

INTISARI

Minyak nyamplung (*Calophyllum inophyllum* L.) dan *niacinamide* merupakan bahan yang memiliki kemampuan dalam menjaga kelembapan kulit serta memperbaiki fungsi *skin barrier* sehingga berpotensi dikombinasikan sebagai bahan aktif dalam sediaan gel pelembap. HPMC dan Na-CMC merupakan *gelling agent* yang banyak digunakan dalam formulasi sediaan topikal, tetapi kombinasi keduanya memerlukan optimasi untuk memperoleh stabilitas serta karakteristik fisik yang ideal.

Penelitian ini bertujuan mengoptimasi perbandingan kadar HPMC dan NaCMC sebagai *gelling agent* dalam menghasilkan karakteristik dan stabilitas fisik optimum. Optimasi dilakukan menggunakan metode *Simplex Lattice Design* dengan *software* Design Expert versi 13. Sebanyak delapan formula gel diuji karakteristiknya kemudian ditentukan formula optimumnya. Parameter respons yang diamati adalah pH, viskositas, dan daya sebar. Stabilitas fisik gel dilakukan pada formula optimum dengan metode *cycling test* selama tiga siklus.

Hasil penelitian menunjukkan bahwa gel minyak nyamplung dan *niacinamide* dengan kadar HPMC 0,50% dan Na-CMC 2,00% memiliki sifat fisik yang baik dengan pH $6,220 \pm 0,022$; viskositas $134,200 \pm 4,007$ dPa·s; daya sebar $19,137 \pm 0,486$ cm²; daya lekat $2,428 \pm 0,135$ detik. Formula optimum stabil pada parameter organoleptik, homogenitas, pH, viskositas, daya sebar, dan daya lekat dengan metode *cycling test*, selama tiga siklus penyimpanan.

Kata kunci: HPMC, Na-CMC, optimasi, minyak nyamplung, *niacinamide*

ABSTRACT

*Nyamplung (*Calophyllum inophyllum* L.) oil and niacinamide are ingredients known to maintain skin moisture and improve skin barrier function, making them potentially useful as active ingredients in moisturizing gel preparations. HPMC and Na-CMC are gelling agents widely used in topical formulations, but their combination requires optimization to achieve ideal stability and physical characteristics.*

This study aimed to optimize the ratio of HPMC and Na-CMC as gelling agents to achieve optimum physical characteristics and stability. Optimization was performed using the Simplex Lattice Design method with Design Expert software version 13. Eight gel formulas were tested for their characteristics and then the optimum formula was determined. The response parameters observed were pH, viscosity, and spreadability. The physical stability of the gel was determined using a cycling test for three cycles on the optimum formula.

The results showed that nyamplung oil and niacinamide gel with HPMC content of 0.50% and Na-CMC 2.00% had good physical properties with pH 6.220 ± 0.022 ; viscosity 134.200 ± 4.007 dPa·s; spreadability 19.137 ± 0.486 cm²; adhesiveness 2.428 ± 0.135 seconds. The optimum formula was stable in organoleptic parameters, homogeneity, pH, viscosity, spreadability, and adhesiveness with the cycling test method, for three storage cycles.

Keywords: HPMC, Na-CMC, optimization, niacinamide, nyamplung oil