



To
Prof. Mgr. Lukáš Kratochvíl, Ph.D.
Head of the habilitation commission
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Ref: Evaluation Report for the Habilitation Thesis of Ing. Antonín Kouba, PhD

Dear Prof. Kratochvíl! Dear Members of the Habilitation Committee!

In response of your kind request, I have prepared this written review for the habilitation thesis submitted by Ing. Antonín Kouba, Ph.D. for granting the title of Associate Professor. Herein, I am providing my opinion on his habilitation thesis "Marbled crayfish, an emerging invasive species".

Formal presentation, contents, strengths/flaws of the submitted habilitation thesis

The habilitation thesis is organized in several chapters, followed by an inclusion of six case studies (publications). In the "Introduction" a general review, background information and state-of-the-art knowledge for the herein presented case studies as well as the recent and actual status of native and introduced and/or invasive crayfish species is presented. In detail, A. Kouba reviewed biological invasions in freshwater ecosystems, crayfish and crayfish plague, native and 'Old' non-native crayfish and 'New' non-native crayfish in Europe, and finally, the specific problems with marbled crayfish. This review is followed by a "Summary of publications" and "Future perspectives" and finished with a list of "References". The six publication are attached.

The scientific review is comprehensive, well presented and provides very accurate and important information on the existing knowledge about the topic. A. Kouba summarized the existing knowledge in the field of invasive species in general and then with crayfish and finally concentrated on the marbled crayfish in detail. He presented existing problems but also brought up emerging problems and discussed potential solutions.

There are no flaws.

General evaluation of the individual papers

The habilitation thesis includes six publications, most related exclusively to the marbled crayfish. A. Kouba is the first author of two articles. Three first authors were/are his former (two) and present (one) Ph.D. students, while one contribution is a collaboration within the university. The first publication is a study of the distribution of marbled crayfish in Europe, followed by a report of its availability in the pet trade and a survey of its established populations in Slovakia. The marbled crayfish's ability to overwinter in the temperate zone of central Europe was confirmed experimentally. This was an alarming result and because it became obvious that the marbled crayfish is capable of forming an integral part of the European crayfish fauna, A. Kouba and his team investigated the species in the context of apparent stressors, testing its burrowing and reproduction capacities under simulated conditions of severe drought.

The succession of papers also provides the way from a general information/distribution of native and non-native crayfish, over the arising problems and to the very important knowledge about the survival and performance of the marble crayfish in European freshwaters. So from a general overview he takes the readers to the very specific conditions, problems and future perspectives.

All publications are published; all in relevant and widely distributed scientific journals with high impacts in the field of crayfish research, invasion biology, biogeography and aquatic conservation.

Originality, significance of the results for the development of science

All the presented results are highly significant. Many details were not known, and the herein presented methodology and experiments for the understanding of biological characteristics and specific abilities of marble crayfish are of great importance for science. The research on the marbled crayfish has yielded much valuable information, and as A. Kouba pointed out, that it seems that the number of unanswered questions increases with each investigation. This is stimulating further research. He particularly mentioned the need of studies of the interactions of marble crayfish with already widespread Old NICS and the effect of temperature, since marbled crayfish disperse into regions with different temperature regimes. He further argues, that these species' co-occurrences provide an opportunity for studying transmission of the crayfish plague pathogen, given the unique relationships between NICS and specific *A. astaci* genotypes. As another important research direction he identified the assessment of the trophic roles of co-occurring NICS.

The herein presented studies already are carried further in A.Kouba's research, where he and his team are approaching topics like ecotoxicology and behavior by using the marble crayfish as a model species. He also intends to integrate these studies into the education at bachelor and master levels.

Signs of plagiarism

The provided test for plagiarism did not show any signs of plagiarism. Also my personal evaluation proofed all the presented material, methodologies and results being original.

Conclusion and overall evaluation

In general, a broad coverage of the relevant literature and existing knowledge is provided, but also in the individual case studies. All the specific chapters are without exception a comprehensive compilation of important data, the case studies (where relevant) have interesting experimental setups, and given the novelty of most herein presented study they are providing interesting results. These results are on the one hand important for crustacean science but on the other hand will be very useful for management advice and implementations.

Based on the herein described qualities, the habilitation thesis itself, but also the performance of the candidate at several scientific conferences and events, where I met him as a highly interacting scientist, satisfy significantly the criteria for granting him title Associate Professor.

Yours sincerely,

Ao.Univ.-Prof. Mag. Dr. Leopold Füreder