

Evaluation of Characteristic Properties and Analysis of Sun Protection Factor Value of Stable Emulsions Containing *Callophyllum inophyllum* Seed Oil

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Sunscreens are photoprotective topical products that protect skin against sunburn and prevent skin cancers. Over many synthetic products, natural products are highly demanded due to several benefits. The aim of this study was to evaluate the physical and chemical properties and analysis of the sun protection factor (SPF) value of stable emulsions containing *Callophyllum inophyllum* (Domba) seed oil. Series of primary and secondary emulsions were prepared according to randomly selected five ratios using commercially available *Callophyllum inophyllum* seed oil, distilled water and, Tween 20[®] or Tween 80[®]. Only the physically stable primary and secondary emulsions throughout 60 days at room temperature (28±5°C) were considered for further analysis. Creaming indices, spreadability, viscosity, microscopic analysis, colour, odour and texture were evaluated as physical characteristics, and pH was considered to chemically characterize the stable emulsions according to pharmacopeia guidelines. The SPF value determination was carried out for all stable emulsions between 290 nm to 320 nm wavelength at 5 nm intervals and absorbance was measured in triplicates every 5 minutes. It was found that four emulsions were stable throughout the physical stability evaluation period without providing any creaming indices within 24 hours. These were oil in water type, pale yellow colour, smooth texture with natural Domba oil fragrance. The spreadability, pH and viscosity parameters were within 8.0-11.5 gcms⁻¹, 6.6-7.0 and 120-30250 cps respectively. Out of four stable emulsions, Tween 20[®] consisting primary emulsion showed the highest SPF value with 22.6. The other three emulsions showed less SPF value (> 5). In conclusion, the ratio compromised with 23.80% *Callophyllum inophyllum* seed oil: 42.85% distilled water: 33.33% Tween 20[®] showed the highest SPF value which can be considered for further development to produce commercially viable natural sunscreen.

Keywords: Sun protection factor value, *Callophyllum inophyllum* seed oil, Tween 20[®], Tween 80[®]