

ABSTRACT
OPTIMIZATION OF LIQUID SOAP FORMULATION CONTAINING
CORN SILK (*Zea mays* L.) EXTRACT USING SIMPLEX LATTICE
DESIGN (SLD) METHOD

By

Claresta Salma Eristo PNR

Background: The development of natural-based liquid soap requires optimization to achieve physical characteristics that comply with quality standards. Corn silk (*Zea mays* L.), an agricultural by-product, contains bioactive compounds such as flavonoids, saponins, tannins, terpenoids and alkaloids with potential antibacterial activity. The success of a formulation is influenced not only by the active ingredients but also by the surfactant composition, which affects the physical properties. This study aimed to obtain the optimal formulation of liquid soap containing corn silk extract using a combination of Cocamidopropyl Betaine (CAPB) and Decyl Glucoside (DG) through the Simplex Lattice Design (SLD) method.

Methods: The extract was obtained by maceration and evaluated for non-specific parameter and phytochemical screening. It was formulated into liquid soap with varying CAPB and DG concentrations. Optimization was performed using Design Expert based on critical responses pH, viscosity, and foam height. The optimal formulation was further evaluated for organoleptic properties, homogeneity, specific gravity, moisture content, irritation, and stability using the cycling test.

Result: The optimal formulation produced a homogeneous brown liquid with a characteristic odor and no irritation. The pH value increased after the stability test, while viscosity, foam height, moisture content, and specific gravity decreased but remained within acceptable quality limits.

Conclusion: The SLD method proved effective in determining an optimal formulation of liquid soap containing corn silk extract that was physically stable and met the required quality standards.

Keywords: Cocamidopropyl betaine, corn silk extract, decyl glucoside, formulation optimization, liquid soap.

ABSTRAK
OPTIMASI FORMULA SEDIAAN SABUN CAIR EKSTRAK RAMBUT
JAGUNG (*Zea mays* L.) MENGGUNAKAN METODE *SIMPLEX LATTICE*
***DESIGN* (SLD)**

Oleh

Claresta Salma Eristo PNR

Latar Belakang: Pengembangan sabun cair berbasis bahan alam memerlukan optimasi formula untuk menghasilkan karakteristik fisik yang memenuhi standar mutu. Rambut jagung (*Zea mays* L.) merupakan limbah pertanian yang telah diketahui memiliki senyawa bioaktif seperti flavonoid, saponin, tanin, terpenoid dan alkaloid yang berpotensi sebagai antibakteri. Keberhasilan formulasi tidak hanya ditentukan oleh bahan aktif, namun juga dengan komposisi surfaktan yang memengaruhi sifat fisik sediaan. Penelitian ini bertujuan untuk memperoleh formula optimal sabun cair ekstrak rambut jagung dengan kombinasi *Cocamidopropyl Betaine* (CAPB) dan *Decyl Glucoside* (DG) menggunakan metode *Simplex Lattice Design* (SLD).

Metode: Ekstrak diperoleh melalui metode maserasi dan dilakukan uji nonspesifik serta penapisan fitokimia, kemudian diformulasikan dalam berbagai variasi konsentrasi CAPB dan DG. Optimasi dilakukan menggunakan *Design Expert* berdasarkan respon kritis pH, viskositas, dan tinggi busa. Formula optimal selanjutnya dilakukan uji organoleptik, homogenitas, bobot jenis, kadar air, iritasi, dan stabilitas dengan metode *cycling test*.

Hasil: Hasil menunjukkan formula optimal menghasilkan sediaan homogen dengan bau khas dan berwarna coklat, serta tidak adanya iritasi. Nilai pH mengalami peningkatan setelah uji stabilitas, sedangkan viskositas, tinggi busa, kadar air, dan bobot jenis mengalami penurunan namun tetap memenuhi syarat mutu sediaan.

Kesimpulan: Metode SLD efektif dalam memperoleh formula optimal sabun cair ekstrak rambut jagung yang stabil secara fisik dan memenuhi persyaratan mutu sabun cair.

Kata kunci: *Cocamidopropyl betaine*, *decyl glucoside*, ekstrak rambut jagung, optimasi formula, sabun cair.