



Confidential

Supervisor's Review of USB RIFCH PhD Thesis

Surname of the PhD student: Ložek	Name of supervisor: Prof. Ing. Pavel Kozák, Ph.D.
Title of PhD thesis: Crayfish cardiac and locomotor activity as a tool for study of pharmaceutically active compounds effect	

OVERALL COMMENTARY ON THE PhD THESIS

The Scientific value, originality and quality of processing of PhD thesis are in a good quality. It is a complex of laboratory studies focused on evaluation of crayfish as good bioindicator to detect selected psychoactive compounds in the relatively low concentrations that were found in the aquatic environment. The originality in comparison with previous studies of PhACs effects on aquatic organisms at environmentally relevant concentrations is combining of both, physiology and behaviour, aspects. The very important part of these is standardisation and description of non-invasive methods for continual recording of biological functions (cardiac and locomotor activity) of crayfish and potentially of other aquatic macro invertebrates. In the second objective, it characterised the intensity of crayfish cardiac and locomotor reactions to stimuli of natural and anthropogenic origin, as odour of conspecific crayfish, predator, food, chloramine-T and injured conspecific. Studies revealed that from selected stimuli the strongest ethophysiological reaction was recorded to scent of injured conspecific, which was considered that as a stress reaction to predation. The main part independent work of Filip was focused on identification of effect of widely used psychoactive compounds, analgesic tramadol (synthetic opioid) and the illicit drug methamphetamine (CNS stimulant) in environmentally relevant concentrations to crayfish biological parameters. As a result, crayfish exposed to tramadol showed a higher increase of heart rate indicating a possible side effect of opioids which is tachycardia, however locomotor activity was slightly decreased after the stressor application. Crayfish in exposure to methamphetamine showed a weaker heart rate and insignificant difference in distance moved before and after the stressor application. The opposite results between cardiac and locomotor activity indicates the suitability of observing both biological parameters.

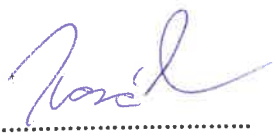
I evaluate this PhD thesis as extremely successful. The crayfish was evaluated as a good model object for biomonitoring. The thesis contains altogether 4 original scientific papers in very good scientific journals (Q1, Q2).

Besides, I would like to point out some words about Filip himself and his character. Filip worked on his topic independently from the planning of methodology to the evaluating and compilation of the publications. We only discussed together the main idea and direction of the research and he was able to solve the problems independently, thoroughly and deeply. To finish it, Filip has excellent abilities of human relations, ready to help me and other colleagues anytime and it was 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

14.5.2020 Vodňany
.....
Date and place


.....
surname and signature