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An Antioxidant Component of Indonesian Herbs in Face Mist and Gel Spray Preparation: A Narrative Review

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A B S T R A C T

Antioxidants for facial skin care would be better formulated in a topical form because the active substances will interact longer with facial skin. Indonesia is known for its wealth of natural ingredients that are useful as antioxidants. Research related to natural ingredients has been widely carried out and has good content for the skin. The good antioxidant content in herbal plants is in the form of secondary metabolites, namely flavonoids, alkaloids, phenolic compounds, carotenoids, tannins, steroids, and triterpenoids. This literature review aims to describe traditional Indonesian natural ingredients that have the potential to contain antioxidants that can be made into face mist and spray gel preparations. In conclusion, plants that can be formulated as face mist preparations are purple cabbage, yam tubers, and saffron flowers. Meanwhile, the herbs that can be used for spray gel preparations are strawberry fruit, buas-buas leaf, sweet orange peel, and purslane plant.

1. Introduction

Facial skin health is part of an attractive appearance for everyone. The tropical climate in Indonesia, which consists of exposure to sunlight and high humidity, can affect skin health. Skin damage is caused by exposure to free radicals from UV rays and environmental pollution.[1] One of the efforts to maintain healthy skin is to use skincare with antioxidant content. Antioxidants are electron-donating compounds (reducing agents) that can neutralize free radical molecules in the body.[2] Antioxidants for facial skin care would be better formulated in a topical form because the active substances will interact longer with facial skin.[3] Indonesia is known for its wealth of natural ingredients that are useful as antioxidants. Research related to natural ingredients has been widely carried out and has good content for the skin. The good antioxidant content in herbal plants is in the form of secondary metabolites, namely flavonoids, alkaloids, phenolic compounds, carotenoids, tannins, steroids, and triterpenoids.[4] The content of antioxidants is currently widely used as a component in skincare and cosmetic formulations. The use of antioxidants is intended as a protective material and maintains the health of facial skin.[5,6]

Face mist is a cosmetic preparation that is used as a toner, which functions to remove residual oil and mild disinfectant in the pores of the face. Toner is included in the lotion preparation.[7] While spray gel is

a cosmetic preparation that has topical advantages that are safer and more practical, and easy to clean.[8] The preparation is quite practical in use. This literature review aims to describe traditional Indonesian natural ingredients that have the potential to contain antioxidants that can be made into face mist and spray gel preparations.

The content of secondary metabolites of herbal plants

Table 1 shows the content of antioxidant compounds contained in Indonesian natural ingredients. The formulations commonly used are face mist and spray gel.

Table 1. Content of secondary metabolites in Indonesian natural ingredients.

Herbs	Antioxidants	Preparation	Methods
Purple cabbage (*Brassica oleraceae* var. *sylvestris*) and Yam bean (*Phacyrhizus erosus*)[7]	Flavonoids and saponins	Face Mist	Maceration extraction, DPPH antioxidant activity test, physical evaluation of the preparation, moisture test
Water apple leaves (*Syzygium aqueum* (Burn.f)) and mango leaves (*Mangifera indica* L.)[9]	Polyphenols and flavonoids	Spray gel	Maceration extraction, phytochemical screening, DPPH antioxidant activity test, physical evaluation of preparations, irritation test, stability test
Strawberry (*Frogaria x ananassa*)[10]	Flavonoids, phenolics, saponins, tannins, alkaloids, triterpenoids, and glycosides	Spray gel	Maceration extraction, DPPH antioxidant activity test, physical evaluation of preparations
Purslane plant (*Portulaca oleracea L.*)[11]	Polyphenols, saponins, and flavonoids	Spray gel	Maceration extraction, DPPH antioxidant activity test, physical evaluation of preparations, hedonic test
Sweet orange peel (*Citrus sinensis* L.)[12]	Flavonoids and phenol	Spray gel	Maceration extraction, DPPH antioxidant activity test, evaluation Jicama
Yam bean (*Pachyrhizus erosus (L.) Urb*) and saffron (*Crocus sativus L.*)[13]	Flavonoids, saponins, alkaloids, phenolics, and carotenoids	Face Mist	Maceration extraction, antioxidant activity test of DPPH, physical evaluation of preparations
Buas-buas Leaves (*Premna serratifolia L).*[14]	Flavonoids, saponins, tannins, and triterpenoids/steroids	Spray gel	Maceration extraction, antioxidant activity test of DPPH, physical evaluation of

Purple cabbage (*Brassica oleraceae* var. *sylvestris*) and yam (*Phacyrhizus erosus*)

Purple cabbage is a type of vegetable that contains anthocyanin polyphenol compounds. Based on previous studies, the formulations for making a good face mist are purple cabbage extract, yam extract, glycerin, PVP, and aquadest. The method used in the manufacture of this preparation is maceration extraction, DPPH for antioxidants. The results showed that the average percentage of inhibition of the two extracts was 56% of antioxidant activity.[7]

Water apple leaves (*Syzygium aqueum* (Burn.f)) and mango leaves (*Mangifera indica* L.)

Both types of leaves contain polyphenolic compounds and flavonoids as antioxidants. Making face mist spray the gel in the extract obtained a

formulation with a good evaluation, namely mango leaf extract, guava leaf extract, vitamin C, HPMC, HEC, propylene glycol, methylparaben, and aquadest. The results of the optimum antioxidant activity in the combination of guava and mango leaf extract with a ratio of 1:2 contained 0.107% antioxidant activity with an IC value of IC_{50} 5.35 µg/mL.[9]

***Strawberry* (*Frogaria x ananassa*)**

Strawberry is a plant that has a high content of phytochemicals, namely flavonoid, phenolic, saponin, tannin, alkaloid, triterpenoid, and glycoside metabolites. Making spray gel 70% ethanol solvent maceration extraction method was performed. The good formulation results were strawberry extract, hydroxyethyl cellulose, HPMC, propylene glycol, methylparaben, strawberry essence drops, and aquadest. The antioxidant activity test obtained an average IC of 29.82%.[10]

Purslane plant (*Portulaca oleracea* L.)

Purslane is a plant that can grow in both highlands and lowlands. In a previous study, a spray gel formulation was made using the maceration extraction method. The good formulation results were purslane extract, HPMC, tween, chitosan, acetic acid, and aquadest. In the identification of antioxidants with the DPPH method, it was found that they contain polyphenols. The saponin content was obtained in the Forth test, and the identification of flavonoids was obtained in the Wilstater test. The antioxidant activity found at IC_{50} inhibited 50% oxidation.[11]

Sweet orange peel (*Citrus sinensis* L.)

Sweet orange is known as a fruit that is high in antioxidants. Preparation of spray gel formulations performed by maceration extraction method with 60% solvent. A good formulation consists of sweet orange peel extract, HPMC, HEC, methylparaben, and aquadest. Based on the DPPH method, the antioxidant activity of the vitamin C sample was found to be IC_{50} 0.689 ppm.[12]

Yam bean (*Pachyrhizus erosus (L.) Urb*) and saffron (*Crocus sativus* L.)

Yam bean contains several compounds, namely flavonoids, saponins, and alkaloids. While saffron flowers contain phenolic and carotenoids. A good face mist formulation is a yam fruit extract, saffron water immersion, glycerin, PVP, and aquadest. It is done by maceration and evaluation methods. Based on research, Yam bean extract has antioxidant potential ranging from the yield of 4.062 %, and the IC50 value bean activity is more optimal when combined.[13,15]

Buas-buas leaves (*Premna serratifolia* L.)

Buas-buas leaves contain secondary metabolites of flavonoids, saponins, tannins, and triterpenoids/steroids. The spray gel formulation obtained good results with the formulation including ethanol extract of wild-buas leaves, carbopol 940, triethanolamine, propylene glycol, methylparaben, propylparaben, oleum citri, and aquadest. This formulation shows an IC_{50} of 24.4 µg/mL, which means it is rich in antioxidants.[14]

2. Conclusion

Plants that can be formulated as face mist preparations are purple cabbage, yam tubers, and saffron flowers. Meanwhile, the herbs that can be used for spray gel preparations are strawberry fruit, wild leaf, sweet orange peel, and purslane plant.

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