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Synthesis and characterization of chitosan nanoparticles and chitosan effect on *Fusarium* head blight and oxidative activity in wheat

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Abstract

The main aim of present study was to prepare chitosan (CS) and chitosan nanoparticles (CS/NPs) to evaluate their antifungal and oxidative activity. CS/NPs were prepared based on the ionic gelation of CS with tripolyphosphate (TPP) anions by using centrifugation and pH change. The obtained nanoparticles (NPs) were characterized by size and zeta potential analysis. The antifungal activity of the CS and CS/NPs were evaluated on the *Fusarium graminearum*, which causes Fusarium head blight (FHB) on wheat by the method of spraying on the Potato dextrose agar (PDA) medium. The Dynamic light scattering (DLS) indicated that particle diameter (z-average) was approximately 180.9 ± 35.5 - 339.4 ± 50.9 and 225.7 ± 42.81 - 595.7 ± 81.7 nm for NPs prepared from CS with different molecular weights by using centrifugation and pH change methods, respectively. Different concentrations of CS and NPs

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