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**Assessment of the doctoral dissertation of Dawid Drózdź, M.Sc.  
“Locomotor system of the aetosaur *Stagonolepis olenkae*”**

In connection with entrusting me with the function of a reviewer in the doctoral dissertation of Dawid Drózdź, M.Sc. based on the resolution of the Council of the Institute of Paleobiology of the Polish Academy of Sciences in Warsaw adopted at the meeting on June 20, 2022, here I present a review of his doctoral dissertation entitled “Locomotor system of the aetosaur *Stagonolepis olenkae*”. The dissertation was prepared by Dawid Drózdź in the Department of Evolutionary Paleobiology, Institute of Paleobiology of the Polish Academy of Sciences, under the supervision of dr hab. Tomasz Sulej and dr Tomasz Szczygielski.

The work presented for review is a manuscript entitled “Locomotor system of the aetosaur *Stagonolepis olenkae*” carefully prepared in the form of a monograph. It represents an important and interesting study in terms of evolution, morphology and anatomy of fossil reptiles. Despite the large amount of research and publications devoted to this group of animals, especially in the context of new discoveries by Polish researchers from the Triassic of Silesia, i.e. from the period of intense radiation of reptiles, the research results obtained by the author and presented in the doctoral dissertation justify taking up this topic by the doctoral student.

**Detailed structure and evaluation of the dissertation**

The work presented for review has 201 pages. It generally has a typical composition for this type of works. It consists of 12 main chapters, ie: 1. Introduction; 2. Geological setting; 3. Material; 4. Taphonomic notes; 5. Methods; 6. Systematic paleontology; 7. Osteology; 8. *Stagonolepis olenkae* and other Aetosaurs; 9. Locomotion and function; 10. Ontogenesis;



11. Conclusion; 12. Bibliography. The chapter “Geological setting” is followed by a short subchapter Institutional abbreviations. There are 34 figures of various types in the text, 4 figures in the Supplement as well as one table with a list of the bone material processed.

The dissertation was written in English which makes it suitable for a wide international audience. It starts with acknowledgments, a summary in Polish, an Abstract in English, and a short text describing the purpose of the research (“The Aims of the study”). They contain all the necessary information about the doctoral dissertation. The aim of the work, the obtained results and conclusions were presented in the correct manner.

The first chapter is “Introduction”. It is clearly written and presents the issues related to aetosaurs. Information about these reptiles, their fossil record, systematics, taxonomic history of *Stagonolepis olenkae*, issues related to the evolution and structure of limbs, as well as aetosaur locomotion were presented, along with a review of previous studies. There is also an introduction to ontogenesis and adaptations for digging.

Chapter 2 “Geological setting” contains a description of the studied localities, Krasiejów and Woźniki, where the remains of *S. olenkae* were discovered, along with the history of discovery, research, stratigraphic context as well as taphonomic, palaeoclimatic and palaeoecological reconstructions, and information on the accompanying fauna. Chapter 3 “Material” contains an inventory of the material prepared in the manuscript along with the necessary information about the place of its storage; data on comparative material used are also presented there. The next chapter – “Taphonomic notes” – describes the state of preservation of the material. Chapter 5 “Methods”, is quite short and describes the research methods and techniques used by the author.

In the chapter 6 “Systematic paleontology” the author describes in detail the systematics of aetosaurs from Krasiejów and Woźniki, and justifies assignment of the species considered to Aetosauria. An interesting hypothesis by the author is that some small species of aetosaurs may have been juvenile forms of other taxa.

The most extensive part of the reviewed work is the chapter 7 “Osteology”, where the skeleton of limbs of *S. olenkae* and almost complete juvenile specimen from Woźniki are described in great detail. The detailed presentation of the bones is noteworthy. Illustrations and reconstructions made on the basis of the specimens considered are assessed very well, they





perfectly illustrate the author's description and constitute a good basis for inference. The reviewer appreciates this approach of the author very much. Nowadays, there is a lack of such detailed morphological studies, which constitute an excellent basis for research by other authors and detailed comparisons with other taxa, which the author of the dissertation made in the following parts. Any conclusions put forward by the author and performed reconstructions, including locomotion and ecology (e.g. digging burrows, gaining food) would not be possible without using such an analytical approach.

Chapter 8 "*Stagonolepis olenkae* and other Aetosaurs" is comparable to the discussion chapter in such kind of works. The author summarizes the results of research and also compares his data very meticulously and in detail against the background of other aetosaurs, analyzing the similarities and differences. It should be emphasized here that, having at our disposal a very well-preserved and relatively complete material, including a juvenile specimen, it is the most revealing and significant element of the dissertation, bringing new data to be known not only for osteology, but also for the biology of this group and other fossil reptiles.

The next two chapters, "Locomotion and function" and "Ontogenesis", are the perfect culmination of the dissertation. The author reconstructed body shape, posture, movement and digging adaptations in order to search for food, as well as strategies for protection against predators and many other valuable palaeoecological data. Here, thanks to the described juvenile form of *S. olenkae* from Woźniki (if the author's diagnosis is confirmed), differences between juvenile and adult individuals were shown, their individual development was reconstructed, and very valuable results of research on the ontogenesis of fossil forms were obtained. Here it is necessary to emphasize the excellent knowledge of the author, both in anatomy and developmental biology. The author perfectly used the knowledge obtained during his studies and research career. Without this knowledge, it would be impossible to obtain such very good results. The last chapter before the reference list, "Conclusions", is a very synthetic, but complete summary of the results obtained in the dissertation.

The last chapter of the dissertation is "Bibliography" which presents a reference list. The author used 174 original publications, mostly in foreign languages. All publications provided by the author, both the newest and the older ones, have been properly used and accurately cited.

It should be emphasized that all the references cited were quoted in the text, but only several items cited in the text were not included in the bibliography.

In the reviewed manuscript prepared by Dawid Drózdź, M.Sc., there are a few minor mistakes.

#### **Comments and suggestions**

The dissertation is extensive, but the reviewer lacks a table with measurements of the studied specimens and at least a brief comparison of these measurements with other aetosaurs. The author only gives the proportions of the limbs and the overall size of *S. olenkae* and, in the opinion of the reviewer, is a certain insufficiency, but it does not reduce my very positive opinion about the work. The addition of the results of the osteometric analysis may be an interesting supplement to the dissertation at the stage of its publication.

#### Reference list:

1. Page 186, Gornicki et al. 2021 – journal title is missing
2. The following publications are mentioned in the text but absent in the reference list: Beddard, 1902; Burns et al., 2013; Carrano, 2000; Ezcurra & Kischlat, 2012; Fowler & Hall, 2011; Frey, 1988; Nesbitt et al., 2013.

All the above-mentioned minor errors do not undermine my high rating of the reviewed work. I hope that minor editorial errors will be eliminated at the stage of preparing the manuscript for publication, and that the inclusion of one or several issues related to osteometry will increase the value of such a publication.

I would like to state that the results obtained by the author of the reviewed work constitute a very valuable source of knowledge and are a very broad, detailed and very solid elaboration of the topic. The work also yielded a lot of data and results new to science. All this, I hope, will inspire the author for further research and syntheses, especially in the case of completing the entire material (K. Książkiewicz's material). Publication of the results obtained will be a very valuable source of information about *S. olenkae* and other aetosaurs.

**In conclusion, I state that the Dawid Drózdź, M.Sc. showed a high ability to conduct scientific research, a very appropriate selection of research methods and a great ability to draw conclusions from the results obtained. Dawid Drózdź's doctoral dissertation entitled "Locomotor system of the aetosaur *Stagonolepis olenkae*" meets the conditions set out in**





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**the Act of March 14, 2003 on Academic degrees and academic title as well as degrees and title in the field of art (Dz. U. z 2016 r., poz. 882 z późn. zm.), in connection with Art. 179 paragraph. 1 of the Act of July 3, 2018, Regulations introducing the Act – Law on Higher Education and Science (Dz. U. z 2018 r., poz.1669 ze zm.). I ask the Scientific Council of the Institute of Paleobiology of the Polish Academy of Sciences to admit Dawid Drózdź, M.Sc. for further stages of defence of the doctoral dissertation.**

Due to the significant contribution of the reviewed work and taking into account the importance and originality of the results obtained as well as high level of its methodological preparation, I request the Council of the Institute of Paleobiology of the Polish Academy of Sciences to award this doctoral dissertation.

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