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FRESHWATER COCCONEIS SPECIES (BACILLARIOPHYCEAE) IN NORTHERN ITALY: NEW FINDINGS AND IMPLICATIONS FOR QUALITY ASSESSMENT

Francesca Ciutti[1]*, Carlos E. Wetzel[2], Demetrio Mora[2], Adriano Boscaini[3], Andrea Chemello[1], Gabriele Consoli[3], Filippo Faccenda[1], Nico Salmaso[3,4] & Cristina Cappelletti[1]

[1]Technology Transfer Center, Fondazione Edmund Mach, Via Edmund Mach, 1, 38098, San Michele all'Adige (TN), Italy.

[2]Luxembourg Institute of Science and Technology (LIST), Environmental Sensing and Modelling unit, Biodiversity Monitoring and Assessment group, L-4422 Belvaux,23 Luxembourg

[3]Research and Innovation Centre, Fondazione Edmund Mach, Via Edmund Mach, 1, 38098, San Michele all'Adige (TN), Italy.

[4]NBFC, National Biodiversity Future Center, Palermo, 90133, Italy.

*francesca.ciutti@fmach.it

In this study, we conducted a morphological analysis of selected Cocconeis Ehrenberg taxa from northern Italy, including samples from watercourses monitored within the Filiera ASTRO project.

The genus Cocconeis is well represented in the samples, reaching up to 53% relative abundance in the AP, and includes several taxa previously unidentified at species level. Our analysis allowed the identification of common species such as C. pseudolineata, C. pediculus and C. placentula. We also confirmed the presence of recently described taxa, including C. fetscheriana, C. czarneckii, C. coreana, C. ectorii, and C. cf. sijunghoensis. The latter two were additionally validated through rbcL sequence data obtained by environmental DNA metabarcoding. Among unidentified taxa, Cocconeis sp. 1 was frequently observed, reaching up to 20.5% abundance in the study area.

In ecological assessments under the Water Framework Directive (WFD) in Italy, the Intercalibration Common Metric Index (ICMi) is applied, combining IPS and TI values calculated with OMNIDIA. However, indicator values (s; v) are still lacking for many species. For instance, C. fetscheriana reached up to 36% abundance but lacks ecological values. The occurrence of C. ectorii, previously reported in Europe only from Germany and Spain and not separated from C. euglypta, is also noteworthy.

The detection of recently described species within the C. placentula group highlights the need for further ecological studies to assign indicator values. An initial ecological characterization of the species will be conducted within the framework of the project, contributing to improved taxonomic resolution and more accurate diatom-based ecological assessments.

Plates illustrating the sternum valve are provided for all species, while raphe valve, valvocopulae and SEM images are presented for a subset.