Degradation of Polyvinyl Alcohol and Polyethylene Glycol Plastics by Fungi Isolated From Soil Samples of Lahore, Pakistan

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Plastic waste plays a large role in land pollution and thus is a factor in climate change. Disposing of it is an important challenge that scientists have been struggling with for decades. Among the many proposed solutions is using microorganisms for its biodegradation—namely, fungi and bacteria. This idea was taken and used as the basis for this research, which is conducted to test and potentially optimize. The project is about Isolation of plastic degradation fungi from soil samples collected from different areas of Lahore, Pakistan where plastic is seen to accumulate, such as a storage unit, a garbage area, and the dumpsite of a textile factory. Efficiency of fungal microorganisms (such as Aspergillus and Penicillium) was tested by growing them using plastic powders as their sole carbon source (Polyethylene glycol and Polyvinyl alcohol) and then inoculating mixed plastic sheets with the grown fungi samples. The plastic sheets were pretreated with different strong chemical reagents in order to measure the efficiency and best degradation value and their effect on the process. Thus, we investigated and optimized the plastic degradation process using microorganisms by adding external chemical reagents into the equation, and measured the degradation results using visual physical evidence of degradation such as accumulation of debris or holes formed in the surface.

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