

Review of the bachelor thesis of Miss Kateřina Kabeláčová: **The fitness of three strains of the alga *Chromera velia* – Salinity and pH**

Presented thesis aims to describe effect of salinity and pH on growth and lipids composition of three strains of *Chromera velia*, organism related to infamous apicomplexans (including *Toxoplasma* and *Plasmodium*, some of the most serious human pests). Compared to these, *Chromera* is still photosynthetic and capable of free-living life style, which makes it a great model-organism for evolutionary biologists/parasitologists. At the same time, it also touches physiological variability and the concept of physiological species. Although the thesis title is a bit too bold and the word **fitness** actually appears only in the title (at least I could not find it elsewhere), I have to say that (with some minor objections) I really like the topic and the amount of work was well balanced for the applicant's level.

The thesis is in English, which is still a bit unusual here. Given the non-native-English nature of the student, one can hardly expect the language level to be of 'mature' scientist standard. And it is not. So now I can either applause the student for her boldness or criticize her for rather frequent (especially in the Introduction) Czeenglish and not-so-elegant expressions. Well, I'd rather do the first and refrain from further commenting of the language with a remark that at least some of it could be filtered out with help of the thesis supervisor.

The thesis follows the standard structure. The **Introduction** is detailed and divided into two parts, one focusing on organism, the second on methodology and metabolism. Even though there is some logic behind it, I somehow find the split a bit too abrupt and lack a interconnection. Aside from language problems mentioned above I appreciate the level of detail and information included there and work with literature.

Unfortunately, the **Aims** are defined only as very vague points. This should have been done in much, much better way! Aims should make a scaffold for presenting the Results, but their careless presentation here doesn't allow for that. On the other hand, I found the **Methods** comprehensive with nice graphics, although some necessary info is still missing (see bellow).

Results are logically presented using appropriate tools, I have just minor comments/questions here. In Methods author states the cultures were grown in 'three repetitions' (replicates?). However, growth curves Figure 6/7 do not show any variability (SD or SE bars). Does that mean it comes only from single measurement? If so, why? Also, why the effect of salinity was observed for 35 days and for pH was the time extended for 41 days? Figure 8 compares growth of three strains in different salinity and pH, are the values on Y-axis net density gains or simply observed densities at the end of the experiment. If so, were the starting concentrations for each strain and experiment equal? Some results of ANCOVA and ANOVA are only mentioned in the text (page), but no values are shown. I think it would be worth to summarize all the observed statistics in one/two tables.

In **Discussion**, author works nicely with available sources and speculates about possible metabolic reasons of observed physiological plasticity, good job! It is probably the strongest part of the thesis. However, one crucial point is missing. Throughout the whole thesis author mentions three strains of *C. velia*, however I lack even if short but clear statement/explanation/definition of their strain status. Why they are not considered to be separate species (I know it, but it should be obvious also from the thesis). She also evades (either intentionally or unknowingly) the question of physiological plasticity and species concept. As shown by PCA and RDA plots, the One-Tree-Island strain has (in my opinion) substantially different lipidomic profile. Relative research, mostly on diatoms, but also other algae, shows similar pattern where molecular barcodes and/or morphology fail to explain clear physiological difference. I know this is not an easy topic, but can author at least shortly address this during the defense?

I hope few reasons of criticism do not overshadow the overly positive impression the thesis left on me. I think it fully meets the criteria on bachelor theses but reserve my final decision on mark after the defense.

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