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Written review of the thesis presented by Mgr. Anna Lampei Bucharová to obtain the PhD degree

PART 1 – SHORT OVERALL ASSESSMENT

Mgr. Anna Lampei Bucharová presents the thesis entitled "Dynamics of rare and threatened species on local and regional scale – from theory to practice" to obtain the PhD degree. In the first three chapters of her thesis, the candidate uses transition matrix models, habitat suitability analises and allozyme electrophoresis to evaluate he population dynamics of two serpentinicolous fern species on local and regional scales. Finally, as a practical application for conservation, she used in the fourth chapter of the thesis periodic matrix models as a practical application for the conservation of a threatened plant typical from semi-natural grasses.

The candidate clearly understands and masters the methods that she used during her PhD and is capable of turning theoretical work into specific measures for rare-species preservation. Researchers with such abilities will be fundamental for the conservation and management of biodiversity under the current scenario of global change. My only major criticism to this thesis is that some additional hours of edition and critical revision by the candidate would have notably increased its quality – some concepts are vaguely explained or possibly not well understood, the English needs improving, and there are some edition and writing mistakes. Nevertheless, the high quality of the field, computer and intellectual work behind demonstrate that A. Bucharová merits the title of Doctor. Therefore, I consider that the thesis is suitable for its defense and, therefore, that its quality meets the criteria necessary for obtaining the PhD degree.

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PART 2 – SPECIFIC QUESTIONS

Question 1 – The reasons put forward to justify the study of *Asplenium adulterinum* and *A. cuneifolium* population dynamics is that both species are rare and of conservation concern. However, the justification to change the study system for Chapter 4 is that both fern species are rare but not actually threatened. **In the light of your results, would you suggest a different threat category or any management measure for any of these two fern species?**

Question 2 – One of the reasons invoked in Chapter 2 to explain the different distribution of *A. adulterinum* and *A. cuneifolium* in different habitats (rocks in open field vs. spruce forest) is the that both species have different abilities to compete with other species. **(i) Is it possible that *A. adulterinum* outcompetes *A. cuneifolium* in open habitats? (ii) What mechanisms could be implied in this theoretical direct competition for suitable microhabitats? (iii) How could the different ploidy level of both species affect their competitive abilities between them and with other species?**

Question 3 – In agreement with the observations made in many fern species, the allotetraploid *A. adulterinum* is assumed to be mainly selfing, whereas the diploid *A. cuneifolium* is assumed to be mainly outcrossing. **(i) Is there any evidence of these two different strategies derived from culture experiments? (ii) Is there any evidence of the production of antheridiogens (i.e. maleness-promoting pheromones) in any of these species? (iii) What implications would these pheromones have on the breeding system of both species and on their population dynamics?**

Question 4 – We can presume breeding systems to play a prominent role on the fate of small populations, mainly due to the effects of inbreeding and genetic drift. **(i) What is the breeding system of *Gentianella praecox* subst. *bohemica*? (ii) What managing measures would you suggest for small, presumably inbred populations? (iii) How could the effects of different breeding systems be incorporated into periodic matrix models?**

Question 5 – Traditionally, "climax" communities have been considered as the paradigm of what should be conserved. However, semi-natural or even artificial landscapes and habitats support species that would be naturally rare in climax conditions. **In your opinion, what are the trade-offs between preserving natural habitats versus man-managed habitats?**

Question 6 – All PhD theses have strong and weak points. **If you had the opportunity to modify three aspects of your thesis, what changes would you make?**