



Envekadea metzeltinii sp. nov., a new diatom (Bacillariophyta) species from the subtropical karstic wetlands of the Florida Everglades, U.S.A.

SYLVIA S. LEE¹, FRANCO A. C. TOBIAS² & BART VAN DE VIJVER^{3,4}

¹Department of Biological Sciences, Florida International University, Miami, Florida 33199, U.S.A. E-mail: Sylvia.lee1@fiu.edu, author for correspondence

²Southeast Environmental Research Center, Florida International University, Miami, Florida 33199, U.S.A.

³National Botanic Garden of Belgium, Department of Bryophyta & Thallophyta, Domein van Bouchout, B-1860 Meise, Belgium

⁴University of Antwerp, Department of Biology, ECOBE, Universiteitsplein 1, B-2610 Wilrijk, Belgium

Abstract

Envekadea metzeltinii sp. nov. is described from periphyton assemblages in the subtropical karstic wetlands of the Florida Everglades, U.S.A. The morphology of the new diatom species is documented by light and scanning electron micrographs and discussed in detail, including comparisons with related species in the genera *Envekadea*, *Caloneis*, and *Navicula*. The new species is characterized by a linear valve outline, a sigmoid raphe course, broad variability in areola shapes and sizes, and two clearly raised axial costae. Apart from the type locality in Florida, the species was observed from similar wetlands in the Yucatan, Mexico. Notes on its ecology and distribution are added.

Based on the morphology of the most similar species, *Navicula palestinae*, the latter is transferred to the genus *Envekadea*.

Introduction

The genus *Envekadea* Van de Vijver *et al.* in Gligora *et al.* (2009: 136) was erected to transfer two species, *Navicula hedinii* Hust. (1922: 132) and *N. pseudocrassirostris* Hust. (1961: 79), that could not be included within the taxonomical concept of *Navicula* Bory de St. Vincent based on ultrastructural analyses. The genus *Envekadea* includes naviculoid species with large, rectangular to irregularly polygonal areolae occluded externally by porous hymenes, a sigmoid raphe path, non-porous girdle bands, and one chloroplast that is H-shaped in valve view. *Envekadea hedinii* (Hust.) Van de Vijver *et al.* in Gligora *et al.* (2009: 136) was originally collected by a Swedish explorer, Sven Hedin, in present-day eastern Turkestan in 1900 from epiphytes in a shallow freshwater lake, Kara-koshun. *Envekadea hedinii* was then described by Hustedt (1922). Gligora *et al.* (2009) collected *E. hedinii* from planktonic, benthic, and periphytic samples from Lake Vrana, a karstic cryptodepression lake in Croatia. The second species, *E. pseudocrassirostris* (Hust.) Van de Vijver *et al.* in Gligora *et al.* (2009: 137), was described by Hustedt in 1961 from Nordåsot, Norway. In his publication, Hustedt (1961) mentioned further records from Fehmarn (Germany) and Eleusis (Greece). Subsequently, *E. pseudocrassirostris* has been identified from several marine and coastal waters (Kaczmarek & Rushforth 1983, Foged 1984, Witkowski *et al.* 2000, Lange & Tiffany 2002, Procopiak *et al.* 2006). A third taxon with similar morphological features as *E. hedinii* and *E. pseudocrassirostris*, including striation pattern, absence of a hyaline zone in the central area, and a sigmoid raphe, was collected by Metzeltin from a freshwater well in the Yucatan, Mexico and identified it preliminarily as *Scoliotropis* sp. in Metzeltin & Lange-Bertalot (2007, plate 154). Gligora *et al.* (2009) were unfortunately unable to investigate this taxon due to an insufficient number of specimens that would allow an unambiguous description.

Recently, during a revision of some taxa from the genus *Mastogloia* Thwaites in W. Smith (Lee *et al.* submitted), a larger population of the Yucatan taxon was found in periphyton assemblages of brackish waters