



### **Review of USB FFPW PhD thesis**

<b>First name(s), surname, titles of the PhD student:</b> Roman Lunda, Dipl.-Ing.	<b>First name(s), surname, titles of supervisor:</b> Assoc. Prof. Dipl.-Ing. Jan Mráz, Ph.D.
<b>Title of PhD thesis:</b> Aquaculture waste valorisation	

#### **REVIEWER:**

<b>Surname:</b> Kloas	<b>Institution:</b> IGB, Berlin, Germany
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<b>Please describe your professional relationship to the PhD student:</b> Roman Lunda performed a 1-month stay at our	<b>Please describe your field of expertise:</b> <i>Animal Physiology, Endocrinology, Ecotoxicology, Sustainable Aquaculture, Aquaponics</i>

### **QUESTIONNAIRE**

#### ***Originality, scientific importance, perspectives and impacts of results presented in the PhD thesis for basic and/or applied research***

Evaluate competitiveness of the PhD thesis in the international context and compare its level with the current state of the art in the field (**extent ¼ – ½ page**):

The PhD thesis of Roman Lunda is providing some good insights towards sustainability of valorisation of aquaculture waste. The focus is restricted to waste produced by RAS being acknowledged to become the future for sustainable resource efficient aquaculture production. Mr. Lunda used three approaches to valorize aquaculture waste: (1) nutrient throughput from operational RAS of different size and implications for its use in aquaponic systems, (2) vermicomposting of sludge derived from RAS, and (3) recycling biofloc waste as protein source for crayfish. All three topics have been published in internationally esteemed scientific journals demonstrating the scientific importance and their contribution to basic and even more for applied research. Thus the cumulative thesis is internationally recognized and peer-reviewed due to the merits that all three topics contribute with new and in part original findings to the field of sustainable aquaculture to extend our current knowledge, which might cause also implications for recent practice.



### ***Elaboration of the PhD thesis, objectives of the work and deliverables***

Evaluate the overall level of elaboration of the PhD thesis (structuring of the main text, comprehensibility, logicity of the chapters and their ordering) and the originality of the selected approaches to solve the objectives; evaluate publications and whether the results described correspond to objectives of the PhD thesis (**extent ¼ – ½ page**):

The PhD thesis of Roman Lunda is dedicated to valorisation of aquaculture waste produced by RAS and focuses on three topics structured in (1) nutrient throughput from operational RAS of different size and implications for its use in aquaponic systems, (2) vermicomposting of sludge derived from RAS, and (3) recycling biofloc waste as protein source for crayfish. Thus the umbrella of the various parts is valorisation of aquaculture waste, however, the different parts for themselves are well done but the overall logic and comprehensibility of the three results chapters are not so obvious. It seems to have done very nice work in different topics using various technologies but a red line to connect all three parts by an overarching hypothesis or vision is to some extent missing. Nevertheless each topic is well addressed separately and provides original research having implications for practice and thus the objectives of the thesis are well covered and elaborated. The main text is well written and addresses each topic in a sound manner but an overarching hypothesis is not proposed and therefore the various parts are also in the main text separately discussed.

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### ***OVERALL COMMENTARY ON THE PhD THESIS***

Please write in the box specific comments concerning the PhD thesis in extent of 1-2 pages:

The PhD thesis of Roman Lunda entitled “aquaculture waste valorisation” aims to investigate, evaluate, and improve sustainability of aquaculture. The content of his thesis is addressing three different parts based on waste derived from RAS: (1) nutrient throughput from operational RAS of different size and implications for its use in aquaponic systems, (2) vermicomposting of sludge derived from RAS, and (3) recycling biofloc waste as protein source for crayfish.

The overall structure with an introduction followed by three chapters concerning results and a general discussion is sound and aims to combine all three topics being addressed by the thesis. The introduction is covering the recent state-of-the-art concerning literature but the three topics are somewhat handled separately. Concerning the part of aquaponic systems the references are in part secondary literature reviewing already the available knowledge. What is missing a bit is a logic explanation why these three topics have been chosen for waste valorisation. The three results chapter as peer-reviewed papers are published in internationally well recognized scientific journals demonstrating the high scientific quality



and originality of each topic. In the general discussion again all topics are discussed one by one separately and sometimes expanding the topics for waste valorisation but still missing an overarching umbrella for the various results parts.

In general the thesis is written in a well understandable English and meets the criteria for a scientific paper. The combination of the three topics should have been explained in more detail.

The conclusions are more a summary of bullet points what has been determined in the results chapters rather than recommendations deduced from the findings.

In general some minor typos occurred and also some light-headed errors for instance at page 84 it is mentioned "Leveraging nutrient rich biomass from biofloc technology as a potential feed source was presented in Chapter 3" but it is in chapter 4. However, such minor points of criticism does not put into question the overall sound scientific quality of the work performed and already published. Therefore I clearly state that the thesis submitted by Roman Lunda is sound and of good scientific quality and I highly recommend it for acceptance.

### **FINAL RECOMMENDATION**

- PhD thesis can be recommended for defence**  
 **PhD thesis can be recommended for defence with reservations**  
 **PhD thesis cannot be recommended for defence**

6<sup>th</sup> July 2021, Berlin

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Date and place

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Name and signature