

Brief information about the project

Title	Development of Biochar Decontamination Technology for Sustainable Waste Biomass Conversion into Value-Added Products.
Relevance	The introduction of biochar derived from waste <i>Miscanthus</i> biomass (contaminated) into the soil poses a significant risk of secondary contamination, which can potentially reduce biomass productivity and inhibit the remediation process. Therefore, given the lack of scientific research to prevent the risks of secondary contamination, i.e. decontamination of the biochar, the current project proposes an innovative strategy involving the immobilization of Zn-solubilizing strains on the biochar, followed by flushing processes to remove the released Zn ions. In addition, microbial strains are expected to have PGP properties, which will eventually contribute to an increase in biomass productivity.
Goal	To develop a technology for decontamination of waste biomass-derived biochar through immobilisation with potentially toxic elements (PTEs)-solubilising microorganisms (in our case: Zn).
Tasks	1. Isolation, screening, and identification of microbial strains with Zn-solubilising and plant growth-promoting traits. 2. Piloting immobilisation and decontamination strategies considering <i>Miscanthus</i> sp. waste biomass-derived biochars. 3. Validation of decontaminated biochar in “soil – biochar – plant” system utilising <i>Triticum</i> sp. as a model organism and <i>Paulownia</i> sp. as energy crop.
Expected and Achieved Results	Effective strategy for decontamination of waste biomass-derived biochar involving the identification of the most promising Zn-solubilising microbial strain/consortium and determination of the optimal conditions for their immobilisation onto biochar.
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Publications list with links to them	Pidlisnyuk, V.; Herts, A.; Kononchuk, O.; Khomenchuk, V.; Horyn, O.; Markiv, V.; Mamirova, A. Comprehensive Study of Biochars from Different Vegetative Feedstocks: Influence on Soil Properties and Development of <i>Zea mays</i> L. <i>Environ. Sci. Eur.</i> 2025 , 37, 77, https://doi.org/10.1186/s12302-025-01118-5
Patent information	No

