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PREPARATION OF CHITOSAN NANOPARTICLES CONTAINING *NAJA NAJA OXIANA* SNAKE VENOM

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ABSTRACT

Hydrophilic nanoparticles have received much attention for delivery of therapeutic peptides, proteins, and antigens. Chitosan (CS) is a biodegradable and nontoxic polysaccharide, as a carrier for drug delivery. The study purpose was to evaluate the influence of a number of factors on the encapsulation of Naja naja oxiana (Indian or speckled cobra) venom and loading capacity, as well as to investigate the physicochemical structure of nanoparticles. CS anoparticles were produced based on the ionic gelation process of tripolyphosphate (TPP) and CS. All the preparations were estimated with diameter 120–150 nm and spherical shape using transmission electron microscopy. Fourier transform–infrared spectroscopy confirmed that tripolyphosphoric groups of TPP linked with ammonium groups of CS in the nanoparticles. Our results showed that CS can react with TPP to form stable cationic nanoparticles. Therefore, when chitosan concentration was increased to 1.5 mg/mL the aggregates with large diameter were formed. Optimum loading capacity and encapsulation efficiency of venom at a concentration of 500 mg/mL were achieved for low-molecular-weight (low-MW) CS at a concentration of 2 mg/mL and high-MW CS at a concentration of 3 mg/mL. The in vitro release of nanoparticles also determined in the present study, showed an initial burst release of about 10% in the first 10 hours, followed by a slow and much reduced further release for about 360 hours. It is suggested that the chitosan nanoparticles, fabricated in our study possibly, could be used as an suitable alternative for traditional adjuvant systems.