

Phthalate esters (PAEs) are among the most common pollutants found in agricultural soils, both in China and Poland. This is crucial, especially in the context of agricultural (vegetable) production on contaminated soils. On the other hand, both in China as well as in Poland, large amounts of garden/agricultural waste are generated that must be managed. The aim of this project is to use horticultural waste to produce biochar, but also endophytic bacterial flora that decompose PAEs, so as to reduce the amount of PAEs in the soil-vegetable system. For this purpose, endophytic bacterial flora, which is highly efficient in removing PAEs, will be selected and then immobilized on biochars. Using vegetables (leafy and root vegetables) as test plants, the process of PAEs removal by endophytic bacterial flora immobilized on biocarbon will be explained in the soil-vegetable system. During the studies the form, availability and release of PAEs in the soil of the vegetable rhizosphere will be determined. The response of microorganisms, the production of enzymes and genes that degrade PAEs in soil and vegetables will be also estimated. On this basis, the chemical and biological mechanisms of PAEs removal from the soil and plant system by endophytic bacterial flora immobilized on biochar will be explained. The implementation of the project will contribute not only to indicating the way of managing waste materials (garden waste) in China and Poland, but also to indicate ways of safe vegetable production in PAEs contaminated areas.