

INTISARI

Kulit buah naga (*Hylocereus undatus*) jarang dimanfaatkan, padahal memiliki kandungan antosianin yang dapat dijadikan pewarna alami untuk lipstik. Banyak lipstik di pasaran menggunakan pewarna sintesis berbahaya dan tidak bisa berfungsi sebagai tabir surya, sehingga bibir hiperpigmentasi dan berkerut. Penelitian bertujuan untuk mengetahui jumlah optimal ekstrak kulit buah naga merah dan titanium dioksida yang menghasilkan densitas warna dan *SPF* yang paling tinggi, serta mengetahui sifat fisik lipstik formula optimum.

Ekstraksi kulit buah naga merah dibuat dengan maserasi menggunakan etanol 70%. Optimasi formula optimum lipstik dilakukan menggunakan metode *Simplex Lattice Design* dengan *software Design Expert v.9.0.4.1*. dimana didapat 8 formula dengan variasi jumlah ekstrak etanolik kulit buah naga merah dan jumlah titanium dioksida. Kemudian nilai densitas warna dan *SPF* prediksi dibandingkan dengan hasil penelitian menggunakan *one sample T-test* (taraf kepercayaan 95%). Untuk mengetahui sifat fisik lipstik dilakukan uji kekerasan, daya lekat, organoleptis, titik leleh, dan daya oles. Kemudian dilakukan analisis normalitas dan statistika deskriptif.

Formula optimum didapat adalah 9,47% ekstrak etanolik kulit buah naga merah dan 5,53% titanium dioksida. Sediaan lipstik formula optimum tersebut memiliki densitas warna dan nilai *SPF* optimum serta titik lebur, bentuk, warna, aroma, dan rasa yang baik. Namun kekerasan, daya lekat, dan daya olesnya kurang baik.

Kata kunci : lipstik, buah naga, TiO₂

OPTIMIZATION OF ETHANOLIC EXTRACT OF RED DRAGON FRUIT SKIN (*Hylocereus undatus*) AND TITANIUM DIOXIDE AS NATURAL COLORANT AND SUN PROTECTING AGENT ON LIPSTICK USING SIMPLEX LATTICE DESIGN METHOD

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ABSTRACT

The skin of the dragon fruit (*Hylocereus undatus*) are rarely used despite its anthocyanin content potential for natural colorant. Lipstick found in the market mostly used synthetic colorant and didn't have sun protecting effect that could cause hyperpigmentation and wrinkled skin. In this research, simplex lattice design method were applied to determine the optimal composition of extract of dragon fruit skin and titanium dioxide that produced highest color density and SPF (Sun Protecting Factor) and to evaluate the physical properties of the optimized formula.

The extract of skin of dragon fruit was made by maceration using 70 % ethanol. Simplex lattice design were applied to optimized the lipstick formulation using Design Expert v.9.0.4.1 software that produced 8 formulation with variation on the amount of the extract and TiO₂. Predicted Color Density and SPF then compared with the result of the research with one sample T-test (95 % Confident level). Physical properties were evaluated with hardness test, stickyness test, organoleptic, melting point, and spreadability. The result then analyzed with normality test and descriptive statistic.

The Optimized formulation obtained in this research was 9.47 % red dragon fruit extract and 5.53% Titanium dioxide. The optimized lipstick formula had good color density, SPF, melting point, shape, color, smell, and taste, but had bad hardness, stickyness, and spreadability.

Keywords : Lipstick, Dragon Fruit, TiO₂