



## Preparation and characterization of *Tribulus terrestris*-loaded nanoparticles

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**Background and objectives:** *Tribulus terrestris* is a flowering herb (Zygophyllaceae) with several properties in folk medicine such as diuretic, tonic, aphrodisiac, analgesic, astringent, and stomachic-lithotripter activities. Although, some extracts and phytochemicals represent excellent bio-activity *in vitro*, less or no *in vivo* activity is observed due to their improper molecular size. The intend of this research was investigation of the feasibility of encapsulating *T. terrestris* into [poly (lactic-co-glycolic acid)] PLGA nanoparticles. **Methods:** Aerial parts of the plant were extracted with aqueous ethanol 85% by percolation apparatus. The nanoparticles of *T. terrestris*-loaded were prepared using a modified simultaneous double-emulsion solvent evaporation/diffusion method. Elucidations were made on the basis of scanning electron microscopy (SEM) and differential scanning calorimetry (DSC). The content of nanoparticles was analyzed by HPLC with indirect method. **Results:** The results stated that increasing the portion of plant extract could cause bigger size with no considerable increase in polydispersity index (PDI). The encapsulation efficiency of *T. terrestris*-loaded nanoparticles was 40.3 to 78.5 and the drug loadings were 0.806 to 6.104, with different ratios of extract. The overall pattern of the release in SDS 1% in dialysis bag in all formulations showed similar and biphasic release kinetic, an initial burst release in the first day followed by constant release over 10 days. **Conclusion:** An effective approach for the preparation of *T. terrestris*-loaded PLGA nanoparticles was performed. The controlled release profile showed that these biodegradable PLGA nanoparticles had great potential and should be given particular consideration in further biological researches.

**Keywords:** nanoparticles, PLGA, *Tribulus terrestris*

