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

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

Supervisor´s Review of USB RIFCH PhD Thesis

Name of the PhD student: **M.Sc. Marcellin Rutegwa**	Name of supervisor: **RNDr. Bořek Drozd, Ph.D.**
Title of PhD thesis: **Pond ecosystem dynamics in terms of production ecology**	

OVERALL COMMENTARY ON THE PhD THESIS

The submitted Ph.D. thesis entitled "Pond ecosystem dynamics in terms of production ecology" is written in a clear way, divided into 5 chapters, three of them are consisted of 3 scientific papers (2 already published papers, 1 in stage of manuscript).

In general, ponds represent complex, highly complicated man-made and man-managed ecosystems that are not easy to work with. The investigation of such biological systems is futher complicated by a strong ecological hysteresis, land use of pond surrounding areas and the present irregular hydrological cycle (unpredictable precipitations, flash floods, periods of droughts). However, Marcellin has coped with this difficulty successfully. From the scientific point of view the submitted Ph.D. thesis represents a valuable contribution to clarify the efficiency of use of inputs (originating from fishery management, inflows, precipitation), fate of nutrients and ecosystem metabolism in semi-intensively managed fishponds in a temperate zone that often suffer from nutrients overloading manifesting in a current highly eutrophic (hypertrophic) state and weakened ecological potential. A specific emphasis was put on the calculation of ecosystem metabolic rates (with special, detailed focus on carbon), macronutrients (phosphorus and nitrogen) balance and estimation of nutrients retention efficiency in ponds (Chapters 2 and 3). Since the environment worldwide concurrently also faces further pungent problems, which global warming surely is, Marcellin within his doctoral study has also started the issue of greenhouse gas production in aquaculture (pond) systems (Chapter 4). This part of the PhD thesis is devoted to the impact of fishery management on greenhouse (methane) emissions and is focused upon the determination and comparison of levels of dissolved methane and diffusive methane emission fluxes in nursery and main ponds and their drivers. This paper published in Aquaculture Environmental Interactions as the feature article became groundbreaking in Marcellin´s professional life since he wants to continue with this topic after coming back to the University of Rwanda where he permanently acts as a member of the academic staff who spent his 4-years long study leave at our faculty. All acquired results are reasonably discussed with pieces of knowledge from literary sources and concluded in chapter 5 – General Discussion.

To sum up, all stated goals have been achieved in the submitted thesis. The thesis contains a lot of valuable scientific findings and conclusions useful for understanding the functioning of semi-intensively managed eutrophic ponds, current pond culture management practice improvement as well as for policy makers and managers, who can concentrate their effort on the improvement of land use. The submitted thesis fulfils all conditions required for a successful defence at the Faculty of Fisheries and Protection of Waters, University of South Bohemia in České Budějovice.

Some personal comments on the author of the submitted Ph.D. thesis: Marcellin belongs to the skilled, hard-working, easy-going people determined to overcome all professional obstacles and pitfalls. He did not let himself be discouraged by the initial snag resulting in the change of topic and supervisor of his Ph.D. thesis. Moreover, no type of work is alien to him. Furthermore, he is always full of ideas of what and how things can be done. He can excellently combine knowledge from multiple disciplines. In addition, Marcellin is a calm, open-minded, friendly man, who is willing to help all the people around him (mainly with statistics). I was honoured to work with him. I hope he will never forget what he has learnt in our laboratory. I wish him good luck and in advance, I hope to continue our prolific collaboration and stay in touch in the future.

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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**

1st June, České Budějovice
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Date and place

.....
surname and signature
Dr. Borek Drozd