



Fakulta rybníkářství
a ochrany vod
Faculty of Fisheries
and Protection
of Waters

Jihočeská univerzita
v Českých Budějovicích
University of South Bohemia
in České Budějovice
Czech Republic

Confidential

Supervisor's Review of USB RIFCH PhD Thesis

Surname of the PhD student: Tomáš Tichopád, Mgr.	Name of supervisor: Martin Pšenička, doc, Ing., Ph.D.
Title of PhD thesis: THE EFFECT OF POLYPLOIDIZATION AND HYBRIDIZATION ON REPRODUCTIVE PHYSIOLOGY IN FISH	

OVERALL COMMENTARY ON THE PhD THESIS

The PhD thesis is composed from introduction, three published articles, one unpublished article, general discussion, and other required parts. In the introduction, the PhD candidate addresses polyploidization and hybridization in evolution of organisms, and genetical consequences of hybridization and polyploidization. He then logically linked these topics to the results of his dissertation.

The chapter II is a publication entitled "Clonal gametogenesis is triggered by intrinsic stimuli in the hybrid's germ cells but is dependent on sex differentiation". In this study, a very challenging method of transferring germ cells from asexually reproducing triploids to sexually reproducing diploid fish and vice versa was used to elucidate the mechanism of asexual reproduction. The recipient body has been shown to influence germ cell sex, but the premeiotic endoduplication that is required for asexual reproduction is controlled by internal germ cell signals. This experiment was good example of high-risk high-gain experiment, which resulted to a high-quality publication.

The chapter III describes physiology and morphology of sperm and reproductive potential in F1 hybrids of common carp and gibel carp. Unlike the previous article, this one uses light and electron microscopy methods and fertilization tests. A large variability in the size of the head and flagellum was found in the sperm of hybrids. In addition, sperm often differed in DNA content and various abnormalities. Nevertheless, these sperm were to some extent capable of fertilization and their offspring were viable.

The chapter IV is an unpublished article. The study describes meiosis suppression in the unisexual Amazon molly, *Poecilia formosa*, and the PhD candidate contributed with bioinformatical analysis.

The chapter V aims optimizing the production and use of triploid zebrafish for surrogate reproduction. The candidate was responsible for data processing in this work.

All the above-mentioned outputs are linked by the common topic of hybrid fish reproduction. The methods used, which the candidate has mastered, are varied. In his research, he has used, among other methods, electron and light microscopy, sperm motility analyses, fertilisation experiments, transplantation experiments, histological, and cytological analyses, and transcriptomic and genomic analyses. Thus, it can be said that the candidate has become a versatile researcher skilled in a variety of research methods. Thus, I recommend the submitted thesis for defense and the candidate for the PhD degree.

FINAL RECOMMENDATION



can be recommended for defence of PhD Thesis



can be recommended with reservations for defence of PhD Thesis



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☐ can not be recommended for defence of PhD Thesis

23.5.2022

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Date and place

PŠEMICKA /m/

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surname and signature