Application of parijoto (*medinilla speciosa* l.,) extract as body lotion

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Abstract. Parijoto fruit is among the potential plant that is potential for beauty products. Parijoto fruit extract composed of flavonoids as source of antioxidants that is useful for maintaining healthy skin. The purpose of this study was to determine the validity and feasibility of hand and body lotion enriched with parijoto fruit extract determined by sensory and preference tests. This study used construct validity. Data was collected through observation and documentation methods. The results showed that hand and body lotion enriched with parijoto fruit extract was declared feasible based on sensory tests with the lowest percentage of 83% and the highest of 92%. The preference test obtained the lowest percentage of 82% and the highest percentage of 97%. Hand and body lotion was declared very feasible based on sensory and preference tests. There is a need of assessment in the used formula in order to obtain the best formula for the production of hand and body lotion.

Introduction

Body skin is the widest body area susceptible to free radicals. The free radicals could bind and damage cell components, results in the skin drying, wrinkling, and premature aging. Along with the increase of public awareness towards skin health, many efforts have been given to prevent skin damage. Application of skin treatment cosmetics containing antioxidants activity is believed to significantly protect the skin from the dangers of free radicals. Stratum korneum, the outermost skin layer, is heterogeneous epidermis layer that is selectively permeable of protecting skin against drying and environmental effects while maintaining the water sufficiency to ensure its role in hydrating skin. The degradation of skin function mostly indicates by the integrity changing of stratum corneum thus increasing the transepidermal water loss and decreasing the skin hydration (Ribeiro, Estanqueiro, Oliveira, & Sousa Lobo, 2015).

Skin aging and dermatological conditions are mostly generated by oxidative stress. External factors affecting skin damage are ultraviolet radiation of sunlight as well as air pollution. Antioxidants play an important role in controlling the formation of free radical. Plant secondary metabolits such as phenolics compound, flavonoids, folic acids, carotenoids, benzoic acids, and tocopherol are the active compounds available in natural antioxidants (Azahar, Abd Gani, Zaidan, Bawon, & Halmi, 2020; Petruk, Del Giudice, Rigano, & Monti, 2018). Melastomataceae is among the well-known sources of plant having therapeutic value. It was revealed that these plants contain bioactive compounds of

flavonoids and phenolic compounds. Phenolic-rich plants are very beneficial raw materials to provide protection towards effects of UV radiation (Anitha, 2012).

Sa'adah et al. (2020) explored parijoto that contains high anthocyanin, included to flavonoids group. They investigated the effect of parijoto extract on antioxidant activity and phagocytosis of macrophage cells. They found that extract of whole parijoto fruit could be applied as a source of anthocyanin which has antioxidant activity. Considering the potential of parijoto fruit as antioxidant, study on the application of parijoto extract as additional agent in the production of hand body lotion was carried out. The results of sensory and organoleptic tests were descriptively analysed.

Method

In this research, hand body lotion was produced with the addition of parijoto fruit extract. The addition of parijoto fruit extract (Medinilla speciosa l) was expected to enhance the utilization of antioxidant content which is safer than that of commercial hand body lotion. Dark red ripe fruit of parijoto was used. Methanol was used as solvent. Other ingredients used in the production of hand and body lotion were stearic acid ($C_{18}H_{36}O_2$), triethanolamine ($C_6H_{15}NO_3$), liquid paraffin, cetyl alcohol ($C_{16}H_{34}O$), methylparaben ($C_8H_8O_3$), fragrances and distilled water. Methanol was also applied to analyse and characterise the parijoto fruit extract. Commercial hand and body lotion was utilised as control.

Parijoto extract was obtained by maceration. Application of maceration process was intended to maintain the phenolic compound of parijoto. It was found that application of heating process could decrease the phenolic compound of about 30% (Pertiwi, Hidayah, Andrianty, & Hasbullah, 2019). Parijoto fruit was washed under running water. The small slices were dried and put in maceration bottle. Methanol was poured until all the sample was submerged and covered by a layer of liquid on top. The volume ratio of parijoto fruit to methanol was 1: 5. The bottle was covered and left for 4 days in a dark and protected from light place, while shaking three times a day. After 4 days, the solution was filtered and let to sit for a few hours before poured it into another container. The process was repeated to reach perfect samples. The obtained liquid extract was then concentrated by means of vacuum distillation to obtain thick extract of parijoto fruit. The procedure was modified from Geraldine et al. (2018).

The oil phase was made by melting stearic acid, cetyl alcohol, and liquid paraffin at 80oC. The water phase was produced by heating aquadest and triethanolamine at 80oC while stirring continuously until homogeneous. Oil and water phases were mixed and crushed to get homogeneous mixture. Parijoto fruit extract was added gradually at 35oC. All the mixtures were stirred to be homogeneous.
Sensory and organoleptic tests were applied to the obtained hand and body lotion samples. Sensory testing was carried out with indicators of colour, aroma, homogeneity, viscosity, texture, absorption, and impression of use. Organoleptic testing was carried out using indicators of colour, aroma, homogeneity, viscosity, texture, absorption, impression of use, and packaging form.

Result and Discussion

Hand body lotion with the addition of parijoto fruit extract could be considered feasible to use after expert, i.e. pharmacist judged that it appropriates in term of safety ingredients used in the manufacture of the hand body lotion product. The assessment indicators consist of colour, aroma, texture, homogeneity and viscosity.

The feasibility of hand body lotion was determined based on sensory test data by expert panelists. This fact shows that the hand body lotion product was suitable for daily skin care cosmetics because the hand body lotion product, apart from having a very good and appropriate colour, also has the best texture and the ingredients used were also classified as safe for does not cause skin reactions in the form of irritation, redness or itching. The colour of the hand body lotion product is slightly yellowish

white compared to the colour of the hand body lotion on the market because of the addition of parijoto extract. The brown colour of the parijoto extract greatly affects the results of the hand body lotion so that the addition of the extract will cause a colour change from white to yellowish white. The more the proportion of parijoto fruit extract added to the hand body lotion product, the colour of hand body lotion product becomes yellowish white to brownish yellow.

According to the results of sensory tests based on aroma indicators, hand body lotion product was considered very well because they have an appropriate aroma and do not sting like commercial hand body lotion products. The addition of fragrances in the product was adjusted to the fragrance formula used in the commercial hand body lotion products thus creates a balanced aroma. The less proportion of fragrance added to the hand body lotion product will affect the fragrance of the hand body lotion product.

According to the results of sensory tests based on texture indicators, expert panelists stated that hand body lotion products have a very appropriate. The produced hand body lotion has a soft texture and easy to use. From the results of the cumulative average sensory test, it can be seen that hand body lotion with the addition of parijoto fruit extract is very suitable for skin care.

The results of the preference test showed that the hand body lotion product that was most liked by the panelists was a brighter colour because of the composition of the parijoto extract in it. Besides having a brighter and more attractive colour, hand body lotion was preferred because of their smooth texture and considered easier to apply than other hand body lotion products. It was determined by the compositions of materials used in the manufacture of hand body lotion products. From the results of the average cumulative percentage of the preference test, it can be concluded that the hand body lotion was very popular to the panelists. The spreadability properties were governed by the addition of triethanolamine. Higher triethanolamine concentration increases the lotion spreadability. On the contrary, the increase of stearic acid concentration decreases the spreadability (Rajendra, Nira, Sahana, & Ashok, 2016).

Skin that loses moisture tends to become dry and rough that needs a input nutrient to maintain and to increase skin moisture. The antioxidant content of parijoto fruit in hand body lotion used for dry skin care can keep skin moist and make skin that was previously very dry gradually becomes normal and moisturized. This is in accordance with the finding of Stallings and Lupo (2009) that the application of botanical in skin care products contain antioxidant and anti-inflammatory benefits that revealed to be beneficial for skin conditions.

The hands and feet skins require cares. The hands skin is the most massive in contact with or in contact with foreign objects which can damage its beauty and health. Moisturiser should immediately be applied after every shower, because when the skin is half wet it is easier to absorb the moisturiser. Hand body lotion needs to be regularly applied every day on the hands skin.

The research showed that daily treatments using hand body lotion on dry skin for several weeks showed an increase in the moisture of hand skin. From the results of clinical test calculations, it can be seen that there is a significant effect before and after treatment using hand body lotion with addition of parijoto fruit extract.

Basically, moist skin contains enough water and not dries. This skin moisture is influenced by several factors, including internal factors and external factors. This internal factor can be caused by not drinking enough water. Water plays an important role in maintaining the skin moisture of hands and feet because water can not only replace lost body fluids but also help remove toxins from the body and maintain skin moisture. Dry skin changes due to summer, cold air, or things related to environmental

factors. Doing outdoor activities without using protective cosmetics also affects the moisture level of the skin. To prevent the skin from becoming damaged, persistence treatment is of important.

Relating the research and existing theories, it can be seen that parijoto fruit with its ingredients can increase skin moisture. The increase in skin moisture occurs gradually from very dry skin to dry, normal then moist gradually and takes a long time. It is therefore combination treatments are needed that also have the potential to affect skin moisture, such as using moisturizing creams, using protective cosmetics from sunscreen when doing outdoor activities, wearing long clothes or other complementary clothing that can protect the skin from direct sun exposure and maintain water consumption of 8-10 glasses per day.

Parijoto contains saponins and kardenolin, besides that the fruit contains flavonoids and the leaves contain tannins. Parijoto fruit contains tannins, flavonoids, saponins and glycosides. Vitamin C, vitamin E, flavonoids and saponins found in parijoto are very useful in overcoming skin problems in women, especially treating skin that tends to be dry (Pertiwi, et al., 2019). Experiments were carried out by using the parijoto fruit as an additional ingredient in the production of hand body lotion products. The research was conducted with the treatment of hand body lotion to respondents by rubbing it on their hands, the experiment were conducted on respondents with normal-dry skin types with different age susceptibility.

The results of laboratory tests on hand body lotion products with the addition of parijoto fruit extract showed that the vitamin C and vitamin E contained in these products were 115.984 ppm and 66.738 ppm, respectively. The high content of vitamin E found in parijoto fruit plays a role in helping to moisturise and soften the skin. Vitamin C found in parijoto fruit can improve skin elasticity. The content of both in the hand body lotion product causes the product to have a high effectiveness in skin moisturising.

The ingredients for hand body lotion including glycerin, TEA, liquid paraffin, Stearic Acid, Cetyl Alcohol, Methyl Paraben, Fragrance, and Aquadest also affect the results of clinical test on skin moisture where glycerin functions as a humectant, i.e. components that dissolve in phase water and is the most important part in the production of hand body lotion. Glycerin is added to cosmetic preparations to maintain the product moisture content on the skin surface during use.
Humectants affect the skin by softening and maintaining skin moisture to keep it balanced. The use of liquid paraffin also softens the skin because it is in the form of a wax-like liquid that can cover the skin surface that it minimise the skin water evaporation.

It was shown that the product quality was determined by texture, colour, aroma, adhesiveness, and reaction to the skin. The hand body lotion has a very soft texture that is smooth on the skin. The hand body lotion has pleasent aroma, generated by fragrance ingredients derived from essential oils obtained naturally from the plant extraction process. The colour of hand body lotion is slightly brownish, given by parijoto fruit extract which is slightly brown in colour. The hand body lotion has very good adhesion to skin that it can adhere perfectly. This is supported by the theory which stated that the lotion preparation must be able to stick to the skin for a long time to allow contact between the lotion and the skin. Sufficient contact time allows the lotion to work effectively on the skin (Dermawan, Pratiwi, & Kusharyanti, 2020).

The results of the clinical test assessment stated that the effectiveness of using hand body lotion with the addition of parijoto fruit extract gave insignificant results, especially on skin elasticity, even there tended to be no change in certain age categories because parijoto fruit did not contain collagen which could effectively increase skin moisture. However, in the adolescent category, the elasticity of the skin tends to change due to the presence of vitamin C in parijoto which can increase skin elasticity. Further

study should be carried out to obtain optimum mixture of the Melastoma extract since it demonstrated good anti-elastase and anti-collagenase activity against premature skin aging (Azahar, et al., 2020).
The skin softness and moisture were increase due to the presence of vitamin E in parijoto fruit which can moisturise and soften the skin. Hand body lotion is proven not to cause any reactions on the hands skin, either in the form of an itching reaction, redness, or a burning sensation in the hands.

Conclusion

Study on the production of hand body lotion enriched with parijoto fruit extract has been done. The validity of hand and body lotion products with the addition of parijoto fruit extract on aspects of colour, aroma, homogeneity, thickness, texture, ease of absorption, impression of use and reactions to the skin were assessed by 3 expert panelists who were doctors, pharmacists and beauty salon owners stated as valid. The appropriateness of hand and body lotion was measured based on sensory tests with indicators of colour, aroma, homogeneity, thickness, texture, ease of absorption, impression of use and reactions to the skin. Assessment results of hand and body lotion product using sensory test resulted in a value of 81% which was categorised as very suitable. The appropriateness of hand and body lotion was also determined from the preference test with indicators of colour, aroma, homogeneity, thickness, and texture. Assessment results of hand and body lotion of preference test resulted in a value of 91% which was categorised as very favourable by the panelists.

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