

LEOPOLD-FRANZENS-UNIVERSITÄT INNSBRUCK
FAKULTÄT FÜR BIOLOGIE

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To
Prof. RNDr. Bohuslav Gas
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Charles University in Prague
Albertov 6, 12843 Prague 2
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Evaluation of the PhD-thesis "Detection, distribution, diversity and phylogeny of the crayfish plague pathogen *Aphanomyces astaci* (Oomycetes)" by Mgr. Eva Kozubíková

Dear Prof. RNDr. Bohuslav Gas,
Dear colleagues,

The PhD-thesis "Detection, distribution, diversity and phylogeny of the crayfish plague pathogen *Aphanomyces astaci* (Oomycetes)" by Mgr. Eva Kozubíková was handed out to me for evaluation.

The thesis includes several chapters, which are as a first part a general overview of the thesis, including the abstracts (Czech, English), an introduction (with 3 chapters, i.e. freshwater crayfish, crayfish plague and diagnostic methods of the crayfish plague pathogen), an outline of publications and manuscripts covered within the thesis, conclusions and outlook for further research and the references. The second part is the compendium of nine publications or manuscripts.

In general, the thesis is organised very well, has a well-balanced and interesting content and contains clearly defined research questions, up-to-date and innovative methodologies and analysis, which are portrayed in the individual thematic chapters. As most of the manuscripts are already published or accepted in highly ranked peer-review journals they had undergone at least one evaluation process indicating and guaranteeing for their high scientific quality.

The research topic of the PhD thesis is covering various aspects of the crayfish plague pathogen *Aphanomyces astaci*. Crayfish plague, responsible for the decline of many populations of crayfish all over Europe, still poses many biological and immunological questions. Nevertheless, only few studies are covering the prevalence and distribution of the pathogen and factors favoring or hindering its existence.

In this respect the thesis is a very important contribution in crayfish research. One central issue of the thesis is the distribution of *A. astaci* in North American crayfish populations in Czech and Hungarian freshwaters. Interestingly, the studies showed that the prevalence of infection in the signal crayfish and spiny-cheek crayfish populations varied, and were to some extent explained by population density and history as well as habitat type. The authors also found that the spiny-cheek crayfish was more problematic as a carrier of the pathogen compared to the other potential host, the signal crayfish. Also the pathogen detection was shown to be partly dependent on the detection method used. These results seem to be a very important information, when it comes to decide which detection method has to be used.

Most of the manuscripts included innovative molecular detection methods, which provided several important results. Firstly, various methods were introduced and tested. Secondly, they showed a difference in detectability of various methods used, but also provided information on the intraspecific diversity and phylogeny of the pathogen. Even a novel *A. astaci* genotype was detected, and in a detailed phylogenetic study three distinct lineages of the genus *Aphanomyces* were found. This is another important basis for the further development of molecular detection methods of the parasitic *Aphanomyces* species. In an appendix, Eva Kozubíková compiled additional three studies related to crayfish plague research.

Overall, based on the thesis and therein covered scientific work, the PhD-candidate Eva Kozubíková showed that she has

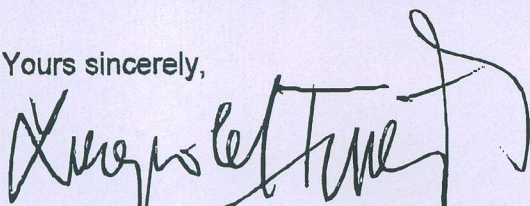
- a general and specific knowledge in the fields of crayfish biology, ecology, immunology and molecular biology, in particular in the field of crayfish plague pathogen detection and distribution history,
- the ability to carry out research from study design and implication of a research program to the understanding and interpretation of results,
- the ability to publish the major activities and results, as already done with at least 4 papers, the others are available as complete manuscripts and some of them already submitted.

And as I have also attended some of Eva Kozubíková's oral presentations at international scientific conferences, she also has

- the ability to present and explain difficult results, knowledge and achievements to a wider audience.

Based on this comprehensive PhD-thesis and therein covered work, the thesis by Eva Kozubíková is ready for the defense and its quality fulfils the criteria necessary for obtaining the PhD degree. For me it was very interesting and a pleasure to read and learn more about the crayfish plague pathogen.

Yours sincerely,



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