

Fermentation tea cascara origin skin coffee arabica and robusta with *Lactobacillus* SP.

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Abstract

Controlling coffee husk waste is still a challenge for farmers, the increase in coffee productivity encourages an increase in the amount of waste from coffee processing such as coffee husks which can be used as cascara and functional drinks. One way to improve the quality of cascara is by adding a fermentation process using lactic acid bacteria (*Lactobacillus sp*). This study aims to determine the physical characteristics of cascara with arabica and robusta coffee bark and to determine the effect of fermentation using *Lactobacillus sp* on the quality of cascara. In this study, the oven method was used for 10 hours with a variation of fermentation time of 24, 48, and 72 hours. The test parameters were pH levels using Mc testers, moisture content and ash content using gravimetric methods, caffeine content using Uv-Vis spectrophotometry, and organoleptic using test scoring methods. The pH test results of cascara arabica experienced a significant decrease compared to cascara robusta with a lowest value of 3.7 after 72 hours of fermentation. The results of the moisture content test on both types of cascara showed a significant decrease in the drying temperature of 50°C which was below 8% in accordance with SNI 3836:2013. Ash content testing showed results below 8% in accordance with SNI 3836:2013, stating that the fermentation period did not have a significant effect. The caffeine content of cascara arabica leads to a yield of 1.1% - 1.2% while cascara robusta leads to a higher value of 2.1% - 2.4%. Organoleptic tests indicated that cascara arabica was preferred at 48-hour fermentation at a temperature of 30°C with an aroma scoring value of 2.8; Taste 2.75 ; Color; 1.65. Meanwhile, cascara robusta offers a stability of flavor that the panelists also liked. This research is expected to be a guide for producers and researchers in optimizing cascara processing to increase economic value and sustainability.

Keywords: Arabika ; Cascara ; Fermentasi ; *Lactobacillus sp*; Robusta

1. Introduction

Coffee (*Coffea*) is one of Indonesia's leading plantation commodities, with high export value and a significant contribution to the country's foreign exchange. Coffee has a high economic value. economy Which tall And Lots consumed in all over world (Abubakar et al., 2020). Indonesia has ideal geographical conditions and soil structure for growing coffee. Coffee varieties Arabica and robusta Lots cultivated in various area, coffee Arabica generally grows in the highlands and robusta in the lowlands (Rohaya et al., 2022). One of the areas that cultivates coffee is Yogyakarta, many Yogyakarta coffee farmers use post-harvest processes. method wet Which produce waste skin coffee in amount big (In et al., 2019). Making beverages from coffee skins has not been widely practiced in Indonesia. So far, coffee skins have been discarded and not optimally utilized, which can cause environmental problems due to the decomposition of coffee skins (Aryani, 2024).

According to Goodness et al (2023), coffee own component polyphenolic Which rich will chlorogenic compounds. Besides That, skin coffee Also own content alkaloids, carotenoids, compound inorganic and vitamin in amount varies. According to research by Muzaifah et al (2022), coffee skin also contains important nutrients including protein (5.2%), carbohydrates (35%), fiber (30.8%), minerals (10.7%), water (84.2%), protein (8.9%), and sugar (4.1%) (Hutasoit et al., 2021). Coffee skin contains many bioactive compounds such as antioxidants (chlorogenic acid, caffeic acid, and anthocyanins), tannins, and pectin. In addition, coffee skin has coarse fiber and coffee skin. These bioactive compounds and nutrients indicate that coffee skin has great potential to be used as a raw material for value-added products, especially in the development of functional drinks that are beneficial for health (Hutasoit et al ., 2021) .

Cascara is a product of drying the skin of Arabica and Robusta coffee cherries and can be used as a functional beverage. Cascara has a fresh, bitter taste and aroma similar to ripe cherries (Garis et al., 2019). Cascara has a raisin-like shape with a round shape typical of coffee beans. wrinkled texture, and own the

texture that easily destroyed (Garis et al., 2019). Robusta and Arabica coffee have different Characteristics Arabica coffee skin contains less tannin compared to Robusta skin and Arabica skin has a taste that tends to be bitter. More sweet and complex with aroma fruit fruit temporary skin robusta tends to be more bitter and has a simpler taste with a stronger coffee aroma (Butar-Butar et al., 2024). Quality cascara influenced a number of factor that is level maturity coffee, type coffee, fermentation conditions, and drying methods (Subeki et al., 2019).

Drying is a process that aims to reduce the content of substances in a material to a certain limit. This process can maintain the quality of cascara. Temperature and drying time can affect the quality of cascara produced by Arival et al (2020). Coffee skin drying is carried out using two methods, namely using sunlight and oven. The drying process is a crucial step in cascara processing. Temperatures that are too low cause the drying process to run slowly, so that the sample is susceptible to mold and active substances such as antioxidants, acidity levels, caffeine, and total phenols can be lost (Hutasoit et al., 2021).

According to Butar-Butar et al (2024) , cascara has a color similar to black tea and has a different taste from coffee. In Nasrudin's (2020) study, the use of Arabica coffee skin (*Coffea arabica*) and carrot juice in making hard candy showed that the concentration of cascara arabica and carrot juice infusions affected the water content, vitamin C, and antioxidants of the candy. The concentration of cascara infusion showed a significant effect on the water content. In addition to being used as hard candy, in the study of Nurhayati et al. (2020) , coffee skin is also used as a refreshing drink, namely kombucha cascara with the addition of sugar and kombucha starter SCOBBY (Symbiosis Culture of Bacteria and Yeast) then fermented for 16 days. This study shows that the concentration of cascara and fermentation time have a significant impact on physical characteristics (amount of dissolved solids, viscosity, and color). There are also changes in chemical characteristics (pH, total acid, and total phenolic). Sumadewi et al (2020), have also processed coffee skin waste into various products including liquid fertilizer, cherry coffee tea, incense and aromatherapy candles.

The process of making cascara as a refreshing drink through fermentation is still rarely done. Fermentation of coffee skin to produce cascara products can involve several microorganisms, such as LAB (*Lactobacillus Sp*). *Lactobacillus sp* bacteria can affect the browning process during coffee skin fermentation caused by polygenol oxidation (Lee et al., 2015). Sundari (2023), stated that LAB (*Lactobacillus sp*) uses the mechanism homofermentative for ferment product side job metabolism sucrose especially glucose, into lactic acid, acetic acid, or alcohol Sundari (2023). This study aims to determine the quality of the physical characteristics of cascara with the following materials: standard skin coffee Arabica and know influence fermentation use *Lactobacillus sp* to quality of cascara. Therefore, researchers want to study the influence The addition of BAL with different fermentation times and drying temperatures on the physical and chemical characteristics of the cascara produced.

The results of this research are expected to contribute to the development of beverage products. fermentation based waste skin coffee, so that own mark plus economy and can be used as an alternative environmentally friendly functional drink and has the potential to be developed on an industrial scale.

2. Research methods

This research was conducted at the Immunology and Virology Laboratory of 'Aisyiyah University Yogyakarta using an oven, MC tester, analytical balance, baking pan, spectrophotometer, hot plate, jar, volumetric flask, measuring cup. In addition, the research was also conducted at the Basic Chemistry Laboratory of Yogyakarta State University which is equipped with a furnace, oven, analytical balance. *Lactobacillus Sp*. bacteria were obtained from the Center for Food and Nutrition Studies, Gadjah Mada University. The research activities took place from May 2025 to August 2025.

2.1. Preparation Sample and Making Cascara

Coffee skin samples were taken from a coffee plantation located on the slopes of Mount Merapi, Sawungun Village, Hargobinangun, Pakem observation sub-district, Yogyakarta. The process begins by picking ripe coffee cherries (red in color) one day before the fermentation process is carried out on the coffee cherries. coffee. After that, done fruit selection coffee best quality by soaking the coffee cherries in a container filled with water, the fruit Poor quality coffee will float on the surface of the water. After separating the good coffee cherries (which sink to the bottom) from the bad ones, the next step is to wash the coffee cherries thoroughly to remove any dirt. This is followed by the process of separating the coffee beans from their skins. (Tampubolon, 2023).

2.2. Process Fermentation

500 grams of washed coffee husks were weighed for each fermentation time variation. The fermentation times used were 24 hours, 48 hours, and 72 hours. The coffee husks were added with 0.05% *Lactobacillus sp* . After that, they were covered with a napkin. After fermentation, the coffee husks were dried in an oven at 30°C, 40°C, and 50°C for 10 hours (Tampubolon, 2023).

2.3. Test Level Sour (pH)

Testing mark acidity (pH) in research this is done using MC Tester. First the sample 3 grams are weighed and then crushed with use blender until become powder Coarsely ground cascara is then mixed with 100 mL of water at 90°C until dissolved, then left for ± 7 minutes to allow the solution to reach room temperature. Then, each sample is tested by inserting the MC Tester into the cascara solution and waiting for a while until the number on the MC tester reaches a stable number. Then, record the number obtained (Damara et al., 2023).

2.4. Test Level Water

Method Which used in testing level water based on standard SNI 3836:2013 using an oven. Measurement of water content by inserting a porcelain cup into an oven at a temperature of 105°C for 20 minutes, then cooling the cup containing the sample in a desiccator for 30 minutes, then weighing the weight of the empty cup using an analytical balance (M_0). After that, put 5 grams of cascara sample into the cup and weigh it (M_1). Then heat the cup containing the sample in the oven for 3 hours at a temperature of 105°C. After heating in the oven is complete, cool it in a desiccator for 30 minutes and after that weigh the cup that containing sample use balance sheet analytic (M_2) (Abubakar et al., 2020). Count using the formula (BSN, 2013) .

$$\text{Water content \%} = \frac{(M_1 - M_2)}{(M_1 - M_0)} \times 100\%$$

Information

M_0 : Weight Cup and Closed (grams)

M_1 : Weight Cup, closed and sample before drying (grams)

M_2 : Weight of cup, lid and sample after drying (grams)

2.5. Test Level Ash

Method testing ash content in accordance with SNI standards 01-2891-1992 relating to food testing and beverage by the FMIPA laboratory team at Yogyakarta State University. The ash content measurement in cascara tea was carried out using a powder sample, then a porcelain cup was heated in a furnace at a temperature of 525°C for 20 minutes, after which the porcelain cup was cooled in a desiccator for 30 minutes, then weighed. heavy cup empty with use balance sheet analytic (W). After That input 3

grams of tea sample into a porcelain cup and weigh (W_1). Then, heat the cup containing the sample in the furnace for 5 hours at 525°C until the ash is white, after heating Then cool down cup Which containing sample to in desiccator during 30 minute then weigh the porcelain cup containing the ash (W_2) and calculate it using the formula (Hasniar., 2019).

$$\text{Ash Content \%} = \frac{(W_1 - W_2)}{(W)} \times 100\%$$

Information

W : Weight Cup without content (grams)

W_1 : Cup Weight And material before ashing (grams)

W_2 : Weight of the cup and material after ashing (grams)

2.6. Test Caffeine Content

Caffeine content testing begins with the extraction of caffeine from tea. A 1gram sample of cascara tea is placed in a beaker, then 150 mL of distilled water that has been heated to 95°C is added, let it stand for 10 minutes and then filtered. The filtrate is placed in a volumetric flask, then 1.5 grams of CaCO_3 are added. Next, it is extracted with 25 mL of chloroform solvent, the bottom layer is taken and the extract is evaporated. The caffeine extract without chloroform is placed in a 50 mL volumetric flask and diluted with distilled water until it reaches the mark and stirred until homogeneous. Next, the caffeine standard is made using caffeine labeled product C0750 from the SIAL brand, with caffeine having the batch number BCCL4511. Next, a standard stock solution is made with a concentration of 50 ppm. After that, take the caffeine standard with a 0.4 pipette; 0.8; 1,2; 1.6; And 2 mL to in pumpkin measuring 25 mL Then add distilled water until limit, so that get concentration solution caffeine 2, 4, 6, 8, 10 ppm/ Then measured using a spectrophotometer at an absorbance of 272nm (Butar-Butar et al., 2024).

2.7. Test Organoleptic

Organoleptic testing in this study used three parameters: color, taste, and aroma. The samples tested were Arabica and Robusta coffee skins treated with the addition of *Lactobacillus* sp., fermented for 10 minutes. 24 hours, 48 hours, 72 hours. The first step is to prepare 18 250 mL bottles for each sample to be tested, then heat them. water mineral until temperature reach 90° After water boiling cascara brewed for 5 minutes. Then filtered use filter tea, results from brew cascara tea left alone during 7 minutes before bottling to ensure room temperature is uniform. Then pour in the cascara tea. as much as 250 mL on each each bottle. Then do test sample to 20 The panelists used in this organoleptic test were untrained panelists with a unisa range of 19-27. year. panelists tasting each each sample test in a way alternate with pouring samples into the glass cups provided, after each sample was tasted the panelists neutralized their tongues by drinking the mineral water provided (Baihaqi et al ., 2023) .

3. Results and Discussion

Food safety is an important factor so that food products can be distributed and consumed widely by the public, including cascara which has been regulated in the provisions of SNI 3836:2013 regarding the safety of dry tea (BSN, 2013) . The fermentation process is one method to improve the quality of cascara products, but cascara fermentation must be strictly controlled to produce cascara. with a quality that can be consumed by the public. Coffee skin can be dried at a temperature of $30 - 90^{\circ}\text{C}$, but the best temperature is No exceed 60°C Because skin coffee Which contain compound active like caffeine content, tannin, and antioxidants Which range against (Hutasoit et al., 2021). Proper temperature control during fermentation is crucial to ensure optimal bacterial growth and produce quality fermented products, *Lactobacillus sp* in fermentation product food Can grow on temperature $30 - 40^{\circ}\text{C}$. Temperatures that are too low can cause fungal growth in fermented coffee skins (Masrukan et al., 2024).

3.1. Analysis Acidity (pH)

Power of hydrogen (pH) is an indicator used to measure the acid or base levels of food and beverage products (Purwadi., 2017).

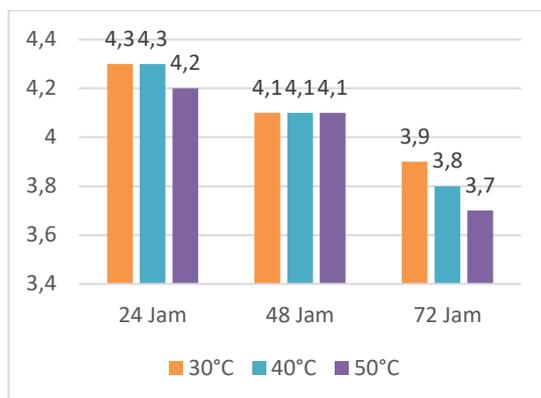


Figure 1. pH level Cascara Arabica

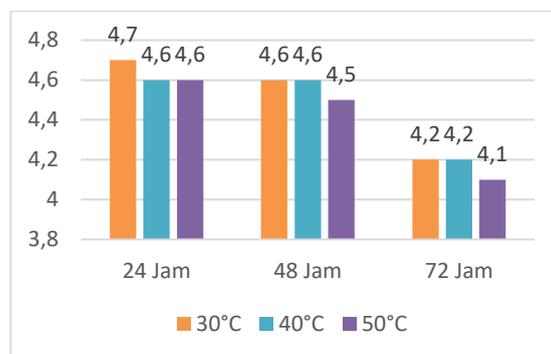


Figure 2. pH level Cascara Robusta

Study This pointing out that analysis pH on treatment skin coffee Arabica and robusta experienced a decline influenced by the length of fermentation. This question is also supported on ANOVA analysis results on Appendix 3 And 4 state that type Coffee skin, drying temperature, and fermentation time have a significant effect of <0.05 on the pH of the resulting cascara. According to Puspaningrum et al (2022), during fermentation pH decrease which is caused existence substrate changes sugar become product alcohol and sour organic decline pH Also happen due to the increase in organic acids produced as metabolite products from *Lactobacillus* sp which play a role in fermentation skin coffee (Galanakis, 2023). On **picture 1**. Seen that the treatment of Arabica coffee skin experienced a lower pH decrease compared to Robusta in 72-hour fermentation of 3.7, while the Robusta treatment in **Figure 2** shows a figure of 4.1.

Type skin coffee influence level pH cascara because of the skin coffee Arabica coffee has a lower pH than Robusta coffee skin. Therefore, the pH level affects the organoleptic properties of cascara and the taste of the brew. coffee Arabica tend more sour compared to with brew coffee robusta (Galanakis, 2023). Mark pH cascara experience decline consequences formation thearubigin compounds or what is often called enzymatic oxidation, enzymatic oxidation is a process important in formation tea black Which aims to carry out enzymatic oxidation reaction between catechins from coffee skin cells that react with oxygen with the help of enzymes, thearubigin compounds that will affect the organoleptic properties of tea. Such as the formation of color chocolate, flavor sour, And aroma typical tea Which No smelly the same once (Galanakis, 2023).

3.2. Analysis Level Water

Based on SNI 3836:2013 about tea dry, the water content in dry tea does not exceed 8% (BSN, 2013). The results of the water content testing that has been carried out show that the water content is as follows.

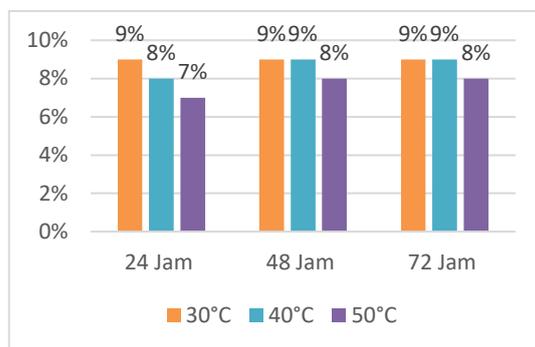


Figure 3. Water Content Cascara Arabica

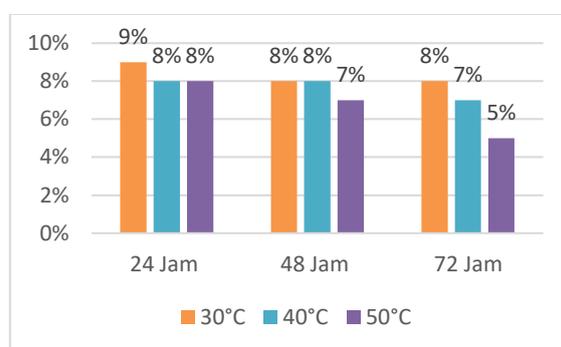


Figure 4. Water content Cascara Robusta

This study shows that the increase in drying temperature is directly proportional to speed up process evaporation, so that level water in material experience significant decrease < 0.05 (Rachmayani, 2015). In figures 3 and 4 it can be seen that the water content treatment Arabica and Robusta skin drying 50°C shows a figure below SNI 3836:2013 8%. In the cascara robusta treatment, the value is lower than cascara Arabica, matter This stated by Wibisono et al (2024), that skin coffee robusta has content water Which more low compared to skin coffee robusta after the drying process.

Water content is also affected by the drying of the coffee bean skin. This is consistent with Thanoza et al. (2016), who explained that during the drying process, coffee skins lose around 47-50% of their water content. According to Galanakis (2023), The more long process fermentation the longer the drying process, the lower the water content produced by cascara. Factors affecting water content include the product's storage location, where the food contains volatile compounds and volatile compounds. Volatile compounds are chemical compounds that evaporate easily and affect the aroma of the food. The longer the drying process, the more volatile compounds will evaporate (Garis et al., 2019).

3.3. Ash Content Analysis

The ash content of a product is influenced by several factors, such as the type of material, the ashing method, the time, and the temperature used during drying. The ash content is a measure for identifying food (Butar Butar et al. 2024).

Table 1. Ash Content

No.	Coffee Skin Types	Treatment	Results (%)
1.	Arabica Coffee Skin	24 Hours 30 °C	0.08
		24 Hours 40 °C	0.08
		24 Hours 50 °C	0.08
		48 Hours 30 °C	0.09
		48 Hours 40 °C	0.08
		48 Hours 50 °C	0.08
		72 Hours 30 °C	0.08
		72 Hours 40 °C	0.08
		72 Hours 50 °C	0.011
2.	Robusta Coffee Skin	24 Hours 30 °C	0.08
		24 Hours 40 °C	0.09
		24 Hours 50 °C	0.08
		48 Hours 30 °C	0.09
		48 Hours 40 °C	0.08
		48 Hours 50 °C	0.09
		72 Hours 30 °C	0.09
		72 Hours 40 °C	0.09
72 Hours 50 °C	0.08		

Research on the ash content of cascara arabica and robusta is shown in Table 1, which states the ash content of the material. cascara arabica increased by 0.09% and 0.011% in cascara Arabica and increase 0.09% on cascara robusta. After done test anova that shown on attachment Table 12. Long fermentation use *Lactobacillus* sp had no significant effect <0.05. Coffee skin contains several minerals such as phosphorus, potassium, calcium, magnesium, iron, manganese, copper, and zinc (Butar-Butar et al., 2024). Drying temperatures that are too high will cause denaturation of proteins and minerals in cascara tea (Ariva et al., 2020).

The ash content of cascara with different fermentation time and drying temperature variations in this study ranged from 0.08%. Using powdered samples that had met the standard test for dry tea ash content SNI No. 01-3836-2013, which is a maximum of 8% (Patin et al., 2018), there was an increase in ash content at 0.09% where the higher the ash content, the lower the ash content. ash Which there is in something material food so the more low quality from the food ingredient (Kristiandi et al., 2021). High ash content is not only influenced by the amount of mineral content, but also the presence of residual water skin or dirt in a food ingredient (Kristiandi et al., 2021). According to Mengiwa et al., (2023), the high ash content of cascara tea can also be caused by the washing and drying process. drying skin coffee not enough maximum, matter This Also supported by Ariva et al (2020), which states that the ash content of a product is influenced by the type of material, ashing method, time, and temperature used during drying.

3.4. Content Analysis Caffeine

Caffeine (1,3,7-trimethylxanthine) is Wrong One type compound alkaloid Xanthine is a crystalline powder, odorless, and bitter. The caffeine molecule has the formula $C_8H_{10}N_4O_2$, which contributes to the taste and bitterness of beverages. coffee and tea (Puspaningrum et al., 2020).

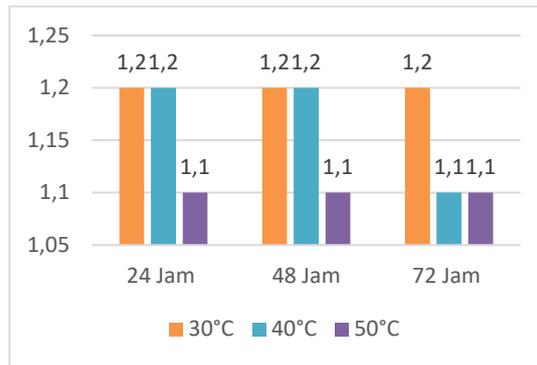


Figure 5. Level Caffeine Cascara Arabica

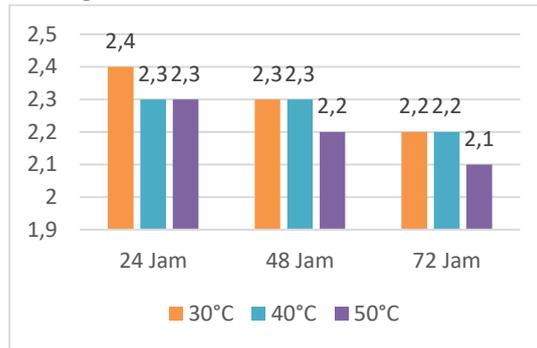


Figure 6. Level Caffeine Cascara Robusta

This study concludes that the caffeine content of cascara arabica and robusta in Figure 5. Shows a range of values 1.1 -1.2 which does not indicate fermentation time and temperature are too significant <0.05. This is also shown in the ANOVA test appendices 14 and 17. A small decrease was seen in the 72-hour treatment with the lowest value of 1.1 this is due to mild degradation of caffeine due to enzymatic activity during fermentation. Which long (Abulais et al., 2024). On Picture 6. cascara robusta seen there is a range of values 2.1-2.4, there is a clearer decrease in caffeine levels in robusta compared to arabica, matter This can caused by content caffeine on skin robusta more sensitive Robusta coffee is resistant to fermentation due to its higher tannin and phenolic content compared to Arabica coffee, which can affect the taste and quality of the resulting cascara product. Tannins are natural compounds that impart a bitter and astringent taste to the beverage (Butar-Butar et al., 2024).

Based on SNI 01-71522-2006, the maximum limit for caffeine consumption in food and beverages is 50 mg/serving (BSN, 2006). Consuming caffeine in low doses can increase alertness, reduce drowsiness and increase energy, relax smooth muscles, especially bronchial smooth muscles, and stimulate the heart muscle (Chusnah et al., 2025). Skin coffee Arabica and skin coffee robusta own difference genetics between the two varieties, Robusta coffee has a higher caffeine content, namely 1.6-2.4 compared to Arabica caffeine levels which range from 0.9-1.2. Research by Rohaya et al. (2022) also supports the results of this study by stating that Robusta coffee skin has a higher caffeine content when compared to Arabica coffee skin, so it can affect the caffeine content of the cascara produced. The low caffeine content in cascara can be caused by wilting before drying, this is also stated by (Chusnah et al., 2025)

3.5. Organoleptic Test

The panelists' assessment of the taste of cascara was carried out using the sense of taste (tongue). The aroma of dry tea according to SNI 3836:2013 has an aroma like... smelly foreign (BSI., 2013). Test organoleptic done after manufacturing cascara that has been brewed. The number of panelists involved in this organoleptic test was 20 panelists, consisting of 12 men and 8 women. The average age of the panelists was 20-27 years the panelists consisted of 2 different employment statuses where 6 panelists worked as baristas at the Avinity coffee shop and 14 consumers were students. With the hedonic scale used 1-5 with each description 1 = Dislike; 2 =

Quite like; 3 = neutral; 4 = like; 5 = really like.

3.5.1. Aroma

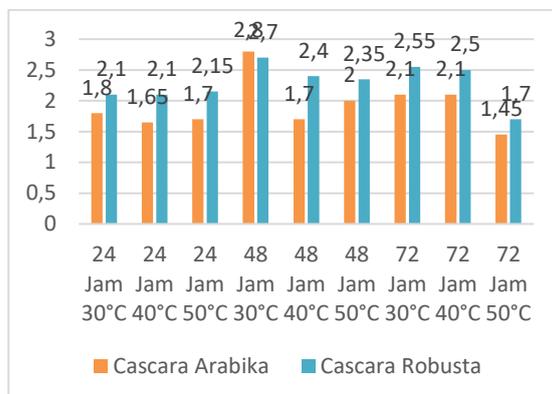


Figure 7. Organoleptic Aroma Cascara

Based on the graph in Figure 7, in general, the preference value for cascara arabica in 48-hour fermentation at a temperature of 30°C shows the highest preference level with a value of 2.8. While cascara robusta has a lower preference value compared to arabica, this is shown in the graph in Figure 7. 48-hour fermentation at a temperature of 30°C, cascara robusta has a preference level of 2.7. After conducting an organoleptic test regarding the aroma of cascara in the 24-hour 30°C and 24-hour 40°C samples, it is still pungent and has a distinctive aroma. cascara with a combination of acids and sweet from the skin coffee cherries as well as on 48 30°C - 72 hours 40°C treatment 2 coffee skins have a sweet aroma like fruit, some panelists said it was similar sour Java so that the aroma can Enjoyable. Arabica beans treated for 48 hours at 40°C developed a strong rancid aroma, making them unpalatable to the panelists.

Aroma is one of the parameters that determine the level of consumer preference for a product. In the food industry, aroma testing is considered important because it can quickly be considered to provide an assessment of a product, whether it is liked or not by panelists (Masrukan et al., 2024). The aroma of cascara arabica and robusta does not have much difference from all treatments when inhaled, the distinctive aroma that comes out of cascara No completely like coffee. Cascara aroma formed on during the process drying gallic acid will be oxidized into thearubigin compounds which are responsible for the fragrant aroma of tea (Prayoga et al., 2024).

3.5.2. Taste

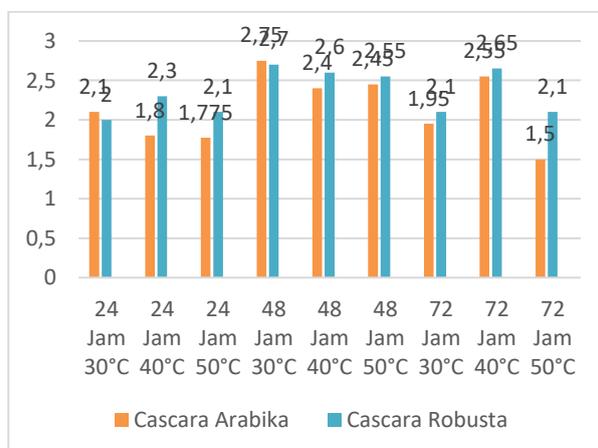


Figure 8. Organoleptic Taste Cascara

On Picture 8. Pointing results favorites panelists about flavor treatment skin Arabica coffee in a 48-hour fermentation at 30°C was higher than the Robusta coffee skin treatment. This is shown in the graph with a figure of 2.75. Meanwhile, cascara robusta tends to be more stable and is preferred by panelists under various conditions, especially during a 48-72-hour fermentation at 40°C. At 50°C, the figure for both samples decreased to 1.95 for cascara arabica, but was still well-accepted. The resulting taste of cascara was unfamiliar to panelists, this is because the taste of cascara tend sour and bitter to the point of not resembling tea at all in general, the 72-hour fermentation of Arabica at 50°C showed a minimum figure of 1.5. Around 17 panelists state that on fermentation 72 O'clock 50°C own flavor Which bitter Which can no longer be enjoyed by consumers.

Cascara skin coffee robusta own resilience flavor more good to variation temperature and time compared to cascara Arabica. Lots panelists Which Not yet familiar with flavor Cascara is sour and slightly astringent. The taste of cascara is influenced by several factors, such as compound chemistry, temperature drying (Baihaqi et al., 2023). The number of panelists showed a preference for 48-hour fermentation at 40°C due to the sour taste of the cascara brew, whereas for treatment other own flavor Which Not yet perfect it feels like A little sepet. The astringent taste of cascara is caused by catechins, which are substances containing tannins which have binding properties like protein, resulting in a tart taste (Thanoza et al., 2016).

3.5.3. Color

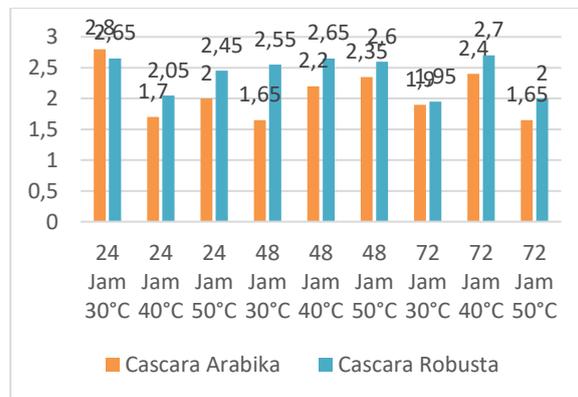


Figure 9. Organoleptic Color Cascara

The results of the organoleptic color test on cascara arabica have the best color appearance. liked on fermentation 24 O'clock temperature 30°C pointing out number 2.8 Own color brownish yellow, while in cascara robusta in figure 9. Shows a better color stability number and a high level of color preference at up to 72 hours at 40°C. Cascara robusta has the lowest number at 72 hours of fermentation at 30°C. The longer the drying process, the thicker the resulting cascara brew. The color change of the coffee skin from red to blackish brown during the drying process using an oven. The drying process results in browning of the coffee skin, resulting in a blackish brown color change after 10 hours of drying in the oven.

The color produced by cascara is not familiar to the panelists, this is because the color of cascara is not as thick as tea in general (Thanoza et al., 2016). (Hutasoit et al., (2021) Mentioning that height level tannin in material so brew coffee getting thicker, on moment tea brewed so tannin will late And then oxidized and produces theaflavins and thearubigins, which darken the color of the cascara. The longer the drying and brewing time, the better the visual quality of the tea. cascara Which produced. Brewing color tea cascara the more colored red concentrated to dark brown because the tannin content in cascara tea increases with the length of drying time (Ariva et al., 2020).

4. Conclusion

Based on study Which Already done that treatment fermentation influential to level pH, level water, level ash, level caffeine and organoleptic on cascara Arabica and cascara robusta. The results of

the study showed that the pH content of Arabica was on average 3 and Robusta 4. However results testing on level water and ash cascara robusta own mark Which lower compared to cascara coffee robusta under 8%, SNI 2013 state that level water and the ash content in dry tea suitable for consumption is below 8%. Arabica's caffeine content is lower on average than Robusta's, at <1%, while Robusta's caffeine content is higher, at <2%. In organoleptic testing, Arabica cascara has superior values to Robusta in terms of taste, color, and aroma. The highest panelist preference value was given to Arabica fermented for 48 hours at a drying temperature of 30°C.

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