

Impact of cascading effects linked to symbionts

Benoît Geelhand de Merxem¹; Margaux Jossart²; François Renoz¹; Thierry Hance¹; Claire Detrain²

1: Earth and life institute, Université Catholique de Louvain, Belgium

2: Unit of Social Ecology, Université Libre de Bruxelles, Belgium

Introduction

Many insects harbor endosymbiotic bacteria which rely on their insect host for resources and transmission opportunities.

These bacterial partners include nutritional obligate symbionts which provides nutritional supplements to an otherwise inadequate diet. There are also facultative symbionts that provides other advantages in some conditions. They can influence the physiology and evolutionary ecology of their host, their associated effects also impact upper trophic levels, particularly by interfering with host/parasite and predator/prey interactions.

In addition to physiological and developmental aspects, it has been shown that aphid-associated bacteria can impact parasitoid behavior.

What is then the impact of a symbiont on higher trophic levels?

Methods

- Large fitness study will be carried out on plants in order to determine the influence of *Serratia* and its ability to transfer directly from plants to ants and parasitoids.
- The infection route for plant will be investigated.
- The detection of *Serratia* will be assessed by olfactometry on parasitoids and ants. Volatiles production will be studied.
- The impact of *Serratia* on the fitness of the aphid-plant system will be studied.
- A field survey will be carried out to strengthen the results gathered in our lab experiments.

Hypothesis

- 1) *Serratia* circulates from plants to ants through the exudates and via aphid's honeydew.
- 2) Aphid is a crucial resource for ants, parasitoids and *S. symbiotica*. There is a common interest for these partners.
- 3) Ants will be influenced by the bacteria and will defend the aphid's colony.
- 4) Specialist parasitoids will be more efficient in detecting *Serratia* infected colonies.

Synthesis

