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Formulation and Effectiveness of Herbal Hair Dye from Ethanol Extract of Banyan Bark (*Ficus benjamina* L)

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Abstract: The banyan plant (*Ficus benjamina* Linn.) is one of the plants that has benefit as a traditional medicine. Almost all parts of the plant have efficacy as a source of medicine and furniture or decoration. However, banyan bark is often considered waste. Based on the results of phytochemical screening that has been carried out, banyan bark contains chemical compounds tannins, saponins, flavonoids, alkaloids and glycosides. Flavonoids are a group of flavanols derived from benzene compounds that can be used as basic compounds of natural dyes. Therefore, the aim of this research is to try to make herbal hair dye using banyan bark (*Ficus benjamina* Linn.) as a natural dyeing ingredient. The research method used is experimental with 80% ethanol solvent. The formulation of herbal hair dye consists of extract of banyan bark (*Ficus benjamina* Linn), Piragalol, Xanthan gum, Methyl parabens, and BHT with concentration of 4%, 6% and 8%, respectively. Tests on the preparations made include organoleptic tests, homogeneity tests, viscosity tests, pH tests, stability tests, irritation tests, color stability tests produced, color stability tests against washing, color stability tests against sunlight and preference tests. The formulation of herbal hair dyes uses ethanol extract of banyan bark which can give color to gray hair with concentrations of ethanol extract of banyan bark 4%, 6% and 8%, Pyroganol 1%, Xanthan gum 1%, Methyl paraben and BHT. Banyan bark ethanol extract (*Ficus benjamina* Linn.) can be used in herbal hair dye by producing a blonde to dark brown color in gray hair. The best dye is obtained from the formula with concentration of 8% which consists of ethanol extract of banyan bark (EKBB) which produces a dark brown color, the pH of the preparation in the range of 5.8 – 6.1, the viscosity in the range of 2800 – 4800 cps, and the preparation is stable in several washes and exposure to direct sunlight and does not cause irritation reactions to the skin.

Keywords: Ethanol 80%, *Ficus benjamina* L, flavonoid, hair dye, phenolic.

1. INTRODUCTION

Hair has been known since ancient times with the nickname "crown" for women [1]. Hair is the part that grows on the dermis layer and follicle ducts of the skin. Hair color will change in old age which is referred to as gray hair whose existence is less favorable. Gray hair occurs because the hair does not receive oxygen and nutrients from the ends of the blood vessels, resulting in poor melanin formation, which can lead to the formation of gray hair in today's modern era, coloring is a hair trend that is popular with both men and women regardless of age. Herbal hair dyes are cosmetics used in hair makeup to dye hair, either used to restore the original hair color or other colors [2]. Dyeing hair not only changes the color of the hair from white (grey) to black or other

colors but can also nourish the hair better. Many hair dyes in circulation contain synthetic ingredients that can cause reactions and allergies. A good hair dye is a hair dye whose function is not only to dye hair, but can also nourish hair so that hair is well maintained and does not become damaged [3]. Therefore, researchers want to make herbal hair dyes using natural ingredients. One of the supplements that can be used is the banyan stem [4]. The selection of the right natural ingredients in the manufacture of cosmetics can reduce the negative effects on cosmetics and minimize the occurrence of allergic reactions on the skin. The type of plant that has never been formulated as a natural hair dye is the bark of the banyan stem. Content of flavonoid and tannin in the bark of banyan stems is a natural dye compound that is effective in giving brown color to hair because flavonoid and tannin have a conjugation system of the khalkon group when reacting with acids, so it usually produces a brick-red color to a blackish brown, in addition to that flavonoid can be used as antioxidants [5]. In addition, it is hoped that banyan bark extract (EKBB) can provide benefits as a substitute for synthetic dyes in cosmetics [6]. Therefore, the use of synthetic dyes can be replaced by natural dyes.

2. MATERIALS AND METHODS

2.1. Materials

The tools used in this study are laboratory glass tools (Pyrex), aluminum foil, blender (cosmos FP-32), desicator (Pyrex), hot plate (joan lab), lumpang, refrigerator (sharp), dryer cabinet, microscope, filter, knife, pH meter (MeterLab®), rotary evaporator (Eyela®), tamper, analytical scale (BB Adam®), viscometer (Brookfield RV).

The ingredients used are banyan bark ethanol extract (*Ficus benjamina* L.), aquaades, 80% ethanol, pyrogalenol, methyl paraben, xanthan gum, BHT, potassium iodide, iodine, mercury(II) chloride, concentrated sulfuric acid, nitric acid, anhydrous acetic acid, hydrochloric acid, iron(III) chloride, chloralhydrate reagent, iron(lll) chloride 1%, 2N hydrochloric acid, magnesium, amyl alcohol, Mayer reagent, Bouchardat reagent, Dragendroff reagent, ethanol 96%, lead(ll) acetate 0.4 M, chlorophorm, isopropanol, Molis reagent, Fehling A, Fehling B, methanol, Libermen-Bouchard reagent and n-hexane.

2.2. Methods

2.2.1. Determination

The bark of the banyan stem (*Ficus benjamina* L) was obtained in Riau Province, Kampar Regency, precisely in Plora Village. The determination was made at the Medanense Herbamium Plant Systematics Laboratory (MEDA) of the University of North Sumatra, Medan.

2.2.2. Extract manufacturing

The extraction is made by percolation using 80% ethanol solvent. Maximization of 1000 gr of simplisia powder for ± 3 hours. In a glass jar as much as 2000 ml of 80% ethanol. After 3 hours, 1000 gr of simplisia powder is put into the percolator. An 80% ethanol solution is added little by little. Close the percolator faucet and insert a new solvent. The percolator faucet is opened for extraction, the faucet is set so that the dripping speed is 1 ml per minute. To determine the end of percolate, a qualitative examination of the active substance can be carried out at the final percolat or it can be seen when the juice is already clear. When the percolation has ended, the percolat is evaporated

with the help of a rotary evaporator at a temperature of 40°C at a speed of 100 rpm, until a viscous extract is obtained. And the viscous extract is stored inside the desiccator.

2.2.3. Phytochemical screening

a. Alkaloid identification

A total of 0.5 g of fresh banyan bark sample, simplisia and ethanol extract were put into 3 test tubes added 1 ml of 2N hydrochloric acid and 9 ml of distilled water, heated for 2 minutes, cooled and filtered. Taken 1 mL plus 2 drops of Mayer's reagent, a white or yellow + alkaloid precipitate was formed. Taken 1 mL plus 2 drops of Bouchardat reagent, a blackish-brown + alkaloid precipitate was formed. Taken 1 mL plus 2 drops of Dragendrof reagent, a red to brown precipitate was formed + alkaloids. If there is a precipitate or turbidity, at least two of the three experiments indicate the presence of alkaloids [7].

b. Flavonoid identification

A total of 1 gr sample of fresh banyan bark, simplisia and its ethanol extract are put into 3 test tubes, 10 ml of hot water is added, boiled for 5 minutes and filtered, into 5 ml of filtrate added 0.1 g of magnesium powder and 1 ml of concentrated hydrochloric acid and 2 ml of amyl alcohol. The formation of orange to red colors with flavonoid [8].

c. Saponin identification

A total of 0.5 grams of fresh banyan bark sample, simplisia and ethanol extract were put into a test tube, then 10 ml of hot water was added, cooled, and beaten vigorously for 10 seconds. If a stable 1-10 cm high foam is formed and not less than 10 minutes and the foam does not disappear with the addition of 1 drop of HCl 2 N [9].

d. Tannin identification

A total of 1 gr of fresh banyan bark sample, simplisia and its ethanol extract are boiled for 3 minutes in 100 mL of distilled water, cooled and filtered, 2 ml is taken added 1-2 drops of 1% iron(III) chloride reagent. If a blackish-blue or blackish-green color occurs, it indicates the presence of tannins [10].

e. Glycoside identification

A total of 4 grams of fresh banyan bark sample, simplisia and ethanol extract were put into the Erlenmeyer added 96% ethanol 84 mL and 36 mL of aqueous acid and 4 drops of concentrated sulfuric acid were diffused for 10 minutes, cooled and filtered. Take 20 mL of filtrate add 10 mL of 0.4 M lead(II) acetate, and 10 mL of aquades are shaken, let stand for 5 minutes filtered. Filtrate is extracted with 20 mL of a mixture of chloroform and isopropanol (3:2), and is further tested as follows:

i. Assay for sugar compounds

- As much as 1 mL of the top layer is taken and evaporated on top of a water bath. The remaining evaporation is added 2 mL of water and 5 drops of Molish reagent solution, and carefully added concentrated sulfuric acid, forming a purple ring at the liquid border, this reaction indicates the presence of sugar bonds.
- A total of 1 mL of the top layer is taken and evaporated on a water bath. The rest of the evaporation is added Fehling A and Fehling B (1:1), then heated. The formation of brick-red

deposits indicates the presence of reducing sugar.

ii. Assay for non-sugar compounds

As much as 1 mL of the bottom layer is taken, evaporated on a water bath with a temperature of no more than 60oC, the remaining evaporation is dissolved in 2 mL of methanol. Furthermore, 20 drops of glacial acetic acid and 1 drop of concentrated sulfuric acid (Liberman-Bouchard reagent) are added, in case of blue, green, purplish-red or purple color, positive for non-sugar. The formation of brick red deposits indicates the presence of glycosides [7].

f. Identification steroids/triterpenoids

As much as 1 g of fresh banyan bark sample, simplisia and ethanol extract were macerated with 20 ml of n-hexane for 2 hours then filtered and 5 ml of filtrate was vaporized in a vaporizer dish until dry. To the residue was added the Liebermann-Burchard reagent. If a purple or reddish-purple color is formed, it indicates the presence of triterpenoids, while steroids are marked as blue or turquoise [11].

2.2.4. Formula preparation

The formula is selected based on the standard formula in the Indonesian Cosmetic Formulary (1985) as shown in Table 1. Based on this study, the preparation to be made is a herbal hair dye using a formula like Table 2 as follows:

Table 1. Standard formula

Composition	Light brown	Dark brown	Black
Henna powder	30	83	73
Pyroganol	5	10	15
Copper (II) sulphate	5	7	12

Table 2. Hair dye formula

Composition	Formulation (%)				Function
	F0	F1	F2	F3	
Banyan stem bark extract	0	4	6	8	Dye
Pyroganol	1	1	1	1	Color Generator
Xanthan gum	1	1	1	1	Emulsifier
Methyl paraben	0.2	0.2	0.2	0.2	Preservatives
BHT	0.05	0.05	0.05	0.05	Antioxidant
Aquadest Ad	100	100	100	100	Solvent

Information: F0 = Blank; F1= EKBB Concentration 4%; F2 = EKBB Concentration 6%; F3 = EKBB Concentration 8%

Working procedure: The active ingredient of ethanol extract of banyan bark was weighed with a concentration variation of 4%, 6%, 8%. Dissolve the xanthan gum in a hot pot until it forms transparent (M1). Eroded with pyroganol, ethanol extract of banyan stem bark into mortar is homogeneously grinded (M2). M1 and M2 are mixed into the homogeneous grind. The mass is transferred into the glass beaker, then BHT and methyl parabens are added that have been dissolved. Then add little by little the aquadest up to 100 ml of Ad, stir homogeneously, then put into a container and evaluate. Wash your hair with shampoo and dry, after which the hair is put

into a mixture of hair dye, soaked for 1 to 4 hours. After being lifted, the hair is washed and then dried and observe the color that forms according to the soaking time.

2.2.5. Evaluation of the quality of herbal hair dyes

a. Organoleptic test

The organoleptic test is intended to see the physical appearance of the preparation which includes shape, color and aroma [12].

b. Homogeneity test

The homogeneity test is carried out by visual observation. Good homogeneity is characterized by a uniform color in the herbal hair dye, in addition to Homogeneity testing ensures the absence of hard or clumpy particles [13].

c. pH test

pH measurement was carried out for 4 weeks to determine the acidity level of hair dye from banyan bark extract, measured using a pH meter in the following way: Calibrate the device first using a solution of pH 7 and pH 4. Then the herbal hair dye is prepared and the pH value obtained is recorded [14].

d. Viscosity test

Viscosity measurement is carried out using a Brookfield viscometer, namely by attaching a spindle No.4 to the tool then dipping it into the preparation to a certain extent and setting the speed to 60 rpm. Each measurement is read on the scale when the red needle has stabilized, the viscosity value is obtained from the multiplication of the dial reading with a special correction factor at each spindle speed [12].

e. Stability test of the preparation

The stability test of the preparation is carried out by paying attention to the shape, color and smell during storage. The process of storing the herbal hair dye is put into a small ointment Pot. Observed changes every 2 days for 1 month [12].

f. Color stability test produced

Gray hair is washed with shampoo and then put into the hair dye formula, soaked. Each preparation is observed the color formed [12].

g. Color stability test against washing

Gray hair is given a pre-made herbal hair dye, washed with 1 drop of shampoo and dried. Washing is done once every 2 days for 1 month [12].

h. Sunlight color stability test

The sunlight stability test is carried out to see the durability of the hair dye made, gray hair that has been colored is dried in the sun for 5 hours in the sun after which the color change is observed, carried out every 2 days for 1 month [12].

h. Irritation test

Irritation test is carried out to determine whether in the formulation of herbal hair dyes there is a reaction between components so that irritant or toxic substances are formed [15].

i. Preference test

The preference test is carried out to find out the level of consumer preference for the dye preparations made [1].

2.3. Data Analysis

The analysis method used in this study is experimental, with a quantitative approach. This experiment was to see the results of the comparison of hair dyes from 3 concentrations, namely: 4%, 6% and 8%.

3. RESULTS AND DISCUSSION

3.1. Determination

The results of plant identification or determination carried out at the Medanense Herbarium Laboratory (MEDA) of the University of North Sumatra stated that the plants used in this study were banyan bark plants (Ficus benjamina Linn.) with the Moraceae family.

3.2. Formulation extract

From 1000 gr of banyan bark simplisia powder, extracted by percolation method using 80% ethanol solvent. Then the percolat is evaporated in a rotary evaporator with a temperature of 40°C at a speed of 100 rpm and concentrated so that a thick extract of 128 grams is obtained.

3.3. Phytochemical screening

Table 3. Results of phytochemical screening of fresh banyan bark, simplisia and ethanol extract

No	Examination	SE	SI	E
1	Alkaloid	+	+	+
2	Flavonoid	+	+	+
3	Saponin	+	+	+
4	Tanin	+	+	+
5	Glikosida	+	+	+
6	Steroid/triterpenoid	+	+	+

Description: SE = Fresh banyan bark; SI = Simplisia banyan bark; E = Banyan bark extract

From the table above, it is obtained from the bark of fresh banyan stems, simplisia and ethanol extracts show the presence of alkaloid compounds shown the presence of blackish-brown color deposits on the bark of fresh banyan stems with the addition of Bouchardat reagents, brown precipitates with the addition of Dragendorff reagents, and in simplisia your banyan stem bark yellowish-white precipitates with the addition of Mayer reagents, brown precipitates with the addition of Bouchardat reagents and brown precipitates with the addition of Dragendorff reagent, and in the ethanol extract of banyan bark there was a yellowish-white precipitate with the addition of Mayer reagent, brown precipitate in the addition of Bouchardat reagent, blackish brown precipitate in the addition of Dragendorff reagent [7].

Presence of flavonoid compounds is indicated by the presence of an orange color in the addition of concentrated Mg and HCl powder and in the amyl alcohol layer given, the color of the solution will be lifted or separated and then pulled by the amyl alcohol and give it an orange color, which proves that fresh banyan bark, simplisia and ethanol extract positively contain flavonoid chemical compounds [8]. Furthermore, there is a saponin compound that forms foam with a height of 1-2 cm in shaking with hot water for 10 seconds and remains stable with the addition of HCl 2N to fresh and simplisia banyan bark, while in ethanol extract of banyan stem bark foam is formed as high as 5 cm in shaking with hot water for 10 seconds and remains stable with the addition of HCl 2N, which proves that the bark of banyan stems is positive for saponins [9]. Tannin compounds

are shown by a change in the color of the blackish-green solution with the addition of FeCl3 which indicates that the bark of the banyan stem is positive for tannins[10].

Glycoside compounds are shown to have a purple ring with the addition of the Molish reaction, which means that the bark of the banyan stem contains sugar compounds, the presence of brick-red deposits in the addition of Fehling A and B shows that the bark of the banyan stem contains reducing sugar compounds [7]. Steroid/triterpenoid compounds are shown by the formation of a purplish-red color with the addition of Lieberman-Bouchard reagents, which means that banyan bark, simplisia and ethanol extracts show the presence of steroid/triterpenoid compounds [11].

3.4. Physical evaluation test of the quality of herbal hair dyes

3.4.1. Organoleptic test

Organoleptic tests according to [16] include the smell, color, and shape of herbal hair dyes produced by visual observation. From the tests carried out, the results can be seen in Table 4.

Table 4. Hair dye organoleptic test

Preparation formulation	Color	Odour	Shape
Blanko	White	Unscented	Thick
EKBB 4%	Red brick	Typical of weak banyan skin	Thick
EKBB 6%	Red brick	Typical of banyan bark is rather strong	Thick
EKBB 8%	Deep brick red	Typical of strong banyan bark	Thick

Based on the results obtained in the form of a semi-solid shape. The color of the preparation has a variety of colors, where the higher the concentration of banyan bark extract, the lighter the color of the preparation. And the aroma produced is typical of the extract, the higher the banyan peel extract used, the stronger the aroma.

3.4.2. Homogeneity test

Homogeneity test for 1 month on herbal hair dyes of banyan bark extract is homogeneous in each formula. There are no lumps or particles separated from the preparation material which indicates that the preparation is well mixed. This homogeneity test was carried out by visual observation using a glass object, with the results of observation of the herbal hair dye of banyan bark extract obtained that the formula was physically stable.

3.4.3. pH test

Acidity (pH) is an important aspect of stability evaluation testing. A good herbal hair dye has a pH that suits the scalp and hair, which is 6-7. Because if the herbal hair dye has it, if the pH is too acidic, it will cause the scalp and hair to become oily, while the pH that is too alkaline will cause the skin to become dry and irritated[17]. The results of the ph measurement can be seen in Table 5.

Table 5. pH test of herbal hair dyes

No	Dosage	pH value				
		I	II	III	IV	Average
1	Blanko	5.58	5.59	5.73	6.30	5.8
2	EKBB 4%	6.02	6.24	6.09	6.39	6.1
3	EKBB 6%	5.69	5.72	5.81	6.24	5.8
4	EKBB 8%	5.34	5.69	6.19	6.42	5.8

The pH testing on the herbal hair dye of ethanol extract of banyan bark in the formula F0 (Blank), F1 (4%), F2 (6%), F3 (8%) has an average of 5.8 - 6.1 which is still safe to use and still meets the good pH criteria in the herbal hair dye because it is in accordance with the pH of the scalp, which is 4.6 - 6.6.

3.4.5. Viscosity test

Testing the viscosity of herbal hair dyes to determine the effect of consistency of the preparation on use, so that the greater the viscosity value, the thicker the preparation. And herbal hair dyes are more comfortable and even when used.

Table 6. Results of viscosity test of herbal hair dyes

Formulation	No spindle	Rpm	Time (s)	Measurement	Viscosity (cp)
Blanko	6	60	30	28	2800
EKBB 4%	6	60	30	29	2900
EKBB 6%	6	60	30	47	4700
EKBB 8%	6	60	30	48	4800

Viscosity testing on herbal hair dyes was obtained (2800 -4800) where the larger the extract used, the thicker it was and the greater the viscosity value of the preparation obtained. So that herbal hair dyes extracted from banyan bark can be used by meeting the requirements of a good viscosity value according to (SNI 16-4399-1996) which is 2000 – 50,000 cp. And from the comparison of the journal of herbal hair dyes from rosella flower extract, it was stated that the viscosity of the herbal hair dyes obtained ranged from (11444 – 12062 cps) of herbal hair dyes [1].

3.4.6. Dosage stability test

Stability testing of preparations to determine the stability of herbal hair dyes, and stability test checks include the texture, color and aroma of the preparations. Stability test checks are carried out during 1 month of storage and are carried out at room temperature.

Table 7. Results of the stability test of herbal hair dyes

Examination	Formulation	Weekly observations			
		M1	**M2**	**M3**	**M4**
Texture	Blanko	Kl	Kl	Kl	Kl
	EKKB 4%	Kl	Kl	Kl	Kl
	EKBB 6%	Kl	Kl	Kl	Kl
	EKBB 8%	Kl	Kl	Kl	Kl
Color	Blanko	P	P	P	P
	EKKB 4%	Mb	Mb	Mb	Mb
	EKBB 6%	Mb	Mb	Mb	Mb
	EKBB 8%	Mbp	Mbp	Mbp	Mbp
Odour	Blanko	Td	Td	Td	Td
	EKKB 4%	Kkl	Kkl	Kkl	Kkl
	EKBB 6%	Kkak	Kkak	Kkak	Kkak
	EKBB 8%	Kkk	Kkk	Kkk	Kkk
	Checklists	Tb	Tb	Tb	Tb

Description : M1 = First week; M2 = Second week; M3 = Third week; M4 = Fourth week; Kl = Thick; Cr = Liquid; P = White; Mb = Red brick; Mbp = Thick brick red Td = Unscented; Kkl = Typical aroma of weak banyan peel;

Kkak = Typical aroma of rather strong banyan peel; Kkk = Typical aroma of strong banyan peel; Tb = Unchanged

From the stability test carried out on herbal hair dyes for 1 month, the preparation did not change and remained stable, both the color of the preparation form remained thick and the aroma of the preparation was typical of banyan bark, while the comparator used on the market did not experience any change in color, shape and aroma.

3.4.7. Resulting color stability test

From the results of the color stability test observations carried out, soaking gray hair with various comparisons of herbal hair dye concentrations provides color results for gray hair as shown in Table 8 below:

Table 8. The results of the color stability test produced

Preparation formula	Colors produced	Preparation formula	Colors produced
EKBB 6%		EKBB 8%	

Color test produced from the application of herbal hair dye on gray hair produced a blonde or golden color in the immersion with a concentration of 4% because the extract used was still small, while in the immersion with a concentration of 6% it produced a light brown color, the color began to thicken because the extract used was higher. And in soaking with a concentration of 8%, gray hair changes color to dark brown. Meanwhile, from the table above, the best color is taken because with the addition of higher extracts it produces a darker and more beautiful color.

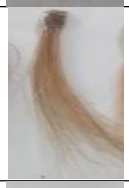
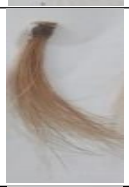
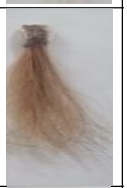
3.4.8. Color stability test against washing

Testing the color stability of herbal hair dye against washing is carried out every 2 days for 1 month. The requirement to wash permanent hair dye using shampoo is done at least 7 washes, this stability test is carried out to see if the color produced by the hair dye remains consistent or changes. Based on the color stability test on the washing of banyan bark herbal hair dye extract, the results were obtained that the four formulas have a color that remains stable up to 15 times washed with shampoo, this is because gray hair uses a mixture of natural dyes with color-producing substances. The mixture can increase the adhesion of the color to the hair so that the dye can stick more firmly to the hair shaft [1].

3.4.9. Color stability test against sunlight

Color stability testing to sunlight is performed to see the color fastness produced to the effect of sun exposure.

Table 9. Results of stability test against sunlight

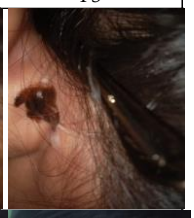
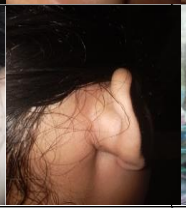
Drying to	Drying time	Color formula			
		F0	F1	F2	F3
1	0 hours				
	5 hours				
15	0 hours				
	5 hours				

The results of the stability test in sunlight carried out by direct drying in the sun showed that the color remained stable and did not change color/remained the same. This is because dyes can penetrate the cuticle and enter the hair cortex so that hair color does not change easily [1]

3.4.10. Irritation test

Irritation test was carried out to ascertain whether in the formulation of hair dye preparations banyan bark extract there was a reaction between the components so that irritant or toxic substances were formed.

Table 10. Irritation test results

No	Treatment	formula			
		F0	F1	F2	F3
1	When applying hair dye				
2	After the application of hair dye				

The results of irritation testing conducted on 6 panelists did not cause irritation such as: erythema, papules, vesicles, and edema in the tested area for 24 hours. So herbal hair dyes from banyan bark ethanol extract with various concentrations of 4%, 6% and 8% are safe to use.

3.4.11. Likeability test

The likeability test was conducted to see the formulas that were very liked by 30 panelists.

Table 11. Likeness test results

Preference test	Preparation formulation	Value range	Smallest preference value	Conclusion
Color	Blanko	3.350787 to 5.11588	3.350787 = 3	Less like
	EKBB 4%	3.899167 to 5.234166	3.899167 = 4	Like
	EKBB 6%	3.899167 to 5.234166	3.899167 = 4	Like
	EKBB 8%	4.520921 to 5.212413	4.520921 = 5	Very much like
Shape	Blanko	2.616133 to 4.250533	2.616133 = 3	Less like
	EKBB 4%	3.622174 to 3.622174	3.622174 = 4	Like
	EKBB 6%	3.751719 to 4.981615	3.751719 = 4	Like
	EKBB 8%	4.594871 to 5.205129	4.594871 = 5	Very much like
Odour	Blanko	2.596231 to 4.470436	2.596231= 3	Less like
	EKBB 4%	3.836758 to 4.963242	3.836758 = 4	Like
	EKBB 6%	3.817712 to 5.182288	3.817712 = 4	Like
	EKBB 8%	4.520921 to 5.212413	4.520921 = 5	Very much like

The results of the test conducted on 30 panelists showed that blank preparations were not preferred by the panelists in terms of color, shape and aroma, this was because blank preparations did not use EKBB so that preparations that did not have less attractive colors, aromas and shapes. While preparations with a concentration of 4% and 6% of the panelists liked the preparations both in terms of color, shape and aroma, this is because the preparations already use EKBB so that the preparations have interesting colors, aromas and shapes, while the preparations with a concentration of 8% are very liked by the panelists, this is because the preparations have a strong color, strong aroma and a more attractive shape. So that from the preference test of the 30 panelists, the concentration that was very liked was a concentration of 8% with a score of 5, which is very liked.

4. CONCLUSION

From the phytochemical screening carried out by fresh banyan bark, simplisia and its ethanol extract contain secondary metabolite compounds tannins, saponins, flavonoids, alkaloids, glycosides and steroids/triterpenoids. It can be formulated into herbal hair dyes that meet the physical quality requirements of the preparation. Then herbal hair dyes are able to cover grey hair color, by giving blonde color at a concentration of 4%, light brown color at a concentration of 6%, and dark brown color at a concentration of 8%. Herbal hair dyes are safe to use because they do not cause irritation and are very liked by panellists.

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Conflicts of interest: Interest All authors stated that there was no conflict of interest in this study.

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