

## IMPLEMENTATION SCALE-UP IN THE PRODUCTION OF PEPTAIBOL COMPOUNDS

**Dóra Balázs<sup>1,2\*</sup>, Gergő Terna<sup>1,2</sup>, Bence Váczl<sup>1</sup>, Fanni Kovács<sup>1,2</sup>, Chetna Tyagi<sup>1</sup>, Ákos Rozsnyói<sup>1,2</sup>, András Szekeres<sup>1</sup>, Mónika Varga<sup>1</sup>, Csaba Vágvölgyi<sup>1</sup>, Tamás Papp<sup>1</sup>, László Kredics<sup>1</sup>, Tamás Marik<sup>1</sup>**

<sup>1</sup>University of Szeged, Faculty of Science and Informatics, Department of Biotechnology and Microbiology, Szeged, HUNGARY

<sup>2</sup>University of Szeged, Faculty of Science and Informatics, Doctoral School of Biology, Szeged, HUNGARY

\*corresponding author: [dora.balazs91@gmail.com](mailto:dora.balazs91@gmail.com)

The increasing challenges in agriculture are prompting the search for new solutions in biological plant protection. To avoid problems caused by chemicals, the application of new alternatives is necessary. Products containing filamentous fungal species from the genus *Trichoderma* are already successfully used in practice thanks to their rapid growth and intensive metabolic production. However, plant, fungal, and human pathogenic species found among the strains may pose risks. Peptaibols, bioactive secondary metabolites produced by *Trichoderma* species, may open new avenues in plant protection, and their use avoids the direct application of fungal species to agricultural areas. The inhibitory effect of these biologically active short *peptides is known against several plant pathogenic bacterial and fungal species, and they are rich in non-proteinogenic amino acids*. In addition to their antagonistic effect, when applied in appropriate concentrations, they can also have a beneficial impact by inducing systemic resistance in plants. We are developing a large-scale method that can sustainably and easily produce large amounts of peptaibols using *Trichoderma* strains. Two methods were developed, using different grains as well as a mycelium-regrowth process, which means the producing *Trichoderma* is regrown on the same media after harvesting the mycelia several times. Both methods significantly increased the final amount of peptaibols. Our results can help to establish the commercial production of peptaibol extracts for application in biological plant protection, opening new avenues in modern biocontrol.

This work was supported by the Hungary–Serbia IPA Cross-border Co-operation Programme (project FERTILEAVES, HUSRB/23S/11/027) and by the Scholarship Program of the Ministry of Culture and Innovation, financed from the National Research, Development and Innovation Fund (EKÖP-24-4SZTE-629 and EKÖP-24-4-SZTE-605).