

INTISARI

Paparan sinar UV dan polusi lingkungan dapat memicu pembentukan radikal bebas yang mempercepat penuaan kulit. Untuk mengatasi hal tersebut, diperlukan produk perawatan kulit yang mengandung antioksidan. Pentagamavunon-5 (PGV-5) diketahui memiliki aktivitas antioksidan tinggi sehingga berpotensi digunakan sebagai bahan aktif dalam produk perawatan kulit. Serum dipilih sebagai bentuk sediaan karena teksturnya ringan, mudah meresap ke kulit, dan efektif menghantarkan zat aktif. Untuk menghasilkan serum dengan karakteristik tersebut, dilakukan pengembangan formula basis serum yang mengandung PGV-5 menggunakan kombinasi *xanthan gum* dan HPMC sebagai bahan pengental.

Optimasi kadar *xanthan gum* dan HPMC dilakukan dengan metode *Simplex Lattice Design* (SLD) berdasarkan tiga parameter respon, yaitu pH, viskositas, dan daya sebar. Setelah diperoleh formula basis optimum, PGV-5 ditambahkan untuk membentuk sediaan akhir. Selanjutnya, dilakukan evaluasi stabilitas fisik serum PGV-5 melalui metode *cycling test*. Parameter yang diamati meliputi organoleptis, homogenitas, pH, viskositas, daya sebar, dan daya lekat. Selain itu, dilakukan pula uji aktivitas antioksidan menggunakan metode DPPH secara spektrofotometri UV-Vis.

Hasil penelitian menunjukkan bahwa formula basis optimum mengandung 0,1% *xanthan gum* dan 0,65% HPMC, dengan pH 6,45; viskositas 1185,71 cP; dan daya sebar 5,94 cm. Serum yang dihasilkan berwarna kuning pekat, bertekstur lembut, sedikit kental, dan homogen. Uji stabilitas menunjukkan bahwa pH mengalami fluktuasi ringan dan viskositas menurun, tetapi daya sebar dan daya lekat tetap stabil secara statistik. Serum PGV-5 menunjukkan aktivitas antioksidan yang sangat kuat dengan nilai IC_{50} sebesar 3,22 ppm (7,82 μ M). Dengan demikian, hasil uji sifat fisik dan aktivitas antioksidan membuktikan bahwa serum PGV-5 berpotensi efektif sebagai produk perawatan kulit.

Kata kunci: optimasi basis, serum, pentagamavunon-5, *xanthan gum*, HPMC

ABSTRACT

Exposure to UV radiation and environmental pollution can trigger the formation of free radicals that accelerate skin aging. To address this issue, skincare products containing antioxidants are required. Pentagamavunon-5 (PGV-5) is known to have high antioxidant activity, making it a promising active ingredient in skincare formulations. Serum was selected as the dosage form due to its light texture, ease of absorption into the skin, and effectiveness in delivering active compounds. To achieve a serum with these characteristics, a base serum formulation containing PGV-5 was developed using a combination of xanthan gum and HPMC as thickening agents.

Optimization of xanthan gum and HPMC concentrations was carried out using the Simplex Lattice Design (SLD) method, based on three response parameters: pH, viscosity, and spreadability. Once the optimum base formula was obtained, PGV-5 was incorporated to produce the final preparation. Subsequently, the physical stability of the PGV-5 serum was evaluated using the cycling test method. Observed parameters included organoleptic properties, homogeneity, pH, viscosity, spreadability, and adhesiveness. In addition, antioxidant activity was tested using the DPPH method via UV-Vis spectrophotometry.

The results showed that the optimum base formulation contained 0,1% xanthan gum and 0,65% HPMC, with a pH of 6,45, viscosity of 1185,71 cP, and spreadability of 5,94 cm. The resulting serum had a deep yellow color, a soft texture, slightly viscous, and homogen. Stability testing revealed slight fluctuations in pH and a decrease in viscosity, while spreadability and adhesiveness remained statistically stable. The PGV-5 serum exhibited very strong antioxidant activity, with an IC_{50} value of 3,22 ppm (7,82 μ M). Thus, the results of this study demonstrate that the PGV-5 serum has strong potential as an effective skincare product.

Keywords: *base optimization, serum, pentagamavunon-5, xanthan gum, HPMC*