

BOOK REVIEWS

Kawecka, B. 2012

Diatom Diversity in streams of the Tatra National Park (Poland) as Indicator of Environmental Conditions

W. Szafer Institute of Botany, Polish Academy of Sciences,
Kraków, 213 pp. ISBN 978-83-89648-91-4

Nadja Ognjanova-Rumenova

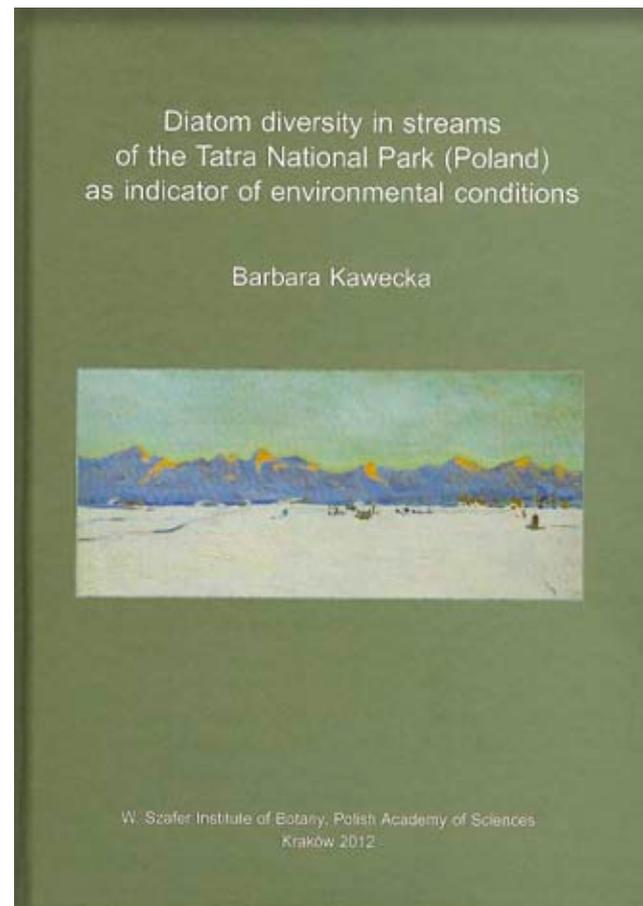
Geological Institute, Bulgarian Academy of
Sciences, Acad. Georgi Bonchev St., bl. 24, 1113
Sofia, e-mail: nognjan@geology.bas.bg

The book is focused on the description of species diversity (understood as species richness and structural diversity) of the diatom flora in running waters of the High Tatra Mts at *ca.* 2030 to 500 m a.s.l., with particular emphasis on their role as indicators of spatial and temporal variation, including human impact. The monograph presents detailed long-term observations of the diatom community structures (1962–2004) in stream habitats provided by B. Kawecka. It comprises 88 pages, and three appendixes: eight tables, 17 figures, and 32 plates with scanning electron microscopical (SEM) images.

The Tatras are the highest stretch of the 1500 km long Carpathian Range; they are young fold mountains elevated during the Alpine orogenesis. They have alpine character and form the highest elevation between the Alps and the Caucasus and between the mountains of the Balkan Peninsula and the Scandinavian Mts.

High-mountain aquatic environments have harsh and sometimes extreme living conditions. In the alpine landscape several types of stream ecosystems with different habitat conditions are distinguished. They originate from different water sources, including kryal streams fed by glacial meltwater, krenal streams fed by groundwater, and rhithral streams fed by rainfall and seasonal snowmelt. The outlet of lakes forms another group, which constitute the corresponding subgroup of rhithral and kryal system depending on the origin of lake water.

A total of 414 diatom taxa were found in these aquatic environments, mostly species with a preference for oligotrophic waters and exhibiting a wide range of ecological tolerance. Species with a high floristic and ecological rank, including organisms with



a Boreo-Alpine preference, as well as being on the Red Lists, endangered, extremely rare and rare taxa, formed a relatively numerous group. The taxonomical list followed all latest rules in the diatom taxonomy and is supported by 32 plates which illustrate most of the common taxa and their intraspecific variability (Appendix 3, Plates 1–32: SEM images for 89 species). Detailed information is provided on all these diatom species, included in the Polish and German Red Lists.

The wide differentiation of diatom communities reflected their integration with the zonal development of higher plant vegetation (alpine, subalpine and montane belts), geological substrata (from crystalline in the Upper Tatras to sedimentary, carbonate, and rich in calcium carbonate in the lower parts and

submountain area), water chemistry and the importance of local factors. The author distinguishes three main groups in diatom communities, which were confirmed by cluster analysis: Group 1 – A greater majority of the diatom communities of alpine and subalpine belt streams; Group 2 – Diatom communities occurring in streams within the upper montane belt affected by tourist lodges, and in streams emerging in the submountain area; Group 3 – Diatom communities, restricted to streams in the lower mountain belt.

Three groups of diatom communities are presented according to the long-term observations (1962–2004), indicating the trends in stream habitat development: 1. stabilization; 2. destabilization and 3. recovery.

Of the environmental factors (altitude, water chemistry, water level fluctuation and in microhabitats: substratum, light intensity, current velocity), differentiation of the diatom community structures was influenced most by water chemistry and hydrobiology (spates, desiccation). These results have been demonstrated best by the Canonical Correspondence Analysis (CCA), with an ordination diagram included in Appendix 2: Fig. 17.

The monograph presented by B. Kawecka is a very nice piece of work from many different view points, especially as a manual of reference sites for further observations of the monitored changes in the Tatras and other mountain areas, in order to preserve their biodiversity. The volume has an excellent layout and is well presented.

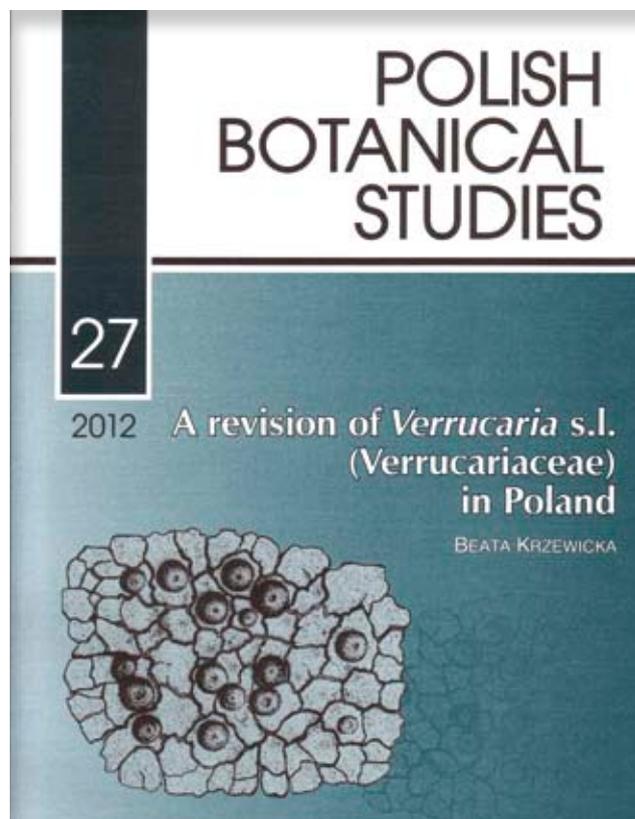
Mirek, Z. & Wójcicki, J. (Eds) 2012

A revision of *Verrucaria* s.l. (Verrucariaceae) in Poland

Polish Botanical Studies, volume 27, publ. by W. Szafer Institute of Botany, Polish Academy of Sciences

Author: Krzewicka, B.

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Dimitar Stoykov

Mycology Section, Department of Plant and Fungal Diversity and Resources, Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, Acad. Georgi Bonchev St., bl. 23, 1113 Sofia, e-mail: stoykovdimitar@gmail.com

This monograph, dedicated to one of the most prominent Polish lichenologists, Prof. J. Nowak, is the first complete taxonomic investigation into the pyrenocarpous crustose, areolate and placodioid lichenized fungi from the genus *Verrucaria* s.l. in Poland, based on a study of ca. 1700 specimens and type collections. The author has included 62 species referred to seven genera, namely: *Bagliettoa* (4 species), *Hydropunctaria* (3), *Parabagliettoa* (3), *Placopyrenium* (3), *Verrucaria* (43), *Verrucula* (4), and *Verruculiopsis* (2). Two new combinations (*Verruculiopsis minutum* and *Protobagliettoa disjuncta*) are proposed.

Structure of the monograph

Introduction

The author presents concisely the concept of *Verrucaria* s.l. (including the main taxonomic characters and notes on ecology of the members). The historical background of the published data on *Amphoridium*, *Bagliettoa*, *Verrucaria*, and *Verrucariaceae* in Poland, provided by foreign and Polish researchers, is given chronologically for a period of over 150 years.

Systematic background

An informative historical review is discussed of the attempts for classification of the main genera of pyrenocarpous lichenized fungi by different scientists, co-workers and scientific teams for the period from 1824 to 2011. Emphasized is the importance of involucrellum, septation of the ascospores (e.g. simple, transverse, muriform), along with the results from the most recent molecular studies and phylogenetic analyses used for separation of the genera.

Materials and methods

This study has been conducted on the basis of Polish material, referable to *Verrucaria* s.l. from 12 collections in Poland, of which the largest one is KRAM (ca. 1350 specimens gathered mostly by J. Nowak) and the author's own collection. The author has examined the type and exsiccatae collections from 19 herbaria, abbreviated according to *Index Herbariorum*. The methodological part is explained in detail, including the specific reactions for treating the endolithic species (mounting mounts and solutions), which helps reveal the vast morphology of the group. A concise and informative glossary of the noteworthy features of *Verrucaria* s.l. is of great value.

Results

The monograph is composed of precisely arranged informative dichotomous keys for recognizing the genera and species (including an extra key to several parasitic species of *Verrucula*, *Verrucaria* and *Placopyrenium*), which make determination of the taxa easy and simple for lichenologists. The keys could be used in practice by lichenologists in other European countries and across the world, where members of genus *Verrucaria* s.l. are spread out.

Mention deserve the excellent historical background overviews preceding the description of the genera, which show most changes in the past and are followed by the au-

thor's notes on morphology and new molecular achievements, habitat information and remarks at the end.

The information on each taxon begins with the correct Latin name, followed by nomenclature of its history, starting with a basionym, informative original description, notes, habitat information, distribution in Poland and across the world, remarks on morphological peculiarities or synonymy, seen exsiccatae (if present), and complete information on the examined specimens.

The author's decision for additional placement (besides under the usual keys) of *Verrucaria hochstetteri* (under the key to *Bagliettoa* species), *V. polysticta* (under the key to *Placopyrenium* species) and *Hydropunctaria rheitrophila* (under the key to *Verrucaria*) is a very good idea, because it clearly shows both the similarities and differences between the taxa.

Illustrations

The descriptive information is supplemented by 107 excellent colour photographs by B. Krzewicka of the essential taxonomic features of all species (including handmade cross sections of the thalli), incorporated into 62 figures. They greatly help the understanding of this very difficult group.

The References comprise 250 titles. At the end of the monograph, there is an alphabetically arranged checklist of the synonyms and correct lichen names (in bold), taken from the Polish literature on lichenized fungi, or from the herbarium labels. A complete Index of the scientific Latin names of lichens and their epithets is also supplied.

In conclusion, the study offers a valuable taxonomical treatment of most freshwater, maritime and non-flooded pyrenocarpous members of the genus *Verrucaria* s.l. in Poland. The keys to the different genera and various species are professionally made and include the most characteristic features of the morphology of the taxa, which makes them easy to work with precision.

I would like to congratulate both the author and the publisher for presenting this accompanying series of the *Polish Botanical Journal* to the scientific community. The monograph will be of use not only to lichenologists working on the pyrenocarpous group in their efforts to describe diversity of *Verrucaria* s.l., but also to mycologists and ecologists.

Wolowski, K., Kaczmarska, I., Ehrman, J., Wojtal, A. (eds). 2012.

Current Advances in Algal Taxonomy and its Applications: Phylogenetic, Ecological & Applied Perspective

W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków, 300 pp.
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Nadja Ognjanova-Rumenova

Geological Institute, Bulgarian Academy of Sciences, Acad. Georgi Bonchev St., bl. 24, 1113 Sofia, e-mail: nognjan@geology.bas.bg



Dedicated to Professor
Jadwiga Siemińska.
(Photo J. Słupski)

A volume dedicated specially to a distinguished scientist should not be evaluated by the usual reviewing criteria, because of the special efforts made by the editors or compilers: on the one hand, of honouring the hero of the jubilee, and on the other, of reflecting the wide range of her scientific work.

This volume includes articles by some of Prof. Siemińska's current and former students, colleagues, collaborators, and friends over the years and reflects her versatile academic interests and areas of expertise. At first, K. Wolowski

and M. Lukaszek describe the life and scientific career of Prof. Jadwiga Siemińska – her comprehensive and diverse contributions to Polish phycology and hydrobiology, and especially to diatom research. Prof. Siemińska has published over 240 scientific papers in Polish, European and American journals. A list of chosen publications is supplied, covering a time period from 1947 to 2010.

The volume is a collection of nineteen articles on different aspects of phycology. The topics covered by the papers include: taxonomy, ecology, and applications of different algal groups.

The chapter "Reviews" presents the known observations on cryptomonads, a group of biflagellate unicellular microalgae/protist/chromists found in all habitats, often with very high population densities. This section provides some very interesting information for the future development of the cryptomonad species concept.

The chapter "Taxonomy" includes articles with several different topics – morphological variability, diversity and distribution of algae in various habitats (as, for instance, in the Lake Baikal catchment, National Parks, peat bogs, etc.). One new diatom species is described: *Achnantheidium sieminskae* Witkowski, Kulikovskiy et Riaux-Gobin from the Kerguelen Archipelago (Sub-Antarctica). Special interest merits the discussion of the latest and unanticipated discoveries in araphid diatom taxonomy, reproduction and systematics. An interesting palaeontological study into the algal microfossils related to the green algae (mainly Zygnematoceae and desmids) in the Upper Miocene deposits from Poland is presented.

The chapter "Ecology" deals with assessment and density-dependent algal growth along the environmental gradients in rivers, lakes and peat-pits. A new approach is demonstrated to stimulation of plant development and growth and intensification of the application of selected metabolic processes using *Anabaena variabilis* Kütz.

The chapter "Applications" is mainly intended for those interested in new methods and strategies in algal research.

The book is highly recommendable. All articles are excellent and interesting and relate to different fields of algology, from the freshwater to the marine domain. It has been also a great pleasure to work with Professor Jadwiga Siemińska over the years.

