

BOOK REVIEWS

Editor: K. T. Kiss

DOKULIL, M. T., DONABAUM, K. and TEUBNER, K. (eds) (2019): *The Alte Donau: successful restoration and sustainable management. An ecosystem case study of a shallow urban lake.* – In: HUISMAN, J. (ed.): *Aquatic Ecology Series.* Springer Nature Switzerland AG, Cham, Switzerland, 407 pp. (ISBN 978-3-319-93270-5)

Intensively used water bodies are vulnerable to eutrophication. The shallow lake Alte Donau (meaning “Old Danube”) is an example for the extent of anthropogenic influence. This is an oxbow that was part of the principle arm of the River Danube before its regulation. Until the second half of the 19th century in the tectonic basin where Vienna is situated, River Danube furcated into a number of main and secondary arms. Every bigger flood that changed the system considerably, created new river arms and filled up others by sedimentation, meant continuous threat to Vienna and its suburbs. Therefore the inhabitants tried to regulate the river several times. Their final solution was a cutoff, digging a new bed, unifying and straightening the river that took place from 1870 to 1875. Former river arms were filled up by the excavation material. Only few parts of the old system of river arms including Alte Donau have survived. During the years, the surroundings of Alte Donau served different purposes, for example agriculture, industrial sites, now it is an important recreation area.

At the beginning of the 1990s the lake suffered from severe eutrophication problems, leading to a deterioration of water quality. The former macrophyte-dominated state changed by a catastrophic shift to a turbid state dominated by high biomass of cyanobacteria. Integrated restoration measures started.

In 1993 the municipal authority 45-Water Management, Vienna (Magistrat 45-Wiener Gewässer) initiated a monitoring project that is still ongoing. Almost all levels of the food web, viruses and bacteria, phytoplankton, macrophytes, zooplankton, benthic invertebrates, fish and waterbirds along with physico-chemical variables were investigated in the sediment, the littoral zone and in the catchment areas. Several restoration techniques were tested and critically evaluated. The final management plan was based on bistable theory to reset the lake from turbid and algal dominated to clear, macrophyte controlled. Numerous additional adjustments and supplementary monitoring procedures were necessary in the recovery and the final stage in order to secure sustainable achievement and to maintain good water quality for recreational activities.

This volume presents a report on the 25-year long-term rehabilitation program to return a deteriorated recreational urban lake to good water quality. It consists of four main parts that comprise chapters constructed in scientific paper structure. First part, Introduction outlines the concepts for restoration outlining in general and specified for the ecosystem in question.

The second part describes the history how Alte Donau developed from a river to an urban lake and the restoration and lake management efforts that were made in order to achieve and to maintain good water quality. Other chapters in this part discuss the morphometric features, temperature and climate including effects of global warming, the

hydrological aspects, the long-term changes of physico-chemical conditions characterising the periods of the lake development and sediment investigations evaluating the sustainability of restoration measures.

The third part presents the biological monitoring of the lake investigating the effects of the restoration. It describes the long-term changes of communities of the macrophytes, phytoplankton (devoting a separate chapter to the variation in photosynthetic rates and production), zooplankton, pelagic ciliates, benthic invertebrates, fish and waterbirds, moreover, a chapter deals with viruses, heterotrophic bacteria and heterotrophic nanoflagellates.

The fourth part focuses on the various aspects of recreation and landscape planning. As bathing is most popular in Alte Donau special attention is paid to the hygienic aspect of monitoring water quality. This helps maintaining excellent hygienic water quality in general only some rare singular events occurred. Another chapter deals with how reed and marsh plants (helophytes) were re-introduced in the littoral zone in order to improve the natural potential of self-purification of the water. In this part we can also read about the new plans in Vienna's water-management, particularly Masterplan Alte Donau that aimed to improve the usability of green spaces and recreational areas in accordance to the sensitivity of the ecosystem and nature protection.

The last chapter provides a synthesis of the key aspects to evolve and implement a successful water management plan. The authors generalise the specific solutions applied for Alte Donau in order to serve as a basis for the development of similar strategies for other urban lakes.

Overall, this book provides an instructive overview about the restoration and monitoring of a vulnerable aquatic ecosystem. Photographs and diagrams illustrate the investigated organisms and landscape and the results of measurements helping the understanding. This book can be recommended to everyone interested in either restoration techniques or shallow urban lakes.

M. DULEBA

HOUK, V., KLEE, R. and TANAKA, H. (2017): Atlas of freshwater centric diatoms with a brief key and descriptions. Melosiraceae, Orthoseiraceae, Paraliaceae and Aulacoseiraceae. Second emended edition of Part I and II. – Fottea 17 (Supplement), 616 pp. (ISSN 1802-5439)

Thirteen years have elapsed since the first part of the Atlas was published. Till now, the first and second parts were sold out, and so the authors decided to prepare an emended edition of these parts. It is clear that the current knowledge of taxonomy has moved forward, and that many important taxa from the families Melosiraceae, Paraliaceae and Aulacoseiraceae were not included in the first part, especially the fossil taxa and those not observed in Europe. Several new genera were introduced in between, and so they were included in the second part. Besides, Ehrenberg (1848) published new genera, *Liparogyra*, *Porocyelia* and *Stephanosira*. Many taxa were observed and investigated in LM and SEM, mainly from the world known diatom collections, often using type material. So, it was dedicated to bring in the results of these observations. The authors also aimed to consider often-misinterpreted taxa or those usually neglected in the contemporary literature in order to help field workers and those dealing with fossil diatoms and, where necessary, to bring back into general use some old names. A special part for explanation of terms help the use of this guide book including many excellent SEM micrographs. Consequently, this exhaustive book can be useful for all those who are interested in centric diatoms taxonomy.

Zs. TRÁBERT

REICHARDT, E. (2018): Die Diatomeen im Gebiet der Stadt Treuchtlingen. – Bayerische Botanische Gesellschaft, München, 1184 pp. (ISBN 978-3-00-060715-8)

‘*Lebenswerk*’ – this is the word as Erwin Reichardt refers to the book resuming approximately forty years of his research. And ‘masterwork’ – the word comes to my mind using it. Already in the first moment when the reader dips into this work is convinced about the merit, preciousness and wealth of it.

Treuchtlingen is situated in the middle of Bavaria, Germany, at the northern periphery of the Southern Franconian Jurassic Mountains directly at the beginning of the famous valley of the river Altmühl. Diatoms in the investigated area were studied for more than 40 years. In general calcilophilous or even calcibiontic diatom communities could be found. Trophic conditions range from oligotrophic to highly eutrophic, most waters are mesotrophic.

Although the investigated area encircles only about 102 km² and that lakes are lacking, about 730 diatom taxa could be classified in 640 prepared samples. They are documented in more than 10,600 LM and SEM micrographs on 451 plates. The long-term investigations allowed to recognise variability of many taxa to a great extent, in many cases full ranges of variation including initial valves could be found. 23 species are described as new and the existence of further new or possibly independent taxa is discussed in the text.

Firstly, the importance of photographs of the genus *Gomphonema* is worth emphasising. That means many images on many *Gomphonema* species, definitely on 60 species, although this book is not specialised in only one group of diatoms. This data also shows that the author is one of the leading *Gomphonema* specialists. Consequently, the researchers are advised to use it confidently, without hesitation. It is advised not only for this genus but for *Nitzschia*, as well. There are only few identification books including such a big variability of *Nitzschia* as this work.

According to Erwin Reichardt, there are two main purposes of this study: Firstly, to explore the diatom flora of his hometown and to document it as far as possible. Secondly, to present the experiences and results of investigations on diatom morphology and taxonomy over a long period of time. Not only the positive ones which led to a better understanding of certain diatom taxa, their morphological features, variability and distribution, but also the more negative or frustrating ones which showed that our knowledge in many cases is still limited and that there are lots of open questions. The discussion of the latter is considered to be very important not only in order to describe more or less doubtful results. It may also encourage further research.

As for the structure of this book, the first volume starts with an extensive abstract in German and English. A two-page introduction explains the goals and aspirations of the work. There was also an ambition to speak to the non-technical audience, in particular to politicians and managers, to foster an awareness of the necessity to deal responsibly, rationally and respectfully with the nature of our homeland, and to protect nature as a whole from destruction. A chapter on the study area provides insights into the richness of the diatom flora of the studied region. The method chapter is also useful because of the valuable hints, for example on diatom photography. The next chapter gives descriptions of the study sites, with physical and chemical parameters. The rest of the book comprises the valuable plates of photos (LM and SEM). There are 451 plates in the two volumes.

This excellent guide book can be highly recommended for all diatomists and students who want to know this group of algae.

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