



POLSKA AKADEMIA NAUK  
**INSTYTUT PALEOBIOLOGII**

*im. Romana Kozłowskiego*

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ul. Twarda 51/55, 00-818 Warszawa

phone: (4822) 697-88-50; fax: (4822) 620-62-25

e-mail address: [paleo@twarda.pan.pl](mailto:paleo@twarda.pan.pl); <http://www.paleo.pan.pl>

Prof. Stanislav Oplustil  
Faculty of Science  
Institute of Geology and Palaeontology  
Charles University  
Albertov 6, Prague 2  
CZECH REPUBLIC

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Review of the PhD thesis

**Tafocenózy s Porifera w české křidové pánvi**  
**(Thaphocenoses with sponges in the Bohemian Cretaceous Basin)**

by Radek Vodrážka, MSc

The presented thesis consists of both, published papers (majority, part with coauthors), as well as unpublished/submitted ones.

All published papers are in the journals included in the Science Citation Index Extended, and most of them are in major international journals with high impact factor such as *Ichnos*, *Palaeontology* or *Cretaceous Research*, thus clearly indicating high level of research. I would like to avoid reviewing papers peer-reviewed by specialists in the field, thus I will comment mostly on general aspects of the submitted thesis.

The first part of the thesis (in manuscript) deals with basic types of preservation of sponges (from piritization to phosphatization and secondary silicification) in the studied material and various methods of their preparation. The description of the new method of preparation, with the use of H<sub>2</sub>SO<sub>4</sub>, was published in *Palaeontology*.

Also in the manuscript form, Radek Vodrážka analyzes distribution and composition of taphocenoses with sponges in the Bohemian Cretaceous Basin, including literature data, his published papers that are part of the thesis (see below), and also his own unpublished data. This part serves as a kind of introduction and summary for the whole thesis.

General aspects of the Late Cretaceous Bohemian Basin sediments, including stratigraphy, their fossils content and taphonomical processes, are presented in two major papers published in the *Bulletin of Geosciences* and *Cretaceous Research*. The first one, deals with detailed sedimentological, stratigraphical and ecological analysis of the late Cretaceous deposits and their fossil content (including palynology), as well as the first occurrence of nontronite mineral in the Bohemian Cretaceous Basin, from Chrtňky section. This analysis serves as a base of sound environmental reconstruction and sedimentological scenario for this section. Such complex and multidimensional studies (in cooperation with other colleagues) need a wide knowledge and a great ability of cooperation – features very important in this type of research.

Even more detailed is the study of phosphatic lag deposits from Byčkovice, that present not only analysis of sedimentological aspects of the lag, but also detailed discussion of fossil assemblage, with special attention of sponges (one poorly known species i.e. *Laocoetis creatacea*, is described and illustrated in details). This analysis allowed for reconstruction of the sedimentological and faunistic history of the sediments recorded only by the lag, as well as in the estimation of the gap duration represented by the lag.

Chosen paleontological aspects of the studied fauna has been described in the published papers dealing with crinoids, bryozoans, boring sponges and hydroids symbiotic with serpulids; one unpublished (submitted) paper is devoted to nautilid beaks. All these papers are on a very high professional level, and each present not only paleontological description but also analysis of mode of life and taphonomy (boring sponges, crinoids, hydroids), interpretation of environment (bryozoans), and analysis of variability and assignation to biological units/species (the case of nautilid beaks).

All the discussed above publication/submitted papers present a wealth of new data and sound interpretations, and are on the high professional level, thus indicating Radek Vodrážka's ability to work independently... It is worth to mention a wide array of subjects studied by Radek Vodrážka, as well as his ability to cooperate with other specialists, the fact not without importance in modern research.

#### **Detailed comments and suggestions:**

1. The chapter on preservation of sponge skeletons is very interesting and worth of future more detailed work, being at the moment only descriptive and rather general. Further microscopic and geochemical studies may lead to the interpretations of described differences.
2. The general part of the study is strictly regional and there is no attempt at all to put it in more general context, to compare, for example, observations from the Bohemian Basin with other well known Cretaceous sponge bearing facies from Europe (England, France, Poland). Facies with multiple generations of phosphatic clasts are well known from other European Cretaceous deposits, and thus can be also compared/discussed. At present the scientific

impact of the papers is diminished for this reason of strict regionalism. However, this may be easily developed in the future works.

### **Final conclusion**

I consider the PhD thesis submitted by Radek Vodrážka MSc as of sound quality and thus fulfilling the criteria for obtaining PhD degree, and suitable for defense.

Warszawa, 11/08/2010

Doc. dr hab. Andrzej Pisera