



***In Vitro* Evaluation of Nickel Nanoparticles against Various Pathogenic *Fusarium* Species**

Ahmed I. S. Ahmed¹, Dil Raj Yadav² and Youn Su Lee²

¹Plant Pathology Unit, Plant Protection Department, Desert Research Center, Cairo, Egypt.

²Division of Bioresource Sciences, Kangwon National University, Chuncheon 24341, Korea.

Abstract:The objective of this study was to evaluate antifungal activity of nickel nanoparticles against *Fusarium* species as an alternative to existing methods. In this study, nickel nanoparticles at concentrations of 10, 20, 50 and 100 ppm, were evaluated for their antifungal activity on 42 isolates of *Fusarium* belonging to different species isolated from crop field soils of different locations in Korea. The fungal isolates were grown on three different media, potato dextrose agar, corn meal agar and malt extract agar, amended with nickel nanoparticles. The results indicate that nickel nanoparticles at concentrations of 50 and 100 ppm inhibited the mycelial growth of *Fusarium* isolates investigated. Nickel nanoparticles at a concentration of 100 ppm caused more than 90% inhibition of mycelial growth of some isolates on malt extract agar media. The range of growth inhibition was 24.7-90.2% and 21.67-85.1% at a concentration of 100 ppm on corn meal agar and potato dextrose media, respectively. The light and scanning electronic microscope examinations revealed that the nickel nanoparticles caused damage of mycelia and spores of tested *Fusarium* species. This study suggests that nickel nanoparticles at high concentration could be used to control *Fusarium* fungi. However, further studies are needed to assess the effect of nickel nanoparticles on the growth of host plant.

Keywords:Antifungal activity, *Fusarium* spp., Nickel nanoparticles.

Ahmed I. S. Ahmed *et al*/International Journal of ChemTech Research, 2016,9(6),pp 174-183.
