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Physicochemical Characteristics Of Shampoo By Added *Sargassum* Sp.

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ABSTRACT

Shampoo works to remove dirt and dandruff found in the hair can strengthen the hair roots so that the hair does not fall out easily. One of the most important compositions is surfactant. Surfactants can also unite a mixture consisting of water and oil. This study aims to obtain formulas and ways of making the optimum seaweed shampoo. This research uses experimental research. All draft formulas (F0-F3) that were sampled in this study were made with different seaweed concentrations. Shampoo is made using different concentrations of seaweed (*Sargassum* sp.) namely F0 (without seaweed), F1 (10 gram seaweed), F2 (20 gram seaweed), and F3 (30 gram seaweed) then evaluated with organoleptic observations, pH measurements, hedonic and hair strength. The results of the pH measurements showed that F0:5; F1:5.4; F2=5.4; and F3:5.3. Organoleptic test showed that all treatment has same of result except control (F0). Hedonic test showed that the most likely formula was F2. And Hairs Strengthness test showed that formula F2 was the strength tahan the oder. and hair strength test results show that preparations with the addition of seaweed with a brown color from the addition of the seaweed.
Keywords: Hedonic test, Pyhsicochemical, Sargassum, Shampoo, Seaweed,

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INTRODUCTION

Sargassum sp. is brown macroalgae (seaweed) that grows in coastal waters. *Sargassum* sp. contains many vitamins and minerals needed by hair growth (Agatonovic, 2013). Seaweed type of sargassum also has benefits for the scalp and hair, the benefits of seaweed are to strengthen hair roots, grow hair and maintain hair to stay healthy and not experience hair loss (Gazali et al, 2018).

The cause of hair loss is the lack of care for the hair and scalp so that the roots of the hair are easily broken and fall out, if left for a continuous period of time, the loss rate will increase so that the scalp will experience baldness Wei (2002). One way to maintain the scalp and reduce hair loss is by providing vitamins to the hair, one of which is shampooing using a shampoo made from natural ingredients such as seaweed. This study aims to find the best formula for making shampoo which is added with brown algae seaweed, Sargassum sp.

EXPERIMENTAL PROCEDURES

Materials

The ingredients used in the manufacture of this shampoo are Seaweed pulp (Sargassum sp.), Sodium Lauryl Sulfate, Aquades, Propylene glycol, Glycerin, Cetyl alcohol, Stearic acid, Citric acid, NaCl, Coconut oil, Tea, Cocomidopropyl betaine, Cocomide DEA. , Phenoxyetanol. The equipment used in making shampoo is soaking containers, spoons, gas stoves, blenders, analytical scales, pans, pans, pH meters.

Preparation of Sargassum's Pasta

Making seaweed slurry, namely dry seaweed washed with running water so that it is clean from impurities that are still attached to the seaweed such as sand, coral, mud. Soak the seaweed for 12 hours, after soaking it, then wash the seaweed thoroughly and boil it on the stove for 30 minutes then drain. Puree the seaweed that has been boiled in a blender with a ratio of 1:1 Seaweed and water (Hidayat, 2017). The purpose of soaking is to soften the seaweed so that it is easier for blending and eliminates the fishy smell found in seaweed.

Figure1. *Sargassum* and *Sargassum*'s Pasta

Formulation of Shampoo by Added *Sargassum's* Pasta

All the basic ingredients for making shampoo that are used are weighed in advance according to the predetermined dose. Melt cetyl alcohol and stearic acid in a pan filled with water, stir in sodium lauryl ether sulfonate, add water a little at a time, then stir gently so as not to create excessive foam, add propylene glycol, Cocomidopropyl betaine and Cocomide DEA, stir until well blended, melt cetyl alcohol, stearic acid and add dissolve NaCl and citric acid, mix all ingredients mix until blended and add the coconut oil, glycerin and TEA ingredients then stir quickly until well blende
d then add preservative and seaweed pulp.

Table 1 formula of Sargassum Shampoo (Mu'awanah *et al*, 2014); (Nurhikma *et al*, 2018)

Material	Composition (g)			
	F0	F1	F2	F3
Sargassum sp.	-	10	20	30
Sodium Lauryl Sulfate	57,4	57,4	57,4	57,4
Cetyl alcohol	1	1	1	1
Citric acid	1	1	1	1
Stearat acid	1	1	1	1
Propilen glikol	7,3	7,3	7,3	7,3
Nacl	1,5	1,5	1,5	1,5
TEA	0,7	0,7	0,7	0,7
Palm Oil	2	2	2	2
Cocomidopropyl betaine	5	5	5	5
Cocomide DEA	7	7	7	7
Gliserin	4,3	4,3	4,3	4,3
Aquades	58,3	58,3	58,3	58,3
Phenoxyethanol	0,8	0,8	0,8	0,8

Shampoo preparations made with various concentrations were then evaluated, namely:

Organoleptic (Anton, 2017)

Observations were made of any changes including the texture, smell, and color of the shampoo preparation to be tested.

pH measurement (Nursalam, 2003)

The pH measurement of the shampoo preparation uses a pH meter. The tool is calibrated first, after that the pH meter is immersed in the shampoo preparation solution. Then the number indicated by the pH meter will appear.

Hedonic Test (Choiriyah, *et al,* 2016)

The hedonic test is also known as liking. In the hedonic test, a person is asked for his personal response about likes or dislikes which is called the hedonic scale. The favorite hedonic scale such as very like very, very like, like, and somewhat like. Conversely, if the response was dislike, it could be in the form of very, very, very dislike, very dislike, dislike, and somewhat dislike, in the hedonic test the penalis was asked to physically assess the preparation from its texture, color and odor.

Hair Strengthness Test

According to the (Nurlaekah, 2017) (with modifications) a hair strength tester by taking a sample then pulling it slowly using a hand or a tool with the same strength and counting how long the hair lasts or does not break. Second, by using a comb, how much hair is lost or taken when combing.

RESULT AND DISCUSSION

Organoleptic Test

Based on the results of observations that have been made on 4 formulations, namely the controls as f0, f1, f2, and f3. The f1 formulation is the addition of 10 grams of seaweed, the f2 formulation is the addition of 20 grams of seaweed and the f3 formulation with the addition of 30 grams of seaweed, with 4 formulations the results are liquid or semi-thick shampoo that smells typical of seaweed, colored white in the formula f0, f1 is liquid or semi-thick with a light brown color, f2 is a liquid or semi-thick form and a light brown color, f3 is dark brown with a liquid or semi-thick form.
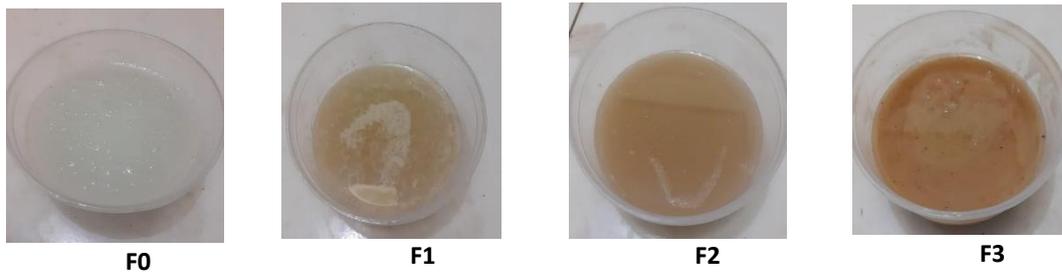
Figure 2. Shampoo with different Formula's

Table 2. Organoleptic Test of Sargassum's Shampoo

No	Formula	Bentuk	Warna	Bau
1.	F0	thick	white	odorless
2.	F1	thick	brown	Seaweed odor
3.	F2	thick	brown	Seaweed odor
4.	F3	thick	brown	Seaweed odor

The results of organoleptic observations of shampoo preparations with various concentrations of seaweed pulp water did not change in shape, color and odor. Based on the results of observations that have been made on 4 formulations, namely control as f0, f1, f2, and f3. The f1 formulation is the addition of 10 grams of seaweed, the f2 formulation is the addition of 20 grams of seaweed and the f3 formulation with the addition of 30 grams of seaweed, with 4 formulations the results are liquid or semi-thick shampoo that smells typical of seaweed, colored white in the formula f0, f1 is liquid or semi-thick with a light brown color, f2 is a liquid or semi-thick form and a light brown color, f3 is dark brown with a liquid or semi-thick form. The color cause tanin content in *Sargassum*. Sargassum have Tanin content and antioxidant (Voight, 1994).

Organoleptic observation aims to observe any changes in shape, color, or smell that may occur during storage. Based on table 2, the organoleptic test results of the shampoo preparations did not change in shape, color or odor during 7 days of storage and there was no change in shape during 7 days of storage due to the shampoo formula made containing surfactants. In addition to surfactants as cleaning agents, surfactants also function as emulsifiers to stabilize shampoo dosage forms.

pH Measurement

Table 3. pH Measurement of *Sargassum's* Shampoo with different formula's

No	Formula	pH
1.	F0	5
2.	F1	5,3
3.	F2	5,4
4.	F3	5,3

Based on table 3.The pH test results show that the shampoo preparation has a pH range of 5-5.4 and a scalp pH requirement range of 4.5-5.5. The pH value of a preparation must match the pH of the skin, namely 4.5-6.5. A pH value that is too acidic can irritate the scalp and if it is too alkaline it can cause scaly skin (Listiyana, *et al* 2014). pH value influence by acid in the raw material. Sargassum has content of alginate acid (Afandi, 2015). If a shampoo preparation is not within the pH range of the skin, it cannot be used because it will irritate the skin.
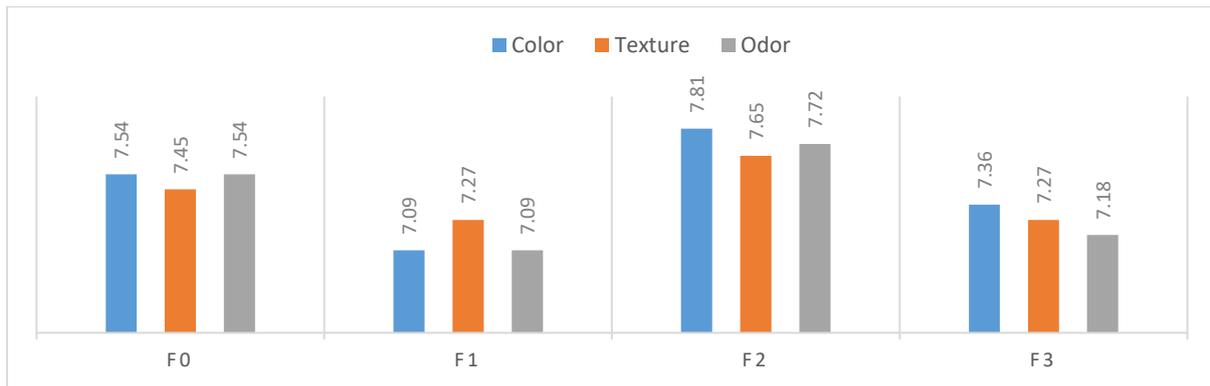
Hedonic Test

Figure 3. Result of Hedonic Test

Based on table 7 and table 8, the hedonic test above is obtained from the hedonic test on 8 respondents based on the order of the level of preference where F0 has 4 respondents very like and 4 likes, F1 has 1 respondent very likes and 7 respondents like it, F2 has 5 respondents very like it. and 3 like, F3 with 2 respondents very like and 6 like.

The hedonic test is also called the liking test, in the hedonic test a person is asked for his personal response about likes or dislikes which is called the hedonic scale such as very like, like, and somewhat like (Benedictus, 2017). Conversely, if the response is not like very, very dislike, very dislike, dislike and somewhat dislike. In the hedonic test, respondents were asked to physically assess the preparation in terms of texture, color and odor.
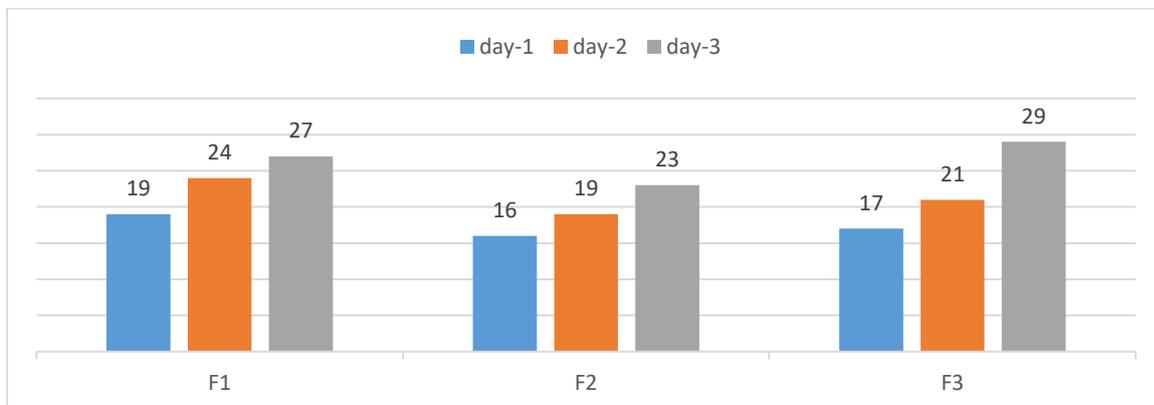
Hair Strengthness Test

Figure 4. Result of Hair Strength Test

Based on the Nurlaekah method, 2017 (with modifications) in table 9 the hair strength test of the formula f1, f2 and f3. on the first day of f1 hair loss reached 19 strands, the second day the hair loss increased to 24 and the day when the number of hair loss was 27 hairs, on F2 the hair loss reached 16, the second day reached 19 hairs, the third day 23 hairs, and f3 on the first day of hair loss reached 17 hairs, the second day reached 21 hairs, the third day reached 29 hairs. Based on the test results on the hair with the least amount of hair loss, namely the formula f2.

Seaweed shampoo can prevent hair loss and this seaweed shampoo can nourish the hair so that the hair is strong and doesn't fall out easily when combed (Apriyani *et al.* 2014)

CONCLUSION

Sargassum sp. could added to the Shampoo's formula and made effect the hair more strength than before. The best formula shamoo with added Sargassum is formula F2. Formula F2 has the most likely by panelis, no acid, ang make hair strongest than the other formulas's.

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