

# The Effect of Colloidal Metals Nanoparticles on Quarantine Bacterium - *Clavibacter michiganensis* ssp. *sepedonicus*

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**Abstract**—Colloidal metal nanoparticles has drawn increasing attention in the field of phytopathology because of their unique properties and possibilities of applications. Their antibacterial activity, no induction of the development of pathogen resistance and the ability to penetrate most of biological barriers make them potentially useful in the fighting against dangerous pathogens.

These properties are very important in the case of protection of strategic crops in the world, like potato - fourth crop in the world - which is host to numerous pathogenic microorganisms causing serious diseases, significantly affecting yield and causing the economic losses. One of the most important and difficult to reduce pathogen of potato plant is quarantine bacterium *Clavibacter michiganensis* ssp. *sepedonicus* (Cms) responsible for ring rot disease. Control and detection of this pathogens is very complicated. Application of healthy, certified seed material as well as hygiene in potato production and storage are the most efficient ways of preventing of ring rot disease. Currently used disinfectants and pesticides, have many disadvantages, such as toxicity, low efficiency, selectivity, corrosiveness, and the inability to eliminate the pathogens in potato tissue. In this situation, it becomes important to search for new formulations based on components harmful to health, yet efficient, stable during prolonged period of time and a with wide range of biocide activity. Such capabilities are offered by the latest generation of biocidal nanoparticles such as colloidal metals.

Therefore the aim of the presented research was to develop newly antibacterial preparation based on colloidal metal nanoparticles and checking their influence on the Cms bacteria. Our preliminary results confirmed high efficacy of the nano-colloids in controlling the this selected pathogen.

**Keywords** — *Clavibacter michiganensis* ssp. *sepedonicus*, colloidal metal nanoparticles, phytopathology, bacteria.

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