

The Influence of Colloidal Metal Nanoparticles on Growth and Proliferation of *In vitro* Cultures of Potato.

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Abstract—Colloidal metal nanoparticles are widely applied in various areas and have great potential in different biotechnological applications. Their particular properties associated with both the antiseptic, antioxidant and antiaging properties as well as ability to penetrate most of biological barriers, synergy in absorption of nutrients and non toxic to plants. The properties make them potentially useful in fast and safe production of healthy, certified starting material in the production of plants exposed to many pathogenic microorganisms causing serious diseases, significantly affecting yield and causing the economic losses. In this case it is crucial to provide appropriate conditions for the production, storage and distribution of the plant material.

Therefore the aim of the proposed research was to develop and identify the influence of four colloidal metal nanoparticles on growth and proliferation of *in vitro* cultures of potato (*Solanum tuberosum*) - one of the most economically important strategic crops in the world.

The research on different varieties of potato were performed by placing the explants of the *in vitro* cultures on sterile Murashige and Skoog (MS) type medium. The influence of the nanocolloids was evaluated using the MS medium impregnated with the examined nanoparticles. The vigour of growth and the rate of proliferation was examined for 6-8 weeks with both night/day-length and temperature over the ranges 8/16 h and 20–22 °C respectively.

The results of our preliminary work confirmed high usefulness of the nanocolloids in the safe production of the examined *in vitro* cultures.

Keywords — Colloidal metal Nanoparticles, *in vitro* cultures, potato, propagation.

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