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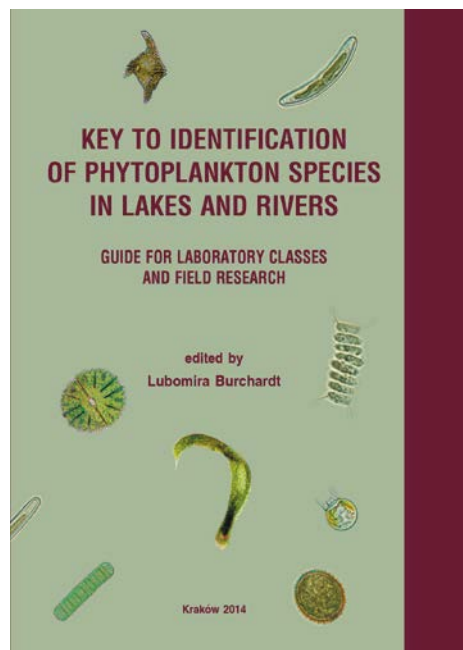
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LUBOMIRA BURCHADT (ed.) 2014. *Key to identification of phytoplankton species in lakes and rivers. Guide for laboratory classes and field research*. W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków, 179 pp., many line drawings and black and white and color photographs. Paperback, 24 × 17 cm. ISBN 978-8362975-19-8. Price: 35.00 €.

Cyanobacteria and algae are a heterogeneous group of organisms, typically microscopic, with several macroscopic representatives and with a worldwide distribution. Thanks to their wide ecological valence across groups, these organisms (genera or species) can be used as basic indicators of environmental quality. A sample of phytoplankton from a pond can quickly provide valuable information about habitat conditions without the need for expensive laboratory testing. Due to the large number of genera and species that may be present in a sample, determining these organisms is a complicated task. For their determination there are several book series intended primarily for the specialist in phycology (e.g., *Flora ślōdkowodna Polski, Süßwasserflora von Mitteleuropa*). The publication of a book that combines basic data for determining cyanobacteria and algae with information about their ecology is a good step. The book can be used as a starting point for quick and easy determination of their genera and sometimes species. Further detailed determinations can be made with the use of specialized literature sources.

This guide starts with a short chapter which gives basic information about the morphology, ecology and taxonomy of planktonic cyanobacteria and algae. It is followed by chapters on individual groups: blue-green



algae (Cyanobacteria), diatoms (Bacillariophyceae), dinoflagellates (Dinophyta), euglenoids (Euglenophyta),

green algae (Chlorophyta) and desmids (Desmidiaceae). Each of these chapters was written by a phycologist or a specialist in the respective group of algae. Below are remarks on those chapters.

The chapter on cyanobacteria (M. Pliński & E. Wilk-Woźniak) gives detailed and hierarchically arranged keys for orders, families, subfamilies and genera, with examples of the most common species. Each taxon is accompanied by a detailed description. The only minor disadvantage is the absence of information about the ecological preferences of the genera or species, which would be useful information for users of the keys. Ecology is only briefly discussed in the introduction to the chapter. Possibly confusing is the inclusion of genera that are not typically planktonic, such as *Nostoc*, *Oscillatoria* or *Phormidium*, in the key.

The chapter on diatoms (A. Witkowski, A. Z. Wojtal, J. Żelazna-Wieczorek & M. Bąk) reflects the use of diatoms as bioindicators, with detailed ecological information for the genera or species. Ecologically distinct species were chosen as examples for each of the genera. Due to the high variability of the shape and surface of diatom frustules, several diagnostic morphological characters were described. The authors marked these characters in the photos so the reader can check whether he or she correctly understands the characters used in the key. This makes the key particularly useful. The morphological descriptions of each genus or species are very detailed and in combination with ecological data can be used as a quick guide for making a rough assessment of a sample containing diatoms. For basic users such as students or people from environmental monitoring groups, the part about preparation of permanent slides, an important step in determining diatoms, should have been included.

The chapter on dinoflagellates (P. Owsiany) is very detailed. It includes a taxonomic part with descriptions of the genera and species, and a methodological part about collecting and processing samples, a very helpful part in view of the difficulties encountered in determining dinoflagellates. The system of dichotomous keys reflects the complex taxonomic situation and the morphological variability of this group of protists. The reader might have trouble understanding the keys at first due to the system for describing the individual plates of the dinoflagellates' theca, but when viewed together with the included photos or drawings it becomes much easier to use. The list of species includes examples of very common taxa with a wide distribution. From my experience, the pool of taxa included in this key is broad enough not only for this kind of guidebook but for a specialist in phycology.

The chapter on Euglenophyta (K. Wołowski & M. Ponięzick) contains a good compilation of descriptions of cell morphology and illustrative photos with important characters marked. Euglenophyte nutrition, reproduction and ecology are also covered briefly. A more extensive section is devoted to research methods that address difficulties in determining euglenoids, especially the genus *Euglena*, enumerating important features that must be noted in making determinations of this group. The key also includes the colorless genera, a good feature of the chapter, as these euglenoids are often overlooked in samples. The list of genera contains morphological descriptions and examples of typical habitat preferences. Common species are given as examples.

The part dealing with green algae (D. Krupa, M. Luścińska, B. Messyasz, M. Sitkowska & E. Wilk-Woźniak) describes one of the most abundant groups of algae in the plankton community. A very short note about systematics and an example of the ecological role and life strategies of this group are given in the introduction. From the huge number of green algae the authors chose a set of common genera from the classes Chlorophyceae and Ulvophyceae to make a clear key. Detailed descriptions of the genera with examples of common species and their habitat preferences, together with drawings or photos, provide a good guide to this ecologically and morphologically variable group of algae. Other groups such as the Xanthophyceae (yellow-green algae) developed in parallel with green algae, and morphologically similar species arose independently (e.g., *Characium/Characiopsis*, *Chlorella/Chloridella* etc.), so it would have been useful to highlight the problem in the key, as Xanthophyceae may also be common in plankton samples.

The last part of the key covers desmids (W. Kowalski, J. Matuła & G. Tomaszewicz), one of the most beautiful groups of algae. After a short introduction to their systematics and morphology, a list of genera is given. The special terminology used in desmid taxonomy is illustrated by drawings. The habitat preferences of this group are described, and the genera and species are described in detail.

The word 'phytoplankton' in the title of the book struck me, as not only typically planktonic cyanobacteria and algae are included. As an example I can mention diatoms, which are described in a large part of the book and which are primarily a component of benthic and periphytic communities. Desmids are another example of a not typically planktonic group of algae, whose main habitats are bogs, where they are again a part of especially the bottom community and only some are planktonic in ponds or rivers. For the reader not sufficiently

trained in the ecology of cyanobacteria and algae this could be quite confusing. Perhaps a better title would have been 'Key to identification of cyanobacteria and algae in lakes and rivers'.

Overall, this book is a very good starting point for beginners in the ecology of cyanobacteria and algae, either students or biologists dealing with environmental monitoring. The book has many drawings or photos

illustrating individual taxa. It gives a good overview of this ecologically, taxonomically and evolutionarily interesting group of ubiquitous organisms. I am happy to include it in my little phycological library.

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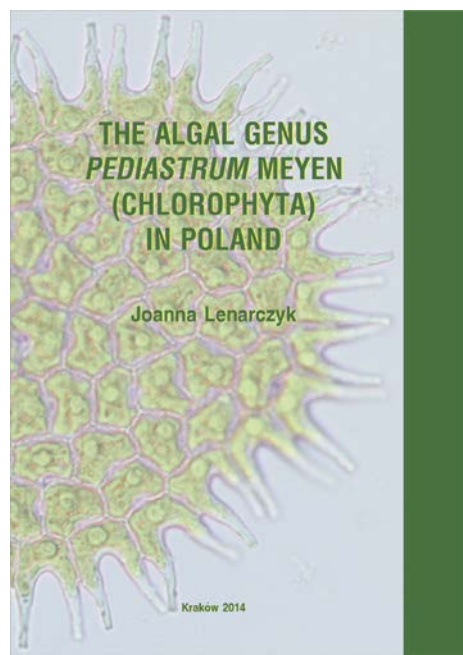


JOANNA LENARCZYK 2014. *The algal genus Pediastrum Meyen (Chlorophyta) in Poland*. W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków, 104 pp, 31 figures including photographs. Paperback, 24 × 17 cm. ISBN 978-8362975-22-8. Price: 21.00 €.

Pediastrum is a common and widespread genus of green algae with a poetic name reflecting its morphology (etymologically it means little or 'child' star). The genus is also interesting for its morphological variability, the structure of its colonies, and particularly its ecology. Currently, research in algology focuses primarily on the use of molecular methods to investigate the evolution, phylogeny and taxonomy of algae. However, there are still gaps in our knowledge of the ecology and distribution of algae. It is very heartening that a publication outside of the 'molecular mainstream' and dedicated to these issues can still be published.

This work summarizes the results of a three-year study of this genus in Poland. It gives data on the occurrence of 23 *Pediastrum* taxa, with detailed descriptions. Their distribution was monitored at localities in nine physiographic regions: the Southern Baltic Coast, Eastern Baltic Lakelands, Southern Baltic Lakelands, Central Polish Lowlands, Polesie, Sudety Mountains and Foothills, Wyżyna Śląsko-Krakowska upland, Northern Sub-Carpathia and Central Western Carpathians. More than 70 localities were sampled; the main habitats were lakes, ponds and peat bogs. Samples were processed by traditional methods used in phycology: optical microscopy and scanning electron microscopy. Several strains were isolated as unialgal cultures. The publication is supplemented with data from herbarium material and literature.

The results are given as a list of taxa of the genus *Pediastrum*. Also listed are other species of cyanobacteria and algae recorded at the localities. Selected species are accompanied by very detailed descriptions of their morphology, ecology and distribution in Poland. The iconographic documentation of the taxa is very good. It consists of optical light microscopy and scan-



ning electron microscopy photographs as well as drawings. Ecological and distributional data are discussed in detail. The author focused mainly on the morphology and ultrastructure of individual taxa; the main assets of the work are its precise morphological descriptions of the cell surface, illustrations, and practical key for determination.

This book is based on a huge amount of work and only minor imperfections can be mentioned. It provides measurements of environmental parameters and data on the abundance of taxa at the sampling sites but those