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### Stability evaluation of virgin coconut oil (VCO) base nano-emulsion for transdermal drug delivery

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Emulsions are made by the agitation of the pure immiscible liquids and those are very unstable and break rapidly to the bulk phase. Such emulsions stabilize by addition of surface active material which protects the newly formed drops from re-coalescence. Formation of nano droplets occurs when correct compositions of water, hydrocarbon, surfactant, and co-surfactant are mixed in the right sequence. Nano emulsion drug delivery system is a popular application to enhance the solubility and bioavailability of lipophilic drugs. The objective of this study was to evaluate the stability of an emulsion containing VCO as the oil phase and Tween 20<sup>®</sup> as the surfactant. Primary emulsions were prepared in different ratios of oil, water and surfactant. To the resulting mixture water was added drop by drop while mixing with the aid of magnetic stirrer. Secondary homogenization was done by applying high shear homogenization. Stability evaluation was done for 60 days after the formulation of 12 different formulae. The formulations were observed visually for phase separation, sedimentation, creaming and flocculation. Centrifugation tests were performed for visually stable formulations. Most stable formulation throughout the study period was with oil 32 % (w/w), surfactant 32 % (w/w) and water 36 % (w/w) and particle size of that formula is 484.25 nm. It was highlighted from this study VCO can be used to formulate nano emulsion for transdermal drug delivery system and it shows good stability. Using VCO in emulsion system is a new delivery method. This formulation can be used as an alternative system for preparation of nano emulsion which is a good carrier of several active ingredients for transdermal drug delivery that can minimize several side effects upon oral administration, such as non-steroidal anti-inflammatory drugs.

#### Biography

N A Sanjeevani has completed BPharm degree and MS in Biotechnology from University of Peradeniya, Sri Lanka. She is a Lecturer (Probationary) of Department of Pharmacy, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka. She is young and energetic researcher and currently carrying out a research project on "Determination of hypoglycemic activity and formulation of a tablet using leaf extract of *Adenantha pavonina*". Her immediate goal is to pursue a PhD in Pharmaceutical Sciences from a US University.

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