

POTENTIAL APPLICATION OF MICROBES FOR XENOBIOTIC-REMOVAL IN AGRICULTURAL SYSTEMS

ANUAR R. ZHUMAKAYEV^{1,2}, LÁSZLÓ KREDICS¹, LÁSZLÓ MANCZINGER¹,
BILJANA ŠKRBIĆ³, CSABA VÁGVÖLGYI¹, LÓRÁNT HATVANI¹

¹Department of Microbiology, Faculty of Science and Informatics, University of Szeged, 6726 Szeged, Közép fasor 52, Hungary

²Doctoral School in Biology, Faculty of Science and Informatics, University of Szeged, Szeged, Hungary

³University of Novi Sad Faculty of Technology Novi Sad, Bulevar cara Lazara 1, 21000 Novi Sad, Serbia
lorant.hatvani@gmail.com

To provide a sufficient level of pest control a wide range of pesticides are used in the modern agriculture. Additionally, agricultural areas are also exposed to various further pollutants of human origin. Organophosphorous (OP), carbamate (CB) and organochlorine (OC) pesticides, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs) and other persistent organic pollutants (POPs) as well as heavy metals and their residues can remain in the soils of cultivation fields causing high environmental hazard. As these compounds might be retained in the crops as well, they also threat human health due to their adverse (e.g., carcinogenic, endocrine disrupting, teratogenic, and mutagenic) effect, resulting in an enhanced risk for the development of numerous severe human diseases such as different types of cancer, cardiovascular disease, damage of kidneys, liver and muscles, disorders of the endocrine and nervous systems. Therefore, the removal of these toxic substances from agricultural systems is of particular importance. Various microbes (e.g., *Pseudomonas*, *Alcaligenes* and *Rhodococcus* species) were found to be capable of degrading certain xenobiotics during their metabolic processes, which makes them potential candidates for bioremediation applications. Within the frames of the proposed review lecture, the potential use of microorganisms for the removal of xenobiotics from agricultural systems will be presented and discussed. This presentation will cover some previously published data as well as our new results, together with the introduction of our recently started research project PLANTSVITA.

Acknowledgements

The preparation of this presentation was supported by the Hungary-Serbia IPA Cross-border Co-operation Programme (HUSRB/1602/41/0031). LK is grantee of the János Bolyai Research Scholarship.