

Review of the Ph.D. Thesis of Jan Štastný „Unveiling hidden species diversity in desmids (Desmiales, Viridiplantae)”

Ph.D. thesis of Jan Štastný Unveiling hidden species diversity in desmids (Desmiales, Viridiplantae)” comprises of a set of eight published articles and a well-prepared introduction. These papers represent a wide range of methods how to look on diversity of one of the most complicated group of algae - desmids, and include floristic and ecological studies (paper I., Štastný 2010), as well as thorough morphological studies (papers II. – Štastný et Neustupa 2008 and III. – Štastný et Kouwets 2012). However, the core part of the thesis is application of the polyphasic approach to diversity of several desmid species complexes (*Xanthidium antilopeum* and *X. cristatum*, Štastný et al 2013; *Docidium* x *Pleurotaenium* x *Triplastrum*, Škaloud et al. 2012; *Micrasterias rotata* and *M. fimbriata*, Neustupa et al. 2011; *Micrasterias truncata* and “vicinity”, Nemjová et al. 2011; *Micrasterias crux-melitensis* and *M. radians*, Neustupa et al. 2010).

As someone, who deals with the application of polyphasic approach to the taxonomy of cyanobacteria, I am delighted that this approach was used with considerable success in another taxonomic group. Although I consider the taxonomic part of the dissertation has the highest scientific value, I think the floristic paper will be the most important study for the society of Czech phycologists.

According to my opinion, the most interesting part of the thesis, having the importance which goes beyond the application in phycology, is the paper VI. (Neustupa et al. 2011) focusing on the analysis of distribution patterns of two pseudocryptic taxa within the traditional species *Micrasterias fimbriata*. This observed phytogeographic pattern is a very nice example of „moderate endemicity model“. Results of this study correspond with my own findings, so I am very satisfied with this.

To enhance the conclusions of the published articles I have two questions for the author:

1. What do you consider to be the main mechanism that causes eventual geographically limited areas of microorganism distribution?
2. Since we know that there are many cryptospecies with different ecological requirements and those can only be recognized by a specialist, and only sometimes, depending on available method. In this case, can we even consider using desmids (or diatoms and other algal groups) for biomonitoring?

The thesis of Jan Štastný is a nice piece of work, which certainly qualifies the author to obtain the long-time desired degree of Ph.D.

České Budějovice, September 4, 2013

Doc. RNDr. Jan Kaštovský, Ph.D.