

Reviewer report:

PhD. thesis „Diatoms of Acadia National Park, Maine, USA, with detailed account on taxonomy and morphology of several remarkable species“

By Mgr. Jana Veselá

It was with pleasure that I read the Ph.D. thesis of Jana Veselá, supervised by Assoc. Prof. J. Kaštovský and Prof. J.R. Johansen. The overall topic of Jana's research is revolved around diatom floristic and taxonomy. Particularly, second and third papers represent a nice piece of taxonomic work. First floristic paper does not deal exclusively with diatoms, but complete the view on the region/habitats under investigation.

The dissertation itself begins with a brief review of the taxonomy of the diatoms and history of algal floristic research in this part of USA. The literature review concludes with a discussion of cryptic diversity and polyphasic approach application in diatom taxonomy. Finally, she concludes with the description of three new *Eunotia* species and characterization of two rare *Surirella* species. It is worthy noting that two of the papers has already been published, clearly indicating that her work is of good quality. Moreover, Jana has two other papers published, they were not included into disertation, because they does not fit to the topic (dealing with arctic/antarctic species).

In my opinion, the PhD thesis meets the criteria for obtaining the PhD degree and I therefore recommend its accepting for the final step, which is the PhD defense.

I have only some comments and questions, which can be used for discussion

- i. I noticed some inaccurate expressing or terminology . For instance term „parent valves“ belongs to sexual part of life cycle, not to cell division. Both taxonomic papers represent standard morphological characterization (LM + SEM), but not polyphasic approach (molecular data are missing). SEM is not analysis, but observation.
- ii. Cryptic diversity. There are many entities marked as „sp.“ in appendix. It is brave that Jana did not apply well known catch-phrase of Prof. Fott („unter den

- iii. Tisch fallen lassen“). Does it mean that all of them are well documented potential new species, or in which proportion they represent one valve only, not sufficient for identification?

Cryptic diversity in *Eunotia* . Following my own experience with *Sellaphora* agg., I understand that even minor morphological differences are usually congruent with molecular data and phylogenetic clusters, thus I believe that new species are correctly described and well supported. But more general question should be discussed,“what shall we do with so many species“....Jana, express your own opinion on directions of modern taxonomy and their impacts to biomonitoring.

- iv. The proportion of centric diatoms is quite low. Does it mean that Jana is not familiar with planktic genera, or there was unequal representation of planktic samples?
- v. Why did you discuss genus/species ratio in first floristic papers and why is a list of species missing?

Prof. RNDr. Aloisie Poulíčková, CSc.

Dept. of Botany, Faculty of Natural Sciences,

Palacký University in Olomouc

In Olomouc 7.5. 2014.....

Review of the Ph.D. thesis by Jana Veselá “Diatoms of Acadia National Park, Maine, USA, with a detailed account on taxonomy and morphology of several remarkable species.

The Ph.D. thesis of Jana Veselá explores the diatom flora in a national park in the north eastern part of the United States of America. The diatom flora of the United States is far less known and less explored than the diatom flora of Europe. Acadia National Park holds a large variety of aquatic habitats with varying chemical and physical parameters. A large number of varied microhabitat's were sampled for this project from freshwater of low conductivity to slightly brackish water. A large number of species in this thesis are unidentified. This indicates that Veselá was a careful scientific observer who does not force-fit North American diatom species into European species concepts. It also clearly illustrates that we know very little about the North American diatom flora. This thesis represents a major contribution to a better understanding of the North American diatom flora.

Questions:

Have all of the species been photo-documented? This would have been a valuable addition to this thesis.

Where will specimens be curated? I recommend a collection be deposited at Drexel's Academy of Natural Science in Philadelphia, Pennsylvania USA.

Are plans underway to publish this flora? Although a lot of work, I recommend its publication as part of the series of the diatom flora of North America. This would be a welcomed major contribution to the documentation of our flora.

Many of your unknown species are marine. Is this because of your lack of familiarity with marine flora or do you think these are truly new species?

Will you contribute species from your flora to the web-based diatom flora of the United States of America?

Most of your *Diadesmis* species have been transferred to *Humidophila*.

Corrections:

"microcopes" = microscopes
"appriciated" = appreciated
"possilbe" = possible

Paper 1: The algal flora of Acadia National Park, Maine. Vaccarino, M.A., Veselá, J. & Johansen, J.R. (2011) The algal flora of Acadia National Park, Maine, U.S.A. Northeastern Naturalist 18: 457–474.

This manuscript documents several species of algae in Acadia national Park. It is well-written with spectacular colored micrographs. Many new park genera records are recorded.

Questions:

Is this paper largely the work of Veselá's Master's thesis? The sequence of authors implies that it is largely the work of Vaccarino.

Paper 2: Three new *Eunotia* (Bacillariophyta) species from Acadia National Park, Maine, USA Jana Veselá & Jeffrey R. Johansen *Phytotaxa* (in review).

The title says it all. Three new species of *Eunotia* described from Veselá's dissertation. This is an excellent piece of work with spectacular micrographs. The scanning electron micrographs show fine detail. This manuscript is particularly timely given that *Eunotia* is one of the dominant diatom genera in Acadia national Park.

Questions:

Will these new species be added to the online webpage of the diatom flora of the United States.

Paper 3: *Surirella terryi* and *S. cruciata*: two rare diatoms from North America. Jana Veselá, Jeffrey R. Johansen & Marina Potapova

This paper represents the first time photographs will be published of these two rare North American diatom species. Such work is critical, particularly as we are in a biodiversity-loss crisis globally. The paper is well-written and I believe these two species have already been added to the web-based flora of the diatoms of the United States.

Conclusion and recommendation: This thesis is well-written and a significant contribution to our knowledge of the algal flora of North America, particularly the diatoms. In my opinion this thesis fully satisfies the PhD thesis requirement. The work is important and will be widely cited by diatomists and those interested in biodiversity.

Sincerely,

Dr. Rex L. Lowe
Professor Emeritus of Biology
Bowling Green State University
Currently, Center for limnology
The University of Wisconsin

A handwritten signature in black ink that reads "Rex L. Lowe". The signature is written in a cursive style with a large initial "R" and "L".