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: BSc. Panagiotis Kosmas

Thesis title: Characterization of Photosystem I in the Red Alga Porphyridium purpureum

Supervisor: RNDr. David Bína, Ph.D.

Referee: Jakub Pšenčík

Referee`s affiliation: Charles University

	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	2
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	2
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		14
(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	3
Logic in the course of the experimental work	0-3	3

* Choose one

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

Completeness of the description of the used techniques	0-3	3
Experimental difficulty of the thesis, independence in experimental work	0-3	3
Quality of experimental data presentation	0-3	3
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	3
Practical requirements – points in total		27
POINTS IN TOTAL (MAX/AWARDED)	48	41[2]

Comments of the reviewer on the student and the thesis:

In this thesis, biochemical and spectroscopical techniques are used to characterize PS I of a red alga. This approach requires an understanding of multiple advanced methods, and represents a significant challenge for an undergraduate student. It is obvious that Panagiotis Kosmas was successful in this respect. He managed to use all the experimental tools in a meaningful way and obtained interesting and original results.

An important part of a scientific work is the presentation of the data. In this respect, the thesis could not start worse. Page 1 begins with a sentence, which is probably not entirely correct, and the Figure 1 and 2 are way too small to be readable. This is hard to understand, as the half of the page 2 is left empty. Fortunately, the rest of the Introduction is of a good standard, and the quality of the text and figures is further improving through the Results and Discussion. Some inaccuracies found in the introduction section are compensated by the quality of the experimental part. The thesis is written in good English. Typos, like 5 ul instead of 5 um (page 19), are quite rare. I can only complain about occasional doubling of the presented information (DEAE on page 17, slit width on page 23). These infrequent formal shortages do not affect the overall scientific quality of the thesis, which I consider to be of a high standard.

Suggestions and questions, to which the student has to answer during the defense. Mistakes, which the students should avoid in the future:

1. What was the most likely source of energy for the very first organisms on Earth?

2. According to the text, fractions 2 and 3 from sucrose gradient (Figure 10) contain phycobilisomes. However, spectra of both fractions look quite differently between 520 and 640 nm (Figure 11). In this part of the spectrum, the fraction 3 resembles a fraction 1, which contains free pigments. Why phycobilisomes in fractions 2 and 3 have different spectra? Is it possible that free phycobilins are present in the fraction 1? By the way, it would be helpful to use the same line colors for the same fractions in Figure 11 and 12.

3. Why carotenoid triplets were not observed previously in eukaryotic PS I complexes? Is it because the triplets are less likely to be generated in PS I complexes from other organisms, or because the sensitivity of the setup used in this work was higher than usual?

4. In the discussion (page 36) it is proposed that there is a major difference between the structural organization of the PS I supercomplex in red and green algae in. However, there is no description of the differences. Can you explain this point in a more detailed way?

5. I could not download the thesis by Shanti Kaligotla from where the extinction coefficient

[2] Enter the number of points awarded.

of a carotenoid triplet state was taken, and I could not find this information in any peer-reviewed publication by the same author. However, the used value seems to be somewhat larger than what determined by Nielsen et al in J. Photochem. Photobiol. A: 112 (1998) 127-133. What would be the estimate of the chlorophyll triplet yield using the triplet extinction coefficient by Nielsen et al?

Conclusion:

In conclusion, I

r e c o m m e n d

the thesis for the defense and I suggest the grade 1. [3]

In **Prague** date **20th January 2020**

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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).