



Přírodovědecká
fakulta
Faculty
of Science

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

OPPONENT'S REVIEW ON BACHELOR/DIPLOMA* THESIS

Name of the student: Christina Zuser

Thesis title: Curated Database Construction for sMMO-Containing Methanotrophs

Supervisor: Dr. Anne Daebeler

Referee: RNDr. Jiří Kyslík, Ph.D.

Referee's affiliation: Institute of Parasitology, Biology Centre CAS

	Point scale ¹	Points
(1) FORMAL REQUIREMENTS		
Extent of the thesis (for bachelor theses min. 18 pages, for masters theses min. 25 pages), balanced length of the thesis parts (recommended length of the theoretical part is max. 1/3 of the total length), logical structure of the thesis	0-3	3
Quality of the theoretical part (review) (number and relevancy of the references, recency of the references)	0-3	2
Accuracy in citing of the references (presence of uncited sources, uniform style of the references, use of correct journal titles and abbreviations)	0-3	2
Graphic layout of the text and of the figures/tables	0-3	2
Quality of the annotation	0-3	2
Language and stylistics, complying with the valid terminology	0-3	3
Accuracy and completeness of figures/tables legends (clarity without reading the rest of the text, explanation of the symbols and labeling, indication of the units)	0-3	3
Formal requirements – points in total		17
(2) PRACTICAL REQUIREMENTS		
Clarity and fulfillment of the aims	0-3	3
Ability to understand the results, their interpretation, and clarity of the results, discussion, and conclusions	0-3	3
Discussion quality – interpretation of the results and their discussion with the literature (absence of discussion with the literature is not acceptable)	0-3	2
Logic in the course of the experimental work	0-3	3
Completeness of the description of the used techniques	0-3	2

* Choose one

¹ Mark as: 0-unsatisfactory, 1-satisfactory, 2-average, 3-excellent.

Experimental difficulty of the thesis, independence in experimental work	0-3	2
Quality of experimental data presentation	0-3	2
The use of up-to-date techniques	0-3	2
Contribution of the thesis to the knowledge in the field and possibility to publish the results (after eventual supplementary experiments)	0-3	3
Practical requirements – points in total		22
POINTS IN TOTAL (MAX/AWARDED)	48	(39) ²

Comments of the reviewer on the student and the thesis:

The author of the thesis fulfilled all the requirements of an early-stage scientific beginner, and the thesis shows a considerable amount of data produced and meets the criteria for a bachelor's degree award. I must emphasize the variety of bioinformatic tools she applied, including custom script development. However, the submitted thesis does not reflect some formal requirements. The introduction lacks citations in the text, and some facts mentioned by the author are misleading, incorrect, or outdated information that I find not accurate for the current context of the thesis. It also contains some inconsistencies in naming and incorrect descriptive terminology used in the taxonomy, but these are just minor things I found during my review. Nevertheless, the clarity of the text is of good quality, including the satisfactory English writing skills of the author at this early stage. The methodology described in the thesis and the presentation of some results are not accurate. In particular, the tree construction methodology is placed incorrectly in an unrelated subchapter. Next, the tree lacks an outgroup that might affect the overall grouping of the individual clades (groups). Moreover, the presented tree is without bootstraps, which makes the outputs very doubtful and not valuable. Indeed, some accession numbers of the tree are do not encode mmox genes but rather individual strain genomes. The tree visualization contains mistakes (eg. Group E is defined in the text, but basal species clusters in Group D). The discussion section is well written but should be improved and linked with existing papers regarding the mmox-related studies or MAGs that I searched additionally. Besides, the author accomplished the set objectives, and the thesis certainly advances the knowledge of methanotrophs in the microbiology field.

Suggestions and questions, to which the student has to answer during the defense.

Mistakes, which the students should avoid in the future:

Q1: Can you explain the selection of the F-INS-I algorithm for multiple alignment construction?

Q2: What was the reference sequence during alignment construction?

Q3: Why did you not perform 16S phylogeny of targeted species simultaneously with mmox, as seen in other published papers related to your thesis focus?

Q4: What was the reason of selecting mmox as target from sMMO operon? Not explained in thesis.

Q5: Did you analyze possible primer dimer formation of designed sets of primers? This feature might influence multiplex PCR considerably.

² Enter the number of points awarded.

Q6: Why you did not use for database comparison GTDB database since contains many times more sequenced genomes and MAGs for Bacteria and seems more accurate with phylum names than NCBI?

Conclusion:

In conclusion, I

r e c o m m e n d

the thesis for the defense and I suggest the grade 2 .³

In České Budějovice date 4. 9. 2023

signature

³ You can suggest a grade, which can be modified during the defense based on the presentation. However, if the reviewer is not present at the defense, the grade will not be counted. Grades: excellent (1). Very good (2), Good (3), Unsatisfactory/failed (4).