

**Gregor Mendel Str. 33**  
**1180 Wien**

To the Study Affairs Department  
University of South Bohemia

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Review of the PhD thesis by Jan Hornik:

The PhD by Jan Hornik is structured like typical cumulative theses. The introduction provides a good overview about the theoretical background of the main questions the candidate tried to answer during his PhD. He focussed on very basic questions of ecological research and contributed to the respective objectives by the analysis of his data set. Very valuable is the concentration on details of plant traits that are responsible for the active and/or passive role of plant species in the game of meadow fertilization or abandonment. He makes use of the most valuable database CLO-PLA to specify the importance of rather neglected traits of vegetative growth and survival of plants.

These traits are characterized as key features of meadow plants responsible for their successful adaptation to mowing but the literature is relatively poor in papers about the dynamic changes of the trait composition during management changes. Studies like those that were presented here are most welcome as they help to understand the dynamics of taxonomical and structural changes during management changes.

The author provides a rough characterization of the experimental design. He could have provided more details about the specific details of management on the plots such as the variation in mowing dates before the study. "Regular mowing" is not specified in the appendix of paper 2. Mowing might differ between years with respect to specific cutting dates because the trucks cannot go there due to very wet conditions in some years. Such can induce annual abandonment and changes in species abundance. Furthermore, the author missed to provide the basic data of the species composition change neither in the PhD volume nor in the cited papers. It would have been possible to add these data to the PhD volume.

I could not find the definition of a control factor configuration in case of the influential factors. The combination of a single annual cut and no fertilization might be stated as control or baseline condition in this time series experiment. I wonder that this term never was used in the context of this factorial design. Obviously, all plots started from this factor combination.

It has to be mentioned that the author indicates a high quality of literature inquiry. Consequently, the three main chapters of the thesis represented by three papers published in valuable and well-cited journals in the respective scientific field, show that the author worked really through the state of the art. Surprisingly, the PhD volume did not comprise of the data supplements of the papers. Such could be expected as regular standard.

Happily, the author deals in the first paper with the effect of scale and the correlation of species area relationship with respect to compositional changes in wet grassland. From the description, it was not possible to understand the soil sampling strategy. Nevertheless, the author could

## **Review of the PhD thesis**

Mgr. Jan Horník

**Changes of the vegetation of wet meadows depending on management (České Budějovice 2015)**

The PhD thesis of Jan Horník consists of five chapters; two of them are synthetic parts (Introduction, Summary). The other chapters (II-IV) represent three papers published in high quality peer-reviewed journals, in which J. Horník is once the first author and two times the third author. Introduction brings nice overview of the drivers of grassland diversity and acquaints the reader with numerous methods of measuring and displaying plant diversity patterns. Summary is weaker part of the Thesis; it should bring a complex synthesis of the author's findings in the context of recent scientific knowledge instead of repetition of summaries of the case studies.

Jan Horník collected a large original dataset from unique series of experiments established in 22 wet meadows and used a wide set of statistical methods (including multivariate techniques). Although he worked as a member of well-established research team and profited from institutionally managed CLO-PLA database, know-how of his supervisor and colleagues, his publication record and ranking of the authorships demonstrated his ability to carry out an independent scientific study and also published the outputs in the international journal. The organization of the plan of the thesis is clear. The methodology (experimental design, protocol of measurements and statistical analysis) applied in studies was in general appropriate.

Thesis deals with interesting topic (diversity patterns of meadows) and discusses the results with current grassland management practices. In my view all the case studies brought significant advance in the specific field of research, however I most like the methodological approach and presentations of results in Chapter IV. In this paper, authors demonstrated that functional dissimilarity between grassland communities under different management increases along the productivity gradient. As authors suggest this finding has important implications for nature conservation and should lead to rethinking of priorities in financial allocations.

**In conclusion, Jan Horník fulfilled all the requirements of the PhD study and should be awarded by the PhD degree (after successful defence).**

higher nutrient availability could represent also the opportunity for trait divergence (p. 68, Fig. 3 this Thesis and paper by Mudrak et al. 2015, Ecography).

Minor comments (not to be discussed during defence):

(1) p. 4 ... according to two paragraphs dealing with the effects of management on grassland diversity it seems that all aspects of the topic were described by the research teams in South Bohemia; the literature survey should be less regional

(2) p. 7 ... correct term is “Shannon–Wiener index”

(3) p. 24 ... the design of the experiment (22 localities with four squares) enabled to calculate models with more than 88 SACs, even with the given condition “all possible nested squares that could be placed in the 1 × 1 m area”; each monitored 1 × 1 m square has four corners, and thus there exist four possible ways to create nested squares

(4) p. 25 ... plant ecologists do not use the term “basic nutrients”

(5) p. 25 ... it is not clear whether soil samples were immediately after digging frozen in order to detect correct field values of  $\text{NO}_3^-$  and  $\text{NH}_4^+$

(6) p. 42 ... authors stated that applied NPK fertilizer contained 10% N, 10%  $\text{P}_2\text{O}_5$  and 10%  $\text{K}_2\text{O}$ ; what elements created the remaining 70% of the fertilizer? Precisely, how many grams of N, P and K were applied per 1 m<sup>2</sup> (summing amounts from both applications)?

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Jan Mladek

Mgr. Jan Mladek, Ph.D.  
Department of Ecology & Environmental Sciences, Palacky University, Olomouc