

Departamento de Ciencias de la Tierra **Universidad** Zaragoza



Dr. Eduardo Puértolas Pascual,

Postdoctoral researcher

University of Zaragoza

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Dear Members of the Evaluation Committee:

I am pleased to write this review and letter of recommendation in support of Mr. Kuzmin Ivan Timurovich. I am postdoctoral researcher in the Department of Earth Sciences at the University of Zaragoza (Spain), and specialist in Vertebrate Paleontology with several works related with Crocodylomorpha and other fossil vertebrates.

Regarding the Doctoral Thesis manuscript presented by Mr. Kuzmin under the title of "ANATOMY, DEVELOPMENT AND EVOLUTION OF BRAINCASE IN CROCODYLOMORPHA (DIAPSIDA: ARCHOSAURIA), the dissertation is more than correct to qualify for the degree of Doctor of Biological Sciences at SAINT PETERSBURG STATE UNIVERSITY, for the reasons stated below:

- The thesis is supported by a compendium of 5 peer-reviewed publications in journals indexed by Scopus and/or Web of Science, so it already has strong support from the scientific community. Actually, several of these papers are already widely cited in the scientific literature. In addition, the PhD candidate has participated and presented his work in more than a dozen scientific congresses. In my opinion, this meets all the requirements to qualify for the doctorate degree. In addition, the memory is perfectly written justifying the thematic unit of the works presented.
- On the subject of the thesis, it has contributed notably to the knowledge of the anatomy and evolution of the neurocranium of Archosauria in general, and of crocodylomorphs in particular. This thesis reinforces previous knowledge on this topic and establishes important novelties that may set precedents for future work on the anatomy and phylogeny of this group of archosaurs. Among these novelties, the following stand out:
 - 1. Creation of 3D models and description of the neurocranium and skull of taxa not carried out until now.
 - 2. Review of the previous anatomical nomenclature on this subject and trying to standardize it, even creating new terminology.
 - 3. Creation of a new phylogenetic matrix of 167 characters related to the neurocranium, half of which is new information. This has allowed for the first time to carry out a phylogenetic analysis based on neurocranial anatomy and that includes representatives of the main clades of Crocodylomorpha.

As a conclusion, I sincerely believe that the achievements obtained and the information provided by this doctoral thesis will be used as a reference for any future study, not only on neurocranial anatomy, but also on neuroanatomy and phylogeny of Crocodylomorpha.

Yours sincerely,

Dr. Eduardo Puértolas Pascual University of Zaragoza 21/09/2022