

***In vitro* release study of Linamarin encapsulated Chitosan nanoparticles**

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Linamarin, a cyanogenic glycoside has exhibited the potential as a drug candidate for cancer treatment. Nano-based delivery system will be a suitable application for selective and safe delivery of linamarin. Chitosan (CS) nanoparticles have gained more attention as effective drug carriers in cancer chemotherapy because of their better stability, biocompatibility and for possessing versatile routes of administration. This study focused on the fabrication, physicochemical characterisation and controlled release properties of linamarin encapsulated CS NPs.

Linamarin loaded nanoparticles were prepared by incorporating linamarin into CS solution followed by drop wise addition of the TPP. The selected mass ratio of CS: TPP was 6:1. The particle size and zeta potential value were 49 ± 2 nm and 52 ± 3 mV, respectively. Entrapment efficiency of 85 ± 6 % was achieved with a weight ratio of 150:1 (CS: linamarin). Nanoparticles were characterised using FT-IR, thermo gravimetric analysis (TGA), TEM and SEM techniques. The shape of NPs particles was approximately spherical according to SEM and TEM analysis. FT-IR results suggested cross-linking and interactions between linamarin and CS as well as CS and TPP. TGA analysis also proved the incorporation of linamarin into CS nanoparticles. *In vitro* release characteristics of linamarin from CS NPs were investigated in buffer solutions with pH 2 (KCl-HCl) and 7.4 (phosphate buffer saline). Release profile in both pH values appeared to have an initial rapid release followed by a controlled release behavior. Released amounts of linamarin at 120 h were 68.83% with pH 7.4 and 70.79% with pH 2.

Smaller size and positive zeta potential for linamarin loaded CS nanoparticles indicate their potential for cellular uptake, long circulation and retention time inside the body. Controlled/sustained release behavior enhances the bio availability of the drug, reducing possible side effects. Therefore targeted delivery of linamarin using CS nanoparticles will be an effective, promising alternative method to other cancer treatment methods.

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