P.PORTO

ESCOLA SUPERIOR DE SAÚDE

8th meeting on medicinal biotechnology

BOOK OF ABSTRACTS

MAY 29TH, 2026
SCHOOL OF HEALTH
POLYTECHNIC OF PORTO

8th meeting on medicinal biotechnology

BOOK OF ABSTRACTS OF THE 8TH MEETING ON MEDICINAL BIOTECHNOLOGY

School of Health - Polytechnic of Porto
Rua Dr. António Bernardino de Almeida, 400
4200 - 072, Porto
Portugal

ISBN: 978-989-9226-20-3
DOI: HTTPS://DOI.ORG/10.26537/ED.P.PORTO.251

May, 2026

Fungal-Mediated Biodegradation of Microplastics: Evaluation of Degradative Potential and Pathogenic Traits

JOEL BARBOSA[1], VIRGÍNIA CRUZ FERNANDES[1,2], JOÃO RUFO[1], MÓNICA VIEIRA[1], CRISTINA PRUDÊNCIO[1] & CLARA PEREIRA[1]

1. RISE-HEALTH, CENTER FOR TRANSLATIONAL HEALTH AND MEDICAL BIOTECHNOLOGY RESEARCH (TBIO), ESS, POLYTECHNIC OF PORTO, RUA DR. ANTÓNIO BERNARDINO DE ALMEIDA, 400, 4200-072, PORTO, PORTUGAL. 2. REQUIMTE/LAQV, ISEP, POLYTECHNIC OF PORTO, RUA DR. ANTÓNIO BERNARDINO DE ALMEIDA 431, 4249-015 PORTO, PORTUGAL

The increasing accumulation of plastics and microplastics in the environment represents a major global concern due to their persistence, widespread distribution, and potential impact on ecosystems and human health[1]. Microbial biodegradation has emerged as a promising and sustainable strategy for plastic remediation, particularly through the use of fungi with enzymatic degradative capacity. This project aims to test the biodegradative potential of different fungal species against the widely used microplastics Polypropylene, Polystyrene and Poly(ehylene-co-cinyl acetate), under optimized growth conditions. The fungi, *Mucor spp*, *Rhizopus spp*, *Scedosporium spp*. and *Nigrospora spp*. were specifically selected because they have never previously been investigated as plastic degraders, thereby offering the opportunity to identify novel biodegradation capabilities. *Aspergillus flavus* will also be included as a control, since this species has recognized degradative capacity against some types of microplastics[2].To identify growth conditions that maximize biodegradation, preliminary studies using *Scedosporium* spp. were performed under different glucose concentrations and medium replacement intervals. Low-glucose media combined with fortnightly medium renewal promoted the highest degradative activity and were selected for the subsequent biodegradation assays. Biodegradation will be assessed through microplastic mass loss determination, Fourier-transform infrared spectroscopy (FTIR), and Raman spectroscopy, allowing the identification of structural and chemical modifications on microplastic surfaces. Fungal adherence to microplastics will be evaluated by microscopic observation and surface colonization analysis, providing insight into biofilm formation and the role of fungal activity in the degradation process. Additionally, fungal pathogenicity-related traits, including biofilm formation and antifungal susceptibility, will be evaluated to determine whether long-term exposure to microplastics influences fungal virulence. This study may support the development of sustainable plastic biodegradation strategies and improve understanding of fungal adaptation to plastic-rich environments.

KEYWORDS: *microplastics, fungi; sustainability; biodegradation*

FUNDING:
This work received financial support from the PT national funds (FCT/MECI) through the project RISE-Health, R&D Unit (reference UID/06397/2025) and the FEDER - the European Regional Development Fund (COMPETE 2030), through the WISE project (No. 17091, ref. COMPETE2030-FEDER-00841800).

REFERENCES:
1Microplásticos: origens, efeitos e soluções europeias. Parlamento Europeu. November 22, 2018.
2Ekanayaka AH, Tibpromma S, Dai D, et al. A Review of the Fungi That Degrade Plastic. *Journal of Fungi*. 2022;8(8):772.