

Hedonic Organoleptic Test of Banyuwangi Special Bagiak Cake Innovation with Arnong (*Nasturtium Officinale*) Fortification

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ABSTRACT

Arnong is a plant that is very rich in sulfur, nitrogen, and iodine. Arnong in Songgon sub-district can fulfill the needs of Banyuwangi. Product innovation with arnong fortification is very interesting to explore, one of which is focused on Bagiak products. Bagiak is a popular dry snack from Banyuwangi. This study aims to determine the hedonic test with organoleptic on the effect of adding nasturtium officinale r. br extract to Bagiak products on panelist acceptance. This research is an experimental study using a Randomized Group Design with 4 treatments; B0 control, addition of B1 Nasturtium officinale 2% r. br extract, addition of B2 nasturtium officinale 5% r. br extract and addition of B3 nasturtium officinale 10% r. br extract. Determination of samples using Simple Random Sampling Technique consisting of 33 respondents who are hereinafter referred to as panelists with certain criteria. Data analysis using analysis of variance (ANOVA) and if there is a significant difference will be further tested using the BNJ test with a confidence level of 5%. The panelists' liking test was conducted on color, texture, taste, and aroma. The results showed that the treatment with the highest average value was the B1 control treatment which was most preferred in terms of color, texture, taste and aroma, while the lowest treatment average value was shown in treatment B3 with the addition of 10% nasturtium officinale r. br extract.

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INTRODUCTION

Arnong (*Nasturtium officinale*, *N. microphyllum*; formerly *Rorippa nasturtium-aquaticum*, *R. microphylla*) is one of the oldest leaf vegetables consumed by humans. Arnong is a plant that is very rich in sulfur, nitrogen, and iodine (Wikipedia 2018). Arnong in Songgon sub-district can fulfill the needs of Banyuwangi (Dewi, 2012). Songgon is located at the foot of Mount Raung consisting of nine villages so the potential for waterfalls is very large. The potential of waterfalls in Songgon is also followed by the potential of its natural products, especially arnong. Arnong thrives in nature that has a large source of clear water, therefore arnong in Songgon is abundant, especially in Sumber Arum village.

Product innovation with arnong fortification is expected to help existing problems in Indonesia, namely tourism. The tourism industry with the diversification of processed products will make tourists interested because there are more and more variations for souvenirs. Innovation with arnong fortification is focused on Bagiak products, Bagiak is a popular and popular dry snack from Banyuwangi. This Banyuwangi Bagiak cake is very delicious and easy to obtain, because it has been widely taken by souvenirs (Dilla, 2018) This research is focused on knowing the panel's preference for Bagiak with arnong fortification with several treatments, this aims to ensure that the product is accepted by the community. Based on the background description, the formulation of the problem is How is the favorability test on the product forak with arnong fortification based on the organoleptic test.

METHODS

The materials used in this study were okra fruit "Bimandiri", Arabic Gum, Guar Gum, Xanthan Gum, cooking oil, water, food coloring (green), pH 2-9 buffer solution, 1M sodium hydroxide, 1M hydrochloric acid, sodium chloride, 96% ethyl alcohol, acetone, and other chemicals used for analysis. The equipment used during the study were a "Philips" mixer, "Sanyo EM-P" microwave, Minolta CR-300 chromameter, "Panasonic MXJ1G" dry blender, water bath, "Memmert" oven, vortex, "Hettich zentrifugen EBA 20" centrifuge, Siever 80 mesh, and so on and so forth.

The type of design used in this research is a complete randomized design (RAL) because it is applied to experiments conducted in a homogeneous environment (or can be considered homogeneous). The research approach used in this research is an experimental approach using a true experimental design. The formulation of arnong extract raw materials and hedonic (without the addition of arnong) in detail is presented in Table 1.

Table 1.
Experiment Group

Group	Description
(3 products)	The product in this formulation does not use the addition of arnong
Bagiak experiment with fortification of arnong extract	1. This formulation uses 500g flour and 10g arnong 2. This formulation uses 500g flour and 25g arnong 3. This formulation uses 500g flour and 50g arnong

The data collection methods used in this study are:

1. Documentation, by searching for data and analyzing documents in the form of notes, books, research journals, and so on.
2. Hedonic test, which aims to provide consumer assessment of the product in terms of aroma, taste, texture and appearance.

Procedure for making arnong extract :

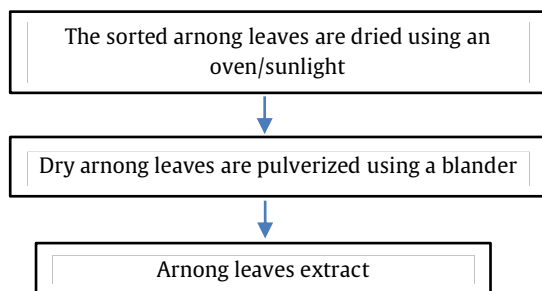


Figure 1.
Flow Chart of Arnong Extract

Table 2.
Questionnaire form

Scale Assessment	Sensory Attributes			
	Aroma	Taste	Texture	Appearance
1	Very dislike	Very dislike	Very dislike	Very dislike
2	Dislike	Dislike	Dislike	Dislike
3	Somewhat Like	Somewhat Like	Somewhat Like	Somewhat Like
4	Like	Like	Like	Like
5	Very Like	Very Like	Very Like	Very Like

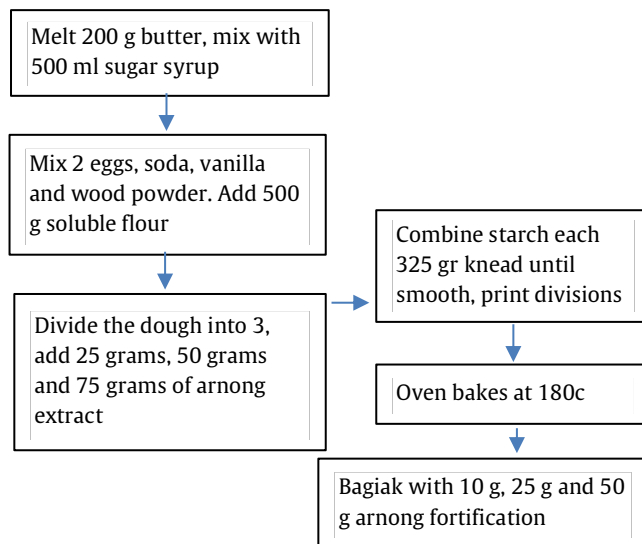


Figure 2.
Flowchart of Making Divan

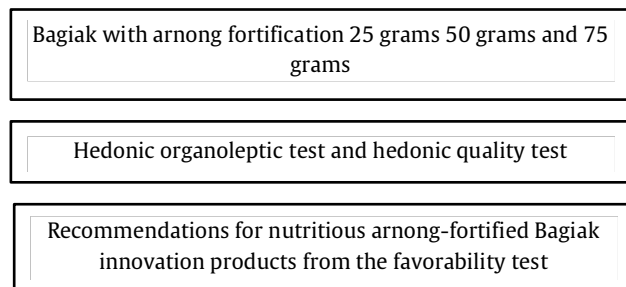


Figure 3.
Analysis Flow Chart

Organoleptic Test.

The liking test was conducted to determine the level of consumer preference for products with attributes of taste, aroma, texture, and appearance. The 30 panelists involved were untrained panelists. Setyaningsih et al (2010) stated that untrained panelists can be used as many as 30-50 people. There are 5 levels of scores to measure the level of consumer liking with the lowest score being 1 and the highest score being 5. The organoleptic test procedure is that panelists are given samples with different codes and then fill out a questionnaire form based on their perception of the product. The questionnaire form that will be used is as follows.

RESULTS AND DISCUSSION

The results of the Organoleptic hedonic test for color liking with 4 treatments and 3 replicates for 33 panelists can be seen in Figure 4.

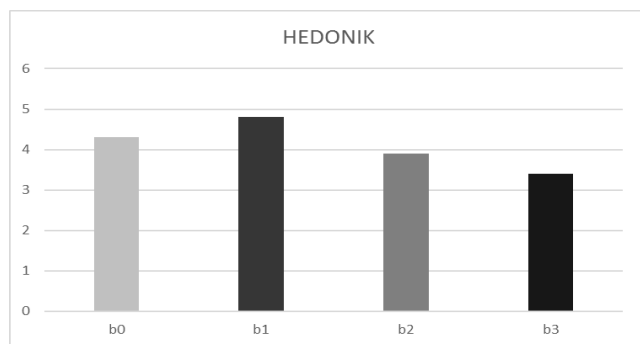


Figure 4.

Based on the results of hedonic analysis using ANOVA in Figure 5, it can be concluded that the color is not significantly different because the calculated F value is smaller than the F table. organoleptic test of color liking the highest value is obtained by treatment B1, namely the addition of extract by 2%.

The results of the Organoleptic Hedonic Test of Taste Favorability with 4 treatments and 3 replicates for 33 panelists can be seen in Figure 5.

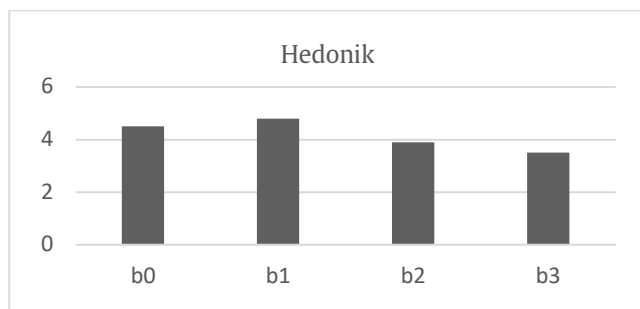


Figure 5.

Based on the results of hedonic analysis using ANOVA in Figure 6, it can be concluded that the taste is not significantly different because the calculated F value is smaller than the F table. organoleptic test of taste preference, the highest value is obtained by treatment B1, namely the addition of 2% extract.

The results of the Hedonic Organoleptic Test of aroma liking with 4 treatments and 3 replicates for 33 panelists can be seen in Figure 6.

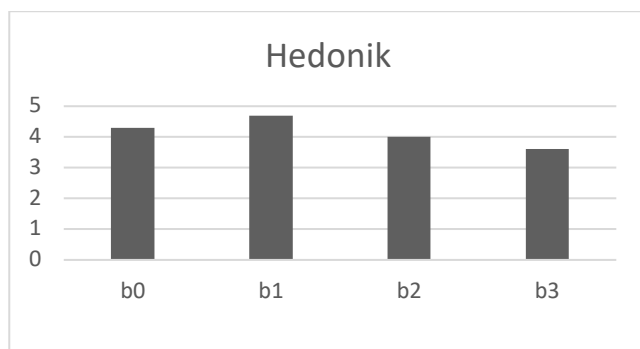


Figure 6.

Based on the results of hedonic analysis using ANOVA in Figure 6, it can be concluded that the aroma is not significantly different because the calculated F value is smaller than the F table. organoleptic test of aroma preference, the highest value is obtained by treatment B1, namely the addition of 2% extract.

The results of the Hedonic Organoleptic Test of Texture Preference with 4 treatments and 3 replicates for 33 panelists can be seen in Figure 7.

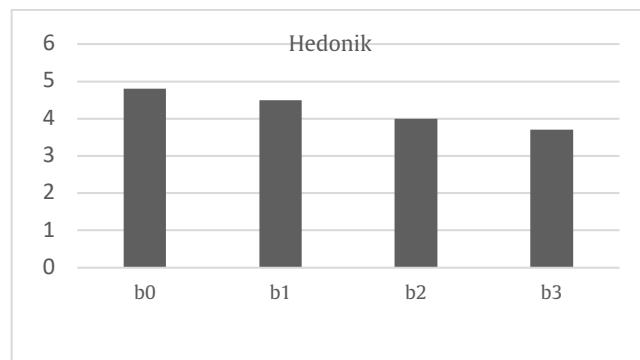


Figure 7.

Based on the results of hedonic analysis using ANOVA in Figure 7, it can be concluded that the texture is not significantly different because the calculated F value is smaller than the F table. organoleptic test of textural preference, the highest value is obtained by treatment B0, namely without the addition of extracts.

So from the analysis of hedonic and hedonic quality tests, the treatment chosen is B1 because at the level of liking it has the highest value at most.

Based on the results showed that the treatment with the highest average value was the B1 control treatment which was most preferred in terms of color, texture, taste and aroma, while the lowest treatment average value was shown in treatment B3 with the addition of 10% nasturtium officinale r. br. extract.

These results are in line with the research of Aisman et. al. (2019) which examines the Characterization of Yoghurt Quality from Several Levels of Cow's Milk Mixture with Watercress Extract or also known as ARNONG, showing the addition of watercress extract affects color, aroma, taste, consistency and appearance. The best product based on organoleptic test is the treatment with an average value of color 3.85; aroma 3.50; taste 4.30; consistency 4.25 and appearance 3.75.

The addition of watercress extract can also provide sufficient additional nutrients. According to Aisman et. al. (2019) that the addition of watercress extract has a significant effect on the number of lactic acid bacteria, total plate numbers, protein content, fat content, ash content, antioxidant activity, viscosity, and calcium content.

ARNONG (Nasturtium officinale) plants besides containing nutritional value also contain antioxidants and antibacterials that are good for the body. Rahman et. al. (2017) in their research found the presence of flavonoids, saponins, tannins, and steroids in phytochemical testing of watercress extract. The results of antioxidant activity testing of ethanol extract of watercress have the potential as an antioxidant, which is 102.26 ppm. Meanwhile, Syartika Y. (2021) in her dissertation on Antibacterial Activity of Watercress Leaf Extract (Nasturtium officinale) Against Staphylococcus aureus, found that the plant extract has antibacterial activity against Staphylococcus aureus

Watercress plant extract or also known as ARNONG has antibacterial activity against *Staphylococcus aureus*. Watercress leaf extract has antibacterial activity at a concentration of 100% with an inhibition zone diameter of 14.12 mm, while in the MIC (Minimum Inhibitory Concentration) test used with a concentration of 90% has antibacterial activity with an inhibition zone diameter of 9.85 mm, at a concentration of 95% has antibacterial activity with an inhibition zone diameter of 11.30 mm, at a concentration of 98% has antibacterial activity with an inhibition zone diameter of 11.90 mm.

However, the geographical location of the growth of the Watercress plant or also known as ARNONG affects the amount of efficacy it contains. Fitriani et. al. (2023) in their research on the Analysis of Iron (Fe) and Zinc (Zn) Levels in Watercress Leaves (*Nasturtium Officinale R. Br*) Based on the Height of the Growing Place, showed that the height of the place affects the levels of Fe and Zn in plants.

CONCLUSIONS AND RECOMMENDATION

Treatment B1 (0%) without the addition of *nasturtium officinale r. br* extract has the highest average value of the favorability test and the closest is B1 with the addition of *nasturtium officinale r. br* extract (2%), followed by B2 (5%), and the lowest is treatment B3 with the addition of *nasturtium officinale r. br* extract (10%).

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Authors Contributions

The first author is responsible for making research proposals, identifying the questionnaires used, making research explanations and approval sheets, analyzing data, making final research reports, searching for journals for publication, and making publication manuscripts. The second and third authors are tasked with collecting data and coding in excel from the data collection results.

Conflict of Interest Statement

Authors declared there is no conflict of interest

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