

## ABSTRAK

Kopi arabika (*Coffea arabica*) merupakan antioksidan alami yang dapat digunakan sebagai pencegahan penuaan kulit. Penelitian ini dilakukan untuk mengetahui perbandingan variasi komposisi HPMC, CMC-Na, dan Karbomer pada formula optimum serum kopi arabika, kemudian untuk mengetahui sifat fisik sediaan, serta nilai  $IC_{50}$  ekstrak dan serum kopi arabika pada uji DPPH. Ekstrak etanol kopi arabika diperoleh dengan metode maserasi menggunakan etanol 70%. Pembuatan sediaan serum mengikuti formula dari *software design expert version 13*. Sediaan serum dibuat sebanyak 13 *run*. Selanjutnya dievaluasi sifat fisik sediaan serum meliputi uji pH dan uji daya sebar. Setelah diperoleh hasil evaluasi sediaan kemudian dianalisis dengan *software design expert version 13* menggunakan metode *Simplex Lattice Design*. Formula optimum serum kopi arabika dievaluasi sifat fisik meliputi uji organoleptis, uji homogenitas, uji pH, uji daya sebar, dan uji daya lekat. Aktivitas antioksidan formula optimum serum kopi arabika diuji menggunakan metode DPPH. Analisa data menggunakan statistik SPSS *One sample T-test*. Hasil penelitian menunjukkan variasi komposisi HPMC, CMC-Na, dan Karbomer pada formula optimum serum kopi arabika sebesar 0,1%:0,8%:0,1%. Formula optimum serum kopi arabika memiliki sifat fisik sediaan yaitu berwarna coklat, beraroma kopi, bertekstur ringan, memiliki sensasi yang dingin saat diaplikasikan ke kulit, homogen, memiliki daya sebar 7,93 cm, daya lekat 1 detik, dan nilai pH 4,9. Nilai  $IC_{50}$  ekstrak kopi arabika dan formula optimum serum kopi arabika sebesar 8.13 ppm dan 250 ppm. Hasil analisis statistik SPSS *One sample T-test* menunjukkan tidak terdapat perbedaan signifikan antara respon prediksi dengan hasil evaluasi formula optimum, sehingga metode *Simplex Lattice Design* pada penelitian ini dapat memprediksi formula optimum serum kopi arabika.

Kata kunci : kopi arabika, antioksidan, serum, *Simplex Lattice Design*

## ABSTRACT

Arabica coffee (*Coffea arabica*) is a natural antioxidant that can be used as a prevention of skin aging. This research was conducted to compare the composition variations of HPMC, CMC-Na, and Carbomer in the optimum formula of Arabica coffee serum, then to determine the physical properties of the preparation, as well as the IC50 value of Arabica coffee extract and serum in the DPPH test. Arabica coffee ethanol extract was obtained by maceration method using 70% ethanol. The preparation of serum preparations followed the formula of the software design expert version 13. The serum preparations were made in 13 runs. Furthermore, the physical properties of the serum preparation were evaluated including the pH test and spreadability test. After obtaining the results of the evaluation of the preparations, they were then analyzed with software design expert version 13 using the Simplex Lattice Design method. The optimum formula of Arabica coffee serum was evaluated for physical properties including organoleptic test, homogeneity test, pH test, spreadability test, and adhesion test. The optimum antioxidant activity of arabica coffee serum formula was tested using the DPPH method. Data analysis using SPSS One sample T-test statistics. The results showed that the composition variations of HPMC, CMC-Na, and Carbomer in the optimum formula of Arabica coffee serum were 0,1%:0,8%:0,1%. The optimum formula for Arabica coffee serum has the physical properties of the preparation, which are brown in color, coffee-scented, light in texture, has a cold sensation when applied to the skin, homogeneous, has a spreadability of 7,93 cm, adhesion of 1 second, and a pH value of 4.9. The IC50 value of arabica coffee extract and the optimum formula for arabica coffee serum were 8.13 ppm and 250 ppm. The results of the SPSS One sample T-test statistical analysis showed that there was no significant difference between the predicted response and the optimum formula evaluation results, so that the Simplex Lattice Design method in this study could predict the optimum formula for Arabica coffee serum.

Keyword: coffee arabica, antioxidant, serum, Simplex Lattice Design