

Opponent Review of the Ph.D. Thesis

Title: Interactions between plants, herbivorous insect and predators: mechanisms and ecological importance

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Opponent: Pavel Drozd (University of Ostrava)

Topic and objectives

At first, I have to mention that for me, as an entomologist, tri-trophic interactions between plants, herbivores and predators are familiar but particularly from the point of view of insect herbivores and predators. Thus, I was surprised that there is a lack of information about the role of plant volatiles in communication between plant and insectivorous birds. For this reason, the thesis represents for me a fresh insight into the problematics of predation on insects. The research topic is relevant and extremely significant for understanding of the food web complexity and top-down and bottom-up effects. Furthermore, the conclusions are also important for applied research, especially biological control. The aims of the research are clearly formulated with respect to the current state of knowledge.

Structure

The thesis is based on three published papers (one review and two research articles) and three manuscripts (research articles), all with the significant contribution of A. Mrázová (first author in four papers). General introduction is short and well written and briefly

explains the main terminology and state of the art in the field of tri-trophic interactions. More detailed information about the role of plant volatiles in tri-trophic interactions are included in Chapter I, a review published in Current opinion in insect science.

Methodology

The thesis is based on the high standards of research design and analyses. The author uses very sophisticated experimental design which is a great example of modern ecological research, and thus her arguments are well supported and discussed.

Results and Conclusions

Results are presented in a clear and logical format using appropriate analytical tools.

Comments and questions to the author:

- Are there any changes in production of jasmonic acid and its derivatives or plant response on methyl-jasmonate during season in temperate ecosystems? For example, could we expect more intensive response at the start of the vegetation season when the damage caused by herbivores is more intensive and also critical for plants?
- Dispersion of the plant volatiles could be affected by weather. Are there differences in predator response during different weather conditions (except morning rain mentioned in the thesis)?

- Do plant endophytes and herbivore symbionts play the role in the production of plant volatiles which attract bird predators? For example, the effect of fungal endophytes was already tested for some insect parasitoids.

Overall assessment

The presented dissertation of Anna Mrázová completely fulfils the requirements of the PhD dissertation. The author proved high theoretical and methodological background. She is able to formulate hypotheses, design the research according to the hypotheses, and present the results. I recommend the dissertation to be defended and I have no doubt that the author will successfully defend her work.

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