

Supervisor's statement on the master thesis 'Characterization of Photosystem I in the Red Alga *Porphyridium purpureum*' by Panagiotis Kosmas, BSc.

Study programme: Biological Chemistry, MSc

The work was dedicated to the purification of the intact photosystem I antenna complex from a mesophilic unicellular red alga. Chloroplasts of the red algae retained some properties of cyanobacteria, such as phycobilisomes that are combined with novel features, e.g. integral antenna complexes associated with photosystem I. Red algae are ancestors of chloroplast of diverse group of algae that rank among the most important primary producers on Earth (e.g. diatoms).

This work was motivated by the fact that no high resolution structure of red-algal was available at the time and the majority of recent research on photosynthetic apparatus of red algae was dedicated to a narrow group of extremophiles. Hence, the primary aim of my student's thesis was to obtain a highly purified protein sample of a novel group to be used for structural studies and perform its basic characterization by biochemical and spectroscopic means.

Rather unfortunately, during the course of the work, two groups of researchers have succeeded in obtaining high-resolution structures of photosystem I from red algae, leading to the change of the focus more to spectroscopy.

In his experimental work, Panagiotis succeeded in obtaining a well defined, stable preparation of the protein complex of interest. He also performed a number of spectroscopic measurements to acquire a very interesting set of results, some of them offering a substantially novel (and publication-worthy) insight into functioning of (eukaryotic) photosystem I-antenna complex. A point that in my opinion deserves mention is that the purification procedure has been remarkably well reproduced hence providing a reliable model system that will be useful in our further research. From this point of view the thesis can be regarded as a complete success, although a more independent attitude on the part of the student would have been appreciated.

As for the text itself, the presentation of the results is reasonably clear and written in solid English. However, the thesis would have benefited from a more careful editing and a more detailed description of experimental approaches. Moreover, more effort could have been invested in the work with literature so that the introduction was less focused on general topics and instead provided a deeper insight into the subject of study and used methods so as to provide a better background for the description of the experimental work.

Nevertheless, I am of the opinion that the present work of Panagiotis Kosmas meets the criteria for a master thesis and recommend it for defense.

In České Budějovice, January 24, 2020

David Bína

