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NEWLY ISOLATED FUNGAL STRAINS ABLE TO DEGRADE BIOPLASTIC

Aneta K Urbanek and Aleksandra M Mirończuk
Wroclaw University of Environmental and Life Sciences, Poland

Nowadays, the accumulation of plastic waste in the environment creates an increasing ecological problem. Due to the constantly growing production of plastic, we need to look for new methods of combating waste. One of them might be the application of microorganisms showing biodegradable activity. It has been proven that microorganisms have unique abilities and can be used in various fields. Hence, searching for microorganisms in different environments with good bioplastic degradability can be the key to solving plastic issue in the future. In our research we were searching for microorganisms from Antarctic soil samples able to degrade bioplastics such as PCL (polycaprolactone), PBS (polybutylene succinate) and PBSA (polybutylene succinate adipate). The final result of the initial tests with bioplastic (BP)-emulsions as a sole carbon source (the clearance method) has allowed us for preservation 51 bacterial and 22 fungal strains as BP-degrading isolates. The comparison of biodegradable activity of the isolated microorganisms has indicated strains with the best capabilities to degrade bioplastic. Among them, a few different fungal strains were shown promising abilities, thus they were tested in a solid plate cultures and in a shake flasks experiments with PBSA, PCL and PBS films as a sole carbon source. To identify isolated strains, gDNA were isolated. After amplification and sequencing of 18S rRNA region, the fungal strains were identified as belonging to genus Fusarium, Geomyces and Sclerotinia. So far, there is no evidence to characterize these fungi as able to degrade bioplastic. The next step in our research is to purify the enzymes responsible for fungal biodegradable ability. Previously was shown that fungal strains are capable to produce extracellular enzymes such as lipases, cutinases, depolymerases, esterases, that allows fungal species to consume and metabolize diverse carbon sources in cold, low-nutrient environments. The obtained results are a good starting point for further research in plastic degradation.

Biography

Aneta K Urbanek has completed her Master of Science from Wroclaw University of Environmental and Life Sciences. She is currently pursuing PhD in field of Biotechnology at Wroclaw University of Environmental and Life Sciences. She has published 2 papers in reputed journals. She has held two internships at Technical University of Denmark and Complutense Univeristy of Madrid. She is a scholarship holder of the Iwanowska programme under the Polish National Academy for Academic Exchange (NAWA). Her research is focused on isolation and characterization microorganisms decompose plastic and bioplastic from extreme environments. Moreover, she has focused recently on purification of enzymes involved in biodegradation process.

aneta.urbanek@upwr.edu.pl