

NEEM OIL NANOEMULSIONS: A NEW APPROACH TO DRUG DELIVERY

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Advanced drug delivery systems have been developed to overcome the major drawbacks associated with the conventional ones.

The aim of the present work is to develop nanoemulsions suitable for delivering bioactive substances.

Nanoemulsions (NEs) are nanosized emulsions, manufactured for improving the delivery of active pharmaceutical ingredients.

In this study, nanoemulsions by Neem seed oil and Tween 20 as non-ionic surfactant were prepared. In particular, Neem oil was selected since it shows many bioactive properties. A mean droplet size ranging from 10–100 nm was obtained by modulating the oil/surfactant ratio. Several nanoemulsion formulations were characterized in terms of size and ζ -potential and physicochemical properties, such as microviscosity, polarity and turbidity and morphology, were evaluated, along with stability in simulated cerebrospinal fluid (CSF), Hep-2 cell interaction and cytotoxicity studies.

This study confirms the possibility of preparing NEs by Tween 20 and Neem oil at different weight ratios. Among the different formulation tested, the three prepared and characterized in the present research paper show the smallest hydrodynamic size, a homogenous sample size distribution. The evaluation of the antioxidant activity of Neem oil alone or as NEs confirms that the structured oil in NEs does not lose its activity and is less cytotoxic than the free oil after interaction with HEp-2 cells.