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Determination of sun protection factor and characterization of a lipid-based drug delivery system for a sunscreen-based hydrogel containing curcuma heyneana extract

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Original Article

Determination of sun protection factor and characterization of a lipid-based drug delivery system for a sunscreen-based hydrogel containing *curcuma heyneana* extract

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Abstract

Curcuma heyneana has been widely used as a traditional ingredient in a topical dosage form. Curcumin and flavonoids are active compounds exhibiting antioxidant properties. The topical preparations containing *C. heyneana* extract can be used to prevent the damage caused by free radicals. Both liquid and hydrogel microemulsions and self microemulsifying drug delivery systems (SMEDDS) were produced using *C. heyeana* extract, each of which were evaluated for physical characteristics and stability. The microemulsion was yellow, had a pH of 7.64 to 8.04, was spherical and had a surface tension of 28.94 to 30.94 dyne/cm. The SMEDDS comprised of a clear yellow preparation with a pH of 7.71 to 8.36 with spherical particles. The gel microemulsion with a surfactant ratio of 70:30 was thick, had the highest dispersive capacity, was stable at room temperature and during a centrifugation test, but underwent syneresis during a freeze-thaw test. The gel SMEDDS with a surfactant ratio of 80:20 had a dispersive capacity of 6.0 ± 0.11 cm. The gel was stable at room temperature for six weeks when stored away from light and stable during the centrifugation test, however it was separated in a freeze-thaw stability test. The gel treatments caused no skin irritation. The gels have no Sun Protection Factor (SPF) value.

Key words: *Curcuma heyneana*, drug delivery system, Gel, Microemulsion, Self microemulsifying, SPF

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