

## BOOK REVIEWS

EDITOR: K. T. KISS

Björk, S. (2014): Limnological methods for environmental rehabilitation. The fine art of restoring aquatic ecosystems. – Schweizerbart Science Publishers, Stuttgart, Germany, 384 pp. (ISBN 978-3-510-65292-1).

Lakes and wetlands, ecologically impaired to different degrees by pollution and exploitation are a sad reality not only in Europe, but around the globe. Fortunately, ecological restoration of these important ecosystems is possible.

Reference cases of restoration projects on waters and wetlands at different latitudes and altitudes all over the globe are described and discussed, including cases where ecological restoration was carried out by contractors, with more and sometimes less success. All experience indicates the need of skilled limnologists and other ecologists to guide such procedures from inception to conclusion, to reach the final aim of restoring a sustainably functioning ecosystem. Experience and knowledge gained in restoration projects, on the processes and approaches that transform turbid green, cyanobacteria-infested lakes into blue waters or how drained, subsiding marshes are converted into wetlands of high biodiversity turn experienced ecologists into specialists in demand in research and administration.

Whenever possible the status of the systems to be modified, the methods of treatment and the recovered ecosystems are in this book described by before and after pictures. This book shows two selected Swedish models and demonstration projects and other examples from all over the world.

The two main Swedish examples are Lake Trummen and Lake Hornborga. Lake Trummen was selected as the representative for the group of lakes polluted by sewage and transformed to hypertrophic ecosystem suffering from the typical symptoms, namely heavy blooms of cyanobacteria in summer and oxygen deficiency in combination with fish-kills in winter. Lake Hornborga is the typical representative of the great number of Swedish waters and wetlands in which the water level has been lowered or the objects have been completely drained, as a rule with the dream to obtain arable land.

In the book, we can also find descriptions of other projects in different countries. Requests for help for the restoration of aquatic systems abroad came primarily from international and governmental agencies for aid. The projects were selected with the aim to create possibilities for students in teamwork to widen their experience of ecosystems outside the temperate zone. The systems investigated consisted of lakes, lagoons, coastal and high-altitude wetlands at various latitudes. In the book, the following examples are presented: Lac de Tunis (Tunisia), Lagoa Rodrigo de Freitas (Rio de Janeiro, Brazil), Lago Paranoa (Brasília, Brazil), The West Lake (Hangzhou, China), the Negril and Black River Wetlands (Jamaica), the Pahlavi Mordab Wetland (Iran), Rio Bogota (Colombia) and Lake Skärgölen (Sweden).

In general, the main aim in this book is to provide information about problems, solutions and whenever possible, long-term results, while the detailed analytical material remains in the reports and publications included at the end of the book.

Overall, this book is perfect for administrators seeking approaches and help to fix ailing aquatic systems and also for aquatic ecologists interested in designing tailor-made methods for restoring. Beside of its usefulness, it is a well-illustrated and colourful book with a lot of pictures made during the restoration.

V. POZDERKA

BRACKEL, W. von (2014): Kommentierter Katalog der flechtenbewohnenden Pilze Bayerns. – Bibliotheca Lichenologica, Band 109. J. Cramer in der Gebrüder Borntraeger Verlagsbuchhandlung, Stuttgart, 476 pp. (ISBN 978-3-443-58088-9).

Though the knowledge on lichenicolous fungi has increased in the last decades, there are still a lot more to know about them. The recent annotated checklist of Bavarian lichenicolous fungi contains data on 403 taxa of 141 genera of which 372 taxa of 135 genera are clearly non-lichenised, while 31 taxa are partly lichenised. Twelve new species have already been published from Bavaria earlier by the author. Further 5 species are newly described: *Hainesia aeruginascens* on *Platismatia glauca*, *H. lecanorae* on *Lecanora muralis* (known also from Italy), *Microsphaeropsis physciae* on *Physcia adscendens*, *Trichoconis physciicola* on *Physcia adscendens* and *P. tenella* and *Trichonectria furcatosetosa* on *Melanelixia* sp., *Parmelia sulcata* and *Candelariella reflexa*. A new combination, *Xenonectriella protopannariae* (Zhurba) Brackel is also introduced.

The huge amount of records originated from ca 1500 literature sources and also from the author's own collection. Distribution data are extracted from literature sources at three levels: worldwide (by continents and countries), Germany (by closer regions, states) and Bavaria. Bavarian distribution is given by detailed locality data both from literature sources and own collections. All so far known hosts are also mentioned – the confirmed type host ("\*") and the new own Bavarian observations ("!") are indicated as presented in brackets. Two historical records mistakenly indicated from Hungary (*Dactylospora athallina* and *Opegrapha pulvinata*) currently belong to Slovakian territory.

The volume covers 476 pages of nicely edited text. There are 13 illustrations: a graph based on the increasing number of known species of lichenicolous fungi between 1817 and 2014, the other figures (colour micrographs and ink drawings) are showing the habit and morphological details of the five new species described by the author. The illustrations are so marvellous that the reader misses similar pictures to all mentioned species. Also a key to taxa would be extremely useful. Consequently, a continuation of this excellent catalogue could be a richly illustrated identification key, especially since the key could be used for

other close or less close areas within Europe. Nevertheless, the records and notes will be highly appreciated first of all by lichenologists and mycologists, but also by ecologists and those who are interested in biogeography and not only from Bavaria but from a wider area.

E. FARKAS

KOCIOLEK, J. P., WITKOWSKI, J., KULIKOVSKIY, M. S. and HARWOOD, D. M. (eds) (2014): Diatom research over time and space. Morphology, taxonomy, ecology and distribution of diatoms – from fossil to recent, marine to freshwater, established species and genera to new ones. Celebrating the work and impact of Nina Strelnikova on the occasion of her 80th birthday. – Nova Hedwigia, Beih. 143. J. Cramer in der Gebrüder Borntraeger Verlagsbuchhandlung, Stuttgart, 518 pp. (ISBN 978-3-443-51065-7).

Professor Nina Ivanovna Strelnikova is the leader of diatom research in Russia. Her researches focus on primarily Cretaceous and Palaeogene diatoms. Her unique collections provided excellent basis for studying diatom evolution. She described 11 diatom genera and 63 species new for science and established 63 new combinations. She is the main force behind the book series “Diatoms of Russia and adjacent countries”. Beside research, she is an erudite professor, mentor of many Russian diatomists and organiser of diatom conferences called “Diatom Schools”.

This volume is dedicated to Professor Strelnikova on the occasion of her 80th birthday. One of her former students, Professor Marina Potapova provides a thoughtful and exhaustive overview of life story of the remarkable scientist in the introduction entitled “Eighty years of life” that is supplemented with photographs. At the end of the introduction of Nina Strelnikova’s publications, the new genera and species described by her, as well as the three genera and nine species named after her honour (some of these patronyms are referred to this volume) are listed.

The introduction is followed by twenty-seven papers. The variety of subjects reflects the diversity of Nina Strelnikova’s scientific interest including research on fossil and recent diatoms.

Fossil diatoms are presented from several sites ranging from New Mexico (United States) to Central Russia, Transuralia and adjacent regions, from Gulf of Gdańsk (Southern Baltic Sea) to Prince Charles Mountains (East Antarctica). The oldest material is from 56 million years old Palaeocene-Eocene Thermal Maximum. In these studies, fossil assemblages were used for constructing biostratigraphic zonation, reconstructing palaeo-environmental changes and tracking diatom evolution. Besides two new genera (the *Strelnikoviella* in the centric Stephanodiscaceae family and *Saeptifera* in the araphid Tabellariaceae family) and seven new species (in the genera *Cyclotella*, *Strelnikoviella* and *Saeptifera*) are described from fossil materials. Gladenkov analysed the geographic distribution of some fossil marine planktonic diatoms typical of the early Oligocene and found a southward then a northward route of migration. He discusses the potential mechanisms for their dispersal. Buczkó *et al.* studied the structure and silicification of *Navicula haueri* reinvestigating Miocene material from the Carpathian Realm by means of light, and for the first time scanning electron microscopy. The authors also provide the biostratigraphy and distribution of the characteristic Neogene freshwater diatom.

Recent diatoms including planktonic and benthic, freshwater and marine taxa are reported from various habitats ranging from mesotrophic lakes in Maine and Vermont (United States), as well as tundra ponds and streams of the Bering Island (Kamchatka) through the Black Sea and mountainous ephemeral rock-ponds in Algeria to tropical res-

ervoirs and coastal waters of Vietnam and South American saline lakes. From these waters a new genus (the biraphid *Ninastrelnikovia*), nineteen new species (in the genera *Diadesmis*, *Eunotia*, *Pinnularia*, *Psammothidium*, *Urosolenia*, *Platessa*, *Craticula*, *Gomphonema*, *Navicula* and *Caloneis*) and two new combinations (in the genera *Ninastrelnikovia* and *Placoneis*) have been described.

Several authors performed morphological investigations in order to clarify the taxonomy of previously established taxa including *Hantzschia amphioxys*, *Cyclotella meduanae*, *Aulacoseira gessneri*, *Hemiaulus giganteus*, *Gomphonema delicatulum* and *G. firmum*, the species complexes of *Placoneis clementis* and *Paraplaconeis placentula*. The analysis of the latter complexes resulted in description of four new species.

Morphometric methods are used in diatom research in quantifying differences and separation of taxonomic groups. Pappas *et al.* review these tools including theoretical background, chronological history and importance of their application in diatom research, as well as the connections between the morphometric methods and biologically meaningful results. The authors provide a detailed description of the outline shape analysis that is the most frequently used method.

Ecology can be important for distinguishing taxa, ecological preferences can indicate cryptic species. However, some taxa have wider tolerance range than originally considered, as Stachura-Suchoples and Kulikovskiy demonstrated. They showed the freshwater tolerance of *Conticribra weissflogii* that was previously considered as a marine and brackish-water diatom.

Overall, this book contains useful information on diatoms on wide spatial and temporal scale. The studied organisms are illustrated on detailed, good quality light and/or scanning electron microscopic photographs. This volume can be useful to everyone investigating diatoms being recent or fossil, freshwater or marine, benthic or planktonic.

M. DULEBA

METZELTIN, D. and LANGE-BERTALOT, H. (2014): The genus *Didymosphenia* M. Schmidt. A critical evaluation of established and description of 11 new taxa. – In: LANGE-BERTALOT, H. (ed.): *Iconographia Diatomologica*, Vol. 25. Koeltz Scientific Books, Königstein, Germany, 298 pp. (ISBN 978-3-87429-458-4).

During nearly eight decades, *Echinella geminata* was handled as a distinct species. Since it was divided into 22 species – among which 11 plus one subspecies are proposed and described here as new to science – after thorough taxonomic surveys. This species, which served as a basis for taxonomic separation of the subsequent *Didymosphenia* genus, was described by Lyngbye from the North Atlantic Faeroe archipelago (Streymoy Island) in 1819.

In the 21st century comprehensive literature is already available on *Didymosphenia* taxa. One example among these papers is about the curiosity of *Didymosphenia geminata* in New Zealand where this species is known as invasive diatom taxon due to its genetic diversity and taxonomy. However, there are many other publications on the taxonomy and occurrences of the genus from different parts of the world.

Due to the structure of the book the plate and the description of the searched taxa can easily be found based on the index of the taxa.

The book displays shortly the origins of the *Didymosphenia* taxa in the abstract and introduction. In the section “Some observations with particular comments” the original Latin description of the *Echinella geminata* can be read. One of the main parts of the volume is the “Description of the taxa in alphabetical arrangement”. This comprises detailed

descriptions (for instance basionym, synonym, holotype, cell structure, lectotype locality, some taxonomic comments, distribution) about all the 23 species, subspecies and varieties of *Didymosphenia* genus known until now. These taxa are illustrated by excellent microphotographs taken by light and electron microscope on 126 plates.

This useful book is recommended for all those who are interested in identifying diatoms with light or electron microscope: for algologists and for those who deal with determination of diatoms thoroughly.

Zs. SZILÁGYI

TELL, G., IZAGUIRRE, I. and O'FARRELL, I. (eds) (2014): Freshwater phytoplankton of Argentina. Phytoplankton diversity and ecology in different aquatic systems. – *Advances in Limnology*, Vol. 65. Schweizerbart Science Publishers, Stuttgart, 444 pp. (ISBN 978-3-510-47067-9).

Argentina is characterised by a large latitudinal extent and peculiar topography ranging from the Andes through high plains or “pampas” to lowland steppes. These geographic properties result in different climatic regions along temperature and aridity gradients. These conditions determine a wide variety of aquatic environments including large, glacier-fed oligotrophic lakes, high altitude or saline, alkaline wetlands, cool, humid peat bogs, as well as the watershed of La Plata with broad valleys of the Paraguay, Paraná and Uruguay rivers. The physical, chemical and biological characteristics of these water bodies can change both spatially and temporally.

The phycological studies in Argentina started with Ehrenberg (1854). Since then several research groups have greatly increased the taxonomic, floristical and ecological knowledge about algae of the country. One of the intensively studied regions is the Paraguay–Paraná–Uruguay river system that has been subjected to dam construction and discharge control. The great amount of papers published and the diversity of habitats and issues related to freshwater algae in Argentina led to the publication of this volume. Thirty-four researchers from across Argentina collaborating in this work aimed at reviewing the existing information from studies on the phytoplankton in freshwater habitats of Argentina including description and analysis of both lentic and lotic communities.

The foreword was written by the great phycologist Colin S. Reynolds whose former students are among the contributors of this volume. The introduction provides a general overview of the content and the structure of the book. These parts are followed by three sections containing review papers.

The first section entitled “Phytoplankton diversity” consists of a paper in which the author, Guillermo Tell provides an overall picture of high phytoplankton diversity in Argentina. This part describes the phytoplankton taxa occurring in the various climatic regions of the country including taxa with wide or narrow distribution range, as well as possibly endemic species and infraspecific entities.

The information in the second chapter is delivered on a habitat-by-habitat basis. There are three main geomorphological regions in Argentina: the Andes Cordillera and associated mountains holding glacial and tectonic lakes, the Great Plains dominated by continental sedimentation processes with neo-tectonic activity and Patagonia with basaltic plateaus and coarse grain fans. Besides, six limno-regions can be defined that constitute the subsections of the second chapter. Puna, Chaco-Pampean Plain, Peri-Pampean Sierras, Andean Patagonia, Patagonian Plateau and Misiones Plateau have different topographical and climatic conditions, therefore containing freshwater habitats with wide range of physi-

cal, chemical and biological characteristics. Information on the phytoplankton inhabiting various freshwater ecosystems in these regions is collected in eighteen papers and the relationship of this community with physical-chemical parameters and in several cases its biological interactions are also discussed. The presented water bodies include both lentic environments ranging from high mountain wetlands and lakes of glacial origin in the Andes to shallow lakes in the Pampean Plain and Patagonia and lotic systems varying from the mainly lowland Paraná River Basin to the exo- and endorheic rivers of Córdoba system in the hilly central area. Aquatic systems exposed to substantial human impact, such as reservoirs, as well as urban and suburban polluted rivers also occur among the studied waters. Previous available information on some regions, e.g. Puna and Patagonian Plateau is scarce that increases the significance of the articles on these regions. Some papers are particularly interesting. Casco *et al.* use more than thirty-year data from monitoring programs on the reservoirs along three Patagonian rivers. Diaz and Beamud present the main patterns of extremophile phytoplankton populations through the 10-year study of the natural acidic Lake Caviahue in Andean Patagonia. Mataloni summarises the results of scarce phytoplankton studies of a major floristical framework carried out on the only insular province of Argentina, Tierra del Fuego that combines lowland dry steppe with the Andean ridges and extended peatland area, eutrophic coastal ponds with ultraoligotrophic glacial lakes and small peat bogs.

The last paper in this chapter slightly differs from the previous ones. Maidana and Aménabar provide an interesting overview of palaeolimnology that has recently begun to improve in Argentina. The article includes the description of conventional methodologies and the history of this discipline in the country.

In the third main chapter, relevant specific issues concerning phytoplankton are discussed involving the available data obtained in freshwater systems from Argentina. Villafañe *et al.* investigate the question what kind of factors can influence the measured values of phytoplankton primary production. Izaguirre *et al.* describe photosynthetic picoplankton including pro- and eukaryotes that are as important in the carbon flow of many aquatic systems as tiny they are (with cell-size in the range 0.2 to 2  $\mu\text{m}$ ). The distribution of the main types of these organisms depends on light intensity.

Light is approached also in two other papers from two sides. Pérez investigate it as the energy source of phytoplankton of which availability can be affected by several factors. He presents an optical characterisation of various clear and turbid vegetated Argentinean lakes using bio-optical properties and optically active substances including chlorophyll-a. Meanwhile, Helbling and Villafañe review the negative impact of ultraviolet radiation on phytoplankton, particularly on the photosystem and DNA molecule. They discuss different acclimation strategies as well.

Beside photosynthesis, some taxa can switch to heterotrophic nutrition mode. This life strategy called mixotrophy is proved to be very useful at both ends of light and nutrient gradients as it can be read in Modenutti's paper.

Harmful algal bloom in Argentina was observed first in 1944. Since then the phenomenon occurred several times mostly associated to toxigenic cyanobacteria. Eschenique *et al.* present four case studies related with the presence of toxigenic cyanobacteria in drinking water.

Overall, this volume contains valuable information on various aquatic habitats characteristic to Argentina. It can be useful to everyone who are interested either in these types of waters or generally the features of phytoplankton.

M. DULEBA