

Comments on the PhD thesis **Population ecology of the invasive alien plant *Heracleum mantegazzianum*** submitted by Jan Pergl:

At first, I would like to say the thesis represents a very good set of particular papers of high scientific quality. Because four of five papers have already passed through a peer review process in the top international journals, my role as the reviewer is easier than in the case of only submitted manuscripts or those before a submission. I guess, also the fifth paper, i.e. the chapter book (Chapter 1) was reviewed. Thus, instead detailed comments on the particular papers, I concentrate here only on some general aspects and a broader context of the study. There is evident from the thesis what has been done, and Jan Pergl has done a lot of work. Beside analytical approach, Jan is capable to synthesize well the results. However in such summarizing work, as PhD thesis is, I would expect also some suggestions what should be done next, where there are gaps in our knowledge, which hypotheses should be tested in a next study. These should be included into Conclusions. I am asking Jan to present these during the thesis defense.

Despite I generally evaluate the thesis as very good, I have some objections: Introduction is rather descriptive. Instead describing what was done, I would prefer to set problems or hypotheses common to all papers. The paragraphs in Introduction devoted to the particular chapters of the thesis represent more or less summaries of the papers which I consider as rather redundant. Information from summaries or abstracts of the papers is mostly repeated there.

Very important conclusion is that there is no simple characteristic responsible for the invasion success of *H.m.* It may be a bad news for some 'optimists' in invasion ecology who expect simple solutions. There are not so many invasive species so intensively studied as *H.m.*, thus can we expect similarly complicated combination of 'invasive' traits in other alien invasive plants? Or does it differ invader by invader and in some other cases some simple species traits can cause the species invasions?

Jan Pergl and his collaborators have gathered huge information about this species. Are you able, based on the knowledge, to predict tentatively a next invasive behaviour of the species? In my experiential knowledge, managed grasslands are generally the most sensitive to invasion (including by *H.m.*) in the moment when the management is stopped. Do you agree with this idea and do you know any exact data concerning this?

Is reasonable to speak about metapopulation dynamics (p. 34) in the case of this species when particular populations can exist independently on each other?

I am not sure if outputs of the models can improve our understanding of invasion dynamics.

In my view, the models can well formalised and visualized the process of invasion but not to understand it (p. 67, below).

How can be forest clearings considered as natural sites of *H.m.* in its native distribution range if there are human-made?

In Conclusions (p. 97) there is written "under suitable conditions [*H.m.*] is able to flower in the second year". However, in Chapter 2 (p. 27, Fig. 6.6) there is no plant indicated as flowering in the second year.

Some printing errors remained in the text (p. 37 etc.), but it nearly always happens.

I do not have any doubts about the important role of Jan Pergl in the research on *H.m.*, but his contributions to the papers where he is not the first autor (Chapters 3-5) are not clear.

Complementarity (or overlappings?) with Irena Perglova seems to be evident not only in life but also in the papers included into both theses.

I can conclude, Jan Pergl presents PhD thesis above usual standard. I especially appreciate the multi-layer approach from individuals and populations to the landscape scale. I fully recommend to continue in the PhD process. I wish Jan success in the next scientific career.

In Trebon, December 5<sup>th</sup>, 2006

Prof. Karel Prach