Grant TK-Ch-1719 “Study of the interaction chitosan (solutions, microgels or nanostructured spheres) – beneficial/pathogenic microorganisms – agricultural crops”

National Science Fund, Thematic competition: “New Materials and Nanotechnologies”

Duration: 2007 – 2010

Key words: chitosan-microorganism interaction, micro- and nanostructured materials, biocontrol

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The aim of the proposed project is to study the main interactions in the system microorganism-polymer-plant necessary for the design of new nanostructured multifunctional phytopharmaceuticals from renewable materials with inherent biological activity. The effect of chitosan and its oligomers of different molar masses and in different forms of application (solutions, microgels and nanostructured beads) on the growth of pathogenic and beneficial soil microorganisms as well as on the stimulation of plant growth will be studied. Chitosan and its oligomers will be characterized by chromatographic and viscometric methods and different spectroscopy methods. The nanostructured beads will be prepared by capillary extrusion. Microorganisms from microbial collections as well as newly isolated microorganisms exhibiting biological activity (e.g. control on phytopathogens, plant stimulation) will be used. The effect of the polymer on the growth of beneficial and phytopathogenic microorganisms will be evaluated by cultivation in presence of the polymer (in a different applied form). The effect of selected systems on plants will be verified by determination of some physiological parameters of the plants in a different phenophase. It is expected that the studies will contribute to the design of new phytopharmaceuticals for agriculture in terms of effective control on pathogenic microorganisms and stimulation of the plant growth.