



Confidential

Supervisor's Review of USB RIFCH PhD Thesis

Surname of the PhD student: Hamid Niksirat	Name of supervisor: Assoc.Prof. Pavel Kozák, Ph.D.
Title of PhD thesis: Biology of reproduction in the crayfish	

OVERALL COMMENTARY ON THE PhD THESIS

The Scientific value, originality and quality of processing of PhD thesis are excellent. It is a complex of laboratory studies focused on basic reproduction of crayfish gametes. The aim of the first part is to study and compare ultrastructure of spermatozoa in the six species of crayfish including: *Astacus astacus*, *Astacus leptodactylus*, *Pacifastacus leniusculus*, *Austropotamobius torrentium*, *Orconectes limosus*, and *Procambarus clarkii*. The second part describe the morphological changes of the spermatophore wall and spermatozoon during post-mating storage on the body surface of the female on example of narrow-clawed crayfish *Astacus leptodactylus*. The last part is focused on the female gametes, especially on the egg ultrastructure and its morphological changes during the egg activation in noble crayfish *Astacus astacus*. The results contain several new findings e.g. 1) evidence of acrosome spike in the spermatozoon of *Procambarus clarkii*, 2) first description of the spermatozoon of *Orconectes limosus*, or 3) process of spermatophore degradation during the ejaculating and post-mating period. Another example is formation of the filament/droplet structure, which may contribute to the mechanism of egg-spermatozoon binding in the crayfish, representative of animals with non-motile spermatozoa. Which is important, is also the description of the ultrastructure of egg in noble crayfish *Astacus astacus*, during different stages of activation. Surprisingly for me, results of the last study showed that the attachment stalk of the egg is derived from the outer layer of first envelope of crayfish oocyte and not from the secretion of the glair gland of the female as was mentioned by some scientists before. I believe that the results of the thesis are highly applicable in the next basic and applied research focusing on crayfish reproduction. This is mainly the artificial reproduction or establishing of the future crayfish gene bank. Finally, the results were published in four good quality international journals.

My comments related to the quality of the present PhD thesis will be rather simple and short. Good work does not need wordy comments. I evaluate this PhD thesis as extremely successful.

Besides, I would like to say some words about Hamid himself and his character. Hamid worked on his topic independently from the planning of methodology to the evaluating and compilation of the publications. We only discussed the main idea and direction of the research and he was able to solve the problems independently, thoroughly and deeply. His publication activity is above-average: 12 publications in peer-review journals (5 as the first author), SCI 54 (50 without self-citation) with 7.7 citations per year, H-index 5. It was a real pleasure to be his supervisor.

FINAL RECOMMENDATION

- can be recommended for defence of PhD Thesis
- can be recommended with reservations for defence of PhD Thesis
- can not be recommended for defence of PhD Thesis

2.5.2014

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Date and place


Pavel Kozák

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surname and signature