

Optimasi Formula dan Evaluasi Gel Antioksidan Ekstrak Rambut Jagung dengan *Gelling Agent* Xanthan Gum Menggunakan *Optimal Mixture Design*

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INTISARI

Rambut jagung telah dikaji memiliki aktivitas antioksidasi. Antioksidan bermanfaat dalam memperlambat proses fotooksidasi akibat paparan sinar UV matahari. Adanya bahan tambahan pada sediaan menyebabkan stabilitas fisik yang beragam, sehingga perlu optimasi. Untuk mempermudah optimasi digunakan *Optimal Mixture Design*. Tujuan penelitian ini adalah mengoptimasi formula dan mengetahui aktivitas antioksidan pada gel. Ekstraksi dilakukan dengan maserasi ultrasonik, kemudian dilakukan pengujian flavonoid (kualitatif dan kuantitatif) dan pengujian antioksidan. Analisis statistik menggunakan *independent t-test software*, Studi optimasi menggunakan *Optimal Mixture Design* dan pembuatan basis gel dengan xanthan gum (X1), propilenglikol (X2), gliserin (X3), viskositas (Y1), daya lekat (Y2) dan daya sebar (Y3). Kemudian data eksperimen dianalisis dengan ANOVA, setelah mendapatkan formula optimal dilakukan pembuatan gel ekstrak rambut jagung dan dilakukan evaluasi dan karakterisasi sediaan. Hasil ekstraksi menunjukkan rendemen sebesar 2,6 % sehingga memenuhi persyaratan pada literatur. Pengujian kualitatif flavonoid memperoleh rf 0,35, sedangkan pengujian kuantitatif flavonoid ekstrak 9,710 mg \pm 0,134 % dan sediaan 6,610 mg \pm 0,268. Pengujian antioksidan menunjukkan nilai inhibisi ekstrak 50,030 % \pm 0,278% sedangkan nilai inhibisi gel 52,398% \pm 0,585 %. Model yang dihasilkan respon viskositas dan daya sebar adalah *linear* sedangkan pada *extrudability* memiliki model *quadratic* dan menghasilkan formula optimal *xanthan gum* 0,904 %; gliserin 10 % dan propilenglikol 19,096 %. Data yang dihasilkan dari verifikasi dan karakterisasi pada masing – masing respon memenuhi syarat. Kesimpulan penelitian ini optimasi gel dapat dilakukan menggunakan metode *Optimal Mixture Design* serta adanya peningkatan aktivitas antioksidan pada gel ekstrak rambut jagung.

Kata kunci : ekstrak rambut jagung, *Optimal Mixture Design*, gel, Xanthan Gum

Formula Optimization and Evaluation Antioxidant Gel of Corn Silk Extract with Gelling Agent Xanthan Gum Using Optimal Mixture Design

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ABSTRACT

Corn silk has been studied to have antioxidant activity. Antioxidants are useful in slowing the photooxidation process due to exposure to UV sunlight. The presence of additives in the preparation causes various physical stability, so optimization is necessary. To simplify optimization use Optimal Mixture Design. The purpose of this study is to optimize the formula and to know the antioxidant activity in the gel. Extraction was performed by ultrasonic maceration, then flavonoid testing (qualitative and quantitative) and antioxidant testing were performed, Statistical analysis using independent t-test software r. The optimization study used Optimal Mixture Design and gel base making with xanthan gum (X1), propylene glycol (X2), glycerin (X3), viscosity (Y1), adhesion (Y2) and dispersion (Y3). Then experimental data were analyzed with ANOVA, after obtaining optimal formula made gel hair extract gel and evaluated and characterization of dosage. The extraction results show that the yield is 2.6% so that it meets the requirements of the literature. Flavonoid qualitative test obtained rf 0,35, while quantitative test of flavonoids extract $9,7103 \text{ mg} \pm 0,1342 \%$ and preparation $6,610 \text{ mg} \pm 0,268 \%$. Antioxidant test showed the value of inhibition of extract $50,030 \% \pm 0,278 \%$ while the value of gel inhibition $52,398 \% \pm 0,585 \%$. The resulting model viscosity response and spreading power were linear while extrudability has a quadratic model and produces the optimal xanthan gum formula of 0,904%; 10% glycerine and propylene glycol 19,096%. Data generated from the verification and characterization of each response were qualified. The conclusion of this research was the increase of antioxidant activity on gel of corn silk extract and gel optimization can be done using Optimal Mixture Design method.

Keywords: Corn silk extract, Optimal Mixture Design, gel, Xanthan Gum.