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PERBANDINGAN AKTIVITAS TABIR SURYA KRIM DAN NANOKRIM MINYAK BIJI BUNGA WORTEL *(Daucus carota* L.*)*

ABSTRAK

Latar Belakang: Indonesia memiliki intensitas sinar ultraviolet (UV) yang tinggi dapat menyebabkan penuaan dini dan kanker kulit. Minyak biji bunga wortel (*Daucus carota* L.) mengandung senyawa terpenoid yang berpotensi sebagai tabir surya alami. Formulasi dalam bentuk krim dan nanokrim dapat meningkatkan efektivitas perlindungan kulit. Tujuan penelitian untuk membandingkan aktivitas tabir surya sediaan krim dan nanokrim berdasarkan nilai *Sun Protection Factor* (SPF).

Metode: Minyak biji bunga wortel diformulasi menjadi krim dan nanokrim dengan konsentrasi 0,4%, 0,5%, dan 0,6%. Pengujian meliputi uji organoleptis, pH, homogenitas, daya sebar, daya lekat, viskositas, dan stabilitas, Pengukuran SPF dilakukan menggunakan spektrofotometri UV-Vis. Data dianalisis dengan SPSS Versi 25.

Hasil: Nanoemulsi berwarna kuning jernih, aroma khas minyak biji bunga wortel dan berbentuk cair. Nanoemulsi memiliki ukuran partikel 75,7-108,4 nm, % transmittan <100% dan indeks polidispersitas 0,198-0,410. Karakteristik fisik krim dan nanokrim berwarna putih kekuningan, aroma khas minyak biji bunga wortel, tekstur lembut dan berbentuk setengah padat, pH antara 5-7, viskositas 23.000-44.000 cPs, daya sebar antara 5-6,5cm, daya lekat 1-2 detik, tipe emulsi M/A. Saat disentrifuge tidak memisah (nilai F=0%), mengalami perubahan fisik pada *cycling test.* Nilai SPF krim formula 1 (5,882±0,15) kategori sedang, formula 2 (6,865±0,13) dan formula 3 (7,864±0,19) kategori ekstra. Nanokrim formula 1 (6,465±0,26), dan formula 2 (7,610±0,17) kategori ekstra. Formula 3 nanokrim (8,459±0,06) kategori maksimal.

Kesimpulan: Peningkatan konsentrasi minyak berpengaruh pada nilai SPF. Nanokrim memiliki nilai SPF lebih tinggi dibandingkan krim, kecuali pada F3 krim dan F2 nanokrim yang tidak menunjukkan perbedaan signifikan karena efektifitas formulasi yang hampir sama dalam perlindungan terhadap sinar UV.

Kata kunci: Tabir surya, minyak biji bunga wortel, krim ,nanokrim, SPF.

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COMPARISON OF SUNSCREEN ACTIVITY OF CARROT SEED OIL (Daucus carota L.) CREAM AND NANOCREAM

ABSTRACT

Background: *Indonesia has a high intensity of ultraviolet (UV) rays that can cause premature aging and skin cancer. Carrot seed oil (Daucus carota L.) contains terpenoid compounds that have the potential as natural sunscreens. Formulations in the form of creams and nanocreams can increase the effectiveness of skin protection. The purpose of this study was to compare the sunscreen activity of cream and nanocream preparations based on the Sun Protection Factor (SPF) value.*
Methods*: Carrot seed oil was formulated into cream and nanocream with concentrations of 0.4%, 0.5%, and 0.6%. Testing included organoleptic tests, pH, homogeneity, spreadability, adhesion, viscosity, and stability. SPF measurements were carried out using UV-Vis spectrophotometry. Data were analyzed with SPSS Version 25.*
Results: *The nanoemulsion was clear yellow, had a distinctive aroma of carrot seed oil and was in liquid form. Nanoemulsion has a particle size of 75.7-108.4 nm, % transmittance <100% and polydispersity index of 0.198-0.410. The physical characteristics of cream and nanocream are yellowish white, distinctive aroma of carrot seed oil, soft texture and semi-solid, pH between 5-7, viscosity 23,000-44,000 cPs, spreadability between 5-6.5cm, adhesiveness 1-2 seconds, emulsion type M / A. When centrifuged does not separate (F value = 0%), undergoes physical changes in the cycling test. The SPF value of formula 1 cream (5.882 ± 0.15) is in the medium category, formula 2 (6.865 ± 0.13) and formula 3 (7.864 ± 0.19) is in the extra category. Nanocream formula 1 (6.465±0.26), and formula 2 (7.610±0.17) extra category. Formula 3 nanocream (8.459±0.06) maximum category.*
Conclusion: *Increasing oil concentration affects the SPF value. Nanocream has a higher SPF value than cream, except for F3 cream and F2 nanocream which do not show significant differences because the effectiveness of the formulation is almost the same in protecting against UV rays.*

Keywords: *Sunscreen, carrot seed oil, cream, nanocream, SPF.*