

Strategies for the development of *Mitragyna speciosa* (Kratom) leaves extract loaded with solid lipid nanoparticles

ABSTRACT

Currently, the use of medicinal plants as an alternative medicine for various treatment has increased tremendously due to their positive effects. This include a potential plant-based source, *Mitragyna speciosa* (MS) leaves (kratom leaves). Besides, previous study has reported the other pharmacological properties of MS which includes anaesthetic, antinociceptive, analgesic and stimulant effects. In general, the pharmacological effects of MS leaves are mainly attributed to its principal alkaloid called Mitragynine. The Mitragynine dose employed in recent studies showed that the dose for analgesic (30-200 mg/kg), pharmacokinetics (20-50 mg/kg) and toxicity (200-477 mg/kg) which varied largely across rodent species. Research has been reported that Mitragynine has been studied at the preclinical stage and progressively gaining more attention as a potential substitute or adjunct drug therapy for addiction and pain. These properties are claim to be beneficial in wound healing thus, proper vehicle mechanism should be applied so that the MS leaves could benefits fully in the treatment of wound healing. Hence, an advanced carrier system technology such as solid lipid nanoparticles (SLNPs) are suitable transportation due to their good biocompatibility, small particle size and low toxicity which enables for better penetration into skin. SLNPs are colloidal carriers developed in the last decade as an alternative system to the existing traditional carriers such as nanoemulsions, liposomes and polymeric nanoparticles. SLNPs also possesses good stability and is able to control the release of the incorporated drug. When compared with polymeric nanoparticles, the physiological lipids-made SLNPs is definitely better tolerated by the human body and its lipophilic nature helps it to penetrate deeper into skin.

Keyword: *Mitragyna speciosa*; Mitragynine; Antimicrobial activity; Solid lipidnanoparticle; Transdermal drug delivery