

Pharmaceutics & Novel Drug Delivery Systems

21st International Conference on

&

Advanced Nanoscience and Nanotechnology

June 21-22, 2018 | London, UK

Study of biogenic iron nanoparticle based on *Trichoderma harzianum* in hidroponic system

Natalia Bilesky-José, Mariana Guilger, Tais Germano-Costa, Leonardo Fernandes Fraceto and Renata Lim
University of Sorocaba, Brazil

Recently, the use of nanoparticles in the agricultural sector has been growing and has as one of the main focuses the control of pathogens, however it is of great importance to take into account its possible impacts to the components of the ecosystem, such as plants. In the case of iron nanoparticles, we know that they are compatible with organisms and can be used in soil and water treatments, but they tend to aggregate easily, which can alter their properties. The biogenic synthesis is an alternative to obtain nanoparticles with better stability and size control, seeing that in this type of synthesis they are covered by molecules from the reducing organism. The aim of this work was to synthesize a biogenic iron nanoparticle (FeCl_3), using *Trichoderma harzianum*, a mycoparasite fungus applied in biological control, to perform the physico-chemical characterization of this new nanomaterial using the dynamic light scattering technique (DLS), microelectrophoresis and nanoparticle tracking analysis (NTA), evaluate its biological activity, and then its possible effects on tomato seedlings in a hydroponic system, using ultrapure water and a commercial

iron nanoparticle (Fe_2O_3) as controls. The nanoparticles presented a hydrodynamic diameter of 207.3 nm, a polydispersity index of 0.45, a zeta potential of 13.47 mV and a concentration of 1.9×10^{10} NPs/ml. The biogenic nanoparticle presented high activity against the phytopathogenic fungus *Sclerotinia sclerotiorum*, while the commercial nanoparticle stimulated the sclerotia germination of this fungus. Nanoparticles did not interfere in seed germination and seedling growth. Considering the results of this study, the biogenic iron nanoparticles present potential for the control of agricultural phytopathogens. Regarding to its effects on the environment, further investigations are still necessary.

Speaker Biography

Natalia Bilesky-José has completed her graduation in Biotechnology and Bioprocess Engineering at University of Sorocaba, Brazil. Currently, she is in the master's course in Pharmaceutical Sciences of University of Sorocaba, Brazil. She is working on the synthesis of biogenic iron nanoparticles aiming agricultural applications and investigating these nanomaterials toxicity.

e: nataliabilesky@hotmail.com



Notes: