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Taxonomic notes on desmids from the Netherlands

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Abstract

From the Netherlands, four desmid species are described as new to science: *Cosmarium pseudodifficile*, *Cosmarium pseudoformosulum*, *Cosmarium pseudoreniforme,* and *Cosmarium turpiniiforme. Cosmarium jelskii* was rediscovered after approximately a hundred years, *Euastrum ansatum* var. *dideltiforme* f. *elongatum* is raised to *Euastrum ruzickae* and *Tetmemorus flensburgii* is separated from *Tetmemorus brebissonii*. Differences with similar-looking species are discussed. In addition, zygospores of *Staurastrum pileolatum* are depicted for the first time.

Introduction

In 2007 I started working on a distribution atlas of desmid species in the province of Drenthe, located in the north of the Netherlands. Since then, more than 1200 water samples have been collected and examined. In some samples desmid species were found that could not be determined with Coesel & Meesters (2007). Consulting additional literature made clear that those species deserve a closer taxonomical study.

In the summer of 2014, in the northern part of the province, a survey was conducted to examine the desmids of some peat pits that had been dug in a nature conservation area in 2010. Even though the peat pits were only five years old, they were already abundantly filled with *Elodea* Michx. and some specimens of *Stratiotes aloides* L. More than 80 species of desmids were found in the samples. Among them some species belonging to the genus *Cosmarium* Corda ex Ralfs (1848: 91), not found in the Netherlands before. Furthermore, interesting species were found in the plankton of larger waterbodies, in shallow pools in other nature restoration areas, and in *Sphagnum* L. at the shore of shallow moorland pools.

In recent years, progress in desmid taxonomy has been made by molecular phylogeny (Gontcharov & Melkonian 2008, 2011). However, that research is only a starting point and even raised new questions, therefore cell morphology is still an important character in desmid taxonomy (Stastny & Kouwets 2012). It is also very important that we have a clear species concept to support molecular research. Many varieties and formae are described for several species. In the monothetic species concept this leads to unclear species descriptions (Kouwets 2008). In my opinion a clear species concept based on morphology with LM and SEM can assist in finding the genetic relation between desmid species by molecular research. It is for this reason that morphological distinguishable taxa are described as species and not as varieties.

Material & Methods

Most of the samples were taken by squeezing aquatic plants and semi-aquatic plants. Aquatic plants were determined with Van der Meijden (2005). On sampling sites where such plants were wanting a plankton net was used. Electric conductivity (EC) and hydrogenionic potential (pH) were measured with a HANNA HI 98129 Combo pH & EC meter. After collecting, the samples were kept at a temperature of 4 °C in a refrigerator and examined alive within a week. Some of the samples were also fixed with lugol (0.2 to 0.5 ml per 100 ml) and formaldehyde (3 ml 37% solution per 100ml).

To study some species in more detail it was decided to prepare SEM samples, using the following method: 12 mm glass coverslips were coated with poly-L-lysine solution to ensure better adhesion of the desmid cells. Then a drop of

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