

Zahra Najma Atika. NPM 220331100052. Analisis Pengaruh Variasi Konsentrasi Minyak Atsiri Jeruk Serta Kondisi Minyak Sawit Terhadap Sifat Fisikokimia dan Mikrobiologi Sabun Cair. **Safira Kanza, S.T., M.T. dan Mojiono, S.TP., M.Si.**

ABSTRAK

Sabun cair berbahan dasar minyak sawit berpotensi menjadi alternatif sabun yang ramah lingkungan. Penelitian ini menggunakan tiga kondisi minyak sawit, yaitu minyak goreng sawit, minyak jelantah, dan minyak jelantah pemurnian. Pemurnian minyak jelantah dilakukan dengan menggunakan arang aktif untuk memperbaiki sifat fisikokimianya. Selain itu, penambahan minyak atsiri jeruk diharapkan dapat meningkatkan aktivitas antibakteri sabun. Penelitian ini bertujuan menganalisis pengaruh kondisi minyak sawit dan konsentrasi minyak atsiri jeruk terhadap sifat fisikokimia dan mikrobiologi sabun cair. Penelitian menggunakan Rancangan Acak Lengkap Faktorial (RALF) dengan dua faktor, yaitu kondisi minyak sawit dan konsentrasi minyak atsiri jeruk (0%, 1,5%, dan 3%). Parameter yang diamati meliputi pH, viskositas, *specific gravity*, warna (L, a, b), cemaran mikroba, dan aktivitas antibakteri. Data dianalisis menggunakan *two way* ANOVA pada taraf signifikansi 5% dan dilanjutkan dengan uji Duncan apabila terdapat pengaruh nyata. Hasil penelitian menunjukkan bahwa kondisi minyak sawit dan konsentrasi minyak atsiri jeruk berpengaruh nyata ($P < 0,05$) terhadap nilai pH, viskositas, *specific gravity*, dan tingkat kecerahan (L^*) sabun cair, namun tidak berpengaruh nyata terhadap nilai a^* dan b . Sabun berbahan minyak goreng sawit menghasilkan nilai pH, viskositas, *specific gravity*, dan kecerahan (L^*) yang lebih tinggi dibandingkan sabun berbahan minyak jelantah maupun minyak jelantah hasil pemurnian. Peningkatan konsentrasi minyak atsiri jeruk menurunkan nilai pH, viskositas, *specific gravity*, dan kecerahan (L^*) sabun cair. Pada parameter cemaran mikroba, seluruh sampel memenuhi persyaratan SNI 4075-2:2017 dengan hasil pengujian ≤ 10 koloni/gram, sedangkan diameter zona hambat yang dihasilkan berada pada kategori sedang hingga kuat. Secara keseluruhan, kondisi minyak sawit dan konsentrasi minyak atsiri jeruk memengaruhi karakteristik fisikokimia sabun cair, tetapi tidak memberikan pengaruh nyata terhadap sifat mikrobiologi, meskipun seluruh sampel menunjukkan aktivitas antibakteri.

Kata Kunci: Sabun cair, minyak jelantah, minyak sawit, minyak atsiri jeruk, sifat fisikokimia, mikrobiologi.

Zahra Najma Atika. NPM 220331100052. *Analysis of the Effect of Variations in Orange Essential Oil Concentration and Palm Oil Condition on the Physicochemical and Microbiological Properties of Liquid Soap.* **Safira Kanza, S.T., M.T. dan Mojiono, S.TP., M.Si.**

ABSTRACT

Palm oil-based liquid soap has the potential to serve as an eco-friendly soap alternative. This study utilized three types of palm oil: fresh palm cooking oil, used cooking oil, and purified used cooking oil. The used cooking oil underwent purification using activated charcoal to improve its physicochemical properties. Additionally, the incorporation of orange essential oil was intended to enhance the soap's antibacterial activity. The study aimed to analyze the effects of palm oil type and orange essential oil concentration on the physicochemical and microbiological properties of the liquid soap. A Factorial Completely Randomized Design (FCRD) was employed, involving two factors: palm oil type and orange essential oil concentration (0%, 1.5%, and 3%). Observed parameters included pH, viscosity, specific gravity, color (L, a, b), microbial contamination, and antibacterial activity. Data were analyzed using two-way ANOVA at a 5% significance level, followed by Duncan's test where significant effects were observed. The results indicated that palm oil type and orange essential oil concentration significantly affected ($P < 0.05$) the pH, viscosity, specific gravity, and lightness (L^*) of the liquid soap, but did not significantly affect the a and b values. Soap made from fresh palm cooking oil exhibited higher pH, viscosity, specific gravity, and lightness (L^*) values compared to soap made from used cooking oil or purified used cooking oil. Increasing the concentration of orange essential oil resulted in lower pH, viscosity, specific gravity, and lightness (L^*) values. Regarding microbial contamination, all samples met the SNI 4075-2:2017 standards, with test results showing ≤ 10 colonies/gram, while the inhibition zone diameters fell within the moderate to strong categories. Overall, palm oil type and orange essential oil concentration influenced the physicochemical characteristics of the liquid soap but did not significantly affect microbiological properties, although all samples demonstrated antibacterial activity.

Keywords: *Liquid soap, used cooking oil, palm oil, orange essential oil, physicochemical properties, microbiology.*