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Chemical and Organoleptic Characteristics of Sambal Ronto

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Abstract

This research studied the chemical and organoleptic characteristics of sambal ronto at various spice concentrations. Sambal ronto is a typical chili sauce from the coastal community of South Kalimantan which is made from ronto mixed with spices and sautéed with cooking oil. The spices used are chilies, shallots, garlic, lemongrass, laos, bay leaves, and palm sugar. The research was conducted with a completely randomized design. The treatments consisted of concentrations of ronto and spices ratio, (1: 1) O, (1: 2) A, (1: 3) C, and (1: 4) D. The proximate test consists of water, ash, protein, fat, carbohydrate (by different) content, and pH. The organoleptic test was carried out by testing the preference for the parameters of color, aroma, texture, taste, and appearance. The results showed that the best ronto: spice ratio was treatment B (1: 3). The chemical characteristics of the best sambal ronto are 44.21% moisture content, 4.20% ash content, 5.92% protein content, 14.47% fat content, carbohydrate content (31.22% by different) and pH 4.79. Organoleptic values for the parameters of color, aroma, texture, taste, and appearance were 4.5, 4.9, 4.9, 4.5, and 4.8, respectively. All parameters indicate a value close to very like.

Keywords: chili sauce; sambal ronto; rebon shrimp

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INTRODUCTION

Rebon shrimp is the catch of coastal fishermen in South Kalimantan. The catch of rebon is abundant in February to June, so it requires processing and preservation into products with a long shelf life. The technologies have been applied are drying, salting and fermentation. One of the rebon fermented products is ronto. Ronto is in the form of a paste like pink to brownish red pulp, has a distinctive aroma of fermented shrimp with a sour to pungent aroma, and a mixed taste of salty and sour (Khairina et al, 2016).

The ronto processing business is very promising as one of the economic businesses of fishermen's families, especially fisherwomen because processing ronto is simple, easy, low cost, and does not depend on the weather. Ronto is consumed as a side dish, chili sauce, and seasonings. Coastal communities use ronto as a substitute for shrimp paste. Sambal ronto has a distinctive taste. Sambal ronto is a household consumption for coastal communities, but there is no commercial sale in food stores yet.

Sambal is one of the typical Indonesian culinary delights that are loved by all people. According to Sarina et al. (2010) sambal is a favorite product in many countries in Southeast Asia such as Malaysia, Singapore and Thailand. Sambal terasi is the daily diet for every household in Indonesia. The availability of chili sauce at the dining table is an

appetizer. Therefore, a variety of chili sauce is sold in the market to meet the diverse tastes of consumers.

Sambal ronto has been made from generation to generation with raw materials such as ronto, chili, shallots, garlic, and Javanese sugar. All ingredients are crushed then sauteed with cooking oil until fragrant and thick (Yazid et al, 2020). The composition of the ingredients varies according to taste and availability of ingredients. Sambal ronto is generally eaten with grilled fish, boiled fresh vegetables, or boiled cassava. The sour, spicy, and sweet taste makes the ronto chili sauce very specific.

Ronto is also used as a flavoring. Ronto is added to cooking to give it a savory taste and distinctive aroma. The savory taste of ronto is due to the high amino acid glutamate content (Khairina et al., 2016). Kleekayai et al., (2015) reported that in Kapi Ta Dam and Kapi Ta Daeng, fermented shrimp products from Thailand contain the amino acid glutamate which dominates from other amino acids. A number of volatile compounds have been identified to contain N-components, S-components, esters, and aldehydes which contribute to the flavor characteristics of fermented shrimp paste.

Sambal is known to the public as chili sauce based on Indonesian National Standard (SNI) No. 01-2976 year 2006. According to Koswara (2009) the quality criteria for chili sauce is determined by its thickness, which is around 24.143 centipoise, has a distinctive aroma and taste of chili, and has a red color. The ingredients added to chili sauce are usually tomatoes, sweet potatoes, papaya or pumpkin to reduce the spicy taste of chili sauce. According to Asni and Novalinda (2012), the vitamin C content of chili sauce is 85.53 mg / 100g.

The spicy chili sauce that is processed using raw red curly chilies is quite liked by the public, while the sauce that uses white bird's eye chilies and raw chili is rather preferred The organoleptic nature of the tempoyak green chili sauce which uses a stabilizer from the red chili variation is preferred by panelists compared to the chili sauce that uses green chili, or a combination of green chili and red chili (Widawati & Efrianti, 2015). The use of red chilies and tomatoes in making sambal ronto can reduce the salty and sour taste. Juliarsi et al. (2018) reported that the treatment of adding 15% salt with a fermentation time of 5 days was recommended as the best treatment for the quality of the typical Sumbawa chili sauce. Meanwhile, ronto processing only uses 12% salt and 20 %% rice (Rita Khairina, 2017). This research studied the chemical and organoleptic properties of sambal ronto at various spice concentrations.

RESEARCH METHOD

Research Materials and Equipment

The raw materials used in this study were rebon shrimp, salt, and rice as raw materials for processing ronto. Furthermore, ronto is used as an ingredient for making sambal ronto. The spices used are shallots, garlic, red chilies, chili peppers, brown sugar, and tomatoes for making sambal ronto. The equipment for ronto processing is plastic baskets, plastic basins, covered buckets, and plastic bottles. Production of chili using a frying pan. and its supporting tools. Equipment for analysis sample includes ovens, micro-kjeldahl, furnaces, and soxhlets

Research Stages

This study is a continuation of several previous studies by Khairina et al., (2017) and Soetikno et al., (2018). Ronto processing is done according to Khairina et al. (2017). Rebon shrimp mixed with salt 12% b / b and rice as much as rice 20% b / b. The mixture of shrimp, salt, and rice was further fermented in a tightly closed plastic bucket for 12 days (Khairina et al, 2016). Furthermore, the fermented ronto is made into ronto sauce.

Sambal Preparation Made from Ronto

Sambal ronto is adopted from the traditional recipe of the coastal community of South Kalimantan with modifications to the composition of each spice. The ingredients used are ronto, red chilies, bird's eye chilies, shallots, garlic, brown sugar, lemongrass, galangal, and cooking oil. Red chilies, bird's eye chilies, shallots, and garlic mashed in a blender for 5 minutes. Next, lemongrass and laos that have been crushed. Prepare the cooking oil in a skillet then heat it. Enter the blended spices, saute until fragrant and yellow. Add ronto according to treatment, namely the ratio of sambal ronto with spices 1: 1 (O), 1: 2 (A), 1: 3 (B) and 1: 4 (C). Add brown sugar and continue to stir until the sauce is thick and brownish yellow. Remove from heat and sauce is ready to be analyzed.

Sample Testing

The samples were analyzed for chemical and organoleptic properties. The chemical properties observed were pH and proximate which included moisture content, ash content, protein and fat (AOAC, 1995). Organoleptic testing used 20 untrained panelists. Panelists consist of adults who are familiar with sambal ronto and consume it regularly. A total of 20 grams of sambal ronto samples from the 4 treatments studied were presented on the observation plate. Organoleptic properties testing was carried out using the hedonic test (Setyaningsih et al., 2010). Panelists were asked to rate color, taste, aroma, and appearance by showing their likes ranging from 1 (dislike) to 5 (very like). Panelists are asked to provide an assessment of which sample is most preferred in order. In order for the assessment to be subjective, all samples were coded with numbers according to random numbers. The test was carried out in the organoleptic laboratory of the Fisheries Product Technology Study Program, Faculty of Fisheries, Lambung Mangkurat University.

This study was designed with a completely randomized design, four treatments and three replications. The treatment was the ratio of ronto and spices, namely 1: 1 (A), 1: 2 (B), 1: 3 (C), and O (control). Observation data were analyzed by ANOVA and further test with BNT or BNJ. Organoleptic test results were analyzed by T test.

RESULTS AND DISCUSSION

Sambal Ronto

The spices used in the making of sambal ronto are shallots, garlic, red chilies, cayenne pepper, lemongrass, galangal, bay leaves, and brown sugar. Cooking oil is used for sauteing. The composition of the modified spices can be seen in Table 1.

Table 1. Composition of Sambal Ronto

Seasoning ingredient	Material weight (g)	%
Red chili pepper	250	25
Rawit chili	50	5
Onion	300	30
Garlic	150	15
Galangal	50	5
Lemongrass	50	5
Sugar	150	15
Total	1000	100

All seasonings are mashed except galangal, lemongrass and bay leaves. After the ground spices were divided into 4 treatment groups. Each treatment used as much as 200 grams of ronto to be cooked with spices according to the treatment. Furthermore, it is sauteed with hot oil until cooked. The amount of cooking oil used is 3% of the weight of the seasoning so that each treatment uses 6 ml (O), 12 ml (A), 18 ml (B), and 24 ml (C)

cooking oil.

Chemical Properties of Sambal Ronto

The observed results of the chemical analysis of sambal ronto were proximate (protein, water, fat, ash, carbohydrates) and pH (Table 2).

Table 2. Proximate and pH of Sambal Ronto

Sample code	Moisture content (%)	Ash (%)	Protein (%)	Fat (%)	Carbohydrate by different (%)	pH
1:1 (O)	47.43±1,32a	8.40±0,4a	5.60±0,2a	14.92±0,4a	23.66±1,17a	4.60±0,0a
1:2 (A)	45.91±0,50a	5.35±0,3b	5.66±0,0ab	14.62±0,0a	28.47±0,85ab	4.79±0,0a
1:3 (B)	44.21±031b	4.20±0,1c	5.92±0,0abc	14.47±0,2a	31.22±0,09abc	4.79±0,1a
1:4 (C)	44.20±1,14b	3.63±0,1d	5.91±0,1abc	14.54±0,3a	31.73±1,60abc	4.80±0,0a

Note: different notations in the same column show a significant difference at the 5% level

Based on the ANOVA results, it can be argued that the difference in spice concentration does not show an effect on the fat content and pH of the resulting chili sauce. Treatments O and A showed the same values for water content, protein and carbohydrate content, but different from treatments B and C. Specifically for ash content, all treatments showed different numbers.

(Suhartini et al., 2019) examined five types of chili sauce in Indonesia. The moisture, ash and pH content of the chili sauce were in the range of 68% - 89%, 11% -14%, 5.7 - 6.4 respectively. The five chili sauce content values of water, ash, and fat were higher than the sambal ronto under study. Based on the water content value, the sambal ronto can be presumed to be more durable because the water content is much lower than the five types of chili sauce reported. (SNI, 2006) requires that a good chili sauce must have a normal smell and taste, a maximum pH of 4, and a positive chilli macroscopic. The pH value of the sambal ronto is already close to the pH value required by the SNI. (Sarina et al., 2010) chili shrimp paste is a balance between spiciness, salty, and sour taste. The addition of kalamansi orange liquid is known to be able to adjust the pH of chili shrimp paste to a pH value of 4 and the panelists liked it. The process of processing the sambal ronto does not add citrus or other types of acid so it is suspected that the pH still meets the SNI requirements for chilli sauce.

The difference in the amount of spices given greatly affects the ash content of the ronto chili sauce. The more spices are given the lower the ash content. The ash content of the chili sauce is strongly influenced by the ronto concentration used. Treatment O with ronto: spice ratio (1: 1) showed the highest ash content and treatment C (1: 4) showed the lowest ash content. Shrimp shells found in ronto are a source of minerals which in turn affect ash content ((Sari, et al., 2011);(Ukhty et al, 2009).

Organoleptic Properties of Sambal Ronto

According to Yazid (2020), Sambal ronto has a different taste from the chili paste sold in traditional markets of South Kalimantan. Table 3 shows the value of the panelists' preference for sambal ronto. The range of values for the liking test was 1 disliked, 2 slightly liked, 3 liked, 4 disliked, and 5 liked very much.

Table 3. Organoleptic test results of Sambal Ronto

	O (1:1)	A (1:2)	B (1:3)	C (1:4)
Color	2.6±0,3	3.9±0,3	4.6±0,5	4.3±0,5
Aroma	2.6±0,4	3.8±0,3	4.9±0,1	4.4±0,6
Texture	3.8±0,4	4.8±0,3	4.9±0,1	4.4±0,6
Taste	1.9±0,5	3.0±0,6	4.5±0,6	4.3±0,5
Appearance	4.3±0,5	4.2±0,6	4.8±0,3	4.5±0,5

The resulting ronto chili sauce for each treatment is shown in Figure 1.

O (1:1) A (1:2) B (1:3) C (1:4) Reference Sambal

Figure 1. Sambal Ronto appearance

The results of the organoleptic test (Table 3) showed that the panelists really liked the sambal ronto with a ratio of ronto and spices (1: 3). Ronto with a ratio of 1: 3 chemically has a low water content and a pH that is not different from other treatments. The sensory determination of sambal ronto is a mixture of spicy, salty, savory, sweet, with a predominantly sour taste. The sour, salty and savory taste of the sambal ronto dominates the taste of ronto. This is in accordance with the description of the taste of ronto according to Khairina et al. (2017) which states that the taste of ronto is a mixture of salty, sour, and savory flavors. These sensory properties appear during the ronto fermentation process which lasts about 2 weeks and is the result of fermentation of lactic acid bacteria.

The seasoning adds to the color, aroma and flavor of the chili sauce. Nursari et al. (2016) stated that each spice component contributes to flavor. Color, aroma, and taste will synergize with new sensations that can increase the taste, acceptance, and identity of each product that is processed. Spices naturally contain various kinds of active components which play a very large role in producing the flavor of a product. Spices contain antioxidant, anti-bacterial, anti-inflammatory, anti-yeast, antiseptic, anticancer and antibiotic substances that make the spices last longer (Muchtadi et al, 2010). Sarina et al. (2010) reported that there is a relationship between pH and sensory uptake in chilli shrimp paste. Panelists gave acceptance values for chilli shrimp paste of 6.5 - 7 with a pH of 4 and 4.5. The value ranges of 1 really don't like and 9 really, really like. This situation is almost the same as the acceptance of sambal ronto, the highest is treatment B (1: 3) with a pH of 4.7 sambal ronto.

A sensory evaluation of Chilli Sauce Shrimp Paste (Suhartini et al., 2019)shows that there is an interaction between the use of shrimp paste and chili sauce. The taste of shrimp paste is similar to ronto, but ronto has a stronger sour taste. The flavors identified in Chilli Sauce Shrimp Paste are salty, sweet, bitter, umami, sour, and shrimp. The making of the sambal ronto is not added with salt so that the salty taste of the ronto chili comes from the salt contained in the ronto. Likewise, with the sour and savory taste (umami) of the chili sauce. The salt content in the ronto ranges from 10% -17% and the savory taste comes from the amino acid glutamate content that is formed during the fermentation of

the ronto (Khairina et al., 2016). Sea salt is reported to have an umami taste and astringency with varying intensities. Salt content also correlates with bitter, salty and umami tastes. This is because the salt contains different calcium, potassium, magnesium, iron, sodium and zinc. Foods that contain seafood have a fishy taste and can increase the intensity of the salty taste (Kawai et al., 2009). The main contributor to the savory taste umami generally comes from glutamic acid, alanine, glycine, leucine, and lysine (Ambarita, 2017)).

The specific taste of sambal ronto is generally formed by the taste of ronto and enriched with the flavor and flavor of garlic, onion, and red chilies and bird's eye chilies. The variety of culinary cultures in Indonesia and South Kalimantan in particular provides opportunities for the development of various types of chili sauce according to local tastes and is subsequently registered as a national cultural wealth. (Khairina dan Jumbahuwa, 2018) write that ethnic diversity, geographical diversity, and diversity of natural resources in South Kalimantan produce a variety of cuisines, culinary delights and types of food according to the needs and tastes of the local community. The unique taste of sambal ronto has the opportunity to enrich the diversity of types of chili sauce in Indonesia. Some community groups add sour tasting ingredients to the fruits available in their environment such as kalamansi, limes, starfruit, kuit limes, bacang, young mangoes and others to increase the overall sour taste of chili sauce (Karim, et al., 2011). The combination of sour and sweet flavors tends to enhance the umami taste. Umami is sometimes associated with sweet and salty tastes and a combination of all these flavors will make food taste better (Kurihara, 2015). Chili plays a role in suppressing sweet and bitter tastes (Suhartini et al., 2019). Each type of chili has its own taste, aftertaste and burning sensation, which are distinguished by Scoville Heat Units (SHU) (Usman et al., 2014).

CONCLUSION

Sambal ronto is processed from a mixture of ronto and spices, sauteed in cooking oil until cooked. The spices used are red chilies, bird's eye chilies, shallots, garlic, lemongrass, laos and bay leaves. The ratio of ronto and spices to produce sambal ronto that was most preferred by the panelists was 1: 3 (treatment C). Sambal ronto has a specific taste and can enrich the repertoire of the national culinary culture to be developed into a traditional sauce typical of South Kalimantan.

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