

## **Nanoderma: Ecofriendly Nano Biofungicides for Controlling Plant Pathogenic Fungi**

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**Abstract :** Studies on bioefficacy (in vitro and in vivo) and mode of action of the nanocides against the most important plant diseases in Egypt and Russia might assist in the goal of sustainable agriculture. To our knowledge, few researchers have evaluated the combined antimicrobial effect of inorganic nanoparticles (NPs) with bioorganic pesticides for controlling plant pathogens in the greenhouse and open field, decontrol investigated synergistic effect. In the current project, we will develop eco-friendly alternative management strategies including the use of heavy nanometal-tolerant *Trichoderma* strains and the main effective material in conventional fungicides (curpic, sulfur, phosphorus and zinc) for controlling plant diseases. Studies on bioefficacy and the mechanism of the nanocides against the most important plant diseases in Egypt were evaluated. There is a growing need to establish mechanisms of action for nano bio and/or fungicides to assist the design of new compounds or combinations of compounds, in order to understand resistance mechanisms and to provide a focus for toxicological attention. Nanofungicides represent an emerging technological development that could offer a range of benefits including increased efficacy, durability, and a reduction in the amounts of active ingredients that need to be used.

**Keywords :** biohybrids, biocides, bioagent, plant pathogenic fungi

**Conference Title :** ICNAPP 2017 : International Conference on Nanotechnologies in Agriculture and Plant Protection

**Conference Location :** Barcelona, Spain

**Conference Dates :** August 17-18, 2017