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Effect of Drying Method and Temperature on the Quality of Cascara Tea

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Abstract. This study aims to determine the effect of the drying method and optimum temperature on the quality of coffee skin tea (cascara). This research was conducted at the Laboratory of Food Processing Technology and Agricultural Products, Department of Agricultural Products Technology, Faculty of Agriculture, Santo Thomas Catholic University, Medan. This research was conducted in March 2023 until completion. This research was conducted using a completely randomized design (CRD), which consisted of 2 factors. The first factor is the drying method (P), namely L : P_1 = 4 hours, P_2 = 6 hours, P_3 = 8 hours and P_4 = 10 hours. The second factor is the effect of drying temperature on the quality of tea from coffee skin (T), namely: T_1 = 40°C, T_2 = 50°C, T_3 = 60°C and T_4 = 70°C. The results showed that the drying method had a very significant effect ($p<0.01$) on the yield, water content, polyphenol content, organoleptic value of taste, organoleptic value of aroma and color organoleptic value of cascara tea produced. The longer drying time, the yield and organoleptic value of flavor increase, while the water content, polyphenol content, organoleptic value of aroma and organoleptic value of cascara tea produced decreases. The drying temperature has a very significant effect ($p<0.01$) on yield, moisture content, polyphenol content, the organoleptic value of taste, the organoleptic value of aroma, and organoleptic value of color. The higher the drying temperature, the higher the yield and taste organoleptic value, while the water content, polyphenol content, aroma organoleptic value and color organoleptic value decreased. The interaction of the drying method and temperature treatment had a significant effect ($p<0.015$) on the moisture content, polyphenol content, and aroma organoleptic value of cascara tea but had no significant effect ($p>0.05$) on yield, taste organoleptic value, and color organoleptic value of coffee skin tea (cascara). The best quality of cascara tea was obtained in the treatment combination P_1T_4.
Keywords: coffee skin; drying; cascara tea

INTRODUCTION

Coffee is one of the plantation crop commodities that has a high economic value among other plantation crops and plays an important role as a source of foreign exchange. This tree-shaped plant is included in the Rubiaceae family and the genus Coffea, which has the characteristics of growing upright, branching, and, if allowed to grow, can reach a height of 12 m; the leaves are ovate with slightly tapered ends. Leaves grow opposite on the trunk, branches, and twigs(Najiyati & Danarti, 2004).

Coffee (*Coffea sp*) is a type of tropical plant. Coffee is also a drink that does not contain alcohol and has caffeine. Many benefits are obtained from consuming coffee, including the caffeine contained in it can increase the body's metabolic rate. For some people with routines that require them to move at night, coffee can be a good alternative drink because its caffeine content can overcome drowsiness. Coffee also has good anti-bacterial properties that make it possible to cure various health-related problems(Maliza et al., 2020) .

Two types of coffee are known, namely Arabica coffee and Robusta coffee. The caffeine content in Robusta coffee is slightly higher than that of Arabica coffee. In Indonesia, Robusta coffee is the most widely produced, reaching 87,1% of the total coffee production in Indonesia. In Indonesia, coffee is traded in the form of coffee beans, roasted coffee, ground coffee, instant coffee, and other foodstuffs containing coffee (Wolska et al., 2017).

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move at night, coffee can be a good alternative drink because its caffeine content can overcome drowsiness. Coffee also has good anti-bacterial properties that make it possible to cure various health-related problems(Wolska et al., 2017).

North Sumatra Province is the largest producer of arabica coffee in Indonesia with coffee production in 2016 reaching 50,405 tons (Ministry of Agriculture, 2016). Coffee production in North Sumatra contributed 30% of national production. The second position is occupied by Aceh with 44,540 tons (27%), followed by South Sulawesi with 21,802 tons (12%), and West Sumatra with 15,930 tons (9%). Based on the production share aspect, North Sumatra arabica coffee is supplied from North Tapanuli Regency (20,61%), Dairi Regency (19,52%), Simalungun Regency (17,27%), Karo Regency (13,96%), Humbang Hasundutan Regency (12,03%), and other districts (16,62%) (Ministry of Agriculture, 2016).

North Sumatra's arabica coffee has an international reputation under the names Mandheling Coffee and Lintong Coffee. The origin of Mandheling coffee is an area in the Bukit Barisan highlands of North Sumatra with an elevation of 1.000-1.600 masl. Arabica coffee from the Simalungun region belongs to the Mandheling Coffee group (Dufour et al., 2021). Mandheling Coffee is a specialty coffee, while Lintong Coffee comes from Lintong Ni Huta in Humbang Hasundutan. Its geographical area is in the Bukit Barisan highlands of North Sumatra, especially around Lake Toba with an elevation of 1.300-1.600 m above sea level. This type of coffee originated in the Toba region(Dufour et al., 2021)

Coffee fruit skin tea products have actually been circulating in the international market but are still very rarely found in Indonesia due to the lack of knowledge and public interest in the existence of coffee fruit skin tea products. This product is known as cascara. This cascara product is a by-product of coffee processing where the coffee fruit skin along with the dried pulp is then brewed and enjoyed like tea in general(Heeger et al., 2017) .

Cascara tea has a sweet taste and distinctive aroma like herbal tea with aromas such as mango fruit, cherry fruit, rose petals and even tamarind (DePaula et al., 2022). According to The stages of the process of making tea from coffee skin consist of sorting and washing coffee fruit, peeling and drying the fruit skin (Arya et al., 2022). Drying process can help shape the aroma and flavor of the resulting tea product (Firdissa et al., 2022). However, because until now it is still very rare to find scientific research on the stages of the drying process and the making of tea from coffee skin, it is necessary to conduct further studies to determine the effect of drying methods and temperatures on the quality of tea from coffee skin in producing good quality color, taste, and aroma of tea. This study aims to test the effect of drying method and temperature on the quality of Cascara Tea.

METHODS

This research was conducted at the Food Processing and Agricultural Products Technology Laboratory, Department of Agricultural Products Technology, Faculty of Agriculture, Santo Thomas Catholic University, Medan. This research was conducted using a complete randomized design (CRD) with 2 replications consisting of two factors, namely : Factor I : Drying method (P) P_1 = 4 hours, P_2 = 6 hours, P_3 = 8 hours, P_4 = 10 hours. Factor II : Effect of drying temperature on the quality of tea from coffee skin (T) : T_1 = 40°C, T_2 = 50°C, T_3 = 60°C, T_4 = 70°C.

The following are the stages of research on making cascara tea: 1. Coffee fruits are harvested and selected that have a red color, are not damaged and are not dirty. 2. Coffee fruits are cleaned and washed with running water until impurities such as dust on the surface of the fruit skin disappear. 3. The coffee fruit is peeled using a manual tool (knife) so as to obtain coffee beans with horns and fruit skin. 4. The coffee fruit skin

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obtained is moved and placed on the drying media according to the drying method, namely a baking sheet that has been coated with aluminum foil for the cabinet drying method. 5. The coffee fruit skins were dried according to the temperature and drying time of each method. 6. The dried coffee fruit skins were crushed using a blender to reduce the size. 7. The dried coffee skins were stored in a sealed container.

RESULTS AND DISCUSSION

From the results of the study, it can be seen that the treatment of drying methods gives an influence on each parameter of coffee skin tea (cascara) produced as shown in **Table 1**.

Table 1. Effect of drying method on observed parameters of cascara tea

Drying Method (P)	Yield (%)	Water Content (%)	Polyphenol Content (%)	Organoleptic Value		
				Taste	Flavour	Color
P_1	86,24	5,59	22,26	2,76	3,43	3,18
P_2	86,07	4,69	22,48	3,05	3,38	2,91
P_3	84,47	4,48	19,69	2,99	3,06	2,91
P_4	83,75	4,05	18,25	3,30	3,20	2,89

Table 1 shows that the longer the drying time, the organoleptic value of flavor increases, while the yield, water content, polyphenol content, aroma organoleptic value and taste organoleptic value decrease. Drying temperature also affects the coffee skin tea (cascara) produced. The effect of drying temperature treatment on each parameter of coffee skin tea (cascara) produced as shown in **Table 2**.

Table 2. Effect of drying temperature treatment on observed parameters of cascara tea

Drying Method (T)	Yield (%)	Water Content (%)	Polyphenol Content (%)	Organoleptic Value		
				Taste	Flavour	Color
T_1	87,36	6,48	22,56	2,66	3,48	3,21
T_2	85,90	4,64	21,48	2,98	3,38	3,13
T_3	84,01	4,19	20,11	3,16	3,24	2,85
T_4	83,27	3,50	18,53	3,30	2,98	2,70

In Table 2, it can be seen that the higher the drying temperature, the organoleptic value of taste increases, while the yield, moisture content, polyphenol content, aroma organoleptic value and color organoleptic value decrease.

Rendemen

Effect of drying method on the yield of Cascara Tea

The treatment of the drying method has a very real influence ($p<0,01$) on the cascara tea. The treatment of P_1 with P_3, P_4 differs very clearly, while the treatment between P_1 and P_2, between P_2 and P_3, and between P_3 and P_4, differs unrealistically. The highest tea yield of the coffee leather (cascara) is found in treatment P_4 at 86,24% and the lowest in treatment P_1 at 83,13%. The relationship between the drying method and the cascara tea yields follows a linear regression curve as shown in **Figure 1**.

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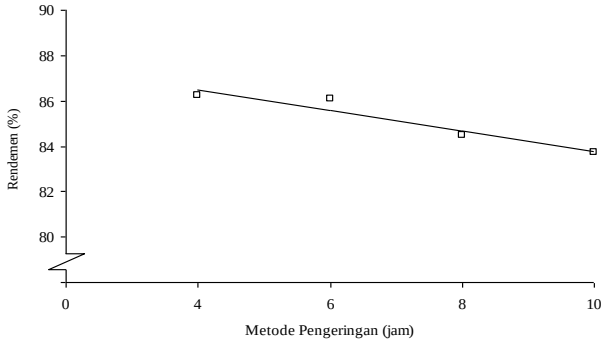

Figure 1. Relationship of drying method on yield of cascara tea

An increasingly prolonged drying method can increase the yield of the cascara tea produced. The decrease in yield is due to the evaporation of water rather than coffee skin, where during drying there will be a considerable loss of weight of coffee skin. The yield is the percentage of the weight of the product produced with the initial weight of material (Ullah et al., 2022). The more components of the material are lost during the process, the smaller the yield will be. (Baihaqi et al., 2022) stated that the longer a material dries in the sun, the lower the yield.

Effects of temperature conditions on yield of cascara

The differences between T_1 and T_4, T_2 and T_4 are very real, between T_1 and T_3, while between T_2, T_2, and T_3 are not real. The highest tea yield of coffee leather (cascara) is found in T_4 treatment at 87,09% and the lowest in T_1 treatment is at 83.02%. The relationship between the temperature of drying and the cascara tea yields follows the linear regression equation as shown in **Figure 2**.

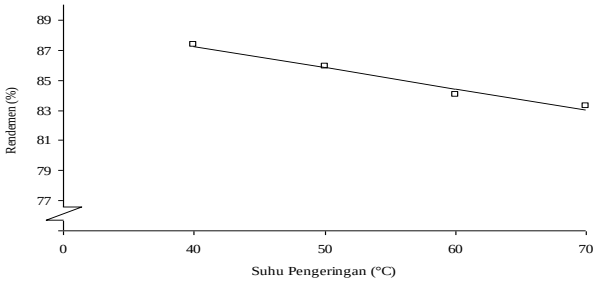

Figure 2. Drying temperature ratio with yield of cascara tea

The higher the drying temperature, the increasing the yield of cascara tea. This is due to the higher temperature of drying, so that the water and other ingredients found in the leather will be lost more. Increasing drying temperatures can cause a decrease in the yield of the extract due to the maximum opening of the cell membrane which eventually causes damage to the components of the composing cell membranes of the material so that the compounds or substituents in the material will evaporate(Sanz-Uribe et al., 2017).

Effects of interaction methods and drying method on the yield of cascara tea

The treatment method interaction and the drying temperature have no real influence ($p>0,05$) on the coffee leather tea yield (cascara), so the LSR test is not continued.

Water Content

Effects of the drying method on water content of cascara tea

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The treatment of P_1 with P_2, P_3, P_4 differs very real, between the treatment P_2 with P_4 the difference is not real, while between P_2 and P_3, as well as between P_3 and P_4 differences are not real. The highest content of coffee tea water (cascara) was found in treatment P_1 at 5,59% and the lowest at treatment P_4 at 4,05%. The relationship between the coffee tea's drying method and tea water content (cascara) follows a linear regression curve as shown in **Figure 3**.

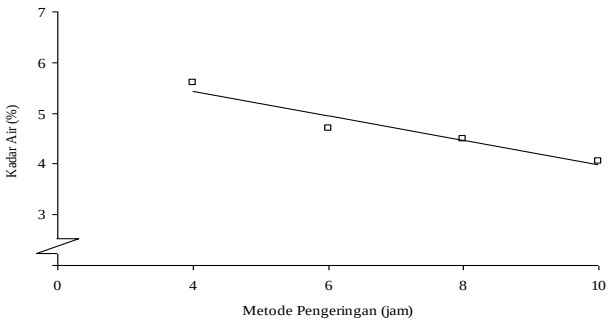

Figure 3. Relationship of drying method on water content of cascara

Figure 3 shows a difference in water levels at each length of drying. The longer the drying time, the lower the water level. The length of the drying process causes the evaporation of the water in the coffee tea to be higher, so the water content in the tea becomes lower (Karyadi et al., 2024). Longer the drying period, the greater the amount of water that comes out of the material, which causes the water content to become lower (Tham et al., 2018).

Effects of drying temperature on water content of cascara tea

From the LSR tests, between T_1 and T_2, T_3, and T4, and between T2 and T4, there are very real differences; between T3 and T4, there is a real difference, while between T2 and T3, there is no real difference. The highest content of cascara tea was found in T_1 treatment at 6,48% and the lowest in T_4 treatment at 3,50%. The relationship between the drying temperature and the cascara tea water content follows a linear regression equation as shown in **Figure 4**.

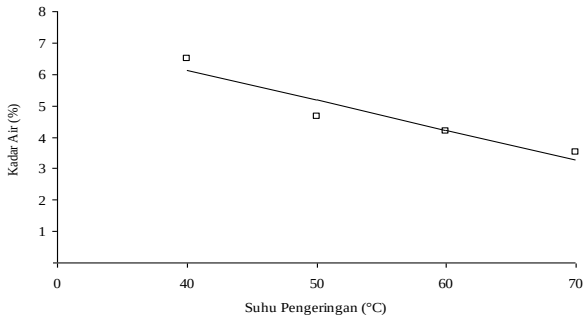

Figure 4. The ratio of drying temperature on water content of cascara tea

The higher the drying temperature, the lower the water content of the cascara tea. The difference in the temperature of drying greatly affects the water content of the coffee leather. The higher the heat received by the material during drying, the more water the material will evaporate (Mahiuddin et al., 2018). Higher drying temperatures will make the water evaporation process faster, so the water content in coffee tea is lower. A decrease in the water content of the coffee skin is essential, given that the water level affects the storage process. The lowest decrease in water content occurred at a drying

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temperature of 70°C, i.e. a water content of 3,50%. This indicates that the water content in the coffee leather produced has met the dry tea quality requirements when referring to the dry tee quality requirements (SNI) of a maximum of 8% (Roslan et al., 2020).

Effects of the interaction methods and drying temperature on the water content of cascara tea.

The highest water content was observed in the P_1T_1 treatment combination of 8,40%, while the lowest water level was found in P_4T_4 treatment combinations of 2,45%. The relationship between the drying temperature and the water content of cascara tea in the various drying methods is shown in **Figure 5**.

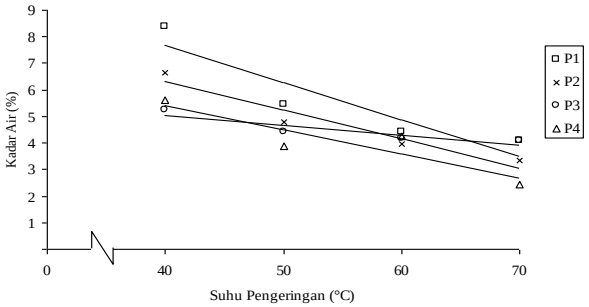

Figure 5. The ratio of the drying temperature to the water content of on various drying methods

Figure 5 shows that the higher the drying temperature, the lower the water content of the coffee leaf. The decrease of the tea leaf water will be faster with the longer drying and also due to the higher heating temperature (Qu et al., 2019). Rate of evaporation of water from inside the material is also affected by the level of humidity also influenced by the temperature around the dried material. The increase in temperature on the material's surface is due to the heat energy supply from the combustion so that the water on the material decreases (Selvie Mahrita et al., 2022).

Polyphenols Content

Effects of drying method on polyphenol content of cascara tea

The treatment of P_1 with P_3, P_4 and between P_2 and P_3, the difference of P_4 is very real, while the treatment between P_1 and P_2, and the difference between P_3 and P_4, is not real. The highest level of polyphenols in cascara tea found in treatment P_1 of 22,89% and the lowest level in treatment of P_4 of 18,25%. The relationship between the drying method and the level of cascara tea coffee polyphenol follows a linear regression curve as shown in **Figure 6**.

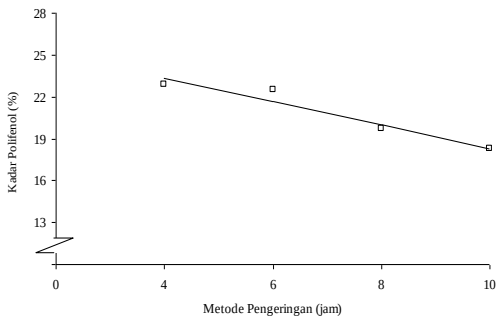

Figure 6. Ratio of drying methods with coffee tea leather polyphenols (cascara)

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An increasingly prolonged drying method can lower the level of polyphenols produced by the coffee leather. Drying processes result in a decrease in the active substance contained in a food ingredient and decreased antioxidant activity affected by enzymatic oxidation processes that result in polyphenols being oxidized and undergoing a decline (Oliveira et al., 2016). The longer the drying time, the lower the phenol levels in rosella tea (Karyadi et al., 2024).

Effects of drying temperature on polyphenol content of cascara tea

The result shows that between the treatment of T_1 and T_3, T_4, between T_2 and T_4 differences are very real, between T_3 and T_4, the difference is real, while between T_1 with T_2 and between the difference of T_2 with T_3 is not real. The highest concentration of coffee cascara tea was found in T1 treatment at 22,56% and the lowest in T_4 treatment at 19,03%. The relationship between the drying temperature and the cascara tea polyphenol levels follows the linear regression equation as shown in **Figure 7**.

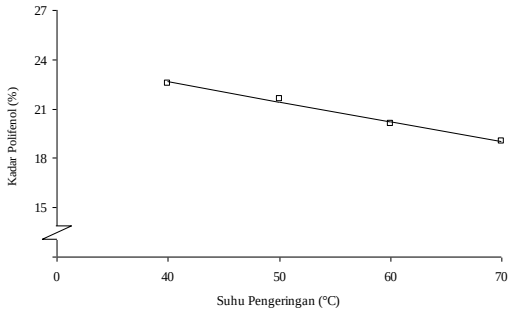

Figure 7. Ration of drying temperature on polyphenol content of cascara tea

The higher the drying temperature, the lower the concentration of coffee tea leather polyphenol. The higher drying temperature results in increased inactivation of polyphenol oxidase enzymes so that enzyme activity will be lower and polyphenol compound damage will be less, but if drying temperatures exceed the optimal temperature, then the stability of the polyphenolic compounds will be disrupted so that it can cause a decrease in the content of polyphenol in the material.

Effects of interaction methods and drying temperature on polyphenol content of cascara tea

The highest levels of polyphenols were found in the P_1T_1 treatment combination of 25,21%, while the lowest polyphenol levels were found at the P_4T_4 treatment association of 15,35%. The relationship between the drying temperature and the cascara tea polyphenol levels in the various drying methods is shown in **Figure 8**.

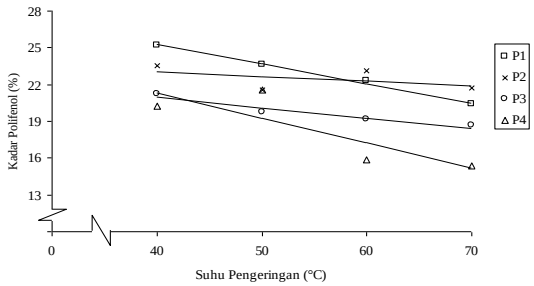

Figure 8. Drying temperature ratio to polyphenol content of cascara tea

Figure 8 shows that the higher the drying temperature, the lower the level of

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polyphenols in cascara tea. The decrease in the polyphenol levels of the tea leather will be faster with longer drying. The increasing drying temperature causes the total tea phenol to be higher. This is because heat can cause damage to the constituent components of the skin cell walls of coffee, namely carbohydrates (including cellulose fiber) and proteins as insoluble components. This damage can make it easier for polyphenol compounds to get out of the skin because polyphenols have a low molecular weight, so it's easy to infuse into the solvent(Ulandari et al., 2019) .The heating process during drying also functions to inactivate the enzyme polyphenol oxidase. The higher drying temperature results in increased inactivation of the polyphenols oxidase enzymes, so the enzyme activity will be lower, and the damage of polyphenolic compounds will be less and less (Havlík et al., 2022).

Organoleptic Nivel of Feel

Effects of the method of contacting the organoleptic niveaus of feeling the coope skin

The treatment of P_1 with P_4 is very different, between P_1 and P_2, between P_3 and P_4 the difference is real, whereas the second P_1 to P_3, P_2 to P_2, P_2 with P_4, the difference is not real. The highest organoleptic value of the cascara tea flavor found at treatment P_4 of 3,30 and the lowest on treatment P_1 of 2,76. The relationship between the drying method and the organoleptic value of the taste of the cascara tea follows a linear regression curve as shown in **Figure 9**.

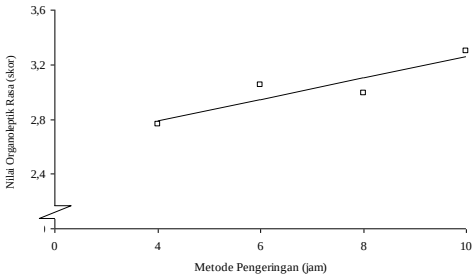

Figure 9. Relationship of drying method with the organoleptic value of the cascara tea taste

The increasingly prolonged drying method can increase the organoleptic flavor of the tea leather caffeine produced. The taste of tea is generally identical, just like tea from coffee leather. Flavor of coffee leather tea is caused by catechins. Catechin is one of the substances that contains tannins that enhance the clumping properties of proteins, thus producing a homogeneous flavor (Zhai et al., 2022). Catechin compounds in the skin of coffee fruit oxidized in tea would produce theaflavin and thearubigin that determine the taste of tea drinking water (Rostagno et al., 2015).

Effects of summary conditions on the organoleptic feel of cooper skin (Cascara)

The result shows that between treatment of T_1 and T_3, T_4 differences are very real, between T_1 with T_2, between T_2 and T_4, differences really, while between T_2, T_3, and between T_3 and T_4 the differences aren't real. The highest organoleptic value of coffee tea leather (cascade) is found in T_4 treatment of 3,30 and the lowest in T_1 treatment of 2,66. The relationship between the drying temperature and the organoleptic value of the taste of the cascara tea follows the linear regression equation as shown in **Figure 10**.

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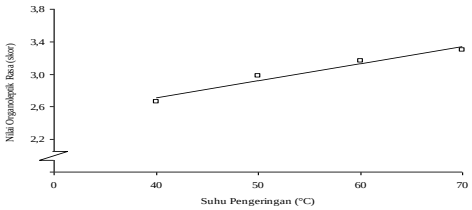

Figure 10. Drying temperature ratio to the organoleptic flavor value of cascara tea

The higher the drying temperature, the higher the organoleptic value of the tea. At all treatments the drying temperature gives cascara tea a slightly different flavor than tea in general. The taste is usually influenced by some chemical compounds, the temperature of drying. A lot of explorers prefer the tea with cascara coffee leather waste at a drying temperature of 70°C, because of the acidity of the tea in a drink of the cascara tea leather, while at a lower drying temperatures the taste is not perfect, that is, it is too smooth. Cascara tea contains acid content in it such as chlorogenic acid and caffeic acid, so the flavor that comes out of the tea leather is acidic. The use of higher temperatures will reduce the flavor and acidity of coffee (Tham et al., 2018).

Effects of interaction methods and drying temperature on organoleptic value of cascara tea.

The interaction of treatment method and drying temperature has no real influence ($p>0,05$) on the organoleptic values of the flavor of cascara tea, so the LSR test is not continued.

Flavor Organoleptic Value

Effect of drying method on the organoleptic value of the cascara tea flavor

The treatment of P_1 with P_3, P_4 and between P_2 and P_3, the difference of P_4 is very real, while the treatment between P_1 and P_2, and the difference between P_3 and P_4, is not real. The highest organoleptic value of the aroma of cascara tea was found in treatment P1 of 3,43 and the lowest in the treatment P_4 of 3,06. The relationship between the drying method and the organoleptic values of the aroma of cascara tea follows a linear regression curve as shown in **Figure 11**.

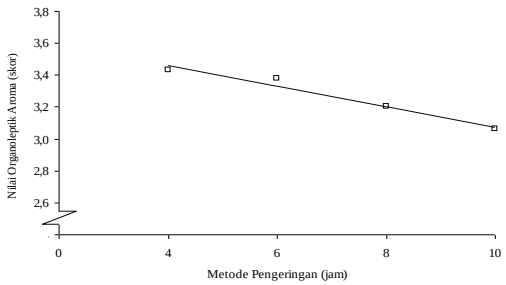

Figure 11. Relationship of the drying method with the cascara tea organoleptic flavor value

An increasingly prolonged drying method can lower the organoleptic value of the aroma of the coffee leather produced. Tea aromatic compounds are mainly composed of essential oils that are easily evaporative and easily reduced so that they can produce a fragrance in tea, in addition to tea also contains a compound of acid flavonoid. When the process of drying in tea occurs, the acid flaw is oxidized into thearubigin compoons. Thearubigine compound is responsible for the fragrance that is present in a teaspoon (Kim et al., 2011).

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Effect of drying temperature treatment on the flavor organoleptic value of cascara tea

The highest organoleptic value of the tea scent of cascara tea found in treatment T_1 of 3,48 and the lowest in treatment of T_4 of 2,98. The relationship between the drying temperature and the organoleptic value of the scent of cascara tea follows the linear regression equation as shown in **Figure 12**.

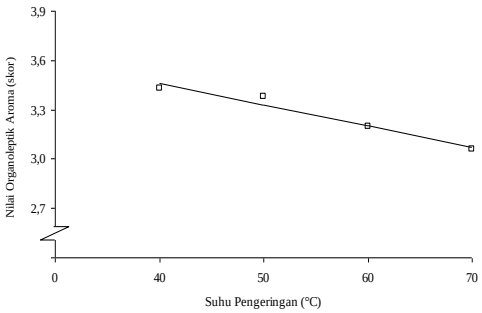

Figure 12. The ratio of the drying temperature to the cascara tea organoleptic value

The typical aroma that comes out of this cascara coffee leather tea is like the aroma of coffee. Aromas are odors that are so difficult to measure that they generate different judgments or opinions about achieving the quality of the aroma. The skin of coffee also contains compounds such as catechins, epicatechins and ferulate acids, but in not too high amounts (Heeger et al., 2017). Catechins will oxidize during the drying process. The oxidized catechins in the tea produce theaflavin and thearubigin, which determine the aroma of the tea and the drinking water. The more theaflavins and theorubigins are discharged during drying, the smaller the aroma. The aromas in tea are usually formed during the drying process, when the process of drying the fatty acid will be oxidized into theerubigin compounds. Thearubigine compound is responsible for the fragrance aroma in tea (Obanda et al., 2004).

Effects of the interaction of drying method and temperature on the cascara tea flavor organoleptic value

The highest aromatic organoleptic values were observed in the P_1T_1 treatment combination of 3,70, while the lowest aroma organoleptic value was observed at the P_4T_4 treatment association of 2,75. The relationship between the drying temperature and the organoleptic values of the scent of cascara tea on various drying methods is presented in **Figure 13**.

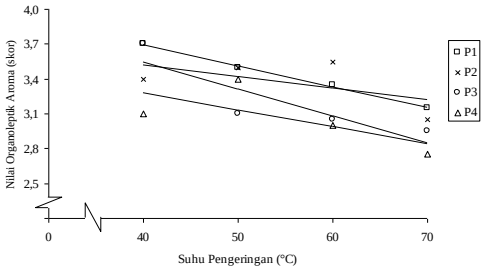

Figure 13. Relationship of Drying Temperature to cascara tea flavor organoleptic value

Figure 13 shows that the higher the drying temperature, the lower the organoleptic value of the aroma of coffee leather tea. The decrease in the organoleptic values of the aroma of coffee leather tea will be accelerating with longer and longer

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drying. Reduced aroma of tea due to enzyme activation in the withering process which causes the release of various volatile compounds on the ingredients so that it produces a specific aroma in the tea and the longer the drying then the aroma of the tea decreases (Yamin et al., 2017).

Color Organoleptic Value

Effect of drying method on the organoleptic value of cascara tea color

The treatment of P_1 with P_2, P_3, P_4 is very tangible, while the treatment between P_2 and P_3 is not tangible. The highest organoleptic value of the tea color of the cascara tea found in treatment P_1 of 3,18 and the lowest on treatment P_4 of 2,89. The relationship between the drying method and the organoleptic value of the color of the coffee leather (cascara) follows a linear regression curve as shown in **Figure 14**.

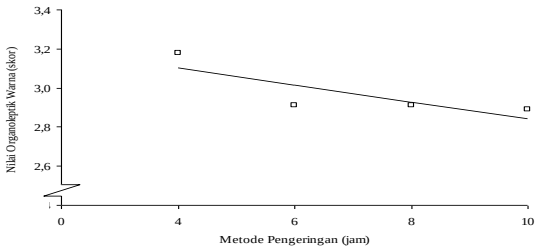

Figure 14. Relationship of the drying method with the taste organoleptic value of cascara tea

An increasingly prolonged drying method can decrease the organoleptic value of the color of the coffee leather produced. The color produced by the tea of the cascara coffee leather on drying for 4 hours with a dark color, whereas at drying 10 hours the color of the tea leather becomes a yellowish yellowing, resulting in the loss of tannin compounds in the tea. Detectives love the tea color of cascara coffee leather. With not too long drying the enzyme polyphenol oxidase is still actively working and oxidizes the polyphenolic compounds in the material so that a browning reaction occurs and produces a dark coloring component. Thro drying, tannins are released (Selvarajan et al., 2018). Tannins can cause the color of the tea to get darker so that the higher the level of tannins in the material, the darker the tea is produced.

Effect of drying temperature treatment on the color organoleptic value of cascara tea

The differences in organoleptic values of the colour of cascara tea due to the influence of the treatment of different drying temperatures are subsequently tested with the LSR test. The result shows that between T_1 and T_3, T_4, T_2 and T_3 differences are very real, while T_1 with T_2, and between T_3 and T_4 differences aren't real. The highest organoleptic value of coffee leather tea (cascade) is found in treatment T_1 of 3,21 and the lowest in treatment of T_1 is of 2,70. The relationship between the drying temperature and the organoleptic value of the color of the coffee leather (cascade) follows the linear regression equation as shown in **Figure 15**.

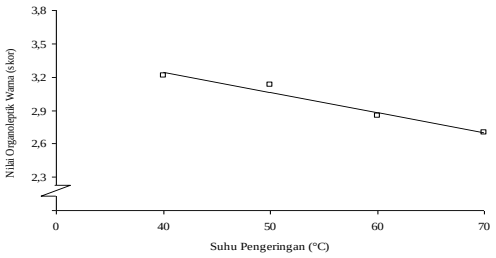

Figure 15. The ratio of the drying temperature on the color organoleptic value of cascara tea

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The higher the drying temperature, the increasing the organoleptic value of the color of cascara tea. The color of the tea produced by the cascara coffee leather is yellowish gold. The initial red coffee skin changes to brown during the drying process. The change occurs because the coffee skin undergoes a browning process during drying, so the color of the coffee leather changes. stated that in addition to influencing the panelist's preferences, the color of the tea that is boiled with water can influence the tea's tannin levels. The more concentrated the color of the tea, the higher the level of the tannins. The color has an important role in the drink, because the color can influence the consumer's acceptance of the drink. In addition, the color may also be an indicator of the quality of the produced drink, and in the color assessment can also influence a taste of the tea produced.

Effect of interaction of drying method and temperature on the color organoleptic value of cascara tea

The interaction of the treatment method and the drying temperature had no real influence (p>0,05) on the organoleptic value of the color of the coffee tea skin (cascara), so the LSR test was not continued.

CONCLUSION

The drying method has a very significant influence (p<0,01) on the yield, water content, polyphenol levels, flavor organoleptic value, aroma organoleptic value and the color organoleptic value of the caffeine tea (cascade) produced. The longer the drying, the more yielding and flavor organoleptic values are increased, while the water level, polyphenol content, flavor organoleptic value and the flavors of the caffeine cascara tea production are decreasing. The drying temperature has a very significant influence (p<0,01) on the yield, water content, polyphenol levels, flavor organoleptic values, aroma organoleptic values and color organoleptic value. The higher the drying temperature, the greater the yield and taste organoleptic values, while the water content, polyphenol levels, aroma organoleptic values and colour organoleptic values decrease. Treatment methods and drying temperature interactions are highly influential (p<0,015 for water content, polyphenol content and organoleptic values of the scent of coffee tea leather (cascara), but have no tangible (p>0,05) influence on the yield, taste organoleptic values and the organoleptic value of the cascsara tea . Cascara tea was best obtained from a combination of P_1T_4 treatments.

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