



Přírodovědecká
fakulta
Faculty
of Science

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

OPPONENT'S REVIEW ON BACHELOR THESIS

Name of the student: Beatrice Hurbean

Thesis title: Acquisition Dynamics of *Borrelia duttonii* by *Ornithodoros moubata* over time

Supervisor: Ryan O.M. Rego, PhD

Referee: Serhii Filatov, PhD

Referee's affiliation: National School of Tropical Medicine, Baylor College of Medicine, Houston, Texas, USA

	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	0
Graphic layout of the text and of the figures/tables	0-3	3
Quality of the annotation	0-3	3
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	2
Formal requirements – points in total		16

(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	2
Discussion quality – interpretation of the results and their discussion with the literature (absence of discussion with the literature is not acceptable)	0-3	3
Logic in the course of the experimental work	0-3	3
Completeness of the description of the used techniques	0-3	3

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

Experimental difficulty of the thesis, independence in experimental work	0-3	3
Quality of experimental data presentation	0-3	2
The use of up-to-date techniques	0-3	3
Contribution of the thesis to the knowledge in the field and possibility to publish the results (after eventual supplementary experiments)	0-3	2
Practical requirements – points in total		24
POINTS IN TOTAL (MAX/AWARDED)	48	40 ²

Comments of the reviewer on the student and the thesis:

I have reviewed the thesis "Acquisition Dynamics of *Borrelia duttonii* by *Ornithodoros moubata* over time" by Beatrice Hurbean. I think it is good quality work researching some of the important questions about transmission dynamics of the African TBRF spirochete, *B. duttonii*. My overall impression of the thesis is that it is well written, the student has shown an adequate understanding of her chosen topic and very well interprets the obtained results in the context of what is known in the scientific literature. However, I have found a number of inconsistencies and imperfections in the text and in the data representation, which preclude me from giving it the grades "1" or "2". Please note, that because I will not be present in person for the defense, the suggested score based on my assessment of the written thesis is only preliminary and depending on how the student presents her work and answers the questions I might have given a higher grade.

The main issue with the "formal requirements" is the inaccurate citing of the references:

- 2 duplicated literature sources with different numbers (i.e. citations #14 & 17 and 15 & 18 refer to the same article);
- reference #20 has the wrong format;
- caption to Figure 2 and the mention of Figure 3 in the text refer to the wrong source (i.e. reference #4 instead of 3 and #16 instead of 17);
- reference #7 has names of the authors swapped and in the text (the last sentence on p. 7) it is mistakenly stated to be about murine models of *B. duttonii*.
- reference #12 (Horak et al., 2002) is just a list of valid tick names and not an appropriate source on the ecology of Argasidae or their ability to transmit *Borrelia*.

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

Mistakes, which the students should avoid in the future:

- There is an inconsistency in the usage of the terms "strain" and "species" in relation to *Borrelia* throughout the thesis and it seems they are used interchangeably. Do you understand they are different terms and if so, can you explain the difference?
- Please provide the definition of the term "zoonotic disease". In your opinion, is *B. duttonii* a zoonotic pathogen?
- Why didn't you follow the course of spirochetemia with daily tail nicks and dark field microscopy to visualize the infection and only check the mice for antibodies before the tick acquisition feedings? At what exact time point (in days post-inoculation) after the infection the feedings were performed? This data should be present in the results. I think this is one of the main shortcomings of your work because the experiments

² Enter the number of points awarded.

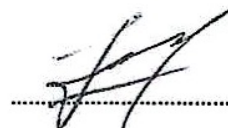
suggest mice have a very long spirochetemia but conclusive data is missing. Or do you think the ticks could have acquired *Borrelia* during their visible absence in the mouse blood?

4. In the Methods you are describing that the remains of the tick suspensions were incubated at 34°C with BSK media and checked for *Borrelia* growth. Why the data is absent from the Results sections? Did the result of this analysis match the data on seroconversion?
5. In the Methods part, the highest temperature ticks in the aim 2 were exposed is 34°C but in the Results it is 37°C. Which one is correct?
6. You have mentioned that you have used 2 different strains of mice (C3H/HeN and Balb/c) for aim 3 but nowhere in the thesis it is reflected how many animals of each strain was used, were there any differences between the CNS infection rates, etc. In this case, what is the point of using different mice? Whether it is acceptable from the methodological point of view to use different strains of mice and treat them as a single experimental group?
7. In the discussion⁶ you make a statement (p. 22) that "This study has furthermore confirmed that *B. duttonii* can be more easily detected/counted with a light microscope when blood samples are prepared via Giemsa staining" What makes you believe so? I have not seen any data backing this conclusion in your thesis.

Conclusion:

In conclusion, I Serhii Filatov r e c o m m e n d the thesis for the defense and I suggest the grade 3.³

In Houston, Texas, USA date 17.01.2022



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).

