

**Recent and fossil freshwater diatoms of Poland:
taxonomy, distribution and their significance
in the environmental reconstruction**

Part 1

**Coscinodiscophyceae, Mediophyceae
and Fragilariophycidae**

Abdelfattah A. Zalat, Jerzy Nitychoruk, Marta Chodyka, Irena A. Pidek, Fabian Welc

Abdelfattah A. Zalat
Tanta University, Faculty of Science, Geology Department, Tanta 31527, Egypt
e-mail: abzalat@science.tanta.edu.eg

Jerzy Nitychoruk, Marta Chodyka
Faculty of Technical Sciences, John Paul II University of Applied Sciences in Biala Podlaska,
ul. Sidorska 95/97, 21-500 Biala Podlaska, Poland
e-mail: jerzy.nitychoruk@akademiabialska.pl; m.chodyka@akademiabialska.pl,

Irena A. Pidek
Maria Curie-Sklodowska University, Institute of Earth and Environmental Sciences,
Al. Krasnicka 2 d, 20-718, Lublin, Poland
e-mail: i.pidek@poczta.umcs.lublin.pl

Fabian Welc
Institute of Archaeology, Cardinal Stefan Wyszyński University,
ul. Wóycickiego 1/3, 01-938 Warsaw, Poland
e-mail: f.welc@uksw.edu.pl

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Preface

Detailed diatom investigation from the sediments of some lakes in northern Poland beside the Eemian deposits of central Poland through the period from 2017-2020, led to identifying and imaging a huge amount of diatom taxa. As a result of diatom data, the Faculty of Technical Sciences, John Paul II University of Applied Sciences in Biala Podlaska, Poland and Department of Geomorphology and Paleogeography, Institute of Earth and Environmental Sciences, Maria Curie-Skłodowska University, Lublin, Poland and cooperation with Geology Department, Faculty of Science, Tanta University, Egypt decided to issue the recent and fossil diatom flora of Poland in an attempt to understand the native species, to serve as an introduction to the common species found in Polish ecosystems and offer important data for sustainable biodiversity conservation.

The current project will produce a comprehensive series of monographs that provide information on the taxonomy, ecology, and distribution of more than 1300 diatom taxa distributed in different Polish ecosystems as well as preserved as fossils in the Pleistocene-Holocene deposits. Results of this research work will be represented through four volumes of diatom monographs. This series of monographs consider a significant source of information for geologists, biologists, and botanists interested in bio-geographic diatom distribution, diatom taxonomy, paleoenvironmental and paleoclimate reconstruction, in particular during the Quaternary period. It is also a reference work for the Polish scientists and it will be a useful identification guide of the freshwater diatoms recorded from Poland. In addition, this work will help in the study of hydrological changes, eutrophication, and climate change. Moreover, the reported diatom data are intended to assist future biomonitoring and paleolimnological efforts and may serve as a valuable environmental marker for the diatomists in the world, especially European researchers involved in environmental and paleoclimate reconstruction based on diatom communities.

Authors

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Abstract

High-resolution diatom investigation from the Polish ecosystem is presented as a contribution to our knowledge of diatom floristics, ecology, biogeography, and their significance in environmental and climate reconstruction in Poland. The study is based on the analysis of 821 sediment samples taken from different lakes in northern Poland, besides 8 borehole-originated from the Eemian paleolakes sites in central Poland. The preceding diatom results in published papers included the diatom flora that were recorded from different habitats in Poland are mentioned in the present work to complete the Polish diatoms list. The current work is the first part in a series of monographs dealing with the diatom taxa belonging to classes Coscinodiscophyceae, Mediophyceae and subclass Fragilariophycidae. A total of 269 diatom species and varieties belonging to 38 genera are recognized. The checklist is comprising 86 entries of Coscinodiscophyceae that includes all radial centric diatoms and 183 taxa of Fragilariophyceae that includes araphid pennate diatoms. Of these 97 diatom taxa are represented as a new record for Poland and 12 new combinations and new varieties. A detailed diatom description, distribution in Poland, and autecological information are presented to round up the content of this volume and documented with 120 plates including 2423 excellent light micrographs of diatom taxa, which allows for a better understanding of morphology to aid in the identification. This work is proposed to contribute towards a general view of the high diatom biodiversity that characterizes Polish ecosystems and provides a revised diatom checklist from Poland. Additionally, it offers the first taxonomic and autecological catalog, which will be significant in the assessment of the water quality monitoring, paleoenvironmental interpretation, and construct the paleoclimate changes.