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PHD OFFER

Increasing knowledge on nano-microplastics-metallic trace elements co-transfers from contaminated soil to plants

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Type of contrat: PhD
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Plastics are globally used in various urban and industrial sectors and in daily human activities. Their global production has increased from 1.5 million tonnes in 1950 to 322 million tonnes in 2015, of which only 5% would be recycled. Plastic waste arriving in the environment can fragment into smaller particles such as microplastics and accumulate in the environment. Today, few studies exist on the absorption and translocation of microplastics by the root system of higher plants. Nevertheless, some have highlighted an impact of terrestrial microplastics on higher plants either by translocation of nano-microplastics at the root level or by changes in the properties of the soil, the rhizosphere or the terrestrial micro- and macro-fauna. In addition, it has been demonstrated that certain microplastics can act as vectors for the transfer of metallic trace elements (ETM) into the rhizosphere, thus contributing to the enrichment of plants in ETM. The underlying mechanisms and conditions of co-transfers, still little investigated, will be the subject of study of the thesis. This will include better understanding the conditions favoring co-transfers between ETM and nano-microplastics from soils to plants and answering the following questions: (1) how the concentration, size, shape and type of microplastics promotes transfer of ETM from soils to plants? (2) are the transfer mechanisms the same for all ETMs? (3) can these transfer mechanisms obtained under experimental conditions be extrapolated under real conditions? The ultimate goal is to respond to management issues of polluted sites by identifying the potential transfer conditions that promote and limit health and environmental risks.

PROFILE

Master's degree connected to environmental sciences

Skills / Knowledge

The candidate should:

- hold or in the process of obtaining a Master's degree or diploma allowing enrollment in a Doctoral School on October 1, 2023;
- have a good level course, a minimum grade of 12/20 is required (provide transcripts of Master's or equivalent);
- have skills in plant biology, soil sciences, analytical chemistry and statistics (eg mastery of R software; ACP, ANOVA) as well as on polluted sites and soils (SSP) would be a plus;
- have a taste for the field, the laboratory and teamwork.
- be autonomous, rigorous, organized and have good analytical and synthesis skills;
- be fluent in French and English.

OTHERS

Duration : 3 years

This position is open to people with disabilities.