

INTISARI

Biji anggur (*Vitis vinifera* L.) dan biji kopi arabika (*Coffea arabica*) merupakan bahan alam yang mengandung senyawa polifenol dan memiliki aktivitas antioksidan sehingga berpotensi dijadikan bahan aktif dalam sediaan tabir surya. Bentuk sediaan yang dipilih adalah gel karena memiliki banyak keuntungan bagi kulit. Penelitian ini bertujuan untuk menganalisis perbandingan kadar *gelling agent* HPMC dan karbopol terhadap sifat fisik dan stabilitas optimum gel serta aktivitas tabir surya gel minyak biji anggur (*Vitis vinifera* L.) dan ekstrak biji kopi arabika (*Coffea arabica*) yang diuji secara *in vitro*.

Penelitian ini dilakukan dengan metode eksperimental. Rentang kadar HPMC yang digunakan adalah 3,5–4,5%, sedangkan karbopol adalah 0,5–1,5%. Delapan formula gel dievaluasi sifat fisiknya untuk didapatkan formula optimum menggunakan metode *Simplex Lattice Design* dengan *software design expert 13.0.0*. Sifat fisik yang diuji berupa organoleptik, pH, viskositas, daya sebar, daya lekat, dan homogenitas. Sementara itu, stabilitas fisik diuji dengan metode *cycling test* selama 3 siklus. Aktivitas tabir surya dari sediaan gel ditentukan menggunakan metode spektrofotometri UV-Vis dengan menentukan nilai *Sun Protection Factor* (SPF), persen transmisi eritema (%TE), dan persen transmisi pigmentasi (%TP).

Hasil penelitian menunjukkan bahwa formula optimum gel minyak biji anggur dan ekstrak biji kopi arabika terdiri dari kombinasi *gelling agent* HPMC 3,5% dan karbopol 1,5% dengan nilai pH $5,14 \pm 0,03$, viskositas $101,4 \pm 0,52$ dPa.s, daya sebar $12,19 \pm 0,24$ cm², dan daya lekat $4,43 \pm 0,17$ detik. Gel memiliki nilai SPF 43,687 (perlindungan tinggi), %TE sebesar 0,006% (kategori *sunblock*), dan %TP sebesar 1,691% (kategori *sunblock*). Formula optimum gel stabil terhadap respon viskositas, daya sebar, dan daya lekat, tetapi tidak stabil terhadap respon pH selama 3 siklus *cycling test*.

Kata kunci : Anggur, arabika, optimasi, sunscreen, gel.

ABSTRACT

Grape seed (*Vitis vinifera* L.) and arabica coffee bean (*Coffea arabica*) are natural ingredients that contain polyphenolic compounds, have antioxidant activity, and have great potential as active ingredients in sunscreen preparation. Gel dosage form is preferred because it has many advantages for skin. This study aims to analyze the comparison levels of HPMC and carbopol as gelling agent to produce the optimum physical properties, stability, and sunscreen activity of grape seed oil (*Vitis vinifera* L.) and arabica coffee bean extract (*Coffea arabica*) gel tested in vitro.

This study was conducted by experimental method. The range of HPMC used was 3.5–4.5%, while carbopol was 0.5–1.5%. Eight gel formulas were evaluated for their physical properties to obtain the optimum formula using the Simplex Lattice Design method with Design Expert 13.0.0 software. The physical properties tested include organoleptic, pH, viscosity, spreadability, adhesiveness, and homogeneity. Meanwhile, physical stability was tested using the cycling test method for 3 cycles. Sunscreen activity was determined using the UV-Vis spectrophotometry method by determining the Sun Protection Factor (SPF) value, percent erythema transmission (%TE), and percent pigmentation transmission (%TP).

The result showed that the optimum formula of grape seed oil and arabica coffee bean extract gel consisted of 3,5% HPMC and 1,5% carbopol with a pH of 5.14 ± 0.03 , viscosity of 101.4 ± 0.52 dPa.s, spreadability of 12.19 ± 0.24 cm², and adhesion of $4,43 \pm 0,17$ seconds. The gel has an SPF of 43.687 (high protection), %TE of 0.006% (sunblock category), and %TP of 1.691% (sunblock category). Gel was stable in response to viscosity, spreadability, and adhesiveness, but unstable in pH during the 3-cycle cycling test.

Keywords : Grape, arabica, optimization, sunscreen, gel.