



Přirodovědecká
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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: Marco Trathnigg
Thesis title: Characterization of fucoxanthin triplet-state in pyridine and photoprotection in the LHC of *Aureococcus anophagefferens*
Supervisor: RNDr. David Bína, Ph.D.
Referee: Jakub Pšenčík
Referee's affiliation: Faculty of Mathematics and Physics, 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	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	3
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	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	3
Formal requirements – points in total		19
(2) PRACTICAL REQUIREMENTS		
Clarity and fulfillment of the aims	0-3	2
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
Completeness of the description of the used techniques	0-3	2
Experimental difficulty of the thesis, independence in experimental work	0-3	2

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

Quality of experimental data presentation	0-3	3
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		23

POINTS IN TOTAL (MAX/AWARDED)	48	42 ²
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Comments of the reviewer on the student and the thesis:

This is a nice bachelor thesis, in which microsecond spectroscopy was used to study quenching of chlorophyll triplet states by carotenoid. This process is vital for aerobic photosynthetic organisms. Samples of different levels of complexity were used, from isolated pigments to thylakoid membranes. The contributions of individual pigments to the transient spectra were quantified, and the data were subsequently fitted by a solution of a kinetic model.

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

1. The description of the electron configuration for singlet oxygen on page 7 sounds like if the electrons in singlet oxygen were violating Hund's rule. Is it true?

2. Is a molecule in its excited state a different chemical species than the same molecule in the ground state, as suggested on page 9?

3. The triplet excitation energy transfer in mixture of pigments occurs via a collision mechanism, and depends on concentration of pigments. Therefore it would be useful to present the concentrations in the thesis rather than ODs, as in Table 1. It should be rather straightforward since all the extinction coefficients are known. What were the used concentrations and stoichiometric ratio of chlorophyll *a* and fucoxanthin in the studied pigment mixtures? What would be the rate constants presented in Table 1 recalculated for actual concentration of the pigments?

4. Why TmS spectra in Figs. 16-18 are not presented on the same wavelength scale? Why the red part is missing in Fig. 16 and the blue part in Figs. 17, 18? It is more difficult to compare them, especially if the main difference between steady-state spectra in Fig. 16 and 17 was observed between 430-460 nm.

Conclusion:

In conclusion, I

r e c o m m e n d

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

In Prague

date 13th September 2018

signature

² Enter the number of points awarded.

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).