

Synthesis and characterization of nanoemulsion of citronella oil (Cymbopogon Nardus L. Rendle) and its Sunscreen Potential Evaluation

Title	Synthesis and characterization of nanoemulsion of citronella oil (Cymbopogon Nardus L. Rendle) and its Sunscreen Potential Evaluation
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Abstract	<p>Abstract Citronella (Cymbopogon nardus L. Rendle) essential oil contains active compounds such as antioxidants and has the potential to be developed as a sunscreen. Nanoemulsion is a water and oil dispersion stabilized by a surfactant layer and has a particle size below 100 nm. This study described the formulation, characterization of citronella oil nanoemulsions, and determination of their activity as a sunscreen through the SPF values. The nanoemulsion formulation was made with 3 variations of oil concentration: F1 (1%), F2 (3%), and F3 (5%). The results of the organoleptic test were following the standards which were clear and no phase separation occurred. In addition, the pH value of the 1%, 3%, and 5% prepared nanoemulsions were categorized as safe to be used on the skin. The prepared formulas were categorized as O/W nanoemulsion types. The viscosity values were found to be 12.76, 25.13, and 84.05 cP respectively. Furthermore, the percent transmittance values were 98.4, 98.9, and 99.9%. The particle sizes, respectively, were 9.4 (100%), 10.07 (97%), and 8.96 nm (82.5%). The centrifugation and freeze-thaw cycle tests showed good physical stability. The results of the sunscreen potential test of the 1%, 3%, and 5% citronella oil nanoemulsion showed SPF values of 1.03, 1.13, and 1.14 with %Te values of 77.42, 70.21, and 67.86% respectively, and %Tp values of 95.94, 94.04, and 93.61% respectively. Keywords: Citronella essential oil (Cymbopogon nardus L. Rendle), nanoemulsion, antioxidant, sunscreen, SPF.</p>
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Author	Dr. UNDRI RASTUTI, S.Si, M.Si