BIOLOGIE DES ORGANISMES ET DES POPULATIONS

M2 bop - 2016-2017
Proposition de stage

Supervision :

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Funding for student:

X yes (2650 CHF/m ~2400€) □ to be discussed □ no

Title of the research project :

"Another one bites the dust"?
Why do root herbivores eat soil?

Key words :

Maize, *Diabrotica virgifera*, plant-herbivore interactions, soil feeding, geophagia, insect behavior and performance.

Summary :

The group of Biotic Interactions offers master internship positions on the interactions between maize and an invasive pest in Europe: Diabrotica virgifera. This insect is extremely harmful for maize crops as it cause about 1 billion dollar crop losses every year in the US (where it originated from) and raises ecological and economic concerns in Europe. As no pest management strategy seems to be efficient, our group aims at understanding the ecological success of the insect using a multidisciplinary approach and outstanding techniques.

Recent research highlights that plants continuously alter their surrounding soil and thereby their environment. This soil conditioning is well known to influence the next generation of plants (growth, resistance) via plant-soil feedback effects. Yet, the direct effects on soil dwelling herbivores remain unknown. We recently made the surprising observation that some root herbivores complement their diet by eating soil. This form of geophagy makes it likely that soil properties affects root herbivore performance directly. This internship aims at investigating the impact of soil feeding on herbivore performance, habitat selection and to understand the associated benefits for the herbivore.

Literature (2 references):

Van der Putten, W. et al. Plant-soil feedbacks: The past, the present and future challenges. Journal of Ecology 101, 265–276 (2013).

Fageria, N. K. & Stone, L. F. Physical, chemical, and biological changes in the rhizosphere and nutrient availability. *Journal of Plant Nutrition* **29,** 1327–1356 (2006).

Technical aspects of the research project :

Behavioral choice assays, performance assays, cell culture (identifying microbes from the soil).

Essential skills and abilities desired :

We are looking for motivated students with a background in ecology, chemical ecology or behavioral ecology, willing to learn and apply multidisciplinary techniques. Candidates with an interest in continuing research after their master (PhD) are encouraged. The members of the lab come from all around the world; therefore, the main spoken language is English. French can also be used with the maize project members.