



**University of South Bohemia**  
**Faculty of Science**

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**Review of a Ph.D. thesis entitled 'Effect of plant-animal interactions on individual performance and population dynamics of *Scorzonera hispanica*' presented by an applicant Zita Červenková**

**Referee: doc. RNDr. Jana Jersáková, PhD.**

The submitted thesis consists of 2 manuscripts and 2 published papers dealing with multiple factors affecting reproductive biology and population dynamics of *Scorzonera hispanica*. The applicant focused on the effects of mother plant traits and population characteristics on seed weight and germination, she explored effects of pollinators and herbivores on seed production, and effects of herbivores and disturbances on current and future metapopulation dynamics of the focal species. The scope of the thesis is very well chosen and the four chapters form a coherent work. I enjoyed reading the thesis very much and appreciated the design of experiments.

Regarding the formal aspects, the thesis has a standard structure, including a general introduction and a summary section. Individual papers are presented in a form of manuscripts prepared for a submission to a journal. To my taste, the thesis contains substantial number of typing errors, which could have been easily solved by spell checker in Word or careful reading of the final product by the applicant. In such case the applicant would do a better job by inserting the original pdfs from the journals. In the table of content, chapters 1 and 3 have the same title.

Regarding the content, a general impression from the submitted thesis is very good. The papers are well written, methods clearly described, data analysed by proper statistical methods, results clearly presented and well discussed, the tables and figures well arranged. Two papers were already published in high-quality scientific journals, the other two so far unpublished ms. are finalized to such an extent enabling submission after minor revision. I would highlight that the applicant collected substantial amount of data over several seasons and become familiar with sophisticated statistical methods such as path analysis and landscape level modelling. Though the thesis represents a complex study of a single plant species, it succeeded to elucidate the general impacts of biotic interactions on plant life cycle and demography that might be applied to other plants species with similar ecological requirements. Overall, the quality of the thesis is excellent and the author clearly

demonstrated her ability to defend her research to other scientists and produce successful publications. Therefore, I recommend this thesis to be accepted for the award of PhD.

### **Questions for discussion:**

#### Paper 1

- The author reports differences in offspring performance among single mother plants. As I have not found anything on that in the results, could you tell me, how big these differences were?
- The effect of population size on seedling growth occurred only once on the 6th day since germination. Do you consider this a well-founded result?
- Germination and survival was affected by population size. Did you try to relate this result to genetic diversity of populations reported in Münzbergová and Plačková 2010?
- *S. hispanica* had large proportion of aborted seeds. Have you observed more empty seeds in small populations?
- Do *S. hispanica* seeds germinate directly after dissemination in the field?

#### Paper 2

- Can you outline in general all possible factors that might be responsible for a high amount of aborted seeds in a plant population?
- Which approaches could you use to evaluate pollination efficiency of individual pollinator groups?
- Vegetation cover affected plant height positively. Please explain why is the vegetation cover a good proxy of resource availability?
- The No. of developed seeds showed large variability in relation to plant height. Would not be better in this case to place both open and suppl. treatments on a single individual?
- You observed less pollinators during the second census. Did it affect seed set?
- You claim that plant traits did not affect pollinator choice. But you detected a preference of pollinators for large flowerheads. Plant traits could also alter insect behaviour on the flower. In discussion, you mention that longer time spent on an individual flowerhead may translate to higher pollen removal and deposition. But is this always a positive?
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Paper 3

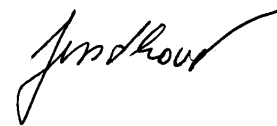
- Can you explain if plants can benefit from being eaten?
- In the methods, the applicant wrote that timing of herbivory did not perform well in the analysis. Could it be because this variable may influence the plant height and flowerhead number in the next season instead of next season flowering?

Paper 4 – I have no comments/questions to this published paper.

Other questions will follow in general discussion.

In České Budějovice, 16. 8. 2016

Jana Jersáková

A handwritten signature in black ink, appearing to read 'Jersakova', written in a cursive style.