ABSTRACT

An attempt was made to develop an oral microemulsion formulation for enhancing the bioavailability of famotidine is a BCS class III drugs which are known to have high solubility but low permeability. A labrafac based microemulsion formulation with labrasol as surfactant and plurol oleique CC 497 as cosurfactant was developed for oral delivery of famotidine. Phase behavior and solubilization capacity of the microemulsion system were characterized, and *in vivo* oral absorption of famotidine from the microemulsion was investigated in rats. A single isotropic region, which was considered to be a bicontinuous microemulsion, was found in the pseudoternary phase diagrams developed at various labrasol: plurol oleique CC 497: labrafac ratios. With the increase of labrasol concentration, the microemulsion region area and the amount of water and labrafac solubilized into the microemulsion system increased; however; the increased of plurol oleique CC 497 percentage produced opposite effects. The microemulsion system was also investigated in terms of other characteristics, such as viscosity, pH, conductivity, clarity, particle size, *in vitro* drug release, *in vitro* stomach and intestinal permeability as well as *in vivo* study of best formulation. Famotidine, a poorly soluble drug, displayed high solubility in a microemulsion formulation using labrafac (11.12%), labrasol (31.10%), plurol oleique CC 497 (7.79%), water (50%). The higher permeability achieved with the microemulsion systems compared to the plain drug solution and commercially available marketed tablets. The developed microemulsion system improved the permeability by increasing the lipophillicity due to the oil phase and also by

destabilizing the membrane stability due the surfactants and may be used as a enhanced delivery of BCS class III drugs.

Keywords: Microemulsion (O/W), BCS class III drugs (famotidine), non-ionic surfactant, cosurfactant, oil, conductivity, viscosity, clarity, pH, *in vitro* drug release, *in vitro* stomach & intestinal permeability, *in vivo* studies of best formulation.