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Quality assessment of bread produced from rice flour, tamarind flour and elderflower
powder blends

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In recent years, as people's interest in food and health has grown, the importance of nutrition has steadily increased, as has the number of studies on food fortification and the production of functional products. Food fortification is one of the techniques developed and applied to solve health problems encountered in society. The need for diverse gluten-free flour alternatives catering to a wide range of dietary requirements and those with gluten intolerance compelled us to focus on this issue. A healthy diet is the central therapeutic measure for gluten intolerance. The objective of this study was the development and nutritional, physical and sensory evaluation of an assortment of gluten-free bread using rice flour, tamarind flour and elderflower powder as raw material. Four types of gluten-free breads were obtained using different flour ratios: rice flour (RF): tamarind flour (TF): elderflower powder (EP): 99:0:1%; 89:10:1%; 79:20:1%; 69:30:1%. The gluten-free bread samples studied were obtained by the direct method.

• Introduction

Consumers demand of new food products not only to satisfy a physiological need but also to have healthy food with necessary nutrients to prevent nutrition-related diseases and to improve physical and mental health. In this regard, a close relation between nutrition and health has been established and functional foods containing ingredients with a specific health benefit were technologically developed. Tamarind flour (TF) is rich in proteins (13.6%), in fibers (21.6%), has high content of calcium, phosphorus, magnesium, potassium, copper, zinc and manganese and significant source of bioactive compounds including polyphenols, especially very rich in flavonoids. Elderflowers powder (EP) contains a large number of bioactive ingredients, including proteins, vitamins, minerals, terpenes, sterols and polyphenols.

• Material and method

Tamarind flour (TF), elderflowers powder (EP) and the other ingredients used in this study were purchased from local market in Timisoara town, Romania.

Production of the composite breads: Bread samples (control and with different substitution levels of RF with TF and EP) were prepared according to the AACC International Method 10-50.05 with minor modifications.

Sensory evaluation of breads with TF and EP. A panel of 20 panelists have evaluated breads using a 9-point hedonic scale. The appearance, texture, flavor, taste, color and overall acceptability, were evaluated.

The proximate composition and physical the bread samples using standard laboratory procedures, were evaluated.

• Results and discussions:

Centralizing the results obtained in terms of sensory analysis of the bread samples, it can be seen that the bread sample with 89% RF:10%TF:1%EP was the most appreciated by the evaluators (appearance – 8.5; texture – 8.4; flavor – 8.1; taste – 8.9; color – 7.9; overall acceptability – 8.3).



Figure 1. Bread with tamarind flour and elderflowers powder

Table 1. Proximate composition of bread supplemented with different quantities of TF and EP

Proximate composition (%)	Bread samples			
	CB	B10TF	B20TF	B30TF
Moisture	30.39	26.44	25.33	24.24
Protein	11.2	12.32	13.54	14.52
Fat	5.4	6.22	7.31	8.47
Carbohydrate	48.57	49.23	45.90	42.72
Fiber	2.52	3.14	4.28	5.33
Ash	1.93	2.65	3.68	4.72

The results obtained regarding the chemical composition of the studied bread samples show the superior nutritional profile of all four bread samples (B10TF, B20TF and B30TF) compared to CB. Physical analysis of the bread samples shows that weight, volume and specific volume of bread increases with TF incorporation, the improvement in the volume of the breads, with different levels of TF, was around 200 – 380cm³/100 g product.

• Conclusions

Based on these results, we can say that this gluten-free bread is healthy, has an important nutritional value, and also the quality is better than wheat flour bread. Therefore, the studied raw materials can be considered a healthy raw material in bakery production.