

Master 2 internship proposal

Drought impact on Biogenic Volatile Organic Compounds (BVOC) emissions and physiology of urban plane trees (*Platanus x hispanica*)

Context:

Urban vegetation is considered as a source of ecosystem services beneficial to the environment, human health and our well-being, making it a priority for many major cities like Paris (<https://www.paris.fr/vegetalisonslaville>). However, two disservices of urban trees must be accounted for by cities trees managers: the allergenic effects and the emissions of BVOC potentially oxidized by anthropogenic atmospheric pollutants. Such oxidation causes the formation of secondary pollutants in the atmosphere, such as O₃, and of secondary organic aerosols (SOA) in the particulate phase. Impact of water stress, the main cause of tree mortality in urban areas, has not been addressed for its impact on air quality, through water-dependent changes in BVOC emission by trees.

Subject:

One of the aims of the sTREEt project (funded by the French National Research Agency (ANR)) is to assess the impact of water stress on the BVOC emissions of young plane trees. Daily and seasonal fluctuations in BVOC emissions will be related to the variations in climatic parameters characterizing urban areas. The work will be based on an experimental set-up including young planes subjected to drought or control conditions mimicking an urban environment. The internship candidate will primarily: (1) be in charge of the experimental set-up and its thorough physiological characterization, to identify physiological parameters correlated to variations in BVOC emissions. Plane tree ecophysiological parameters of interest are: gas exchange (net photosynthesis, stomatal conductance) and chlorophyll fluorescence, pre-dawn and minimum leaf water potential and chlorophyll contents. The canopy temperature and spectral indices (NDVI, PRI) will be monitored continuously. (2) participate in the measurements of BVOC emissions by plane trees, notably to assess the variability of BVOC emissions within and between control and stressed trees.

Requirements:

- Master 1 degree in plant ecophysiology or related field
- Experience in experimental work and plant ecophysiology methods
- Good data management and statistical analysis skills (R programming)
- English proficiency
- Experience in plant biochemistry and mass spectrometry will be appreciated
- An interest to pursue with a PhD degree

Opportunity:

A funded three-year PhD position will be available starting 1st October 2020. Candidates will be selected by PhD selection committee.



Enquiries and further information:

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Applications:

Please send applications (letter describing your interest and your CV with 2 references) to J. Leymarie and R. Puga-Freitas

Timeline:

Closing date for applications: 12.11.2019 (or until position is filled).

Starting date: 1st of February 2020

Duration: 6 months

Place of work:

EcoPhyS team - iEES Paris
University Paris Est Créteil
Faculty of Science and Technology
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