

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 anti aging properties as well as ability to penetrate most of the biological barriers, synergy in the absorption of nutrients and nontoxic to plants. The properties make them potentially useful in the 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 was 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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