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Extended Abstract

Plant Biostimulants Based on Selenium Nanoparticles Biosynthesized by *Trichoderma* Strains †

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Biostimulants are a novel class of additives used to promote plant vigor and resistance to abiotic stress, such as desiccation. The most used biostimulants are humic and fulvic acids, seaweed extracts, and biopolymers, as well as beneficial bacterial and fungal strains [1]. One such beneficial fungal strain is *Trichoderma,* which exists in the soil and colonizes the root system and can enhance root proliferation [2]. *Trichoderma* spp. were shown to be able to bio-synthesize selenium nanoparticles (SeNPs) [3]. Selenium (Se) is known to have beneficial effects on plant and animal metabolism at low concentrations, being involved in protection against reactive oxygen species (ROS) in the form of selenoproteins [4]. Se can also act as a protective agent against the harmful effects of heavy metals [5]. Nevertheless, Se has a narrow physiological window, and the toxicity depends on Se species, SeNPs being much less toxic than Se salts [4].

The aim of this study was to develop and test a plant biostimulant based on SeNPs bio-synthesized by *Trichoderma* spp. by monitoring its effects on different stages of plant growth, as well as some biochemical markers of these effects. The tests were conducted on *Vigna radiata* seeds, which were germinated in aqueous solutions of SeNPs or Se selenite and compared to a control group that were germinated in water. The germinated seeds were planted in sterilized soil and grown in a lux-chamber. Post-harvest, the plant material was ground into a powder after freezing with liquid nitrogen, and small samples of this powder were used to assess lipid peroxidation and chlorophyll production of the plant tissue. SeNPs were found to be much less toxic than Se selenite and to protect the plants against phytopathogens.

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