

Fungicidal Action of the Mycogenic Silver Nanoparticles Against *Aspergillus niger* Inciting Collar Rot Disease in Groundnut (*Arachis hypogaea* L.)

Authors : R. Sarada Jayalakshmi Devi B. Bhaskar, S. Khayum Ahammed, T. N. V. K. V. Prasad

Abstract : Use of bioagents and biofungicides is safe to manage the plant diseases and to avoid human health hazards which improves food security. Myconanotechnology is the study of nanoparticles synthesis using fungi and their applications. The present work reports on preparation, characterization and antifungal activity of biogenic silver nanoparticles produced by the fungus *Trichoderma* sp. which was collected from groundnut rhizosphere. The culture filtrate of *Trichoderma* sp. was used for the reduction of silver ions (Ag⁺) in AgNO₃ solution to the silver (Ag⁰) nanoparticles. The different ages (4 days, 6 days, 8 days, 12 days, and 15 days) of culture filtrates were screened for the synthesis of silver nanoparticles. Synthesized silver nanoparticles were characterized using UV-Vis spectrophotometer, particle size and zeta potential analyzer, Fourier Transform Infrared Spectrophotometer (FTIR) and Transmission Electron Microscopy. Among all the treatments the silver nitrate solution treated with six days aged culture filtrate of *Trichoderma* sp. showed the UV absorption peak at 440 nm with maximum intensity (0.59) after 24 hrs incubation. The TEM micrographs showed the spherical shaped silver nanoparticles with an average size of 30 nm. The antifungal activity of silver nanoparticles against *Aspergillus niger* causing collar rot disease in groundnut and aspergillosis in humans showed the highest per cent inhibition at 100 ppm concentration (74.8%). The results points to the usage of these mycogenic AgNPs in agriculture to control plant diseases.

Keywords : groundnut rhizosphere, *Trichoderma* sp., silver nanoparticles synthesis, antifungal activity

Conference Title : ICGFS 2015 : International Conference on Global Food Security

Conference Location : Miami, United States

Conference Dates : March 09-10, 2015