



Abstract

The WeTreat project is at the forefront of enhancing the removal efficiency of micropollutants such as pharmaceuticals and polyfluoroalkyl substances (PFAS) from wastewater treatment plant (WWTP) effluents through the strategic use of optimized wetland-based solutions.

The project utilizes constructed wetlands (CWs) that harness natural processes including biodegradation, sorption, photodegradation, and phytoremediation to address the persistent challenges posed by these pollutants.

Central to WeTreat's innovative strategy is the use of wetland plants that have been specifically selected and cultivated for their superior ability to absorb and metabolize pollutants.

Advanced plant tissue culture (PTC) techniques are employed to propagate elite plant varieties known for their high pollutant accumulation capacity, enhancing the effectiveness of CWs and ensuring biodiversity conservation and carbon sequestration. This aligns with broader environmental sustainability goals.

The project is powered by a transnational consortium of experts from Portugal, Italy, Luxembourg, and the Netherlands, encompassing agronomists, biologists, engineers, chemists, and biotechnologists. This diverse team brings deep expertise across various disciplines including plant physiology, bioremediation, microbial interactions, and ecological engineering.

Together, they drive a comprehensive approach to the development and optimization of CW systems.

WeTreat is committed to identifying and propagating the most effective plant species for micropollutant uptake and metabolism. It focuses on optimizing plant growth, resilience, and environmental adaptability. The project enhances the scalability of in vitro propagation methods to maintain genetic diversity and ensure sustainability in plant cultivation. Additionally, it involves designing and piloting CW systems adaptable to various environmental settings and scalable for broad implementation. The impact of plant-based micropollutant removal on water quality, plant health, and ecosystem functionality is rigorously evaluated, with specific assessments of interactions between plant roots and the rhizo-microbiome.

Stakeholder involvement is a priority to ensure the developed technologies are accessible and applicable across diverse geographic and climatic conditions. WeTreat aims to extensively disseminate its findings through scientific publications, workshops, and conferences, promoting widespread understanding and adoption of its innovative water treatment solutions.

The project anticipates establishing a robust repository of elite wetland plant varieties, optimized CW systems for diverse environmental settings, and a deepened understanding of plant-pollutant interactions, informing future applications and policies. In doing so, WeTreat contributes significantly to the sustainable management of water resources, aligning with the EU's Green Deal and the updated EU urban wastewater directive, which mandates improved treatment standards to mitigate environmental threats.



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- UNIVERSITY OF PISA - ITALY
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► Funding organisations

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