

Supervisor's statement on the bachelor thesis "**Carotenoid pool of the extremophilic bacterium *Deinococcus radiodurans***" by Natálie Pokorná.

Study program: Biological Chemistry

Deinococcus radiodurans is an organism well known for its ability to withstand extremely adverse conditions that include, remarkably, high doses of ionizing radiation. Among the set of adaptations is the capacity to synthesize carotenoids. The major component of the pigment complement of this bacterium is the eponymous keto-carotenoid, deinoxanthin.

Rather recently, it was demonstrated that a significant portion of the carotenoid pool is bound to the protein forming the surface layer of the cell. Moreover, it was shown that this protein complex is capable of binding a diverse set of deinoxanthin derivatives. At present, the functional relevance of the carotenoid in the surface layer complex, as well as the reasons behind its complex pigment composition are not fully understood.

Since *D. radiodurans* was a novel organism in our lab, the stated purpose of the present thesis was to perform a set of experiments that would provide the basic biochemical characterization of the organism in local setting to provide foundation for further biochemical work towards preparation of material for biophysical studies, for instance on the surface proteins with modified pigment composition. This included also evaluation of application of locally established chromatographic methods for pigment for analysis of carotenoid of a "novel" (in local context) organism.

In the course of her work, Natalie performed mostly cultivation, pigment extraction and chromatographic analysis of the pigments. She showed strong interest in the work, determination and invention, coming up with her own ideas for experiments. Unfortunately, during the course of her stay in our lab, Natalie was faced with adversity in the form of general mayhem caused by the epidemic. This somewhat limited the extent of the work performed in comparison to expectations. In spite of that, the student managed to perform even more experiments than the thesis presents even though some results thus achieved remained too fragmentary to find their way into the thesis. Nevertheless, all the data acquired are very valuable, for a major part also well reproduced and provide important clues to direct further research. This applies also to even the negative results, such as demonstration of the pigment instability in the course of sample preparation for mass spectrometry. Such results are in fact of high practical importance for any laboratory work.

As for the text of the thesis, after a rather difficult start, Natalie managed to improve the clarity of her writing significantly, so that the final form of the thesis is written in a concise style, well referenced, and the results are presented with reasonable clarity.

As such, the present bachelor thesis fulfils all the criteria to be submitted for defense.

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