

The scientific aim of the project is to deepen the knowledge on the phenomenon of entomoremediation. entomoremediation (from the Greek *entomon* – insect and the Latin *remedium* – to clean or restore) can be defined as the use of specialized insects and their associated microorganisms to utilize, extract, sequester and/or detoxify pollutants from soil, sediments and organic biomass. This is a new subdivision of bioremediation as an application of living organisms to remove contaminants from different environmental compartments. The reason for submitting the project was the desire to continue and extend the author's research on this issue already published in scientific journals. In addition, the desire to explore the pros and cons of an entomoremediation approach, which, like any new concept, can bring very interesting discoveries if it is further developed. The project will investigate larvae of two insect species - mealworm (*Tenebrio molitor*) and *Hermetia illucens*, an insect without a Polish name. The larvae of both species feed on dead organic matter and are very voracious. The possibility of their development will be investigated on two types of troublesome waste: sewage sludge and plant biomass with increased content of heavy metals, which remains as waste after phytoextraction (i.e. removal of heavy metals from the soil by means of plants). During larvae development, the dry mass of waste will decrease. In addition, the potential of insects to bioaccumulate various elements will be investigated. The expected effects of the project are the development and popularization of knowledge about entomoremediation and new concepts for the management of onerous organic waste, as well as for the first time determining the ability of selected insect species to bioaccumulate various elements, including particularly interesting technologically critical elements. This will be the first research of this type in the world. The implementation of the project objectives will directly contribute to the development of knowledge about entomoremediation and may bring interesting discoveries about the ability of selected insect species to bioaccumulate various elements, including technologically critical ones. In the future, the results of research undertaken in the project can be used to create a technology for recovering important elements from sewage sludge and to help close their circulation in the anthroposphere. The final stage of the project will be experiments aimed at revalorising the final products of entomoremediation (i.e. insect moultings and dead insect biomass) and larval feeding residues on the above mentioned wastes, in accordance with the European Waste Hierarchy - chitin will be recovered, the possibility of recovering technologically critical and rare metals will be assessed and the residues will be methane fermented for energy recovery. In this way, the project concept fits into the context of the circular economy and green chemistry.