

Polychlorinated Biphenyls Degradation by Soil Microbiota upon Stimulation of Root Exudates.

Eleonora Rolli¹, Elisa Ghitti¹, Lorenzo Vergani¹, Francesca Mapelli¹, Elena Crotti¹, Sara Borin¹.

1. Department of Food, Environmental and Nutritional Sciences, University of Milan, Italy.

Corresponding author: eleonora.rolli@unimi.it

Rhizo-remediation is a promising technology for pollutant clean-up provided by the plant holobiont, composed by the host plant and the root-associated microbiome. Through root exudation, the plant nurtures and shape the structure and functionality of the microbial communities inhabiting the root system. The complex interactions between the plant host and the microbiome are poorly understood, in particular in contaminated environments where the pollution stress may induce specific root exudation profiles that could have a role in the activation of the microbial degrading metabolism. This is particularly relevant for highly phytotoxic and poorly degradable pollutants, like polychlorinated biphenyls, a class of 209 recalcitrant congeners containing biphenyl with one up to ten chlorine atoms.

The project aims to investigate the involvement of flavonoids, plant secondary metabolites, in supporting the bacterial PCB degradation and other functional traits that are important for the rhizocompetence, to investigate the changes in root chemistry upon PCB stress and sort out the time-spatial synergistic interplay within the plant holobiont components.

The project outcomes will improve the understanding of the plant holobiont system applied to environmental biotechnology, focusing on the role of root exudates to boost soil microbiome degradative potential.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement N° 841317.