

INTISARI

Minyak biji anggur (*Vitis vinifera* L.) dan ekstrak biji kopi arabika (*Coffea arabica*) adalah bahan alam yang keduanya telah terbukti mengandung senyawa fotoprotektif sehingga mampu memenuhi kebutuhan konsumen yang memiliki kulit sensitif untuk perlindungan terhadap radiasi sinar UV. Penelitian ini bertujuan untuk mengevaluasi perbandingan kadar karbopol dan Na-CMC sebagai *gelling agent* yang menghasilkan sifat dan stabilitas fisik optimum serta mengevaluasi aktivitas sediaan gel minyak biji anggur dan ekstrak biji kopi arabika secara *in vitro* dengan metode spektrofotometri.

Metode yang digunakan dalam optimasi adalah *Simplex Lattice Design* dengan *software* Design Expert versi 13. Kedelapan formula gel diuji organoleptis, homogenitas, pH, viskositas, daya sebar, dan daya lekat. Stabilitas gel diuji dengan metode *cycling test* selama tiga siklus. Sementara, aktivitas gel minyak biji anggur dan ekstrak biji kopi arabika sebagai *sunscreen* diuji secara *in vitro* dengan spektrofotometer UV-Vis dengan menentukan nilai *Sun Protection Factor* (SPF), persen transmisi eritema (%TE), dan persen transmisi pigmentasi (%TP).

Hasil penelitian menunjukkan bahwa gel minyak biji anggur dan ekstrak biji kopi arabika dengan konsentrasi karbopol 0,50% dan Na-CMC 3,00% memiliki pH sebesar $6,31 \pm 0,02$; viskositas $169,375 \pm 0,63$ dPa.s; daya sebar $11,57 \pm 0,52$; serta daya lekat $5,75 \pm 1,18$ detik. Gel minyak biji anggur dan ekstrak biji kopi arabika stabil pada respons pH, daya sebar, dan daya lekat, namun tidak stabil pada respons viskositas selama penyimpanan tiga siklus. Selain itu, gel minyak biji anggur dan ekstrak biji kopi arabika memiliki rata-rata nilai SPF sebesar $42,77 \pm 0,149$; %TE $0,013 \pm 0,0002$; serta %TP $2,44 \pm 0,012$ setelah diuji secara *in vitro* menggunakan metode spektrofotometri.

Kata kunci: anggur, arabika, gel, optimasi, sunscreen

ABSTRACT

Grape seed oil (Vitis vinifera L.) and arabica coffee bean extract (Coffea arabica) are a combination of natural ingredients that have been proven to contain antioxidant compounds so that they can meet the needs of consumers who have sensitive skin for protection against UV radiation. This study aims to evaluate the comparison of carbopol and Na-CMC levels as gelling agents in gel base formulations that produce optimum physical properties and stability and to evaluate the activity of grape seed oil and Arabica coffee bean extract sunscreen gel preparations in vitro.

The method used in the optimization is Simplex Lattice Design with Design Expert software version 13. The eight gel formulas were tested for organoleptic, homogeneity, pH, viscosity, spreadability, and adhesion. Gel stability was tested using the cycling test method for three cycles. Meanwhile, the activity of grape seed oil and Arabica coffee bean extract gels as sunscreens was tested using the spectrophotometric method by determining the Sun Protection Factor (SPF) value, percent erythema transmission (%TE), and percent pigmentation transmission (%TP).

The results showed that combination gel of grape seed oil and Arabica coffee bean extract with a concentration of 0.50% carbopol and 3.00% Na-CMC had a pH of 6.31 ± 0.02 ; viscosity of 169.375 ± 0.63 dPa.s; spreadability of 11.57 ± 0.52 ; and adhesiveness of 5.75 ± 1.18 seconds. Combination gel of grape seed oil and Arabica coffee bean extract were stable in pH, spreadability, and adhesiveness responses, but were unstable in viscosity responses during three cycles of storage. In addition, the combination gel of grape seed oil and Arabica coffee bean extract had an average SPF value of 42.77 ± 0.149 ; %TE 0.013 ± 0.0002 ; and %TP 2.44 ± 0.012 after being tested in vitro using the spectrophotometric method.

Keywords: *grapeseed, arabica, gel, optimatizion, sunscreen*