

Review on Ms Thesis

Taxonomic position, phylogenetic relationships and metal resistance of green algae dominating in phytoplankton of two acid lakes

by Bc. Dovilė Barcytė

Green algae represent wide group of eukaryotic algae occurring all over the world. Their importance as primary producers within food chains makes them one of the most important group among phototrophic organisms. However despite their importance, their taxonomy and ecology are still less known. I appreciate that Dovilė Barcytė decided to study these fascinating algae and focused on complicated group of small coccal greens.

Presented Ms Thesis contains all chapters and formal arrangement typical for this kind of student work. In contrast to other Ms Thesis I reviewed before I can say that this Ms Thesis represents one of the best I have ever read. Student is not a native speaker. I found few spelling mistakes, but I consider her English very well and easy to read and understand.

Chapter "Aims and objectives" is clear. All hypotheses follow taxonomy and ecology of *Coccomyxa/Pseudococcomyxa* group. Chapter "Literature review" follows the main idea of Ms Thesis. I highly appreciate subchapters summarizing the influence of ecological variables. I have two questions: 1) "Which factor influences natural acidity of rainwater?" and 2) "Does Dovilė know what was level of pH decreasing caused pollution from continental Europe and Great Britain in Scandinavia? What was reaction of Scandinavian countries?" Subchapter focused on taxonomy of *Coccomyxa/Pseudococcomyxa* is quite short. Dovilė paid her attention especially to *Pseudococcomyxa simplex* and *P. adherens*. It would be good, if she can introduce taxonomy of these algae in more detail. I have a question here: "What is her opinion on conflict in the taxonomy of *Coccomyxa/Pseudococcomyxa* group? Is it monophyletic or polyphyletic unit? What would she suggest on condition that it is monophyletic unit or polyphyletic unit?" Chapter "Methods" contains description of all methods and material used. I consider this chapter fully sufficient. Chapter "Results" is clear and follows aims defined in the chapter "Aims and objectives". I have few comments to this chapter. First, I see pdf file and the majority of figures show low quality. On page 38 she writes: "*Coccomyxa/Pseudococcomyxa* monophyly was suggested by the tree topology but without statistical support (posterior probability (PP) = 0.52)". I would avoid this kind of interpretation if there is no statistical support for this clade. Figures 22-25 are made under different scales. It would be better to take pictures under the same magnification with respect to visual comparison of studied

strains. Figure 32 shows growth curves of *Monoraphidium griffithii* CCALA 375. How explains Dovišková sudden culture fall after 20th day of cultivation for all tested metals?

Dovišková discusses morphology of isolated strains on pages 79-80. Unfortunately, she does not discuss differences between natural populations and isolated strains under laboratory conditions or experiments. Pages 80-81: "Secondly, the small coccoid algae were always a problem for identification and misleading conclusions could have been made about algal composition in one or other acid lake in the past. For example, some species of *Monoraphidium* have also been reported occurring in acid lakes in Scandinavia (Almer et al., 1978; Hörnström et al., 1995), as it was done for Plešné Lake (Nedbalová et al., 2006)". Strain CCALA 375 originates from ecologically different pond in Třeboň. It would be better to compare *Monoraphidium* strains originate from acid lakes. Page 81: "Furthermore, I found out that the same species is capable to inhabit both acid lakes and laboratory solutions, and especially successful in extreme conditions can be the strains genetically identical to Hromnice strain (CAUP H 101, S3)". Can Dovišková explain it? I highly appreciate number of cited references. Undoubtedly, Dovišková must study a lot of literature and gather a wide theoretical background.

Despite few comments mentioned above I consider Ms Thesis by Bc. Dovišková Barčáková excellent and warmly recommend to defense committee of the Faculty of Science at Charles University in Prague to accept this work.

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In Olomouc 8. 9. 2015