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OPTIMISATION OF CURCUMIN MICROEMULSIONS USING PALM OIL

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ABSTRACT

Curcumin is a natural hydrophobic polyphenol derived from the curcuminoids of Curcuma longa. Curcumin is commonly known as turmeric and it gains the interest of scientific and clinical researchers as it exhibits great pharmacological benefits such as anti-cancer, anti-inflammatory and anti-oxidant properties. Nevertheless, curcumin is still not an approved drug in clinical settings due to its poor aqueous solubility and low oral bioavailability. Therefore, a self-microemulsifying drug delivery system (SMEDDS) was used as an approach to enhance the solubility and bioavailability of curcumin. The microemulsion was devised in a pre-formulation phase using a surfactant (Tween 80), a co-surfactant (polyethylene glycol, PEG 400), a lipid phase (palm oil) and an aqueous phase (water). A ternary phase diagram was used to identify the self-microemulsifying region in a formulation. Five of these formulations (F1, F2, F4, F7 and F10) were found to be stable with no phase separation observed upon overnight storage. All of the five formulations (except F4) possessed a high percentage of transmittance (86%–100%), which signified the formation of a stable microemulsion when they were diluted in a 1:100 ratio by water. Curcumin microemulsions were formulated by loading curcumin into F1, F2, F7 and F10. Only F1 and F2 curcumin microemulsions exhibit a clear appearance, however, F7 and F10 form a turbid solution, which indicates the formation of the emulsion. The results indicated that F1 and F2 which contain a high surfactant/co-surfactant-to-oil ratio of 9:1 is optimum to formulate the curcumin microemulsions.

Keywords: Curcumin, Microemulsion, Self-microemulsifying drug delivery system

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