

## ABSTRAK

Minyak daun pala (*Myristica Fragrans* Houtt) merupakan salah satu bahan alam yang memiliki aktivitas antioksidan dan berpotensi sebagai tabir surya. Penelitian ini bertujuan untuk membuat nanoemulsi minyak daun pala, karakterisasi, dan menguji potensi minyak daun pala dan nanoemulsi minyak daun pala sebagai tabir surya. Nanoemulsi minyak daun pala dibuat dengan variasi kandungan minyak daun pala sebesar 0,5; 1; 3; 5; dan 7 mL dan kontrol tanpa kandungan minyak daun pala. Emulsi juga dibuat dengan formula yang sama sebagai pembandingan. Karakterisasi nanoemulsi meliputi uji organoleptis, uji pH, uji viskositas, uji persen transmittan, uji tipe nanoemulsi, uji PSA, dan uji stabilitas termodinamik dan kinetik, sedangkan karakterisasi emulsi dilakukan tanpa uji PSA dan uji stabilitas. Pengujian potensi tabir surya dilakukan dengan menggunakan spektrofotometer UV-Vis pada rentang panjang gelombang 290-400 nm dengan etanol sebagai blanko. Hasil pengujian organoleptis nanoemulsi menunjukkan penampakan jernih dan stabil, sedangkan emulsi memiliki penampakan yang lebih keruh dan tidak stabil. Hasil pengujian pH, viskositas, tipe nanoemulsi, persen transmittan, dan uji ukuran partikel nanoemulsi menunjukkan hasil yang baik dan sesuai dengan parameter. Emulsi memiliki pH, viskositas, tipe emulsi yang baik, namun emulsi dengan kandungan minyak daun pala 5 dan 7 mL tidak dapat digolongkan ke dalam emulsi yang baik karena memiliki persen transmittan kurang dari 90% dan memiliki penampakan yang keruh. Emulsi tidak dilakukan pengukuran SPF karena tidak memenuhi syarat pengukuran pada spektrofotometer yaitu larutan yang jernih. Oleh karena itu, digunakan minyak daun pala tanpa dijadikan nanoemulsi sebagai pembandingan. Hasilnya diperoleh aktivitas tabir surya nanoemulsi minyak daun pala lebih tinggi daripada aktivitas tabir surya minyak daun pala tanpa dibuat nanoemulsi. Sediaan nanoemulsi yang memiliki aktivitas tabir surya terbaik adalah nanoemulsi dengan kadar minyak daun pala 7 mL dengan nilai SPF sebesar 1,503; nilai %Te sebesar 48,391%; dan nilai %Tp sebesar 80,257%. Nanoemulsi dengan kadar minyak daun pala 7 mL termasuk kategori regular suntan.

**Kata Kunci:** Minyak Daun Pala, *Sun Protection Factor*, Eritema, Pigmentasi

## ***ABSTRACT***

Nutmeg leaf oil (*Myristica Fragrans* Houtt) is one of the natural ingredients that has antioxidant activity and has the potential as a sunscreen. This study aims to make nutmeg leaf oil nanoemulsions, characterize, and test the potential of nutmeg leaf oil and nutmeg leaf oil nanoemulsions as sunscreens. Nutmeg leaf oil nanoemulsion was made with variations in nutmeg leaf oil content of 0.5; 1; 3; 5; and 7 mL and control without nutmeg leaf oil content. Emulsions were also made with the same formula as a comparison. Nanoemulsion characterization included organoleptic test, pH test, viscosity test, percent transmittance test, nanoemulsion type test, PSA test, and thermodynamic and kinetic stability test, while emulsion characterization was carried out without PSA test and stability test. Testing the potential of sunscreens was carried out using a UV-Vis spectrophotometer at a wavelength range of 290-400 nm with ethanol as a blank. The results of the organoleptic test of nanoemulsion showed a clear and stable appearance, while the emulsion had a more cloudy and unstable appearance. The test results of pH, viscosity, nanoemulsion type, percent transmittance, and nanoemulsion particle size test showed good results and were in accordance with the parameters. The emulsion had a good pH, viscosity, emulsion type, but emulsions with 5 and 7 mL of nutmeg leaf oil content could not be classified as good emulsions because they had a transmittance percentage of less than 90% and had a cloudy appearance. The emulsion SPF was not measured because it did not meet the measurement requirements on the spectrophotometer, namely a clear solution. Therefore, nutmeg leaf oil was used without being used as a nanoemulsion as a comparison. The results obtained that the sunscreen activity of nutmeg leaf oil nanoemulsion was higher than the sunscreen activity of nutmeg leaf oil without making a nanoemulsion. The nanoemulsion preparations that had the best sunscreen activity were 7% nutmeg leaf oil nanoemulsion with an SPF value of 1,503; the value of %Te is 48.391%; and the %Tp value is 80.257%. Nutmeg leaf oil nanoemulsion 7 mL belongs to the regular suntan category.

**Keywords:** Nutmeg Leaf Oil, Sun Protection Factor, Erythema, Pigmentation