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Characterization of Tween 80[®] consisting Neem oil based emulsion

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In pharmaceutical industry emulsions provide a liquid drug delivery medium in the form of min globules rather than in bulk form and permits easy drug administration to the human body. Neem oil is used in Ayurveda medicines due to its numerous medicinal properties. It is also used in various cosmetic preparations. A wide variety of different analytical techniques and methodologies have been developed to characterize the properties of emulsions. Since initial properties of an emulsion are changing over the time, characterization should be considered in order to evaluate the quality of an emulsion. The main objective of this study was to formulate and characterize a Tween 80[®] consisting Neem oil based stable emulsion formulation. Primary emulsions were prepared according to randomly chosen ratios of water: oil: surfactant using magnetic stirrer at 300 rpm for 10-15 min. Secondary emulsions were obtained by secondary homogenization of the prepared primary emulsions using high shear homogenizer at 10,000 rpm for 5 min. Microscopic analysis, pH value, viscosity, creaming index and colour were used as the parameters for the characterization of stable emulsion formulations. Methylene blue was taken as the dye in order to stain the emulsions to observe the type of the emulsions. Samples were subjected to 50% dilution with distilled water to measure the pH using a pH meter. The viscosities of emulsions were measured using a Redwood viscometer. Creaming indices of freshly prepared emulsions were measured after 24 hr. Microscopic analysis revealed that the most stable primary and secondary emulsions were oil in water (O/W) type. Secondary emulsions showed greater viscosity than respective primary emulsions and the most stabilized formula of secondary emulsion had 2750 Redwood seconds of viscosity. Creaming indices were zero for all the emulsions. Secondary emulsions were brighter than the respective primary emulsions. The pH values of stabilized emulsions ranged between 4.35 - 5.20. These values are in the non-skin irritating pH range of 4 - 7. Considering all these characteristics, it can be concluded that this formulation can be developed to use as a topical preparation.

Keywords: Characterization, creaming index, redwood seconds, secondary homogenization