PFAS-HEMP

Assisted phytoremediation of Perfluorinated Alkyl Substances with industrial hemp: physiological and molecular analyses combined with innovative non-invasive analyticalmethods

Perfluorinated alkyl substances (PFAS) are a class of compounds still intensively used insome crucial industrial sectors, which release into the environment causes persistent soiland water contamination. They can easily enter into the food chain causing harmful effects on human health, an alarming situation being currently reported in north-east Italy. Within this framework, this research aims at verifying whether phytoremediation with a biomass crop species such as industrial hemp (Cannabis sativa L.) could be an option to mitigate soil contamination caused by polluted irrigation water in agricultural land. This strategy involves the cultivation of industrial hemp which combines efficient root uptake and translocation to the shoot with high biomass yield to be harvested andused for energy purposes. The widespread long C-chain PFOA (perfluorooctanoic acid)and PFOS (perfluorooctanesulfonate) will be spiked to the soil for mimicking soil pollution. Hemp will be grown in mesocosms with artificially highly contaminated soil. The application of humic acids will also be investigated in order to improve root growth and the phytoremediation potential, in this way optimizing the set-up of a phytoextraction protocol.

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