

Sensory Evaluation Formula Hair Tonic Extracts Pandanus Amaryllifolius and Seaweed

Biyan Yesi Wilujeng^{1*} Octaverina KP² Mutiah³ Dewi Lutfiati⁴

^{1,2,3,4}*Department of cosmetology, Home economics, Universitas Negeri Surabaya*

^{*}*Corresponding author: biyanyesi@unesa.ac.id*

ABSTRACT

This research was conducted to determine the panelists' acceptance of 3 *pandanus amaryllifolius* extracts and *eucheuma spinossum*. Formula hair tonic extracts *pandanus amaryllifolius* and *eucheuma spinossum* consist of PG helm, Aquades, Alcohol 96%, methyl paraben, menthol, D-Phantenol, armotan, pandanus amaryllifolius and eucheuma spinossum extracts. The formula is made by varying the volume of pandanus amaryllifolius and eucheuma spinossum extracts with a total weight of 100 ml. Each formula is coded (123, 234, 345) hedonic tests include color, smell, impression on the skin, and homogeneity by 50 rather trained panelists on 6 hedonic scales. The highest *pandanus amaryllifolius* and *eucheuma spinossum* hair tonic extract in terms of color, smell, impression on the skin, and homogeneity is formula 123. The results of the analysis with One Way ANOVA showed that there were significant differences between hair tonic formulas in terms of color and scents (sig value (P)<0.005) but there was no significant difference in terms of an impression on the skin and homogeneity (sig value (P)>0.005).

Keywords: *hair tonic, organoleptic, hedonic*

1. INTRODUCTION

Hair as a crown not only serves as a protective head covering from adverse environmental conditions, but also as an attraction as well as a symbol of beauty. Beauty comes from health and health will be obtained from cleanliness, therefore the scalp and hair need care so that it remains clean and healthy. Healthy hair has the characteristics of thick, black, shiny, no tangle, and does not fall become the needs of everyone. Haircare is not enough just to use shampoo and conditioner, because hair is a living cell, it needs to be nourished, cared for and given fertilizer so that it can grow healthy and beautiful. One way is to use a hair grower commonly called a hair tonic[1].

Hair tonic is a cosmetic preparation used to treat hair growth [2]. The benefits of hair tonic cosmetics include stimulating hair growth, preventing hair loss, eliminating dandruff (medicated tonic), maintaining hair color from fading, a source of hair nutrition, improving dry and dull hair becomes shinier[3]. The advantage in using hair tonic cosmetics is to reduce the growth of microorganisms that cause hair loss, because its use is not rinsed so it takes longer to soak the scalp. The hair tonic formula consists of basic ingredients and active ingredients.

The basic ingredients used are 96% alcohol, aquades. The active ingredient used is methyl paraben, menthol, D-phantenol, propylenglycol and perfume. The active

ingredients used can have various effects including cleaning, fertilizing or removing dandruff. The trend of cosmetics for both skin and hair lately is returning to nature. Psychologically the use of natural materials is more secure for users. Several natural ingredients are empirically used by the community to stimulate hair growth which can be used for active hair tonic ingredients.

One of the plants that can be used empirically as a hair treatment is fragrant pandan leaves[4]. Pandanus amaryllifolius is a plant that is often used by its leaves as a food additive, generally a green coloring agent and scent giver. The content of fragrant is alkaloids, flavonoids, saponins, polyphenols, saponins, polyphenols which function as natural antioxidants [5]. The polyphenol content is taken from pandan leaves using a solvent extraction process with ethanol 96% [6]. As an active ingredient for this hair tonic cosmetics, pandanus amaryllifolius extract functions as an anti-bacterial namely flavonoids and polyphenols.

Seaweed is now also widely used as a basic ingredient for cosmetics both skin and hair because it is one of the many aquatic products containing bioactive compounds that can be utilized in the cosmetics field that functions as anti-oxidants and anti-bacteria. Researchers used seaweed for the development of hair tonic based on mixture pandanus amaryllifolius and eucheuma spinossum. The content of seaweed is vitamins A, B1, B2, B6, B12, C, E, K, beta carotene, potassium,

calcium, phosphorus, sodium, iron, and iodine[7]. Vitamins B1 and B2 are good for healthy skin. Seaweed, in general, has the ability as an antioxidant, immunostimulant and anti-bacterial[8].

Making hair tonics using natural ingredients, it requires proper extraction so that the substances contained therein are not lost. The extract itself is a thick preparation obtained by extracting active compounds from vegetable simplicia using an appropriate solvent, then all or almost all solvents are evaporated and the remaining mass or powder is treated to meet the raw material that has been applied [9]. Factors affecting the quality of extracts are biological factors such as species, location of plant origin, storage of plant material and age of plants. Other factors that influence are chemical namely the active compound in the material, the extraction method used, the solvent used.

Various methods of extraction are maceration, percolation, reflux, and soxhlet. Maceration is the process of extracting simplicia by using solvents with several shaking or stirring at room temperature. The process of separating extracts from the extractor liquid can be carried out using the principle of a rotary evaporator with accelerated heating by rotation of a round bottom flask, the liquid can vaporize 5-100 below the solvent due to a pressure drop. With the help of a vacuum pump, the steam of the conduit solution will evaporate up to the condenser and condensate into molecules of pure solvent liquid which are accommodated in a cross-section round bottom flask. Natural extract water content is <10%[10].

The finished product of a product needs organoleptic testing which is a test based on the sensory process. Sensory is defined as a physio-psychological process, namely awareness of the recognition of sense devices of the properties of objects due to stimuli received by the sense organs. Stimulation can be mechanical (pressure, puncture), physical (cold, heat, light, color), chemical properties (color, scents, taste). In organoleptic assessment, hair tonic product uses color, smell, impression on the skin and homogeneity.

The Hedonic test is something related to liking and the hedonic test aims to measure the degree of liking and acceptance of the product by consumers. Organoleptic testing to obtain optimal results requires careful preparation. Preparation made were panelists, panelists selection, and testing laboratories. There are 7 types of panelist namely individual panelist, limited, trained,

somewhat trained, consumers and children. Consumer panelists are marketing targets of products consisting of 30-100 people. This panelist must be able to represent the target market based on certain groups/regions. Organoleptic quality assessment can be done on the market or door to door. The panelist selection stage consists of interviews, selection, training and ability testing stages. The selected laboratory is the one that meets the standard preparation room, test room, and waiting room [11].

This study aims to determine the results of the sensory evaluation of hair tonic extract pandanus amaryllifolius and eucheuma spinosum.

2. METHOD

Data collection methods used in this study are the method of observation and documentation. The instrument used was using 6 hedonic scales. There are 50 consumer panelists. This research in the A3 building at the Universitas Negeri Surabaya, Cosmetology laboratory in May-September 2019. The data analysis method used One Way ANOVA with SPSS16.

The research procedure consisted of (1) preparation of tools and materials, (2) preparation of formulas, (3) making hair tonic, (4) organoleptic/sensory testing.

1. Preparation of Tools and Materials

The tools used in this study were cutting tools, baking cups, cups, measuring cups, stirring spoons, filtering devices, rotary vacuum evaporators.

The materials used are PG Helm, Aquades, alcohol 96%, methyl paraben, menthol, D-phenolol, armotan, pandanus amaryllifolius extract, and eucheuma spinosum extract.

2. Formulation Hair Tonic

The research began with the preparation of hair tonic formula consisting of PG Helm, Aquades, Alcohol 96%, Methyl paraben, menthol, armotan, pandanus amaryllifolius extract and eucheuma spinosum extract. There are 3 versions of the formula created. Each formula is made by varying the volume of pandanus and eucheuma spinosum extract. Formula 1 coded 123, formula 2 coded 234, formula 3 was coded 345 and then a hedonic test was carried out covering color, scents, impression on the skin and homogeneity by 50 consumers panelist on 6 hedonic scales.

Table 1. Formula hair Tonic *Pandanus amaryllifolius* and *euchema spinossum*

Material Type	Amount of Material (gr) and sample code		
	123	234	456
PG Helm	2,5	2,5	2,5
Aquades	50	50	50
Alkohol 96%	75	75	75
Menthol	0,25	0,25	0,25
Armotan	1,25	1,25	1,25
Pandanus extract	1,75	1	0,25
Euchema S. extract	0,25	1	1,75
D-Phantenol	1,25	1,25	1,25

3. Making Hair Tonic

The first step is to make extract pandanus: cut the fragrant pandanus into smaller sizes, then aerate it to dry. After dry then mashed. Then do a location shift. After completion of concentration using a rotary vacuum evaporator. Making euchema S extract: cut the seaweed into smaller pieces, then aerate it to dry, The next step is to smooth seaweed. After that, the location is done and continued with concentration using rotary vacuum evaporation.

After the extraction is finished. Next step is to prepare a measuring cup A, add alcohol, armotan, methyl paraben, D-phantenol, menthol, extract pandanus, extract euchema spinossum by stirring until blended. The next step is to prepare measuring cup B, insert PG-helm and aquades, stir until dissolved. The final step is to enter the finished product A into B then stir until homogenous.

4. Organoleptic/sensory testing

Organoleptic/sensory test preparation includes panelist, sample preparation and laboratory/testing rooms. In organoleptic assessment, there are 7 types of panelists based on their expertise in conducting assessments, one of which is a consumer panelist. Sample preparation is very important in getting attention to sensory testing. The sample presentation takes into account temperature, size, code, and several samples when testing.

The research uses 50 consumer panelists. Samples to be tested are 3 hair tonic formulas with the code 123, 234, 345. Each code represents one formula. Samples are presented on the testing room together, 3

samples are tested by 1 panelist. Researchers explain the assessment instruments and other important things when doing organoleptic tests.

The organoleptic test chosen in this study is the hedonic test or a preference test which is one of the acceptance tests. Panelist were asked to write responses according to the hedonic scale that was provided by putting a checkmark in the box according to the impression they felt using 6 scales namely dislike moderately (1) dislike slightly (2), neutral (3), like slightly (4), like (5), and like very much (6). In testing the panelist smell using the sense of scents, in the color of observing using the sense of sight, the impression on the skin using the sense of touch, assessing homogeneity using the sense of sight.

3. RESULTS AND DISCUSSION

The result of the hair tonic sensory test pandanus amaryllifolius and euchema spinossum extracts use sensory that is the human senses, with a hedonic test using 6 hedonic scales. The rating scale consists of 6 scales namely dislike moderately (1) dislike slightly (2), neutral (3), like slightly (4), like (5), and like very much (6). Hair tonic formulas are composed of 3 formulas with codes 123, 234, 345 respectively. Each formula weight 100 ml. There were 50 panelist qualifications. Panelists were asked to write down their responses and impression of color, scents, impression on the skin and homogeneity. The sensory test results for the 3 hair tonic formulas 123, 234, 456 are as follows.

Table 2. Sensory Test Results 3 Formula

	Color	Scents	an impression on the skin	Homogeneity
123	5,6	5,88	5,88	5,86
234	4,84	5	5,88	5,76
345	4,06	4,04	5,86	5,74

The following diagram shows the average yield of the three hair tonic product formulas:

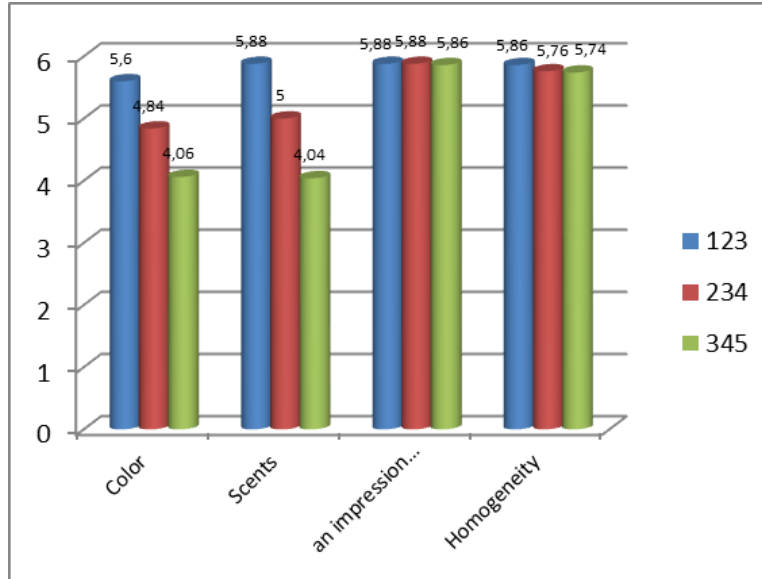


Figure 1. Sensory 3 Formula Test Results

1. Color

Sensory test results show that product 123 gets an average score of 5,6 levels of liking is in the very like category. Product 234 gets an average score of 4,84 which means that likes. Product 345 gets an average score of 4.06 which means likes. Most panelists like the

hair tonic 123 product formula in terms of color. Color on showing golden yellow, the youngest when compared with the other two colors, so the color is more attractive. Seen from the side of the hairtonic preparations, the clear hair tonic preparations shouldn't be cloudy.



Figure 2. Color Product Hair Tonic

The results of the one way ANOVA color test conducted on 3 hair tonic formulas are follows:

Table 3. ANOVA Color

ANOVA					
Color					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	59.293	2	29.647	95.697	.000
Within Groups	45.540	147	.310		
Total	104.833	149			

ANOVA color test results showed that there were significant differences in the three formulas for hair tonic product, The significant value is 0,00.

2. Scents

Based on Figure 1 can be seen, the scents component formula 123 get an average score of 5,88 (very like category), 234 gets an average score of 5 (category likes), 345 gets an average score of 4,04 (somewhat

likes). On product 123, the scents gets the highest average score when compared to the other two products, because of more pandanus scents of seaweed so that makes panelists really like. The scents on 123 products is also not overpowering, so the proportions are just right.

Here is a table of the results of one way ANOVA on scents:

Table.4 ANOVA Scents

ANOVA					
Scents					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	84.693	2	42.347	361.916	.000
Within Groups	17.200	147	.117		
Total	101.893	149			

ANOVA scents results showed there were significant differences in the three formulas for hair tonic products. The significant value is 0.00

3. Impression on the Skin

Sensory test results showed 123 products received an average score from panelists 5,88 (very like), 234 products received an average score from panelists 5,88 (very like) and 345 products received an average score

of 5,86 (very like). From the results, the average panelist rating showed a score that was not too far away, because the alcohol content of the three products was the same, so the impression of use on the skin seemed to be almost no difference.

The results of the one way ANOVA data analysis table on the impression on the skin can be observed in the following table:

Table.5 ANOVA Impression on skin

ANOVA					
Impression on skin					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.013	2	.007	.059	.943
Within Groups	16.580	147	.113		
Total	16.593	149			

ANOVA test results showed no significant differences between the three formulas. The significant value is 0,943.

4. Homogeneity

Sensory test results show the average score of panelists on the homogeneity of the product 123 shows an average of 5,86 (very like), 234 shows an average of

5,76 (very like) and 345 shows an average of 5,75 (very like). From the sensory results of the panelists the three products showed a very like, because the results of the three homogeneous products, there were no deposits or small granules at all. The one way anova data analysis results on homogeneity can be observed in the following table:

Table. 6 ANOVA Homogeneity

Homogeneity				
Sum of Squares	df	Mean Square	F	Sig.
.413	2	.207	1.227	.296
24.760	147	.168		
25.173	149			

ANOVA test results showed no significant differences between the three formulas. The significant value is 0.296.

4. CONCLUSION

1. The highest hair tonic extracts pandanus amaryllifolius and euchema spinossum in terms of color, scents, impression on the skin and homogeneity is formula 123.
2. The results of the analysis with One Way ANOVA show that there are significant differences between hair tonic formula in terms of color and scents (sig value <0.005) but there was no significant difference in terms of an impression on the skin and homogeneity (sig>0.005).

REFERENCES

- [1] Wasitaatmaja, Sjarif. 1997. Penuntun Ilmu Kosmetik. Jakarta: Gramedia
- [2] Peraturan Kepala Badan Pengawas Obat dan Makanan Republik Indonesia Nomor 34 Tahun 2013 Tentang Kriteria dan Tata Cara Pengajuan Notifikasi Kosmetika.
- [3] Rejeki. 2010. Analisis Etanol dalam Hair Tonic. Surakarta: Universitas Setia Budi
- [4] Mannion M.1998. *Nutraceutical revolution continues at foundation for innovation in Medicine Conference*. JAm J Nat Med, pp 5:3
- [5] Prameswari, O.M., dan Widjanarko, S.B., 2014. Uji efek ekstrak air Daun Pandan Wangi Terhadap Penurunan Kadar Glukosa Darah dan Histopatologi Tikus Diabetes

- Mellitus. Jurnal Pangan dan Agroindustri Vol.2 No.2 p.16-27
- [6] Osawa, T., 1994. *Novel Naturl Antioxidants, Edisi kesatu. Hlm. 241-251*
- [7] Peraturan Presiden Nomor 33 Tahun 2019. Panduan (Road Map) Pengembangan Industri Rumput Laut Nasional Tahun 2018-2021.
- [8] Selim, S.A. 2012. Antimicrobial, antiplasmid and cytotoxicity potentials of marine algae Halimedaopuntials and Sarconemafiliforme collected from red sea coast. Word Academy of Science. Journal Engineering and Technology. 2 (1): 1154-1159
- [9] Parameter standar umum ekstrak tumbuhan obat . 2000. Departemen kesehatan RI Direktorat Jenderal Pengawas Obat dan Makanan Direktorat Pengawas Obat Nasional.
- [10] Peraturan Kepala Badan Pengawas Obat dan Makanan Republik Indonesia Nomor 12 Tahun 2014 tentang Persyaratan Mutu Obat Tradisional
- [11] Kusuma, Titis dkk. 2017. Pengawasan Mutu Makanan. Malang: Universitas Brawijaya Press