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Prof. Oldrich Fatka  
Examination Chair  
Faculty of Science,  
Albertov 6, 128 43  
Prague 2, Czech Republic

Dear Prof. Fatka and members of the examination panel,

**THESIS TITLE:** Vertebrates of the lower Palaeozoic from the Barrandian are (Bohemian Masiff) and their comparison with faunas of adjacent areas

**Candidate**

This is a well-constructed thesis that discusses and reviews the phylogeny and biogeography of placoderms from the Prague Basin. It comprises an introductory chapter, a detailed methodology section, an overview of the fauna, and conclusions. The body of the work is presented as 5 scientific papers, 4 co-authored papers already published in which the candidate is senior author and 1 further single author paper is under review. I was a reviewer for paper 11 and I am currently reviewing paper IV. The candidate has formulated well thought out and integrated hypotheses in the introduction and answers these in each paper. The work presents information on the sedimentology, stratigraphy, fauna, palaeoenvironment and taphonomy of the study area and as such is a significant contribution of original research. There are some issues with the English composition of the thesis and I would suggest that the thesis be thoroughly edited by a scientific editor before final publication.

I recommend that the thesis be presented for defense

I suggest the following points for discussion at the defense:

1. There is a discrepancy between the author contribution in Paper 3 and the thesis statement of contribution. The thesis introduction states the candidate's contribution as 80% whereas equal contribution by both authors is given as 50% in the published paper.
2. How feeding strategies are determined in homosteiids when only one median head-shield plate has been recovered and one trunk shield plate.
3. Instances on intraspecies variation in sensory line canals and the limitations of the use of various morphological features that show variation in species diagnosis.
4. It states in paper 4 that acid preparation of the specimens was not successful. What methods of protecting the specimens in acid were trialled? We use 8% buffered acetic acid, however the moment some bone is exposed we place a very dilute solution of paraloid onto the bone and keep doing this until the bone can absorb no more. We then coat the bone in a more viscous solution and then re-immerses the specimen in acid and keep repeating this until the specimen is prepared.

Comments regarding each paper are as follows:

#### Paper 1.

This paper placed the placoderms described within this thesis in a stratigraphic context and reviews the diversity, abundance and faunal change throughout the Lower to Middle Devonian of the Prague Basin. This paper documents an important faunal overturn, notably the arthrodiroids replace acanthoracids. It also documented that unlike other Early and Middle Devonian sites where there was increasing diversity in placoderms the Prague Basin had a relatively low diversity and this was attributed to local conditions.

#### Paper 2.

A new homosteid species, based on isolated and fragmented material is described. The candidate uses the presence of homosteid remains in the Prague Basin to support the northern migration route hypothesized by Young (2003). This is an important observation and shows the candidate's knowledge of the literature and ability to build scholarly knowledge and make scientific conclusions based on the data she described. As mentioned when I reviewed this paper I still find it difficult to reconcile that feeding strategies are discussed when only a central and anterior dorsolateral plate were described. I acknowledge that all known homosteiids are microphageous, but for many the gnathal plates are not known so we have no way of determining if more diverse feeding strategies were present in this group. One argument for every homosteid having identical feeding strategies is the absence of more than one species in a site. Where there are multiple species there is often different feeding strategies present and where there is only a single species present the feeding strategies between different species is often the same. An evaluation of the sediment (being nutrient rich) is identified by the candidate as support for the argument for filter feeding within homosteiids. In my opinion, additional observations could have helped support this argument further, however, the paper has been peer reviewed and accepted by the journal and is a valuable piece of research. I was one of the reviewers on the original manuscript and the candidate has adequately addressed the comments suggested by the reviewers.

#### Paper 3

This published paper states that each author contributed equally to the paper, however the statement at the beginning of the thesis states that the candidate contributed 80% of the work towards this paper. This needs to be clarified to the thesis examining body.

This work presents initial taxonomic findings and is particularly important as it determines many previous descriptions combined material from different species into a single taxon. In my experience it is difficult to sort this out and it is a credit to the candidate that the level of taxonomic resolution obtained was achieved. There are some tantalising hints in this paper on new information on the jaw and gill structures as well as questions around macro and micromery in placoderms, but as the authors state these will have to wait until the synchrotron data is analysed. It is good to see that this data has been collected and further work is being undertaken on these exceptional specimens.

A detailed analysis of the taphonomy and palaeoecology of the specimens is provided. This paper presents significant findings.

#### Paper 4

This paper is currently under review. As a reviewer I have attached my reviewers report for your information. I feel that some of the comments regarding the taxonomic significance of sensory lines and suture patterns are overstated, in light of recent papers that show significant variation in these features within species. However, the conclusions based on previously reported morphological differences being the result of different diagenetic processes in each locality discussed are robust. I have recommended that this paper be accepted for publication with revisions including through editing of the English and additional line drawings to clarify the morphological features referred to on the photographs.

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#### Paper 5.

This paper provides a detailed analysis of the palaeoenvironment and unites sedimentology, palaeobotony and faunal analyses to draw conclusions about the ability of fish to utilise and migrate into the environments of the Prague Basin. This paper demonstrates the candidate's ability to synthesis data from multiple sources and make valid interpretations and form hypothesis to support faunal changes in the study area.

Kind regards

*Kate Trinajstic*

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