Review of the Habilitation Thesis of RNDr. Jiří Kvaček

I am very much impressed by the scientific work that Dr. Jiří Kvaček has performed in the course of the years, and I am of the opinion that his Habilitation is more than deserved.
In my review I will first deal with the first part of the thesis (and I attach a pdf of the thesis with some minor remarks in this part), and then a general evaluation of the various papers in the Appendix will follow.

- The first part of the thesis is a great piece of work combining all data of the knowledge of the Late Cretaceous floras in Central Europe. It is an excellent overview, but also new ideas are developed.

I particularly like Chapter 6 on the whole-plant concept and reconstructions; this might be later published as a separate paper. Chapter 7 on the various habitats is very interesting as well, and the hypothesis of the influence of large herbivorous dinosaurs and their influence on the landscape and thus the evolution of especially the Angiosperms, is completely new and worth a paper of its own. Finally, Chapter 9 (the CLAMP analyses) is very important for the understanding of the evolution of the climate during the Late Cretaceous.

- I also have a few comments to this first part of the thesis, things that I miss or suggestions for improvement:
First of all, the layout sometimes varies throughout the manuscript (font, size etc).

I miss a few references used in the text in the list of references (such as Schweigert 1992).

Chapter 3 on the Geology of the area shows the distribution of the various localities, indicated with letters. It would help if you added these letters to the subsequent paragraphs where these localities are discussed; especially for readers that are not very familiar with these various floras, this would be a great help.

In Chapter 3, I miss a simple stratigraphic column.

On p. 17 you discuss very briefly the Netherlands-Germany border area, but only with respect to the Santonian flora. You have completely missed the Maastrichtian floras from the type area – there are some 8 papers by Van der Ham and co-workers. Campanian plant fossils do also occur in the area, although they are rare.

Then a final question concerning the 4 floras that you discuss in detail: What is the reason for the sequence in which you discuss these floras? It does not appear to be age, of geographical position. I am in need of a simple map to indicate the geographical position of these floras, and a small comparison table indicating age, area, depositional environment etc might help as well, especially for the reader that does not know these floras by heart.

But on the whole, it is an excellent piece of work.

- A general evaluation of the excellent and diverse papers displayed in the Appendix:
Appendix 1 is a paper on the interpretation of the early angiosperm fossil *Pseudoasterophyllites cretaceous* (including its male and female reproductive organs) and its place in the tree of life. A series of phylogenetic analyses resulted in the suggestion of the systematic position of this taxon in the early angiosperm Chloranthaceae-*Ceratophyllum* clade

and that this clade occupied more diverse habitats than can be imagined from its modern relics.

Appendix 2 is a completely different paper dealing with Coniacian flora of the Sudetes (Idzikow - paragraph 5.3 in the thesis) and palaeoclimatic interpretations using the CLAMP analysis that is part of Chapter 9 of the thesis. Although a detailed palaeoecology of the flora is difficult to reconstruct, four different forest communities could be recognized.

Appendix 3 deals with the new monocot aroid foliage genus *Orontiophyllum*, characterized by a very typical venation pattern. The genus was created for foliage assignable to the Orontioideae but lacking reproductive structures. Two different species were recognized, of different Late Cretaceous age and area of occurrence in Central Europe.

Contrary to appendix 3, Appendix 4 deals with the new angiosperm reproductive genus *Zlatkocarpus* consisting of a compound inflorescence with fruits and attached pollen. It is a beautifully illustrated and detailed description of this mesofossil reproductive genus. Its systematic position is still unclear although relationship with the Chlorantaceae is a possibility.

Chapter 5 is by far the largest and well-known paper. The famous Monograph on the Campanian Grünbach flora is already a classic paper in its field. This mire flora added a lot of new data to the scientific world in terms of taxonomy of Late Cretaceous species, but also on the palaeoecology of the area and the palaeoclimate.

ot only angiosperm taxa have been dealt with, Chapter 6 concerns the new ginkgoalean reproductive structure *Nehvizdyella* gen. nov., a genus that added considerably to our knowledge of the evolution of the Ginkgophyta. The presence of the associated leaves of *Eretmophyllum obtusum* resulted in a reconstruction of a short shoot bearing both these leaves and the *Nehvizdyella* reproductive structures.

The final Chapter 7 of the appendix deals again with angiosperm remains, i.e. a paper on the foliage of monocots of the Grünbach flora. The results from this paper have mostly been included in the Monograph of Chapter 5.

- Concluding, this habilitation thesis shows that Dr. J. Kvacek has considerably contributed to the scientific development and understanding not only of the field of Palaeobotany, but also of Palaeoecology and Palaeoclimatology. All his work (together with his co-authors) is original and has a very high standard; moreover, it is innovative as well, especially in developing and using CLAMP analysis for Late Cretaceous floras resulting in knowledge of their ecology and climatology.

Therefore, I highly recommend accepting this habilitation thesis and granting Dr. J. Kvacek the title of Associate Professor.

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