THE MYCOBIOTA OF A SOIL CONTAMINATED BY POLYCYCLIC AROMATIC HYDROCARBONS IN A FORMER URBAN GARDEN: FROM THE STUDY OF BIODIVERSITY TO THE MYCOREMEDIATION POTENTIAL

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The soil ecosystem is variable and complex and host a huge variety of microorganisms, including fungi, that provide several ecosystem services.
Due to the increase of industrial activities and to the combustion of fossil fuels and organic matter, the release of polyaromatic hydrocarbons (PAHs) threatens the health of natural ecosystems. Soil contamination by PAHs is an ever more severe issue that requires a sustainable solution. A wide range of fungi are capable of degrading these recalcitrant compounds through their enzymatic arsenal. Thus, investigating and identifying the cultivable mycobiota inhabiting PAH-contaminated soils is crucial for designing appropriate remediation approaches.
In this work, we investigated the fungal diversity of a formerly cultivated urban garden in Torino (Italy), mainly contaminated by benzo(a)pyrene, benzo(g,h,i)perylene, fluoranthene, and fhenanthrene.
Overall, 181 fungal isolates, mostly belonging to Ascomycota were retrieved and were affiliated to 38 genera and 66 species, including putative novel *taxa*. In parallel, a metabarcoding analysis applied to investigate the unculturable diversity, confirmed the dominance of Ascomycota (99%), while Basidiomycota and Mortierellomycota accounted for less than 1%.
Following, to select those strains capable of degrading PAHs, enrichment assays were conducted with the target pollutants as sole carbon source. Interestingly, many of the 105 isolates retrieved belonged to species that were not detected in the previous analysis of the bulk soil. These organisms are currently object of deep investigation whose outcome will serve to evaluate their degradative potential and to plan and develop remediation strategies, based on microbial consortia, for *in situ* applications.