**Assessment of the habilitation thesis by Jan Roleček: A coexistence hotspot: From the extremely species-rich White Carpathian meadows towards the Peri-Carpathian forest steppe**

It was a pleasure to read the Jan Roleček's habilitation thesis on peri-Carpathian steppes. It consists of a readable introduction and a set of attached papers, in many of which the candidate was either first or senior author.

A casual observer might say that the papers included in the thesis are fairly disparate in their topics, ranging from vegetation classification and diversity assessment though paleoecological studies using several proxy data (macrofossils, charcoal, pollen) to papers using molecular phylogenetics and phylogeography to address the issue of (non-) continuity of Central European steppe vegetation. However, all these seemingly divergent pieces of research are based on clearly well deliberated research directions, inspired and stimulated by the exceptional species richness in one particular region. The candidate used this exceptional species richness as a motivation to foray farther in space and deeper in time to understand it in a much broader context and to identify main drivers of this richness.

He seeks the main reason for this richness in the large species pool that have developed over long time spans and has been maintained by a set specific conditions. His approach to the species pool effects is empirical and a sort of down-to-the-earth; while others struggled with identification of species pool effect on local richness, he has wisely taken the effect for granted. This helped him to explore historical and ecological reasons for formation of one specific species pool without getting lost in the quagmire of species pool formal definitions and measurements, which has plagued a lot of literature on the topic.

I found his arguments supporting the continuity of the peri-Carpathian forest-steppe convincing and well-supported; personally I liked most the phylogeography-oriented papers most, as they provide a fresh perspective on an old problem (BTW. They provide strong support for the candidate's argument.)

Two specific points perhaps need to mentioned in addition to that. First, while the candidate's interests clearly lie at large-scale processes that determine species pools, his interests are not limited to large spatial and temporal scales only. He appreciates the role of fine-scale coexistence mechanisms, which are so characteristic of species rich grasslands (as also clearly indicated by the title of the thesis: "a coexistence hotspot", while leaving the reader to find the scale referred to themselves), and invokes modern coexistence theory as a tool to understand how species coexist at the fine scale.

Further, I also appreciate the good historical (in terms of botanical research done on the topic and region) background, which nicely puts the candidate's research into a broader framing of

scientific development in Moravia and the Carpathians (the stay of the Josef Podpěra, a foundational figure for Moravian plant geography and ecology, in Siberia as a POW during the First World War fitting nicely into this context).

The introductory part of the thesis summarizes his research path nicely. As perhaps may be expected, the presentation of the problem rests heavily on classification approach of the communities in question, which guides the reader through the intricacies of vegetation composition of peri-Carpathian species-rich grasslands and (as classifications are expected to do) helps orientation of the reader. When I was reading it, I realized that the introduction has, in spite of its itemized structure, all features of a good dramatic story: begins with a setting and introducing the characters, with a long presentation of the problem, setting the plot with a conflict, and the final resolution in terms of vegetation continuity of peri-Carpathian species-rich grasslands. It was a good and inspiring read.

I have a few questions I would like to ask the candidate:

First, I have always been puzzled by searching for "records", as the maximum value of a sample of any continuous variable depends on the sample size (if sampling is done randomly) and/or on the sampling strategy (in stratified random or preferential sampling). I would appreciate if the candidate can comment on sampling strategies used by researchers reporting species richness maxima in the studies cited in the thesis, and how were the exact locations of the relevés decided upon.

Fig 28 of the introduction shows power relationship between maximum richness and plot size, something that is found also in earlier papers on the topic (Wilson et al., Chytrý et al.). I would like to know whether it might be meaningful to search for nonlinearity (in the log-log space) due to saturation, which can take place in data not based on "records".

The candidate refers to high fertility of the clay soils. I would appreciate if the candidate could develop the concept more specifically, as soil fertility is not a unidimensional concept. Further, it is well known that the relationship between soil fertility and stand productivity is not straightforward: it depends on the observation scale and species pool structure. Would the candidate comment on these two points?

Finally, the author claims (though with a proviso) that potential natural vegetation is a useful concept. While I would not like to question it, I still would appreciate hearing where he sees potential merits of this concept.

To sum up, I am convinced that the habilitation thesis constitutes a clear demonstration of the candidate's ability to pose good and interesting scientific questions, approach them from a number of different perspectives to get a clearer picture, and come to really interesting findings,

which, as common in science, pave the way for new research paths and directions. This, though indirectly, also shows his ability to ask open questions which can then be pursued by his students or collaborators, which is the other constitutive ability of a good researcher/teacher. Without any hesitation, I recommend this thesis to be accepted and the candidate promoted to the appropriate position.

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