



Přírodovědecká
fakulta
Faculty
of Science

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

SUPERVISOR'S STATEMENT ON BACHELOR THESIS

Name of the student: Helena Kapurani

Study program: Biochemistry

Department/Institute: Institute of Parasitology, Academy of Sciences of the Czech Republic

Thesis title: Detection of Lyme disease spirochetes and *Borrelia miyamotoi*
in samples of Czech patients

Supervisor: MSc. Natalie Rudenko, Ph.D.

Supervisor's affiliation: Deputy in chief, Laboratory of Molecular Ecology of Vectors and Pathogens

	Point scale ¹	Points
(1) FORMAL REQUIREMENTS		
Formal and graphical quality of the thesis	0-3	3
Ability to work with literature	0-3	3
Language and stylistics	0-3	2
Formal requirements – points in total		8
(2) PRACTICAL REQUIREMENTS		
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 results and their discussion with the literature	0-3	2
Experimental difficulty of the thesis, independence in experimental work	0-3	2
Contribution of the thesis to the knowledge in the field and the possibility to publish the results (after eventual supplementary experiments)	0-3	3
Practical requirements – points in total		13
POINTS IN TOTAL (MAX/AWARDED)	21	(0-24)²

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

² Enter the number of points awarded.

Comments of the supervisor on the student and the thesis:

The bachelor thesis of Helena Kapurani aims to determine the spectrum of *Borrelia* spirochetes in samples from Czech patients previously diagnosed with Lyme disease, with undiagnosed disease or classified as "problematic" with suspicion for Lyme disease. The further aim was to establishing a correlation between the species found in the samples and the patients' diagnosis (in samples where it was provided).

After initial supervision and appropriate training with the laboratory methods routinely used in the laboratory, Helena managed to perform all the work independently, with great responsibility and care. During her work in the laboratory, Helena learned many modern techniques, such as DNA extraction, PCR (conventional, nested, species-specific), electrophoresis, purification of PCR products, sequencing, and reverse line blotting. Helena has shown that she can work with scientific literature. She managed to write a detailed but at the same time very specific introduction to her work and then interpret the results obtained and compare them with previously published data.

Analysis of limited number of samples, that were not collected specifically for the aim of presented project, but rather represent the "leftovers" after the clinical testing conducted in the hospital, nevertheless the samples with high value for the research laboratory due to their source of origin, resulted in data of significant scientific and medical importance. Results obtained by Helena are in agreement with the results of research previously conducted in our lab as on tick vectors of LD, so as on clinical samples.

The limited time and complications caused by COVID epidemic with no doubts affected Helena's work, mostly on the final stage of writing her thesis (multiple misprints, mistakes or the use of improper words are present in the final version of the thesis). Nevertheless, in spite of formal imperfection in written thesis, results that Helena obtained in the laboratory are important and of high value. The most important finding of the study was the abundant presence of *B. burgdorferi* s.s. in the samples, followed by *B. garinii* and *B. afzelii*. Such "not traditional" for the Czech republic cause of human LD as *B. bissettii* and *B. carolinensis* species were also detected in some samples, confirming our previous findings. Another important finding was the detection of *B. miyamotoi* in a human patient as a co-infection with *B. garinii*. Co-infection was also found to be a common phenomenon in the patients in endemic regions, including Czech republic. All these factors could most likely explain the difficulties in evaluating these samples according to standard hospital protocols and thus why they were classified as "problematic." Helena completely fulfilled the aims of her project.

The results obtained by Helena Kapurani will be included in the broad analysis of human samples routinely performed in our laboratory and could be used for further publications.

Conclusion:

In conclusion, I r e c o m m e n d the thesis for the defense.

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In České Budějovice ,

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