sciforum-088149: A bacterial strain from the biofilm on the surface of poly(ethylene terephthalate) from soil in Chernihiv city (Ukraine)

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Bacteria take an active part in the degradation of polymer materials, as they have high biochemical activity and are able to form biofilms. In order to expand our knowledge about the soil bacterial biodiversity on the surface of artificial materials from the soil of Chernihiv (Ukraine), in this study, the bacterial strain PET1 was isolated from the biofilm formed on the poly(ethylene terephthalate) bottle material taken from the soil. The strain was isolated and purified on Postgate's "C" medium and modified by us (using poly(ethylene terephthalate) as the only source of carbon). The following methods were used in the research: 1) microbiological: inoculation in a liquid medium, inoculation in a solid medium, morphological analysis of the micro-organisms' colonies, methods of staining bacterial cells and their structures (according to Gram in Kalina's modification, endospores according to Hansen), and methods of determining physiological and biochemical properties (catalase and oxidase tests); 2) molecular genetic: DNA isolation from bacterial cells, polymerase chain reaction with primers to the 16S rRNA gene, 16S rDNA sequencing, and phylogenetic analysis using the GenBank database and the MEGA 11 computer program. It was established that the bacterial cells of the isolate PET1 are Gram-negative short rods with rounded ends, single or in pairs; do not form spores; are mobile; and exhibit fast helical movement. The bacteria are catalase- and oxidase-positive. On the dendrogram of genetic similarity, the strain PET1 entered the same group as *Achromobacter xylosoxidans* strains. Therefore, the PET1 strain was identified as *Achromobacter xylosoxidans* based on a complex of microbiological and molecular genetic features. Bacteria of the species *A. xylosoxidans* belong to risk group 2 (according to the German Technical Regulations for biological agents) and can be used during scientific research on the biodegradation of poly(ethylene terephthalate).