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Isolation of cellulose degrading microorganisms from cow rumen

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The application of fossil fuels results serious environmental problems moreover these energy sources are getting exhausted.

These facts inspire the researchers and developing labs to find alternative solutions. The cellulose/hemicellulose-based technologies can provide the solution. Cellulose is the most abundant organic compound on the Earth and it is found many places, e.g. in the cell wall of plants between lignin and hemicellulose. The most important component of hemicellulose is xylan. High amount of cellulose/hemicellulose is produced by industry, agriculture, etc. Many microorganisms are able to degrade these biomaterials under aerobic or anaerobic conditions with complex enzyme systems. Breakdown of cellulose/hemicellulose by cellulases and xylanases results monosaccharides an/or secondary metabolites that can be further fermented by other microorganisms. During the progress several alternative energy carriers e.g. biodiesel, bioethanol, H₂, etc. can be produced. Our goal was to isolate cellulose and xylan degrading microorganism(s) from cow rumen content under aerobic conditions. We isolated two strains which showed good cellulase and xylanase activity on minimal salts agar plate supplemented with microcrystalline cellulose or xylan as carbon source. The activity of enzymes were determined by Congo-red probe then strains were identified by 16S rDNA-based method. The physiological and biochemical characteristics of the isolates were determined, as well.

Biography

Árpád Szilágyi has completed his MSc degree. He studied at University of Szeged, Faculty of Science and Informatics as biologist (Molecular-, Immun- and Microbiology specialization). He started his PhD programme at Doctoral School of Environmental Sciences in 2013 and his supervisor is Dr. Gábor Rákely.

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