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Development of biodegradable sustained-release damnacanthal nanocapsules for potential application in in-vitro breast cancer studies

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Abstract

The "noni" species of *Morinda citrifolia* L., is using in traditional medicine in the tropical country for over 2000 years. Noni fruit has come from the *Morinda citrifolia* tree which is called Rubiaceae, and it is from the coffee family. It is a perennial herb whose ripe fruit has a robust butyric acid smell and flavor. Recently scientists have proven that this fruit has antioxidant and antibiotic properties in vitro. An anthraquinone, damnacanthal, is one of the constituents of *Morinda citrifolia*. It has been demonstrated to have anti-cancer properties. Damnacanthal has low water solubility and low bioavailability. Formulating of damnacanthal into the biodegradable nanocapsule drug delivery system may increase its bioavailability. Various formulations of damnacanthal would be developed to enable the selection of a dosage form that could offer the provision of the anti-cancer bioactive substance with suitable sustained- or controlled release properties. The efficiency of extraction of damnacanthal will be compared using both conventional and traditional method. Both the damnacanthal and an anthraquinone active compounds extracted from noni roots, are currently being studied in the context of anti-cancer study. Soon, the medical values, bioactivities and nutritional of this fruit can be assessed, especially its anti-cancer activity, this fruit extract could play an outstanding economic role in Malaysia and other tropical countries.

Keywords

Author Keywords: Damnacanthal; subcritical water extraction; nanocapsules; drug delivery; PLGA; anti-cancer

KeyWords Plus: MORINDA-CITRIFOLIA NONI; SOLID LIPID NANOPARTICLES; POLYMERIC NANOPARTICLES; CARBON NANOTUBES; DRUG-DELIVERY; CELL-DEATH; APOPTOSIS; PROTEIN; ANTIOXIDANTS; STRATEGIES

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