

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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