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Study of Bengkuang Mask Formulation (*PachyrhizusErosus L*) with Ethanol Extract of Sweet Potato Leaves (*Ipomoea Batatas L*) as Antioxidant

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Abstract:

The leaves of purple sweet potato or purple yam contain compounds that are essential and provide a good benefits for human health such as vitamins, protein, calcium, iron, beta-carotene, and etc. As antioxidant source, it can be added as an active compounds to mask which mostly used in this era. The present study aims to prepare and characterize the mask prepared using bengkuangor Jicama/Mexican turnip as basic mask, combined with an ethanol extract of sweet potato eaves as antioxidant. Mask formulation was made by the experimental method.The face mask formulation was made by mixing three ingredients namely bengkuangpowder, ethanol extract of purple sweet potato and real honey.The organoleptic test, irritation test and preference test (probandus) were used to characterized three as-prepared masks (F1, F2, and F3). The results showed that the liquid (F1) and semi-solid (F2 and F3) masks, ethanol extract of purple sweet potato leaves provides an additional aroma to the as prepared mask in wich the F3 mask has the best aroma compared to the other mask. In irritation testing, no irritation occurred after 2 weeks for the 3 formulas that were made. The subsequent studies are changes in facial skin after wearing a mask for 2 weeks, the face felt every probandus face becomes a little more moist and smoother. Therefore, the face mask type 3 (F3) was the best formulation for considered for further application.

Keyword: Bengkoang (*Pachyrhizus Erosus L*), Face mask, Sweet Potato Leaf (*Ipomoea Batatas L*), and ethanol

1. Introduction

Having a smooth, soft and pimply in the facial skin certainly becomes a dream for every woman. In fact,some people often desire the facial skin appeared cleaner, smoother and healthier. Unfortunately, the cosmetics products that sold on the market, wasn't safe and healthy for application. The number of facial care cosmetic products that use substances derived from chemicals such as mercury, hydroquinone, etc.These chemical substances are very dangerous to use for long periods of time, because it can damage the skin. Therefore, the cosmetics made from natural products were more safe than synthetic product. Natural masks are masks made from natural ingredients without the addition of chemicals and preservatives.[1] Masks with natural composition can befabricated from fruits, stems, or leaves, as for one of the natural ingredients that can be used as masks made from natural is bengkoang.The benefits of masks are to improve and stimulate the activity of skin cells that are still active. Removes dirt and horn cells that are still present in the skin in depth.[2]Skin that is routinely treated using a mask will avoid the symptoms of premature aging. Besides that the mask also makes the face always look brighter, fresher, and healthier.[3]

Bengkoang has a high moisture content and anti-inflammatory properties which functions to cool the skin from the feeling of dryness that attacks the skin due to very hot sun, by using bengkoang for facial masks so that facial skin is protected from feeling dry, brighter and appear fresh.[4]Bengkoang fruit masks can show a change that is to reduce wrinkles on facial skin by 100%.[5] Yam tubers contain whitening agents (whitening agents) that can whiten and eliminate black marks and pigmentation on the skin.

Masks made from bengkoang can be combined with a variety of plant extracts / other plants, such as fruit extracts and other leaves.[5] The Formulation Of Natural Masks Made From Bengkoang and Black Cumin To Reduce Wrinkles On Facial Skin. Besides black cumin leaves, the possibility of purple sweet potato leaf extract can also be combined with bengkoang mask because purple sweet potato leaves have high antioxidant compared to the fruit the high antioxidants from sweet potato leaves.[6] purple until it reaches 70% of 100%. Purple pigment in purple sweet potato is useful as an antioxidant because it can absorb air pollution, poisons, oxidation in the body, and inhibits the collection of blood cells.Sweet potato leaves contain quite a lot of vitamin C, even more than the sweet potatoes.[7]

Antioxidant activity of purple sweet potato juice as free radicals can be known using the reagents 1,1-diphenyl-2-picrylhydrazyl (DPPH) which results in the highest antioxidant activity possessed by vitamin c, ngu sweet potato juice, juice yellow sweet potato, and white sweet potato juice.[8]Antioxidant power test of the ethanol extract of tubers and leaves of several varieties of yam, which results in yam leaves having higher antioxidant power compared to yam tubers.[9]Phenolic levels and antioxidant activity at various concentrations of liquid extracts of purple sweet potato leaf ethanol extract, the result that the largest total phenolic content was found in 70% ethanol extract and the

highest antioxidant activity in 30% ethanol extract.[10]

Antioxidants are substances that are able to neutralize or reduce the negative effects of the presence of free radicals.[11]Antioxidants function to protect the body from free radicals, both endogenous and exogenous. Parts of the body that are often exposed to exogenous free radicals are the skin, such as ultraviolet radiation, and cigarette smoke. High exposure to free radicals on the skin can cause stress on the skin. Stress on the skin, will result in skin prone to diseases such as atherosclerosis, skin cancer, and premature aging. Purple sweet potato leaves can improve the quality of the skin that is able to prevent wrinkles and prevent pigmentation, this is reinforced by research Antioxidants contain phenolic or polyphenolic compounds which are flavonoids.[12] Flavonoid compounds as antioxidants todayare very much studied, because flavonoid compounds found in antioxidants have the ability to change or reduce the risk that can be caused by free radicals and can also be used as anti-free radicals.[13]

Based on the above background, researchers are interested in conducting research with the title "Study of Bengkoang Mask Formulation (Pachyrhizus erosus L) with Ethanol Extract of Purple Sweet Potato Leaves (Ipomoea batatas L)".

2. Methods

2.1 Preparation of Bengkoang Blubs

3 Kg of bengkoang was chopped, and blended until smooth.Then squeeze the bengkoang which has been blended on the filter until it runs out. Discarded pulp from bengkoang bulbs that is not needed. Next, the juice from the bengkoang bulbs is deposited in a baking pan dish overnight at room temperature. Supernatant discarded after ascertained that bengkoang bulbs settles at the bottom of baking pan. The bengkoang bulbs is roasted at 45ºC to dry for 120 hours (5 days). After dry, then the bengkoang bulbs is dried at room temperature for 15 minutes. Then crushed until smooth and sifted so that bengkoang tuber juice is produced in the form of smooth powder. Then put into a container.[5]

2.2 Purple Sweet Potato Leaf Extract Procedure

Weighed purple sweet potato leaves as much as 3.5 kg. Cleaned purple sweet potato leaves. Then drained and chopped into small pieces. Then dried and protected from direct sunlight.Then the dried leaves are divided into 2 containers. The first container was dissolved 96% ethanol as much 1,4 L. then the second container was dissolved 96% ethanol as much ,4 L so that the total solvent used was 2,8 L. Every now and then stirring, and this process is carried out for 3 days. The ethanol extract is filtered, then evaporated on a water bath and kept in the temperature until it is almost dry or thick. Then obtained thick purple sweet potato leaf extract. Put in a container and avoid direct sun contact, stored in a cool place.[6]

2.3 Procedure for Making (Formulation) Facial Masks

This natural face mask formulation is made with different formulas. The formula can be seen in Table 1. Natural face mask formulations are made by mixing three ingredients, bengkoang powder,ethanol extract of purple sweet potato and real honey. The ingredients are placed on a plate. The plate used is a ceramic plate, so that the ingredients

don't stick. Starting from bengkoang powder as much 2 grams, then added and mixed with 7 grams of

honey, stir until evenly distributed then add 1 gram extract purple sweet potato leaf to top of bengkoang powder that has been mixed with honey. After mixing the ingredients, then stir with a spatula until homogeneous. The mask is put in a cream pot. The mask that has been put in a cream pot, then stirred again with a spatula, so that the mask is more homogeneous, and

with a total weight of mask per cream pot is 10 grams. Masks are stored at room temperature.[5]

Tabel 1. Natural Facial Mask Formula

No	Formula	Bengkoang Powder	Ethanol extract of purple sweet potato leaves	Honey	Total
1.	Formula 1	2 grams	1 grams	7 grams	10 grams
2.	Formula 2	2,5 grams	1,5 grams	6 grams	10 grams
3.	Formula 3	3 grams	2 grams	5 grams	10 grams

2.4 **Characterization**

1. Organoleptic test

Make observation of the smell, color, and shape for 2 weeks.

2. Test the facial mask irritation

The feasibility of using a face mask is first tested on the skin of the hands and the skin behind the ear of the probandus. The mask is applied to the back of the hand and the skin behind the ears, wait for 20-30 minutes, then the mask is removed. Seen the results, is it safe to use or not. If it does not cause irritation to the skin, then the mask can be used for facial skin.

3. Test on probandus

Face cleaned first (washing face) then rinse with water. Dried with a soft towel or tissue. The mask is mixed with a little water and then applied to the face evenly (except eyes and around lips) use a mask brush and wait for 30-60 minutes. Then the mask is removed with water using a soft towel until clean. Masks are used at the age of 20-40 years. The mask is used until the mask is used (2 weeks).

3. Results

3.1 Data on Organoleptic Test, Irritation Test and Discussion

Research on the Bengkoang Mask Formulation Study with Ethanol Extract of Purple Sweet Potato Leaf. The results of each test formulation include organoleptic tests, irritation tests can be seen in Table 2.

Mask formulation made from natural ingredients using bengkoang juice, thick extract of purple sweet potato leaves and real honey can make the face become moist, and smooth. Organoleptic Test and Irritation Test Results can be seen in Table 2. shows the shiny black organoleptic parameters and smell from the thick purple sweet potato leaf extract. The sparkling black color is caused by a mixture of thick purple sweet potato extracts so that when homogeneous it becomes sparkling black.

Table 2. Test Results of the Organoleptic Test and the Irritation test

No.	Formula	Organoleptic Test	Irritation Test
1.	1	Color : Brown Smell : Typical Purple Sweet Potatoes Form : Liquid	Do not irritate the skin of the palms and behind the ears
2.	2	Color : Black Smell : Typical Purple Sweet Potatoes Form : Semi-Solid	Do not irritate the skin of the palms and behind the ears
3.	3	Color : Black Smell : Typical Purple Sweet Potatoes Form : Semi-Solid	Do not irritate the skin of the palms and behind the ears

This preparation is produced in the form of a paste or semi-solid after mixing and observed for 2 weeks. The irritation test performed on probandus who will use the mask does not occur, this is because the ingredients used are natural ingredients and are not harmful to the skin. This irritation test needs to be done to determine the safety of the preparation due to external use, when using a mask the skin becomes brighter, smoother and moisturized.

The results of observations from studies conducted on formulas 1,2,3 and 3 include organoleptic observations (smell color and shape for 2 weeks), irritation test and test on probandus. Mask formulation 1 changes in the second week the change from paste to liquid, this is because of the incompatibility in the formula made so that the mask does not last long in the form of paste or semi-solid. The phase of changing the paste to liquid occurs on the 9th day, this is due to the addition of too much honey, in experiment formulation 1 so that the combination of bengkoang extract and purple sweet potato extract became less effective so that the form of pasta that should last for ± 1 month is shorter. In irritation testing, No irritation occurred after 2 weeks for the 3 formulas that were made.

The irritation test is done on the 7th day behind the ear and behind the palm of the hand for 30 minutes to find out and see if irritation occurs. This irritation can be seen and felt when after 30 minutes wearing the mask in the test area, if a rash or itching occurs, then this mask is not safe to use so further testing must be stopped, but the formula made does not cause rashes or itching so that this face mask is safe to use on facial skin, and can be continued in the next test.

3.2 Change Data Test Results on Facial Skin and Discussion

Based on the test results in Table 2, the test for facial skin changes using probandus can be continued, which can be seen in Table 3.

Figure 1. Mask formulation

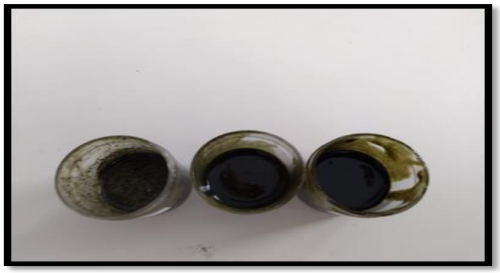

Figure 2. Mask

Table 3. Test Results for Changes in Facial Skin Data

Formula	Probandus	Change	Hasil
Formula 2	Probandus 1	2nd Week	The face becomes a little more moist and a little brighter
	Probandus 2	2nd Week	The face becomes a little smoother and a little more moist
Formula 3	Probandus 3	2nd Week	The face becomes a little smoother and slightly moisturized
	Probandus 4	2nd Week	The face becomes a little smoother and slightly moisturized

4.Discussions

The results of subsequent studies are changes in facial skin after wearing a mask for 2 weeks, the face felt every probandus face becomes a little more moist and smoother, this is due to a combination of honey, bengkoang powder and purple sweet potato leaf extract, which makes the face change a little, changes that occur a little longer, because the mask used is a mask of natural ingredients, whichs takes a little longer to provide optimal effect. The use of masks is done every 1 time 2 days within 2 weeks of use. After treatment different results are obtained compared to the initial conditions of use, changes that are seen after the use of a mask that is a very good improvement seen from the condition of the facial skin becomes a little smoother, softer and a little more moist.

Assessment is done on 4 probandus. The results of changes in the face of probandus at 2 weeks can be seen in Table 3 based on observations concluded that there was a change in facial skin. Skin changes that occur after 2 weeks due to the mask used is a natural mask, then no quick change is obtained. The results of changes in the skin test showed that there were changes felt by each probandus after using this natural face mask, where the probandus skin feels a little more moist, a little smoother and tighter. The mask is very helpful for probandus to moisturize dry skin. Probandus feels comfortable during use because it does not cause irritation to the skin, but feel uncomfortable about the smell of purple sweet potato extract. Probandus prefers F3 because the distinctive smell of purple sweet potato leaf extract is not too strong so F3 is preferred by probandus.

In formula 1 no further research was conducted, because the colors and shapes

change, so it is feared it can cause undesired irritation. Changes in formula 1 can be caused by the temperature and the addition of excess additives which makes the semi-solid form not durable so on the 9th day there is a change in shape and color.

This is in accordance with the benefits of bengkoang , purple sweet potato leaves, to treat facial skin beauty and has no side effects. The content of vitamins C and B1 in bengkoang can brighten, smoothing and vitamin C functions for collagen formation.[8] Purple sweet potato leaves used have antioxidant content that can rejuvenate the skin and can protect the body from particles that can harm health.

Bengkoang made in obtaining the results of facial brightness data showed a change in facial skin color.[5] The antioxidant content in purple sweet potato leaves has been tested with high antioxidants from purple sweet potato leaves to reach 70% of 100%.[6] Purple pigment in purple sweet potato is useful as an antioxidant because it can absorb air pollution, poisons, oxidation in the body, and inhibits the collection of blood cells.

This natural face mask has the advantage that consists of a blend of bengkuang powder,purple sweet potato leaf extract and honey, its use is efficient and does not require any additional tools so it can be used and does not contain harmful ingredients for facial skin. While the drawback is that it takes a long time to make bengkoang juice and purple sweet potato leaf extract, for storage can only last for 1 month. To make this face mask last longer you need to add preservatives, the preservative added must be natural, so it doesn't make the mask react with the preservative.

4. Conclusion

The conclusion of this research is the bengkoang mask containing ethanol extract of purple sweet potato leaves has a liquid form (F1) and semi-solid form (F2 and F3) that are brown to black, which has a distinctive odor of purple sweet potato extract The mask does not irritate the irritation test. The best bengkoang purple sweet potato extract mask preparation is in formula 3 based on the probandus test.

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