

[The Synergistic Effect of Butter Oil and Capsaicin in the Microemulsion Based gel Formulation for Anti-Inflammatory Effect in Treatment of Arthritis](#)

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Purpose

Certain oils like butter oil and sesame oil have been traditionally used to reduce inflammation. The objective of the study was to use these oils for the formulation of microemulsion based gel containing capsaicin so as to give synergistic effect.

Methods

Solubility studies of capsaicin were done in oils, surfactants and cosurfactants. Pseudoternary phase diagram was constructed to identify the ratio of surfactant to cosurfactant. Capsaicin-loaded microemulsion was formed using water titration method. The microemulsion was evaluated for globule size, polydispersibility index, zeta potential, % drug content and in vitro drug release. The desirable microemulsions were converted to gel using Carbopol 934P. The microemulsion based gels were studied for viscosity, spreadability, pH, % drug content and in vitro drug diffusion. These gels were further tested for % drug permeation through rat skin, skin irritation and anti-inflammatory activity using rat paw oedema method and stability.

Results

Butter oil, cod liver oil and sesame oil were selected as oil components, Tween 80 and polyethylene glycol 400 (PEG 400) were identified as surfactant and cosurfactant respectively. Microemulsions formed using these components were loaded with capsaicin and screened to identify compositions that gave small globule size and lower values of PDI. The so formed micromulsion had globule size of less than 200 nm and zeta potential of around – 20mV. Microemulsions were then formed in to gel using 1% Carbopol 934P. Butter oil-based microemulsion gel had higher anti-inflammatory effect and lower values of primary irritation index as compared to other gels. All the transemulgels remained stable over a period of 1 month.

Conclusion

Caspsaicin-loaded, butter oil based microemulsion gel shows promise as topical delivery system for anti-inflammatory activity.