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10 August 2018

To Whom It May Concern,

I am pleased to provide this review and letter of recommendation for Pavel Skutschas's dissertation, entitled "*Early stages in the evolution of salamanders (Lissamphibia, Caudata) and the transition from stem- to crown-group salamanders*", being submitted for the degree of Doctor of Biological Sciences. I am a palaeoherpetologist who specializes in the evolutionary history of salamanders and related amphibians. I have known Pavel for over a decade and am quite familiar with, and impressed by, the quality and breadth of his work, both in the field and in the laboratory.

Pavel's dissertation summarizes one major aspect of his research program, specifically the early evolutionary history of salamanders as documented by the group's fossil record in Middle Asia, Kazakhstan, and Siberia. Although salamander fossils have been known from these regions since the 1970s and 1980s, they were not well studied and, unfortunately, came to be regarded as being of secondary importance compared to better documented occurrences and fossils from elsewhere in Eurasia and in North America. A major contribution of Pavel's work has been the discovery, description, and interpretation of new localities, specimens, and taxa of Mesozoic salamanders, as well as detailed re-descriptions of previously known, key salamander taxa. His work—which has been reported in over a dozen peer-reviewed scientific papers (several of which I reviewed and/or handled as a journal editor)—has shown that Middle Asia, Kazakhstan, and Siberia are equally important for elucidating the early evolutionary history of salamanders and has revealed some unexpected findings. For example: that the most primitive stem salamanders were more widely distributed and speciose than previously known; that stem salamanders overlapped for about 40 million years with their more derived descendants (crown salamanders); and that Western Siberia was a refugium for Jurassic aspect vertebrates (including salamanders) well into the Early Cretaceous. Pavel's laboratory work utilizes a variety of traditional and new study techniques, demonstrating his desire to employ all available methods of research and embrace new techniques and approaches. To cite several relevant examples: his microCT work and palaeohistological work have yielded new insights into, respectively, skeletal morphology and tissues, which could not have been obtained from more traditional techniques.

In summary, Pavel's work is re-invigorating the study of early salamander evolution and he is becoming a leading authority on that subject. As Pavel's work continues, we can expect new discoveries and insights that will further improve our understanding of this long-lived and important group of amphibians. In my opinion, his work and dissertation certainly warrants him being awarded a Doctor of Biological Sciences degree.

Respectfully,

Jim Gardner, PhD.
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Associate Editor, Canadian Journal of Earth Sciences

Вх: 09/2-200 от 28.09.2018