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The Organoleptic Test of Organic Rice in Banyuwangi

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***Abstract* - Organic Rice is produced from cultivation with low chemical residues. So it can be well consumed and digested by the body. This study was to determine the consumer preferences with parameters of color, aroma, taste, and texture involving 40 panelists. The research method used a Completely Randomized Design (CRD) using ANOVA (5%) followed by Duncan's test to see the differences between treatments including B0 (non-organic white rice), B1 (organic white rice), B2 (organic black rice), B3 (organic *melik* black rice), B4 (organic brown rice) and B5 (organic red rice). The results showed that B0 and B1 treatments were not significantly different for all parameters. B0 and B1 with other treatments were significantly different in all parameters. B1 was the most preferred for the parameters of color, aroma, and texture. While the most preferred taste parameter was B0.**

Keywords: Banyuwangi, organic rice, organoleptic test

I. INTRODUCTION

The development of organic agriculture follows changes in people's lifestyles that lead to the fulfillment of organic products. The assumption of health is the factor for the increasing demand for organic products [1], [2]. This has an impact on the issue of certification as a guarantee for the practices of organic farming. The increase in the organic market has not been optimized for Indonesia as a producer of organic products when compared to other countries such as India, United States, and Argentina. Indonesia as an agricultural country has the potential to become an organic producer at the international level because it has comparative advantages [3], [4]. Meanwhile, the number of certified organic farming actors in Indonesia is relatively small, as well as the total area of organic farming in Indonesia that still needs to be increased [5]. This is because organic certification is expensive [3].

The government has launched policies on organic agriculture such as "Go Organic 2010". The "Go Organic 2010" program activities include the development of organic farming technology, the formation of farmer groups, and marketing strategies for organic products. Many researchers have indicated that the program targets were not reached. The 'Go Organic' program is expected in 2013 for Indonesia to become a producer of organic products that can compete at the world level and create opportunities to increase farmers' income. Even though organic farming is profitable as in the study [5], [7] but it has slow growth [3]. Support and assistance from the government are needed to increase the motivation of farmers in developing organic farming practices [6].

East Java Province has begun to develop organic rice products, this can be seen from the total area of organic rice land in several districts which can be seen in Table 1.

Table 1. Land Area of Organic Rice Commodities in Several Regencies in East Java Province in 2015

No.	Regencies	Land Area (Ha)	Share (%)
1	Jombang	70,68	32,67
2	**Banyuwangi**	**56,44**	**26,09**
3	Mojokerto	49,8	23,02
4	Pasuruan	5,73	2,65
5	Tulungagung	20,34	9,40
6	Sidoarjo	10,29	4,76

7	Trenggalek	3,08	1,42
	Jumlah	**216,36**	**100**

Source: Pertanian Sehat Indonesia (2016)

Based on the table, it can be seen that Jombang Regency has the largest organic rice area with a contribution of 32.67% in East Java Province. Banyuwangi Regency is in second place as a center for organic rice development with an organic rice field contribution rate of 26.09%. Banyuwangi Regency has successfully registered organic rice varieties at the Indonesian Ministry of Agriculture.

The Banyuwangi Regency Organic Rice Development Road Map, directed at the development of organic rice. Seven districts in Banyuwangi Regency (Singojuruh, Rogojampi, Songgon, Sempu, Licin, Glenmore, and Kalibaru) are directed to be prepared as centers for organic products. Based on data from the Department of Agriculture Banyuwangi, two districts have received a certificate of LeSOS (*Lembaga Sertifikasi Organik Seloliman*) in the Singojuruh District And Rogojampi District. Singojuruh district was represented by Sumber Baru Village and Rogojampi district was represented by Watukebo Village as an organic rice development village.

PT Sirtanio and the Sumber Urip Farmers Group are LeSOS certified organic rice producers. There are several types of rice produced, namely: organic white rice, Organic Black Rice, Organic *melik* black rice, Organic brown rice, and organic red rice. Consumers' preferences need to be improved to increase trust in organic products [8], [10] so that it has an impact on increasing marketing [11], [12]. This research is expected to improve the product quality of the company and the farmer group. Therefore, this research is very important to carry out organic rice producers who have consumer preferences with parameters of color, aroma, taste, and texture.

II. RESEARCH METHODS

This research is focused on an organoleptic test of organic rice in Banyuwangi. This test includes aroma, taste, color, and texture. The instrument in this study used an organoleptic test questionnaire with a Likert scale. The research method used was a Completely Randomized Design (CRD) using ANOVA (5%) followed by Duncan's test to see the differences between treatments. The research was conducted at Processing Laboratory, Program Study of Agribusiness State Polytechnic Banyuwangi.

This research is an experimental study with 6 treatments on organic rice, namely: B0 (non-organic white rice), B1 (organic white rice), B2 (organic black rice), B3 (organic *melik* black rice), B4 (organic brown rice). and B5 (organic red rice). Then organoleptic testing was carried out based on the parameters of color, aroma, taste, and texture. The sampling technique used is simple random sampling consisting of 40 panelists with the following respondent criteria:

a. 15-25 years old
b. Willing to consume rice
c. Willing to be a research respondent.

III. RESULTS AND DISCUSSION

The results of the average difference test between treatments for all parameters showed that there was a significant (sig < 0.05). This suggests that further testing could be done to see the difference between treatments in all parameters. Complete results of the difference test between treatments are presented in Table 2 below:

Tabel 2. Tests of Between-Subjects Effects

Parameters	F	Sig.	Adjusted R Square	Note
Color	140,344	0,000	0,976	Significant
Aroma	50,279	0,000	0,935	Significant
Taste	74,431	0,000	0,956	Significant
Texture	43,411	0,000	0,926	Significant

Further test results between treatments for all parameters were carried out to test which treatments were different from other treatments. Further test results are presented in Table 3 below:

Tabel 3. Average consumer preference on Banyuwangi organic rice for color parameters

Treatments	Color	
	Mean	Notation
B0	3,35	c
B1	3,37	c
B2	2,97	b
B3	2,93	b
B4	2,18	a
B5	2,99	b

Table 3 describes the average response of the panelists based on the color parameters. Color parameters were statistically divided into three groups. The first group was B4 which was significantly different from all treatments. The second group is B2, B3, and B5 which have a brown-black color. The third group is B0 and B1. The most preferred color parameter preference is B1 and the least preferred is

B4. Statistically, B1 was not significantly different from B0 and different from other treatments (B2, B3, B4, and B5). Treatment B1 and B0 both have a white color. The high perception of B1 treatment was due to the panelists' consumption habits in consuming rice. The habit of consuming non-organic rice which has the same white color causes the panelists to like the B1 treatment. The B4 treatment of the color parameter was significantly different from the other treatments. This causes the panelists to perceive that B4 is the least preferred. Treatment B4 has a color that leads to a yellow color. While B2, B3, and B5 lead to a brown-black color. Statistically, B2, B3, and B3 were not significantly different.

Tabel 4. Average consumer preference on Banyuwangi organic rice for aroma parameters

Treatments	Aroma	
	Mean	Notation
B0	3,09	c
B1	3,17	c
B2	2,85	b
B3	3,07	c
B4	2,46	a
B5	2,75	b

Aroma parameters were divided into 3 groups. The first group is B4. B4 has an aroma like stale rice. This causes B4 to have the lowest average score. The second group is B2 and B5. In terms of aroma parameters, B2 and B5 have a stronger aroma than the first group, namely B0, B1, and B3. Treatments B0, B1, and B3 had a more volatile aroma on the noses of the panelists so that this first group was favored by many panelists. From an aroma perspective, B1 is the rice that the panelists most like. Statistically, B1, B0, and B3 were not significantly different. B2 and B5 are not significantly different. B4 has a perceived aroma that is significantly different from the other treatments and B4 has the least preferred aroma by the panelists.

Tabel 5. Average consumer preference on Banyuwangi organic rice for taste parameters

Treatments	Taste	
	Mean	Notation
B0	3,07	d
B1	2,96	d
B2	2,38	bc
B3	2,48	c
B4	2,23	a
B5	2,31	ab

The taste parameters were divided into 4 groups. The first group is B4 and B5. The taste parameter describes that B4 and B5 have the same taste, namely the panelists' dislike of taste. B4 and B5 have a slightly sour taste. The second group is B2 and B5. The third group is B2 and B3 and the fourth group is B1 and B0. The preference for taste between B1 and B0 is not significantly different and tends to have the same assessment by the panelists. This happens because B1 has a taste that is close to B0, and the only difference is the cultivation method, namely B0 conventionally while B1 is organic. B4 is the most disliked treatment by panelists because it has a different taste from B0 and is foreign to panelists who rarely consume organic brown rice.

Tabel 6. Average consumer preference on Banyuwangi organic rice for texture parameters

Treatments	Texture	
	Mean	Notation
B0	2,99	c
B1	3,01	c
B2	2,08	a
B3	2,29	b
B4	2,24	ab
B5	2,23	ab

Texture parameters are divided into three groups. The first group is B2, B4, and B5. The second group is B3, B4, and B5. The third group is B0 and B1. The first and second groups have a rough texture so that they have a smaller average value than the third group. B0 and B1 have a soft and *punel* texture. Statistically, B1 is not significantly different from B0. The lowest perceived rice is B2, namely Black rice which has a harder texture than B0 and B1. This is due to the comparison of the composition of water with rice when cooking is the same as B0 and other treatments. This means that when cooked B2 requires more water, the goal is to improve the texture of the resulting rice.

Panelists' assessment of the parameters of Color, Aroma, Taste, and Texture had significant differences and the closest to the control treatment was B1 (Organic White Rice). This happens because of the habit of consuming types of rice daily where the selected panelists are panelists who are accustomed to consuming non-organic rice compared to organic rice which has the same color, aroma, taste, and texture as non-organic rice. So that the habit factor determines the selection of B1 as the treatment that is closest to the control treatment from all aspects of the parameters.

Treatment B3 had the same level of preference as B0 for the aroma parameter. This shows that organic black rice (B3) has a greater market opportunity than other treatments in terms of aroma. Regarding the taste and texture parameters, further research needs to be done on the method or procedure and composition of the cooking ingredients, namely the water used to produce the best taste and texture and is preferred by panelists who do have a habit of consuming non-organic rice before.

IV. CONCLUSION

Treatment B0 with B1 was not significantly different for all parameters. B0 and B1 with other treatments were significantly different for the parameters of color, taste, and texture. B1 is the most preferred for the parameters of color, aroma, and texture. While the most preferred taste parameter is B0.

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