

DESCRIPTION FOR THE GENERAL PUBLIC

Within the framework of the project a series of basic examinations is planned with an aim of carrying out a synthesis and detailed physical and chemical analysis of multilayer composite capsules in the form of biomass immobilised in a polymer matrix, additionally enriched with microelements. There are few studies devoted to polymer/biomass biocomposite synthesis. Immobilisation of even very fragmented biomass in a biopolymer matrix may significantly improve its stability and effectiveness during biosorption of microelements (metal ions) as compared to traditional biosorbents. Also, functional biopolymer groups may participate in binding metal ions from aqueous solutions.

This will be a cognitive study in material selection for developing capsules, long-term stability and mechanic durability of the composite structures, investigating microelements transportation mechanisms in the polymer matrix and their controlled release. We are looking for an answer to the question what elements building the composite capsule have the greatest impact on the selective release of micronutrients and whether it is possible to control the physicochemical and mechanical properties of the designed structures.

The study proposed here will result in a synthesis of a multilayer biocomposite polymer capsule in terms of its chemistry, microbiological properties and mechanism that is characterised by controlled release of preselected microelements during the plant growth. The selection of the most efficient composite set and the unravelling of the mechanism of adsorbed metal ions release may directly contribute to the development of studies on their application in balanced soil fertilisation.