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### Biodegradation of polyester polyurethane by *Aspergillus tubingensis*

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The xenobiotic nature and lack of degradability of polymeric materials has resulted in vast levels of environmental pollution and numerous health hazards. Different strategies have been developed and still more research is being in progress to reduce the impact of these polymeric materials. This work aimed to isolate and characterize polyester polyurethane (PU) degrading fungi from the soil of a general city waste disposal site in Islamabad, Pakistan. A novel PU degrading fungus was isolated from soil and identified as *Aspergillus tubingensis* on the basis of colony morphology, macro- and micro-morphology, molecular and phylogenetic analyses. The PU degrading ability of the fungus was tested in three different ways in the presence of 2% glucose: (1) on SDA agar plate, (2) in liquid MSM, and (3) after burial in soil. Our results indicated that this strain of *A. tubingensis* was capable of degrading PU. Using scanning electron microscopy (SEM), we were able to visually confirm that the mycelium of *A. tubingensis* colonized the PU material, causing surface degradation and scarring. The formation or breakage of chemical bonds during the biodegradation process of PU was confirmed using Attenuated Total Reflectance Fourier Transform Infrared (ATR-FTIR) spectroscopy. The biodegradation of PU was higher when plate culture method was employed, followed by the liquid culture method and soil burial technique. Notably, after two months in liquid medium, the PU film was totally degraded into smaller pieces. Based on a comprehensive literature search, it can be stated that this is the first report showing *A. tubingensis* capable of degrading PU. This work provides insight into the role of *A. tubingensis* towards solving the dilemma of PU wastes through biodegradation.

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