

## Formulation And Anti-Aging Effectiveness Of Sheet Mask Formula Containing Macadamia Oil

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### **Abstract.**

*Aging is an inevitable physiological process that must be experienced by every human being. This process is irreversible which includes all organs of the body including the skin. The skin is one of the tissues that will directly show the aging processes. Premature aging can happen to anyone. Especially in Indonesia, which is a tropical climate country with higher intensity sunlight. The degenerative process in skin that is too often exposed to ultraviolet light takes place more quickly to aging. Premature aging can happen to anyone. Especially in Indonesia, which is a tropical climate with higher intensity sunlight. The degenerative process in skin that is too often exposed to ultraviolet light takes place more quickl.*

**Keywords:** *Effect Aging, Premature Aging, Tropical.*

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### **I. INTRODUCTION**

Anti-aging is a process that is useful for preventing or slowing down the effects of aging so that it looks fresh, more beautiful and youthful. Anti-aging therapy would be better if done as early as possible, when all the functions of the body's cells are still healthy and functioning properly. With advances in technology and cosmetic science, aging can be reduced and inhibited so that the skin can look younger [1,2]. Various ways are found to prevent or improve the effects of aging, starting from cosmetic products that are applied topically or drugs taken orally, dermabrasion, chemical peeling, laser peeling, thread lifting. The use of antioxidants is one of the efforts that is often done to prevent aging [3]. Antioxidants are compounds that can neutralize and reduce free radicals and inhibit the occurrence of oxidation in cells thereby reducing the occurrence of cell damage. The human body does not have antioxidant reserves in excess, so if there is excessive exposure to free radicals, the body needs antioxidants from outside. Based on the source of acquisition, antioxidants can be divided into two groups, namely natural antioxidants and synthetic antioxidants. Natural antioxidants are more in demand than synthetic antioxidants, because synthetic antioxidants are feared to have side effects so that natural antioxidants become a much-needed alternative. [4,5].

Utilization of natural ingredients as a source of antioxidants has been developed in cosmetic preparations. Utilization of antioxidant effects in preparations intended for facial skin is better when formulated in topical dosage forms than other

preparations [6]. Facial cosmetics are available in various dosage forms, one of which is in the form of masks [7]. Masks are one of the most effective facial cleansers. Masks include depth cleansing cosmetics, cosmetics that work deeply because they can remove dead skin cells. Masks have many uses, especially for skin tightening, removing horn cells that are ready to peel, providing moisture and nutrition to the skin, improving facial texture, rejuvenating skin, brightening skin tone, shrinking pores, cleaning facial skin pores. clogged with dirt, refreshes the face because it will have a relaxing effect on the facial muscles [8,9]. Compared to other mask forms, sheet masks have good sealing or adhesive properties, thereby increasing the moisturizing, whitening and anti-aging effects of the active ingredients. The use of masks can make the skin temperature increase, the pores will slowly enlarge so that the essence can be absorbed into the skin.

The use of masks can increase the absorption of the active substance 5-50 times [10]. Macadamia oil contains vitamin E (tocotrienols and tocopherols) which are natural antioxidants. These antioxidants can reduce inflammation and oxidative stress on the skin, and this oil exhibits palmitic acid and unsaturated fatty acids similar to those found in the skin [11]. Macadamia oil also contains a lot of oleic acid which is very good for softening the skin, regenerating skin cells, moisturizing the skin and is a natural anti-inflammatory. The content of linoleic acid helps restore the skin's barrier function and reduces Transepidermal Water Loss (TEWL) [12]. Macadamia oil also contains squalene which benefits cell regeneration and acts as an antioxidant by protecting the skin from UV-induced lipid peroxidation [13]. Macadamia oil exhibits high emollient properties and fast penetration thereby helping to maintain the physiological function of the skin [14,15]. Macadamia oil is widely prepared in the form of facial soap, hand cream, face cream and gel as an anti-aging agent. Macadamia oil with a concentration of 25% is formulated as a cosmetic preparation for topical use as the prevention and treatment of dry skin, in addition to the gel formulation as a skin repair due to sunlight and reduce wrinkles when using macadamia oil with a concentration of 0.2% to 2.7%. [16,17].

## II. METHODS

In this paper, experimental research to determine the anti-aging effect of macadamia essence, applied by using mask sheet into the skin, there are 4 type of formulations that used in this paper, the first formula is blanko, the second one is 1% of macadamia essence, the third one is 3% of macadamia essence, and the fourth one is 5% of macadamia essence that applied to sheet mask. The macadamia essence formula is made by macadamia oil, glicerine, butylene glycol, PEG-60 hydrogenated castor oil, makimousse12, nipagin, ethanol, perfume and water. This study used an experimental method in which 12 volunteers divided into 4 groups, 1 group contain 3 volunteers. The procedure to make the essence, Makimousse 12 was added with butylene glycol and glycerin then crushed until homogeneous (mixture I). Nipagin dissolved in hot water

(mixture II). Macadamia oil and PEG-40 hydrogenated castor oil were dissolved in distilled water (mixture III). The second mixture was slowly mixed into the first mixture to form a homogeneous mass, then the third mixture was mixed and crushed until homogeneous. 96% ethanol and 1 drop of perfume were added to the mixture and stirred until homogeneous.

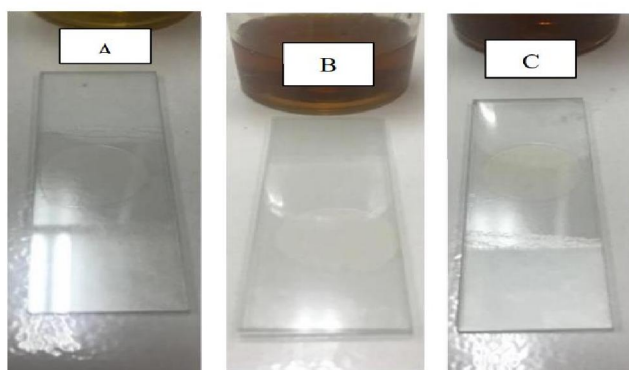
### III. RESULT AND DISCUSSION

Phytochemical screening test was carried out to determine the chemical compounds contained in simplicia macadamia oil. Based on research conducted that macadamia oil has a class of flavonoid compounds, saponins, alkaloids and glycosides. The results of these data can be seen in Table 1.

**Tabel 1.** Compound

No	Compound Group	Result
1	Alkaloids	+
2	Flavonoid	+
3	Glycoside	+
4	Saponin	+
5	Tannin	-

Flavonoids as antioxidants can inhibit lipid peroxidation reactions and good reducing compounds. Flavonoids act as good inhibitors for hydroxyl radicals and superoxide thereby protecting lipid membranes which can lead to reduced pore size and improved skin texture. The results of homogeneity examination of macadamia oil essence showed that all preparations did not show any coarse grains when the preparation was smeared on a transparent glass. The result can be seen on Fig.1.



**Fig 1.** (A) 1% of macadamia oil, (B) 3% of macadamia oil, (C) 5% of macadamia oil.

Evaluation of stability in this study aims to observe changes in color, odor and pH changes in macadamia oil essence preparations. Evaluation of the stability of the preparation was carried out during 12 weeks of storage at room temperature with observation intervals every 2, 4, 6, 8, 10 and 12 weeks. The results of the stability evaluation of each parameter can be seen in table 2.

**Table 2.** Stability Result

Parameter	Formula	Times (Weeks)					
		2	4	8	6	8	10
Color	F <sub>1</sub>	(-)	(-)	(-)	(-)	(-)	(-)
	F <sub>2</sub>	(-)	(-)	(-)	(-)	(-)	(-)
	F <sub>3</sub>	(-)	(-)	(-)	(-)	(-)	(-)
Smell	F <sub>1</sub>	(-)	(-)	(-)	(-)	(-)	(-)
	F <sub>2</sub>	(-)	(-)	(-)	(-)	(-)	(-)
	F <sub>3</sub>	(-)	(-)	(-)	(-)	(-)	(-)
pH	F <sub>1</sub>	6.1	6.1	6.1	6.1	6.1	6.1
	F <sub>2</sub>	6.0	6.0	6.0	6.0	6.0	6.0
	F <sub>3</sub>	6.9	6.9	6.9	6.9	6.9	6.9

The results of observing the color of the macadamia oil sheet mask essence in formulas I, II and III gave a golden-brown color. The observations made showed that the color and odor of the preparations derived from the typical perfume did not change during 12 weeks of storage at room temperature. This shows that the preparation of macadamia oil sheet mask essence is stable. Based on the results of the irritation test carried out on 12 volunteers, which was carried out by attaching a sheet mask preparation containing macadamia oil essence to the skin behind the ear, it showed that all volunteers gave negative results on the irritation reaction parameters. The parameters observed were the presence of red skin, itching, or swelling. From the results of the irritation test, it was concluded that the sheet mask preparation containing macadamia oil essence was made safe to use. The measurement of anti-aging effectiveness was carried out by measuring the condition of the volunteers' skin which included moisture, evenness, pore, spot and wrinkle with the aim of seeing how much effect a sheet mask containing macadamia oil essence had to overcome premature aging of the skin, seen from the percent recovery.

The results of increasing moisture on the volunteer's facial skin for four weeks of treatment by giving sheet mask formula with macadamia oil essence with intervals of use for once a week on a regular basis, the moisture on the volunteer's skin increased in formula III with an average percent recovery of 16.33%, and the blank formula experienced a slight increase with an average percent recovery of 3.23%. After using a sheet mask with macadamia oil essence, the blank group showed a small increase in skin smoothness of 3.83% while F<sub>1</sub>, F<sub>2</sub>, and F<sub>3</sub> showed an increase in skin smoothness to become smoother with an average percent recovery of 8.23%, 13.83%, and 18.8%. From the data obtained in the test of the effectiveness of sheet masks with macadamia oil essence in pore size recovery, it can be seen that in groups F<sub>1</sub>, F<sub>2</sub> and F<sub>3</sub> showed a reduction in pore size, each with an average percent recovery of 8.73%, 17.4% and 30.7%. Meanwhile, the blank group (F<sub>0</sub>) did not show a significant reduction in the pore size of the volunteers, which was 3.27%.

From the data obtained in the test of the effectiveness of sheet masks with macadamia oil essence in the recovery of the number of spots, it can be seen that in

groups F1, F2 and F3 showed a recovery in the number of blemishes, each with an average percent recovery of 13.23. %, 18.57% and 27.17%. From the results obtained in testing the number of facial wrinkles showed that the skin of the volunteers did not have too many wrinkles (17-25). After using the mask, it can be seen that the blank formula has an effect in reducing the number of wrinkles with a low recovery percentage of 5.3%. In the FI, FII and FIII groups, there was an effect of reducing the number of wrinkles with recovery percentages of 16.9%, 23.27% and 32.87%, respectively. There was a change in the number of wrinkles, there was an increase in the volunteer's face from wrinkled (wrinkled parameters: 20-52) to no wrinkles (non-wrinkled parameter: 0-19) in formula III.

#### IV. CONCLUSION

Macadamia oil can be formulated in essence for use in sheet masks with concentrations of 1%, 3% and 5% as well as good physical and preparation stability in storage for 3 months on homogeneity, organoleptic parameters. Macadamia oil essence can provide an anti-aging effect on the skin of volunteers where the macadamia oil essence is prepared at a concentration of 1%, 3% and 5% for 4 weeks of treatment.

The difference in the concentration of macadamia oil in the essence of sheet mask preparations affects the anti-aging effect with the highest concentration showing an increase of 5% which shows the most significant results during 4 weeks of treatment.

#### V. ACKNOWLEDGMENTS

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