Browntop millet is one of the underutilized millet having good nutritional and health benefits. In the present study browntop millet instant dosa mix was developed and analyzed for sensory parameters. Browntop millet flour was substituted with rice flour in rice dosa mix from 50 g to 70 g and were named as millet 50, millet 60 and millet 70. The scores for Instant browntop millet dosa and rice dosa for appearance ranged from 6.80 to 8.50, color ranged from 6.85 to 8.45, flavor from 6.85 to 8.20, taste from 7.05 to 8.25, texture from 7.05 to 7.95 and overall acceptability ranged from 6.90 to 8.50 respectively. The scores were significantly different in all the parameters. Acceptability index scores of Instant browntop millet dosa with 50 g, 60 g and 70 g were 80.64, 92.31 and 76.85 respectively. Instant Browntop millet dosa mix with 60 percent was incorporated with dehydrated carrot powder. Carrot powder incorporation was varied from 10-30 g. Instant browntop millet dosa mix with dehydrated carrot powder of 20 g was scored highest in all the sensory parameters and other two dosa mix with carrot powder of 10 g was scored low and 30 g dehydrated carrot powder showed the least scores in all the sensory parameters. Acceptability index score for instant browntop millet dosa mix with dehydrated carrot powder of 20 g was scored high (90.92) followed by 10 g dehydrated carrot powder (80.46) and 30 g dehydrated carrot powder (79.35) respectively.

Keywords: Development, standardization, instant browntop millet dosa mix

Introduction

Millet is a collective term referring to a number of small seeded annual grasses that are cultivated as grain crops, primarily on marginal lands in dry areas in temperate, subtropical and tropical regions (Baker, 1996) [3]. Small millets have their origin chiefly in Asia and Africa. The most important domesticated areas are East Asia, Indian subcontinent and the regions from Southern margin of Sahara to the Ethiopian high lands of Africa (Seetharam and Gowda, 2007) [5].

Browntop millet (*Brachiaria ramosa* (L.) Stapf; *Panicum ramosum* L.) is an introduced annual grass that originated in South-East Asia. It is grown in Africa, Arabia, China and Australia (Clayton *et al.*, 2006) [4]. It was introduced to the United States from India in 1915 (Oelke *et al.*, 1990) [6]. In the US, it is mainly grown in the South-East for hay, pasture and game bird feed. The browntop millet, called *korale* in Kannada, is specially grown in rainfed tracts of Tumakuru, Chitradurga and Chikkaballapura districts of Karnataka state. The crop is popular in this region in terms of cultivation and consumption. This millet seed is grown in a variety of soils and climates. Like other millets, it is a hardy crop and well suited for dry land. Browntop millet is underutilized millet which is neglected by the monocrop based agriculture system and is not popular for food use. There is limited information on brown top millet; hence the present study has been undertaken with the following specific objective was undertaken.

Objective

To develop value added product using different processing methods.

Methodology

Procurement of sample

Browntop millet was procured from green organic store, dharwad. The millet was cleaned, washed in running water, dried and milled to flour.

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The millet grains were used for analysis of physico-chemical and functional properties. The flour was packed in air tight container and used for product development. Other ingredients like bold rice, black gram dhal, fine semolina, rice flakes, fenugreek seeds and salt were procured from local market, Dharwad.

Standardization of browntop instant dosa mix

The standardized procedure of rice instant dosa mix of Madhushree Y MHSc, UAS, Dharwad was followed for the preparation of browntop instant dosa mix (2020). The composition of instant control mix was rice (70 g), black gram dhal (17.5 g), fine semolina (5 g), rice flakes (5 g), fenugreek (1 g) and salt (1.5 g). Control formula was used for development of instant browntop millet dosa mix. Rice (70 g) was replaced with browntop millet flour at 40, 50, 60 and 70 g to develop instant browntop millet dosa mix. The proportion of other ingredients was like black gram dhal (17.5 g), fine semolina (5 g), rice flakes (5 g), fenugreek (1 g) and salt (1.5 g) were not altered.

Development of brown top instant dosa mix enriched with carrot powder

Enriched dosa mix was prepared with incorporation of Carrot powder. The carrots were procured from local market, Dharwad. The carrots were cleaned and washed manually in water. Carrot was sliced and blanched for 2-3mins. The blanched carrot slices were dried and made into powder form. The 10 g of carrot powder was incorporated in the instant

dosa mix.

Experimental results

Browntop millet is one of the underutilized millet having good nutritional and health benefits. In the present study browntop millet instant dosa was developed and analyzed for sensory parameters.

Table 1: Formulation of brown top millet flour

| Parameters Dosa mix | Control | Trial 1 | Trial 2 | Trial 3 |
|---------------------|---------|---------|---------|---------|
| Rice | 70 | 20 | 10 | 0 |
| Browntop | 0 | 50 | 60 | 70 |
| Black gram | 17.5 | 17.5 | 17.5 | 17.5 |
| Semolina | 5 | 5 | 5 | 5 |
| Poha | 5 | 5 | 5 | 5 |
| Fenugreek powder | 1 | 1 | 1 | 1 |
| Salt | 1.5 | 1.5 | 1.5 | 1.5 |
| Total | 100 | 100 | 100 | 100 |

Formulation of browntop millet flour was presented in Table 1. In formulation of browntop millet dosa mix three formulation was prepared. In formulation browntop millet flour was substituted with rice flour in control dosa mix from 50 to 70 per cent. Other ingredients used for preparing dosa mix were blackgram dhal (17.5 g), poha (5 g), semolina (5 g), fenugreek powder (1 g) and salt (1.5 g) and these ingredients kept constant.

Table 2: Sensory parameters of different variation of browntop millet

| Parameters Dosa mix | Appearance | Color | Flavor | Taste | Texture | Overall acceptability | Acceptability index |
|---------------------|------------|-----------|-----------|-----------|-----------|-----------------------|---------------------|
| BM 50 | 7.30±0.92 | 7.40±0.68 | 7.10±0.78 | 7.25±0.71 | 7.25±0.91 | 7.25±0.71 | 80.64 |
| BM 60 | 8.50±0.68 | 8.45±0.75 | 8.20±0.95 | 8.25±0.91 | 7.95±1.05 | 8.50±0.68 | 92.31 |
| BM 70 | 6.80±1.05 | 6.85±0.98 | 6.85±0.74 | 7.05±1.09 | 7.05±0.88 | 6.90±0.78 | 76.85 |
| F value | 18.754** | 19.670** | 14.869** | 9.725** | 4.929** | 26.401** | |
| S.Em± | 0.52 | 0.47 | 0.48 | 0.53 | 0.54 | 0.42 | |
| CD | 1.47 | 1.34 | 1.36 | 1.50 | 1.55 | 1.19 | |

BM - browntop millet, * significant at 5% ($p < 0.05$), NS – non significant, same superscript in the column indicates non-significant difference. BM50-Browntop millet 50 g, BM60-Browntop millet 60 g, BM70 –Browntop millet 70 g.

Sensory scores of dosa prepared with instant browntop millet dosa was presented in table 2. With varying proportions of substitution of browntop millet flour from 50 g to 70 g and were named as millet 50, millet 60 and millet 70. The scores for appearance ranged from 6.80 to 8.50, color ranged from 6.85 to 8.45, flavor from 6.85 to 8.20, taste from 7.05 to 8.25,

texture from 7.05 to 7.95 and overall acceptability ranged from 6.90 to 8.50 respectively. The scores were significantly different in all the parameters. Acceptability index scores of browntop millet dosa with 50 g, 60 g and 70 g were 80.64, 92.31 and 76.85 respectively.

Table 3: Formulation of carrot powder with instant brown top millet dosa mix

| Parameters Dosa mix | Control | Trial 1 | Trial 2 | Trial 3 |
|---------------------|---------|---------|---------|---------|
| Rice flour | 10 | 10 | 10 | 10 |
| Browntop | 60 | 60 | 60 | 60 |
| Black gram | 17.5 | 17.5 | 17.5 | 17.5 |
| Semolina | 5 | 5 | 5 | 5 |
| Poha | 5 | 5 | 5 | 5 |
| Fenugreek powder | 1 | 1 | 1 | 1 |
| Salt | 1.5 | 1.5 | 1.5 | 1.5 |
| Carrot powder | -- | 10 | 20 | 30 |

Formulation of carrot powder in browntop millet dosa mix was presented in Table 3. Carrot powder incorporation was varied from 10-30 g. Browntop millet dosa mix of 60 percent

was taken as control with that dehydrated carrot powder was incorporated of 10 g, 20 g and 30 g respectively.

Table 4: Sensory parameters of different variation of dehydrated carrot powder

| Parameters Dosa | Appearance | Color | Flavor | Taste | Texture | Overall acceptability | Acceptability index |
|-----------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|---------------------|
| BMC10 | 7.35±0.67 ^b | 7.35±0.58 ^b | 7.15±0.67 ^b | 7.20±0.61 ^c | 7.20±0.83 ^b | 7.20±0.61 ^b | 80.46 |
| BMC20 | 8.35±0.67 ^a | 8.35±0.74 ^a | 8.10±0.91 ^a | 8.05±0.82 ^a | 7.85±0.98 ^a | 8.40±0.68 ^a | 90.92 |
| BMC30 | 7.20±0.69 ^c | 7.10±0.71 ^c | 7.15±0.48 ^b | 7.25±0.78 ^b | 6.90±0.96 ^c | 7.25±0.71 ^c | 79.35 |
| F value | 16.941** | 18.541** | 11.867** | 8.130** | 5.426 | 20.402** | |
| S.Em± | 0.39 | 0.39 | 0.41 | 0.43 | 0.53 | 0.38 | |
| CD | 1.11 | 1.12 | 1.16 | 1.22 | 1.52 | 1.09 | |

BMC -browntop millet dosa mix with dehydrated carrot powder, * significant at 5% ($p < 0.05$), NS – non significant, same superscript in the column indicates non-significant difference.

Table 4 infers the sensory scores of instant browntop millet dosa with dehydrated carrot powder at BMC10 g, BMC 20 g and BMC 30 g. Instant browntop millet dosa with carrot powder of 20 g was scored highest in all the sensory parameters and other two dosa mix with carrot powder of 10 g was scored low and 30 g dehydrated carrot powder showed the least scores in all the sensory parameters. The all the sensory parameters were significantly different at 1% ($p < 0.01$). Acceptability index score for instant browntop millet dosa with dehydrated carrot powder of 20 g was scored high (90.92) followed by 10 g dehydrated carrot powder (80.46) and 30 g dehydrated carrot powder (79.35) respectively. The instant browntop millet dosa with dehydrated carrot powder of 20 g was accepted and taken for further analysis.

Conclusion

Browntop millet is one of underutilized minor millet. Browntop millet is rarely used has food grain in some parts of the Karnataka. Browntop millet value added product was developed and standardized. In formulation browntop millet flour was substituted with rice flour in control dosa from 50 to 70 per cent. Acceptability index scores of browntop millet dosa with 50 g, 60 g and 70 g were 80.64, 92.31 and 76.85. Instant browntop millet dosa with 60percent was accepted and taken for further value addition of carrot powder. Dehydrated carrot powder was incorporated with 60 percent instant browntop millet dosa upto 10 g-30 g. Acceptability index score for instant browntop millet dosa with dehydrated carrot powder of 20 g was scored high (90.92) followed by 10 g dehydrated carrot powder (80.46) and 30 g dehydrated carrot powder (79.35). Hence instant browntop millet dosa mix with dehydrated carrot powder with 20 g was accepted.

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