UNIVERSITÀ DI PAVIA

Corso di Dottorato in Scienze della Terra e dell'Ambiente

FORM PER PROGETTI BANDO DOTTORATO

1. Project title

Selection and characterization of fungal strains for innovative technologies in wastewater treatment

2. Proposer

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4. Key words

(Max. 5 – at least 2)

Fungi; wastewater; degradation; pilot reactor

5. Abstract

(Max.1.500 characters with spaces)

Wastewater depuration and sludge disposal meet the challenges by circular economy to save energy and rescue value from wastes.

Based on the previous experience of Projects MicoDEP and CE4WE, this proposal deals with enhancing the role of fungi in the depuration process. Looking for the final application at the real plant scale, the current state of play is: a basic range of macro- and micromycetes have been isolated and identified; selected strains have been preliminarily tested for acting on a set of featuring parameters in depuration to intersect the depuration stream where the fungal component may be best placed; trials at the pilot scale are ongoing.

The main challenges of this proposal are summarized: to search, isolate and identify fungal strains from wastewater/sludge and lignocellulosic substrates; to culturally and metabolically characterize selected strains at the lab- and pilot-scale; to increase the quantitative/qualitative degradation efficiency by fungi on sludge; to set the inoculation ratio by investigating the possible drivers (biomass, metabolites) of its efficiency; to maximize the inoculation efficiency by relying on waste substrates; to increase the robustness of general protocols and conceptual base to minimize the impact of poor substrate reproducibility; to investigate the evolution of the pre-inoculation stage depending on the pressure by environmental contaminants, unpredictable microbial consortia, temperature variation and substrate composition.