

To:
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Evaluation and review of the dissertation thesis entitled “Spatiotemporal distribution and shoaling behaviour of fish” submitted by Zuzana Sajdlova.

The thesis encompasses three publications in peer reviewed international journals. Each of these journals is renowned in the field of fisheries biology and in aquatic sciences with relatively high impact factors, and the journal of the third publication, i.e. Freshwater Biology is one of the leading journals in the field. This statement, by its own, allows conclusions on the quality of the thesis: Zuzana Sajdlova has convincingly proven her ability to act as leading author in high quality, scientific, impacted journals. Each of the papers has went through a stringent quality assurance procedure encompassing evaluation by expert reviewers and editors. In reading the thesis I found no sign whatsoever that raises any doubts on the quality of the papers and I am fully convinced that each of the three papers is a very valuable contribution to fish biology. Naturally, it is difficult for any external reviewer to objectively assess the contribution of each member in a group producing a multi-authored paper. Young scientists working in their PhD projects unavoidably need guidance and support from supervisors and colleagues, specifically during the early phase of conceptualizing their project and to develop innovative research questions and hypotheses. Only if the candidates develop positively during their projects they can reach a level allowing them to take a lead role (together with their supervisors) in developing excellent publications as first authors. This has been achieved by Zuzana Sajdlova during her PhD project and the result raises no doubt that she acquired the expertise and skills to work as an internationally recognized scientist. This is not only shown by her publications, but also by her collaborative projects in Norway described in the summarizing section.

Her first paper on fish behaviour in response to a midwater trawl footrope in temperate reservoirs brings new information to the community by focusing on vertical escape responses. This is a very valuable addition to information available for horizontal escape responses. She used a creative and innovative system to acoustically measure and analyse vertical escape swimming behaviour including slope and tortuosity. The focus on escape behaviour in relation to a trawl immediately raises the question how this fits to the umbrella topic, i.e. spatiotemporal distribution and shoaling behaviour? However, it becomes apparent that trawling results are strongly affected by spatiotemporal

distribution of the fish communities in open water habitats, predominantly vertical distribution patterns.

For the second and third paper it is very obvious that those are very well summarized using the umbrella topic of the thesis. Both are focussing on spatiotemporal distribution patterns and shoaling of juvenile perch.

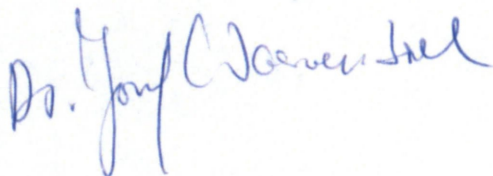
The second paper describes deep water refuge seeking of juvenile perch (bathypelagic habitat) which is generally well known from publications of the senior author. However, in this case they found an extreme case of a population in which the majority of the population performs diurnal vertical migration to and from the bathypelagic habitat. This represents a previously unknown situation and the publication convincingly explains the phenomenon with the exceptional physico-chemical framework found in this particular reservoir.

The third paper represents a true highlight of the thesis. Using a very creative experimental setup driven by strong underlying hypotheses on diel vertical migration patterns of juvenile fish communities a clear picture emerges revealing the proximate and ultimate causes of spatiotemporal distribution patterns. This represents a true milestone in our understanding of habitat selection in juvenile fish under such situations and could serve as a solid basis for future predictive modelling of juvenile fish spatiotemporal distribution.

The general, summarizing section before the research papers gives a very general overview of the topic and is clearly dominated by a collaboration project with Norwegian partners. While it is understandable that young scientists get excited on new and vastly differing research opportunities, this section might raise critique as the thesis loses some of its cohesion. Specifically the excursions on whales and other mammalian predators could be seen, at first sight, as distracting from the main topic and leaving an impression of unfocused story telling. Anyhow, after giving this a second thought this could be also interpreted as a strength of the thesis. Zuzana Sajdlova showed convincingly that she can generalize on widely different ecosystems and on divergent predators and prey while still focusing on shoaling behaviour of (prey) fishes. This leaves a deep impression of a more mature scientist being able to abstract the essential driving forces across diverse biological systems.

In summary, I evaluate the thesis of Zuzana Sajdlova with the highest mark or class available. I definitively recommend the thesis to be defended.

Sincerely,



J. Wanzenböck

Posudek oponenta na PhD disertaci
Mgr. Zuzany Sajdlové

Spatiotemporal distribution and shoaling behaviour of fish

Disertace (83 stran) vychází ze třech originálních prací publikovaných se spoluautory, kde Mgr. Z. Sajdlová je vždy prvním autorem. IF periodik se pohybuje mezi 2-4

Prvních 40 stran textu věnuje autorka Úvodu, Shrnutím výsledků, Společné diskusi a Literatuře (kolen 120 položek).

Důležité diskutované otázky:

Aktivní „útěk“ ryb před tralem lze pozorovat především ve dne (celkově se však vyhnulo ulovení jen 2% ryb)

Úlovky jsou ovlivněny velikostí ryb, velikostí a rychlostí tralu

Ryby se v noci vyskytují v horních vrstvách vody, ve dne ve větší hloubce Teplota a množství potravy toto chování ryb mnoho nemění

Po překrytí velké plochy hladiny neprůsvitnou folií, společenstvo ryb setrvalo u hladiny 24 hodin

Tyto jevy významně ovlivňují lov ryb, jak autorka ukázala ve společné diskusi.

Do jaké míry je obsah této první část disertace odlišný od literárního přehledu, výsledcích, diskusi a závěrech v dále uvedených publikacích?

Publikované práce již byly hodnoceny oponenty, nehodnotil jsem je.

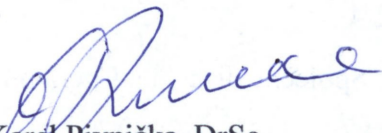
Terénní práce, které se autorka disertace účastnila nelze dělat jinak než s účastí kvalifikovaných spolupracovníků. Nepochybují o tom, že její účast byla srovnatelná s ostatními. Problematika pro ni nebyla nová, neboť jak bakalářská, tak magisterská práce ji dobře připravila. Shromáždila také údaje, jak rybářské flotily využívají informace o chování rybích hejn, (migraci ke tření či při hledání potravy) ke svému prospěchu. Oceňuji články ve Vesmíru o migraci kytovců,

K disertaci nemám další otázky.

Závěr

Mgr. Zuzana Sajdlová předložila kvalitní práci, ze které je patrná jak práce v terénu tak schopnost výsledky utřídit a vyvodit z nich odpovídající závěry

Doporučuji proto, aby Mgr. Zuzaně Sajdlové byl po úspěšné obhajobě přiznán titul doktorky filosofie PhD.



Prof. Karel Pivnička, DrSc.

V Praze dne 5. ledna 2019