

Encadrement :

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Titre du stage :

Priming of plant defenses against insect herbivores via volatile organic compounds in *Phaseolus lunatus*

Mots clés :

Plant-plant communication ; chemical ecology ; evolutionary ecology ; VOCs

Résumé (150 mots maximum) :

Plants have evolved a wide array of strategies to protect themselves against herbivores. It was recently demonstrated that plants can use herbivore-induced volatiles organic compounds (VOCs) produced by neighboring plants to increase their own defenses prior to herbivore attack. In the Lima bean *Phaseolus lunatus*, this "priming" effect was shown to decrease herbivore damage at the end of the field season. Moreover, priming was more effective if the emitting plants were from the same family as the receiver plant. However, many of the ecological aspects and biochemical mechanisms behind this priming effect remain unknown. The main objective of this project is to determine if priming is dependent on the quantity and timing of VOCs produced by emitter plants. Working with three wild populations of *P. lunatus*, the student will perform laboratory bioassays and chemical analyses to reach this objective.

Deux références bibliographiques:

Boggia, L., B. Sgorbini, C. M. Berteà, C. Cagliero, C. Bicchi, M. E. Maffei and P. Rubiolo (2015). "Direct Contact–Sorptive Tape Extraction coupled with Gas Chromatography–Mass Spectrometry to reveal volatile topographical dynamics of lima bean (*Phaseolus lunatus* L.) upon herbivory by *Spodoptera littoralis* Boisd." *BMC plant biology* **15**(1): 102.

Moreira, X., W. K. Petry, J. Hernández-Cumplido, S. Morelon and B. Benrey (2015). "Plant defence responses to volatile alert signals are population-specific." *Oikos*: n/a-n/a.

Techniques mises en œuvre:

Wind tunnel laboratory bioassays ; Volatile collection bioassays ; Gas Chromatography-Mass Spectrometry (GC-MS) and Ultra High Performance Liquid Chromatography (UHPLC) chemical analyses ; multivariate statistics.

Compétences particulières exigées:

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