

## INTISARI

**NURHAYATI, N., 2019., OPTIMASI FORMULA SABUN MANDI CAIR EKSTRAK ETANOL KAYU SECANG (*Caesalpinia sappan L.*) DENGAN KOH, ASAM STEARAT DAN ASAM SITRAT MENGGUNAKAN METODE *SIMPLEX LATTICE DESIGN* DAN EFEK ANTIBAKTERINYA TERHADAP *Stapylococcus aureus* ATCC 25923.**

Sabun yang paling banyak digunakan adalah sabun dari garam natrium, tetapi sabun kalium merupakan sabun yang lebih lembut dan lebih mudah larut dalam air, sehingga sabun kalium dibuat untuk fungsi yang khusus, seperti sabun cair. Brazilin pada ekstrak kayu secang (*Caesalpinia sappan L.*) berpotensi sebagai zat antioksidan dan antibakteri. Sifat fisik sabun mandi cair ditentukan dari basis, Basis yang sering digunakan pada pembuatan sabun mandi cair adalah KOH, asam stearat, dan asam sitrat. Penelitian ini bertujuan untuk mengetahui pengaruh kombinasi KOH, asam stearat, dan asam sitrat terhadap sifat fisik sabun mandi cair, mengetahui komposisi formula optimum, aktivitas antibakteri dan pengujian iritasi.

Serbuk kering kayu secang diekstraksi dengan etanol 96%, dikentalkan kemudian dilakukan pengujian ekstrak. Empat belas formula sabun cair menggunakan 0,2 % ekstrak kayu secang dengan variasi basis KOH, asam stearat, dan asam sitrat diuji sifat fisiknya meliputi viskositas, pH, dan alkali bebas.. Formula optimum diperoleh dengan metode *Simplex Lattice Design*, hasil dianalisis dengan *software design expert*. Formula optimum diuji sifat fisik kemudian dianalisis menggunakan *one-sample t-test* dan dilakukan uji iritasi.

Formula optimum sabun mandi cair ekstrak kayu secang mengandung KOH 0,6121 %, asam stearat 0,613 % dan asam sitrat 0,085 % dengan sifat fisik viskositas sebesar 9,69, pH sebesar 9,95 alkali bebas sebesar 0,08. Sabun mandi cair formula optimum mampu menghambat *S. aureus* ATCC 25923 sebesar  $32,6 \pm 0,75$  mm. Hasil uji t menunjukkan tidak berbeda signifikan antara respon sifat fisik hasil percobaan dan prediksi *software*. Formula optimum saban mandi cair ekstrak kayu tidak mengiritasi kulit.

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Kata kunci : Kayu Secang, Optimasi Sabun Cair, *Simplex Lattice Design*

## ABSTRAK

**NURHAYATI, N., 2019., OPTIMIZATION OF LIQUID BATH SOAP AND EXTRACTS OF ETHANOL WOOD ON SECANG (*Caesalpinia sappan L.*) WITH KOH, STEARATE ACID AND SITRATE ACID IN THE *SIMPLEX LATTICE DESIGN* METHOD AND THE ANTIBACTERIAL EFFECT ON *Stapylococcus aureus* ATCC 25923.**

The most widely used soap is soap from sodium salt, but potassium soap is a softer and more soluble soap in water, so potassium soap is made for special functions, such as liquid soap. Brazilin in secang wood extract (*Caesalpinia sappan L.*) has potential as an antioxidant and antibacterial agent. The physical properties of liquid bath soap are determined from the base, the bases that are often used in making liquid bath soap are KOH, stearic acid, and citric acid. This study aims to determine the effect of a combination of KOH, stearic acid, and citric acid on the physical properties of liquid bath soap, determine the composition of the optimum formula, antibacterial activity and irritation testing.

Secang wood dry powder was extracted with 96% ethanol, thickened and then extracts tested. Fourteen liquid soap formulas using 0.2% secang wood extract with variations of KOH base, stearic acid, and citric acid were tested for physical properties including viscosity, pH, and free alkali. The optimum formula was obtained by Simplex Lattice Design method, the results were analyzed by software design expert. The optimum formula was tested for physical properties then analyzed using one-sample t-test and irritation test.

The optimum formula of liquid bath soap secang wood extract containing KOH 0.6121%, stearic acid 0.613% and citric acid 0.085% with physical properties of viscosity of 9.69, pH of 9.95 free alkali of 0.08. The optimum formula liquid bath soap can inhibit *S. aureus* ATCC 25923 as large as  $32.6 \pm 0.75$  mm. T test results showed no significant difference between the response of the physical properties of the experimental results and software predictions. The optimum formula for shower bath liquid wood extract does not irritate the skin.

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Keywords: Secang Wood, Liquid Soap Optimization, Simplex Lattice Design