



Preparation and physicochemical evaluation of topical formulations of purified curcuminoids from *Curcuma longa* rhizome

K. Berenjjan^{1*}, K. Derakhshandeh², Y. Shokoohinia³

¹Tehran University of Medical Sciences, Tehran, Iran.

²Medicinal Plants and Natural Products Research Center, Hamadan University of Medical Sciences, Hamadan, Iran.

³Pharmaceutical Sciences Research Center, School of Pharmacy, Kermanshah University of Medical Sciences, Kermanshah, Iran.

Background and objectives: The purpose of this study was optimization of semisolid topical formulation from ethanol extract of turmeric and evaluation of rheological characterization and investigation of physicochemical control tests. **Methods:** The ethanolic extract was prepared with Soxhlet method and the compounds were isolated with silica gel column chromatography. Isolation of curcuminoids was accomplished by preparative HPLC. The accelerated and real time stability tests for the formulations were investigated at 40±2 °C/70% RH for 90 days and 30±2° C/35%±5 RH for 12 month, respectively. **Results:** The yield of pure curcuminoids was 0.8%. The results of rheograms at 25° C showed pseudoplastic, plastic and pseudoplastic behavior for the ointment, cream and gel formulations respectively. The pH was measured by using digital type of pH meter by dipping the glass electrical probe for all of formulation, and the consequences exhibited PH values of 6.6, 6.8 and 6.9 for the ointment, cream and gel, respectively. The results of cumulative release (µg/cm²) for ointment, cream and gel formulation achieved with dissolution media which contained buffer phosphate with pH 7.2 and 1% tween 20 after 24 h were 693.6, 648.5 and 650.5, respectively. **Conclusion:** The advantage of this method extraction compared to previously described methods, was utilizing safer solvent for extraction. The cumulative release of formulation and drug content during the physicochemical control tests was compared with commercial product and showed no significant difference ($p>0.05$). The formulations of this study showed functional and physical stability in the period of the study.

Keywords: cumulative release, curcumin, physicochemical control, rheological behavior