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Application of Synthesized Silver Nanoparticles via Aqueous Extract of Sour Orange Peel to Control of Fusarium wilt disease in tomato (*Solanum lycopersicon* L.)

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Wilting disease caused by *Fusarium oxysporum* f.sp *lycopersici* is one of the most important tomato diseases. Regarding to the destructive effects of overuse of chemical pesticides in the environment, applying of nonchemical compounds for plant disease control is unavoidable. Therefore the goal of this research was producing of green silver nanoparticles and understanding of their fungicide effects on F1 and F16 strains of *F.o*.f.sp.*lycopersici*. For this reason, fungicide effects of Ag NPs that were made under dark and lighting conditions, investigated by factorial method under CRD examination with three replications for each treatments. All experiments were done under *in vitro* and *in vivo* conditions. Treatments were distilled water as negative control, 25, 75, 100 and 120 mg L^{-1} concentrations of Ag NPs suspension and aqueous sour orange extract. More effectively treatments regarding to their capability for highest inhibitory effects on fungal growth under *in vitro* condition were selected and used for *in vivo* experiments. These treatments were 50, 100, 200 and 300 mg L^{-1} concentrations of Ag NPs (were made under dark and lightening conditions) that were applying as pre and post treatments on diseased tomato plants by *F.o*.f.sp.*lycopersici*. Morphological properties, disease incidence (DI) and disease severity (DS) were evaluated in this section. Finally the results of this research show that, 120 mg L^{-1} concentration of Ag NPs (were made under dark condition) had the highest inhibitory effects on F1 and F16 strains of *F.o*.f.sp.*lycopersici* under *in vitro* condition. Also under *in vivo* condition, 300 mg L^{-1} concentration of Ag-NPs (were made under dark condition) was more effectively than other concentrations and it could be reducing DI and DS. But yield of tomato with 300 mg L^{-1} concentration of Ag-NPs was reduced regarding to Ag NPs toxicity effects.

Keywords: Disease severity, Disease incidence, Tomato, Silver nanoparticles, anti microbial effect Fusarium wilt.

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