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Grapes Biologically Active Substances Using in the Bread Production

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ABSTRACT

A study of total phenols, tannins and antioxidant activity transferred in bread enriched with grape pips flour and Rkatsiteli wine was conducted. When adding 20 ml of Rkatsiteli, the amount of total phenols was 228 mg/l, when adding 30 ml - 315 mg/l. The amount of tannins was 74.45 mg/l and 82.71 mg/l, respectively. And the antioxidant activity was 43.41% and 57.78%. In the mentioned samples, the effect of adding wine was expressed organoleptically more in taste, smell and color than in the amount of chemical parameters transferred from the wine. However, it should be noted that the transfer of phenolic compounds from wine to bread has added antioxidant nutritional value and distinct technological and organoleptic value to the product. The phenolic compounds transferred from Rkatsiteli wine to the bread, together with other biologically active substances contained in the bread, determine the high biological activity of the bread and, accordingly, its functional purpose from a curative-prophylactic and preventive point of view.

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The quality of food occupies one of the most important and prominent places in all eras. Bread is the main product of the human diet, and that is why ensuring the balance of the composition of bread and increasing its nutritional value is a very relevant and important issue in modern life. At the expense of adding various natural ingredients to bread products, it is possible to extend the shelf life of bread, improve its texture, obtain a dietary and therapeutic-prophylactic product, and also fill in insufficient nutrients in the diet. Scientists have studied the amount of phenolic compounds and antioxidant activity in bread enriched with fruits and vegetables. It has been confirmed that the total amount of phenolic substances and the antioxidant activity index have significantly increased in this bread. Scientific studies have confirmed the positive effect of the winemaking residue, namely the dried grape juice taken after the alcoholic fermentation, on the functional properties of bread, such as texture, sensory and physico-chemical indicators. It has been established that grape juice is an important enriching ingredient in the production of bakery products, as it increases the amount of dietary fiber, antioxidant activity and phenolic compounds in the final product [1-4].

During the production of bread, it is relevant and important to use grape components, which are rich raw materials due to their high antioxidant and other biological activity. Phenolic substances play an important role in shaping the therapeutic and prophylactic value of the target product. They are represented by flavonoid (oligomeric and polymeric procyanidins, catechins, flavonols, anthocyanins) and non-flavonoid (phenolic acids, stilbenoids, etc.) groups. It should be noted that grape phenolic substances are characterized by high biological activity in various directions and their content in wines and other products of grape origin determines the functional purpose of these products in terms of therapeutic and preventive properties [5-7]. Scientists have experimentally determined that products with a total composition of polyphenols are characterized by synergism of antioxidant activity [8]. The aim of the research was to investigate some phenolic substances in bread enriched with Rkatsiteli wine and grape seeds. The following were used as research objects:

Control sample (I)

- Bread enriched with grape seed flour (II)
- Bread enriched with Rkatsiteli wine and grape seed flour (III)
- Rkatsite wine.

Research samples were prepared on the basis of "Mzetamize - Gemovani Puri" LLC. The first sample was made as a control, the second sample was enriched with grape seed flour, and the third sample was made with the addition of Rkatsiteli wine and grape seed flour. All samples - control and research samples, were made in compliance with the sequence of technological operations and execution mode adopted at the enterprise. Total phenols of Rkatsiteli wine used in bread baking were determined.

Total phenols in the skin and heart of the research samples were determined according to the Gloria method, using a spectrophotometer (HACH / DR / 3900) at 420 and 520 nm wavelengths [9]. In order to detect grape seed tannins, their amount was determined at a wavelength of 280 nm in sodium bisulfite or aqueous test samples of model solutions with different (3.2-1.0) pH.

In the control and research samples of bread, organoleptic parameters were determined, including: color, smell, taste and aroma, surface, appearance of crumb, porosity. The results of the study are given in Table 1.

Results and Disscussion

Table 1: Organoleptic Indicators of Control and Research Samples of Bread

Quality Indicators	Research Results	study sample	
	Control sample I	Bread enriched with grape seed flour II	Bread enriched with Rkatsiteli wine and grape seed flour III
Surface	With slight unevenness, without cracks and splits, uniformly colored bark	uniform, views and without cracks, with uniformly colored bark.	Straight, uniform, cracks and without cracks, with uniformly colored bark.
The face of the fragment	Well-baked, cross-section shows no traces of kneaded dough, thin-walled, with equal porosity, without voids.	Well baked, cut across No traces of kneading dough are fixed, thin-walled, with equal porosity and without voids	Well baked, cut across No traces of kneading dough are fixed, thin-walled, with porosity and without voids.
Color	Brownish-creamy	Light brown	Brownish, wine-colored
Porosity	Well-baked, with thin walls, the core of the bread is porous, elastic, after lightly pressing it with a finger, it takes its initial shape. It does not leave a feeling of stickiness or moisture when touched by hand.	With thin walls, the heart of the bread is porous, elastic, easily recovers its shape when lying down. It does not leave a feeling of stickiness or moisture when touched by hand.	With thin walls, the heart of the bread is porous, elastic, easily recovers its shape when lying down. It does not leave a sticky feeling when touched by hand. It is moderately humid.
The Smell	Pronounced aroma of bread, very light, harmonious sour smell.	With a very light scent of Rkatsiteli and a harmonious smell.	With a specific, light scent and harmonious smell of Rkatsiteli.
Taste and Aroma	With a distinct wheat aroma characteristic of baked bread, with a light sour taste	With a pronounced wheat taste characteristic of baked bread, very light, with a pleasant Rkatsiteli aroma.	With a pronounced wheat taste characteristic of baked bread, light, Pleasant, harmonious aroma of Rkatsiteli.

Table 2: Total Phenols, Tannins and Antioxidant Activity in Bread Enriched with Grape Seed Flour and Buckwheat Flour

Name	Common Phenols (mg/l)	Tannins (mg/l) 605 nm	Antioxidant Activity with DPPH 517 nm (%)	Organoleptics
Rkatsite wine	257.7	_		characteristic variety aroma
100 gr Flour , natural Flour , salt , water (without additional ingredients)	-	-	-	typical
100 gr flour, 5 g (5%) of grapes of pods Flour , natural yeast , water, salt	-	-	-	highlighted aroma and taste Without , pleasant
100 gr flour, 7 g (7%) of grapes of pods Flour , natural Yeast , salt , water	12			highlighted aroma and the taste
100 gr flour, 5 g (5%) of grapes of pods Flour , natural yeast, salt, Rkatsiteli (20 ml), water (40 ml)	228	74,45	43 , 41	Pleasant varietal aroma characteristic of Rkatsiteli and white wine
100 g flour, 5 g (5%) grape seed flour, natural yeast Salt, Rkatsiteli (30 ml, water 30 ml), salt.	315	82, 71	57,78	Sharp varietal aroma characteristic of Rkatsiteli and white wine

When adding 20 ml of wine, a small, cool pleasant aroma of Rkatsiteli was felt in the bread sample, the heart of the bread was characterized by a light brown color; The amount of total phenols in the mentioned sample was 228 mg/l, tannins 74.45 mg/l. As for the added sample of 30 ml of Rkatsiteli wine, it revealed Rkatsiteli varietal aroma and clearly noticeable light, brownish color, pleasant taste and moderate humidity. The amount of total phenols in this sample was 315 mg/l, the amount of tannins was 82.71 mg/l. (Table 2).

Thus, based on the results of the research, we can conclude that it is appropriate to use Rkatsiteli wine to increase the nutritional value of bread, to improve the quality of finished products, to improve taste properties and to expand the assortment of bread. Bread, like bread, is a wonderful combination, which complements each other not only with taste, but also the useful substances included in the product made from different natural ingredients together determine the high nutritional value of the final product. The phenolic compounds transferred from the Saferavi wine to the bread, along with other biologically active substances contained in the bread, determine the high biological activity of the bread and, accordingly, its functional purpose from a curative-prophylactic and preventive

point of view.

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