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Penium amplificatum status nova (Desmidiales, Streptophyta)

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Abstract

From extensive field studies in the Dutch province of Drenthe and comparative literature research it appeared that *Penium spirostriolatum* var. *amplificatum* differs from the nominate variety of *Penium spirostriolatum* not only by its capitate cell ends but also by coarser and more spiralized ridges on the cell wall and by distinctly different ecological demands. Var. *amplificatum*, found in 23 Drenthian locations, occurred exclusively in samples with pH<5 whereas var. *spirostriolatum*, encountered in 25 other locations, was found predominantly in water with pH>5 (up to 7.3). Based on their results the authors propose to raise var. *amplificatum* to species rank: *Penium amplificatum stat. nov.*

Key words: desmids, ecology, morphology, *Penium spirostriolatum*, new taxonomic rank

Introduction

In Europe, usually two varieties of *Penium spirostriolatum* are distinguished: *Penium spirostriolatum* var. *spirostriolatum* Barker (1869: 194) and *Penium spirostriolatum* var. *amplificatum* Schmidt (1903: 16). The latter variety has been regarded to differ from the nominate variety by capitate cell ends (Krieger 1937).

In 2007, the first author began an investigation of the desmid flora of the Dutch province of Drenthe in the north-eastern part of the Netherlands (Fig. 1). The goal of the survey of fen hollows, moorland pools, ephemeral puddles, ditches, ponds, and other kinds of natural water bodies, is to produce an atlas with distribution maps of desmid species in the province of Drenthe. From these data it appeared that the two varieties of *Penium spirostriolatum* occurred in different habitats. From 2009 pH and conductivity were also measured, together with floristic and geographical data. This set of data forms the basis for the current study. Moreover, an additional reliable, morphological feature discriminating the two varieties became apparent. In the present paper those findings are presented in more detail.

Material and methods

The samples were taken from about 900 localities in the province of Drenthe in the years 2007–2011. As pH and conductivity are important in the following discussion, it was decided to consider only the data from samples containing *Penium spirostriolatum* with known pH and conductivity. This resulted in 48 samples taken from the beginning of 2009 until the end of 2011 to be included in the present study. Samples were mostly collected in the period from April–October in the years 2009–2011. Whenever possible, (semi)aquatic plants (mainly *Sphagnum* spp.) were squeezed. A total quantity of about 100 ml of water was collected. Conductivity and 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 the dark in a refrigerator and examined alive within a week.

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