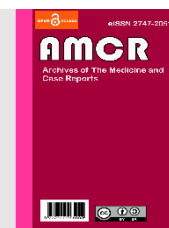




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## The Potential of Natural Ingredients *Ziziphus spina-christi*, *Nauclea subdita*, and *Sauropus androgynus* as Skin Care

Alliza Nur Shadrina<sup>1</sup>, Nieda Berliana Eiko<sup>1</sup>, Wella Sulvita<sup>1\*</sup>, Nia Yuniarsih<sup>1</sup>

<sup>1</sup>Faculty of Pharmacy, Universitas Buana Perjuangan Karawang, Karawang, Indonesia

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#### \*Corresponding author:

Wella Sulvita

#### E-mail address:

[Fm19.wellasulvita@mhs.ubpkarawang.ac.id](mailto:Fm19.wellasulvita@mhs.ubpkarawang.ac.id)

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### ABSTRACT

Skin aging is characterized by wrinkling, dryness of the skin, discoloration, and loss of elasticity. In addition to genetic factors, environmental hazards such as UV radiation and oxidative stress contribute to skin aging. There is evidence to support that antioxidants can reduce the damage done by oxidative stress in the skin. However, criticism has been raised on the safety of synthetic antioxidants, so efforts have been made to explore various natural substances as powerful antioxidants. Currently, many plant extracts are used in cosmetics for the optimization of antioxidant effects. Bidara leaves (*Ziziphus spina-christi* L.), Bangkal trunk bark (*Nauclea subdita* (Korth.) Steud.) and katuk leaves (*Sauropus androgynus* (L.) have the potential to be developed as skin care.

### 1. Introduction

Skin aging is characterized by wrinkling, dryness of the skin, discoloration, and loss of elasticity. In addition to genetic factors, environmental hazards such as UV radiation and oxidative stress contribute to skin aging. There is evidence to support that antioxidants can reduce damage caused by oxidative stress in the skin. However, criticism has been raised on the safety of synthetic antioxidants, so an attempt was made to try to explore various natural ingredients, such as strong antioxidants. Currently, many plant extracts are used in cosmetics to optimize the

antioxidant effect. Moreover, consumer response to these ingredients is a very positive response.<sup>1</sup>

Indonesia is an archipelagic country. It has a tropical climate which is located between two continents, namely Asia and Australia, and two oceans, namely the Indian Ocean and the Pacific Ocean. Geographical location, outside the area, and the number of islands make Indonesia a country that has a diversity of flora species that have the potential as natural ingredients used for various types of cosmetics. Cosmetics are preparations or mixtures of materials that are ready to be used on the outside of the body to clean, perfume, change the appearance



and improve body odor or protect and maintain the body in good condition. Skin is the organ of the human body that is located on the outermost and largest in humans and serves as a barrier layer to protect the body against environmental influences. The skin has a complex structure of epithelial tissue that is elastic and sensitive and has a type and color that varies depending on climate, race, gender, and age.<sup>2,3</sup>

Antioxidants have many benefits for skin health, namely as anti-aging. Antioxidants also protect against ROS due to oxidative stress and UV protection. Anti-aging is a well-known complex physiological process that is accompanied by progressive memory loss, dementia, cognitive dysfunction, schizophrenia, Parkinson's, Alzheimer's disease, and so on. Intake of natural antioxidants from plants that can produce many antioxidants to control oxidative stress and oxidative control stress caused by sunlight and oxygen it can be a source of new compounds with antioxidant activity that are effective and safe to inhibit the aging process. Protection from ROS is living tissue that has a control mechanism to maintain the balance of ROS. The relative importance of antioxidants depends on which ROS are generated and how they are. Antioxidants also inhibit the production of ROS by direct cleavage and reduce the number of oxidants in the surrounding cells, preventing ROS from reaching their biological targets, limiting the spread of oxidants that occur during lipid peroxidation, and thwarting the action of oxidative stress, which thereby preventing aging.<sup>4</sup>

#### **Benefits of bidara leaves (*Ziziphus spina-christi* L.) as lip balm**

Bidara is a thorny tree that is resistant to heat and drought and has a very strong taproot. Studies reveal that bidara leaves have a variety of active chemical compounds, including alkaloids, and flavonoids such as rutin, quercetin, and tripernoid, that play a role in medicine. All plant parts of bidara have pharmacological activity because they have

antibacterial, antifungal, antioxidant, anti-inflammatory, and antihyperglycemic activities.<sup>5,6</sup>

A study states that bidara leaves contain significant antioxidants that have the potential to optimize skin care. A study made bidara leaf extract into lip balm preparations. In this study, there were 4 lip balm preparations enriched with 0 bidara leaf extract; 1; 2; and 3%. The antioxidant activity test was carried out using the DPPH (1,1-diphenyl-2-picrylhydrazyl) method and identified the active components using GCMS. The results showed that bidara leaf extract had a very strong antioxidant activity with an  $IC_{50}$  25.22 ppm.<sup>7,8</sup>

#### **Bangkal trunk bark (*Nauclea subdita* (Korth.) Steud.) as preparation for lotion**

Bangkal (*Nauclea subdita* (Korth.) Steud.) is one of the swamp plants of Borneo, an upright tree with a height of 7 to 16 meters. Leaves leathery, oblong to oblong-ovate, 11 to 25 cm long, round or heart-shaped at the base. Stipules are green, ovate to elliptical, 1 to 3 cm long. Bangkal plant (*Nauclea subdita* (Korth.) Steud.) contains secondary metabolites from the polyphenol group, such as flavonoids, saponins, steroids, and tannins which have the potential as natural antioxidants. Antioxidants also function to protect the body from the bad effects of free radicals that can cause skin damage. This bangkal plant was formulated with variations in the concentration of stearic acid as an emulsifier, namely FI (2%), F2 (3%), and FII (5%), into lotion preparations. In determining antioxidant activity using the DPPH method with ascorbic acid as a comparison, the  $IC_{50}$  value. Methanolic extract of the bark of *N. subdita* was  $34.1787 \pm 0.2781$ , which was classified as a very active antioxidant. Results showed an increase in the concentration of stearic acid affects the antioxidant activity. The higher the concentration of stearic acid, the greater the  $IC_{50}$ . The results of  $IC_{50}$  lotion at FI, FII & FII were  $61.5593 \pm 0.2673$  ppm,  $66.8051 \pm 0.2317$  ppm &  $72.6253 \pm 2.3117$  ppm, respectively. Based on the research. It can be concluded that the methanolic



extract of the bark of Bangkal (*Nauclea Subdita* (Korth.) Steud.) has a very active antioxidant activity.<sup>9,10</sup>

### **Katuk leaves (*Sauropus androgynus* (L.) as preparation for liquid soap**

Katuk (*Sauropus androgynus*) is a vegetable plant that is widely found in Southeast Asia. The characteristics of the katuk plant are the branches are rather soft, the leaves are arranged alternately on one stalk, oval to round in shape with a length of 2.5 cm and a width of 1.25-3 cm. Katuk (*Sauropus androgynus*) is a traditional medicinal plant that has high nutritional value, is an antibacterial, and contains beta carotene as an active substance for carcass color. Katuk leaves have flavonoid chemical compounds that have antioxidant activity. Antioxidants can be produced from natural products, one of which is katuk leaf which is a plant that contains vitamin C and flavonoid compounds as antioxidants. *androgynus* (L.) Merr.) Ethanol extract of 80% katuk leaf has an IC<sub>50</sub> value of 813.09 ppm, and for 96% ethanol extract, it is 1024.27 ppm. The research showed that in the organoleptic test, the pH, as well as the height and stability of the foam, met the requirements of SNI. At concentrations of 0.02, 0.04, and 0.06 while the specific gravity test at concentrations of 0.02, 0.04, and 0.06 did not meet the requirements of SNI. So that the formulation of katuk leaf ethanol extract with a concentration of 0.02 gram is the best preparation of katuk leaf ethanol extract of liquid soap.<sup>11-14</sup>

### **2. Conclusion**

Bidara leaf (*Ziziphus spina-christi* L.), Bangkal trunk bark (*Nauclea subdita* (Korth.) Steud.), and katuk leaf (*Sauropus androgynus* (L.) have been the potential to be developed as skin care.

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