

ABSTRAK

OPTIMASI FORMULA SEDIAAN SAMPO GEL MINYAK SERAI WANGI (*Citronella oil*) DENGAN KOMBINASI HPMC, SLS, DAN COCAMIDE DEA SEBAGAI ANTIFUNGI *Pityrosporum ovale*

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Latar Belakang: Minyak serai wangi memiliki kandungan citronella yang dapat dijadikan sebagai zat aktif sampo antiketombe terhadap *Pityrosporum ovale*. HPMC dapat digunakan sebagai *thickening agent*. Kombinasi surfaktan yang digunakan yaitu sodium lauril sulfat (SLS) dan Cocamide DEA yang dapat meningkatkan kualitas *foaming* serta menstabilkan busa. Sehingga, perlu dilakukan variasi konsentrasi HPMC, SLS, dan Cocamide DEA untuk mengetahui perbandingan dan interaksi komponen bahan serta mendapatkan formula optimum dengan dilakukan optimasi menggunakan metode *Simplex Lattice Design*.

Metodologi: Sampo gel minyak serai wangi dibuat dengan variasi konsentrasi HPMC 1,5%, 2,1%, 2,5%, dan 3,5% ; SLS 13%, 13,67%, 14%, 15% ; Cocamide DEA 2%, 2,67%, 3%, 4%. Hasil uji sifat fisik organoleptis, homogenitas, dan uji stabilitas *freeze-thaw* dianalisis secara deskriptif kualitatif. Hasil uji pH, kemampuan dan stabilitas busa, persentase zat padat, dan viskositas dari dianalisis menggunakan *Design Expert* versi 11.1.2. Hasil validasi formula optimum dianalisis menggunakan uji *One-Sample T-test*. Uji antifungi formula optimum terhadap *P. ovale* menggunakan metode difusi sumuran.

Hasil Penelitian: Variasi konsentrasi HPMC, SLS, dan Cocamide DEA tidak berpengaruh terhadap pengamatan organoleptis, homogenitas. Sedangkan pada pengamatan pH, kemampuan dan stabilitas busa, viskositas, persentase zat padat dan stabilitas dipengaruhi oleh masing-masing komponen, namun tidak dipengaruhi oleh interaksi antarkomponen. Formula optimum adalah Formula III (HPMC 1,5%, SLS 13%, dan Cocamide DEA 4%) dengan nilai percobaan dan nilai teoritis yang diprediksi *design expert* tidak berbeda signifikan ($p\text{-value} > 0,05$). Formula optimum memiliki aktivitas antifungi terhadap *P. ovale* dengan diameter zona hambat kategori kuat $15,1 \pm 1,25$ mm.

Kesimpulan: Minyak serai wangi dengan konsentrai 1200 ppm dapat diformulasikan menjadi sampo antiketombe dengan basis HPMC 1,5%, SLS 13%, Cocamide DEA 4%, propil paraben 0,2%, dan mentol 0,25%. Respon pH dipengaruhi oleh komponen Cocamide DEA, Viskositas dipengaruhi oleh HPMC. Sedangkan volume busa dan persentase zat padat dipengaruhi oleh SLS.

Kata Kunci: Minyak Serai Wangi, *Simplex Lattice Design*, HPMC, sodium lauril sulfat, Cocamide DEA

ABSTRACT

OPTIMIZATION OF CITRONELLA ESSENTIAL OIL GEL SHAMPOO WITH COMBINATION HPMC, SLS, AND COCAMIDE DEA AS ANTIFUNGAL Against *Pityrosporum ovale*

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Background of the Study: Citronella essential oil contains citronella which can be made as shampoo for dandruff treatment caused by *Pityrosporum ovale*. HPMC can be used for thickening agent and foam stabilizer. The combination of surfactants used are sodium lauryl sulfate (SLS) and Cocamide DEA that can improve the quality of foaming and stabilize the foam. So, it is necessary to do variations in the concentration of HPMC, SLS, and Cocamide DEA to know the comparison and interaction of material components and obtain optimum formula with the optimization done using Simplex Lattice Design method.

Research Method: Citronella essential oil gel shampoo was made with the variation of HPMC 1,5%, 2,1%, 2,5%, 3,5% ; SLS 13%, 13,67%, 14%, 15% ; Cocamide DEA 2%, 2,67%, 3%, 4%. The results of organoleptical, homogeneity, and stability test of freeze-thaw are analyzed in a qualitative descriptive. pH test results, foam stability, solid substance percentage, and viscosity of the analysed using Design Expert version 11.1.2. Optimal formula validation results are analyzed using the One-Sample T-test. The antifungal activity of the optimal formula was tested against *P. ovale* using a diffusion method.

Result: Variations in the concentration of HPMC, SLS, and Cocamide DEA have no effect on organoleptical observation and homogeneity of citronella essential oil gel shampoo. While on the observation of pH, the ability and stability of foam, viscosity, the percentage of solids and stability influenced by each component, but not influenced by intercomponent interactions. The optimum formula is FIII (HPMC 1.5%, SLS 13%, and Cocamide DEA 4%) with trial value and theoretical value the predicted design expert has no significant difference (P-value > 0.05). Optimum Formula has antifungi activity against *P. Ovale* with the diameter of a strong zone of the category 15.1 ± 1.25 mm.

Conclusion: Citronella essential oil concentration of 1200 ppm can be formulated into antidandruff shampoo with HPMC 1,5%, SLS 13%, Cocamide DEA 4%, propyl paraben 0,2%, and menthol 0,25%. The pH response is affected by the Cocamide DEA component, viscosity is influenced by HPMC. While the volume of foam and the percentage of solid substances is influenced by SLS.

Keywords: Citronella Essential Oil, *Simplex Lattice Design*, HPMC, sodium lauryl sulfate, Cocamide DEA