



**Confidential**

### Review of USB FFPW PhD Thesis

|                                                                                                           |                                                                                               |
|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>First name(s), surname, titles of the PhD student:</b><br>Adam Bořík, Ing.                             | <b>First name(s), surname, titles of supervisor:</b><br>Assoc. Prof. Mgr. Roman Grabic, Ph.D. |
| <b>Title of PhD thesis:</b><br>Tracing of PPCPs from sources to recipient                                 |                                                                                               |
| <b>REVIEWER:</b>                                                                                          |                                                                                               |
| <b>Surname:</b><br>Šimek                                                                                  | <b>Institution:</b><br>Masarykova univerzita Brno                                             |
| <b>Name:</b><br>Zdeněk                                                                                    |                                                                                               |
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| <b>Please describe your professional relationship to the PhD student:</b><br>No professional relationship | <b>Please describe your field of expertise:</b><br>Environmental analytical chemistry         |

### 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):

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The dissertation thesis is the result of quality systematic research and development of new analytical methods and their use for the description of sources and fate of pharmaceuticals and PCPs in environmental and biological matrices. The work brings new results that significantly contribute to the development of knowledge in the field of analytical methods for the detection and quantification of organic pollutants. The results are published in highly respected scientific journals and can therefore be considered of exceptional quality. The work is consistent in all published papers.

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***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**)::

Adam Bořík's dissertation is prepared in the form of unifying expert commentary on individual papers published in international scientific journals. The core are the results published in three journals with analytical focus (all three at Q1 level). These works contain the original result of systematic studies focused on the development, evaluation and practical use of high-resolution mass spectrometry in combination with the specific ionization techniques for analyses of the fate of pharmaceuticals in the environment and biota. The dissertation contains both general and specific chapters focused on the description of the interrelationship between the achieved results. The scientific goals are clearly and specifically defined in the introduction part and linked to the results presented in the author's papers.

**OVERALL COMMENTARY ON THE PhD THESIS**

Please write comments in extent of 1-2 pages:

The introduction part of the dissertation thesis contains good characterisation of PPCPs in the context of their chemical, physical and ecotoxicological properties. Satisfied information can be find on sources and fate of studied compounds in the environment. The methods of PPCPs removing from waste waters are clearly described. The reasons of monitoring of the content of PPCPs in various matrices are sufficiently discussed. Subsequently the existing analytical methods are assessed in order to explain the need of further methods development. Almost a hundred relevant literary references are a sufficient source of information for these purposes.

The presented results have undergone a rigorous review process in quality scientific



journals and can therefore be considered as highly valid. The use of high- and low-resolution MS in the analysis of low concentrations of pollutants in complex environmental and biotic matrices is evaluated based on the author's original experimental data. The presented work proves that the trend of simplifying the preparation of environmental and biotic samples in the analysis of organic pollutants by HRMS allows increasing the credibility of results of analysis.

Conclusion part contains a broad discussion of the results achieved on the background of previously published data and the method of extraction and final chromatographic/mass spectrometric analysis. The author of the dissertation thesis highlights the indisputable advantages of simplified sample preparation and final analysis, which does not require thorough chromatographic separation of the complex mixture. It would certainly be correct to pay the same attention to the disadvantages. Please summarize any disadvantages.

I have a few other comments and questions that are mainly a tool for understanding the presented results.

- The paragraph "The scientific aims of the thesis" contains the statement : ".....development and evaluation of novelty advanced analytical method." How do the obtained results correspond to the requirements for novelty?
- Evaluate the importance/unimportance of chromatographic separation coupled with mass spectrometry for the analyses of complex environmental and biotic samples.
- Describe the methods for determining LOD / LOQ and explain why you used the method given in the published papers.
- Why is page numbering missing?

## **FINAL RECOMMENDATION**

**PhD Thesis can be recommended for defence**



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

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

- PhD Thesis can be recommended with reservations for defence  
 PhD Thesis can not be recommended for defence

9.7.2020 Brno

.....  
Date and place

Zdeněk ŠIMEK

.....  
Name and signature