



Magali Proffit **First prize 2012**

Swedish University of Agricultural Sciences
Department of plant protection biology

Magali Proffit's research focuses on investigating interactions between species and the mechanisms, particularly the signals, involved in their maintenance. Chemical signals, volatile organic compounds mainly, are one of the most important mediators of interaction between species. Therefore, Magali has been particularly interested in the role played by odours in mediating plant-insect dynamics in ecological and evolutionary time.

Her research necessitated, in addition to her background in ecology, acquisition of skills in chemistry of natural substances at both technical and fundamental levels. She has tried to reinforce this parallel approach throughout her Ph.D. and her post-doctoral positions. She showed that plant odour is the main signal promoting both the attraction and the specificity in different plant-pollinator as well as plant-herbivore interactions. In more complex plant-insect interactions, she also demonstrated that olfactory signals could limit competition among insects parasitizing the same plant species and thus the importance of chemical mediation in ecosystem organization.

Using fine chemical analysis of odour emitted by plants, she characterized some of the volatile organic compounds responsible for the attraction of insects to their host plant. The use of synthetic volatile compounds to attract the main insect pests in the field and/or in the greenhouse could allow monitoring and control via mass-trapping and consequently reduce the size of the pest population. Therefore, the interface between chemistry and ecology can provide alternative methods to control important insect pests with the overall objective of reducing the use of pesticides, noxious for human health and environment in general.

In her current post-doctoral position, Magali studies the resilience of chemical communication between plants and insects in the context of the ongoing climate changes due to increasing global human activities. One of the major consequences of these changes is temperature increase, promoting the invasion of species in environments that used to be too cold for them. These invasive species could disrupt the complex local networks of species. In the future, she would like to extend this project by including the effect of the increase in atmospheric pollutants on these interactions. This study will provide a framework and applicable real-world model for predicting and understanding the impact of future changes in atmospheric gases on natural and agroecosystems.