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BOOK REVIEWS

Editor: K. T. Kiss

Borhidi, A., Fernández-Zequeira, M. & Oviedo-Prieto, R. (2017): Rubiáceas de Cuba. – Akadémiai Kiadó, Budapest, 494 pp. ISBN

The book is a complete taxonomic monograph of the Rubiaceae, the largest Dicot family of the Flora of Cuba, comprising the detailed descriptions of all the genera and species of the family existing in the Cuban Archipelago and the analytic keys for their identification. The Rubiaceae family has a considerable importance because of its plants of economic and medicinal (coffee, quinine, ipecacuana), aromatic and ornamental value (*Gardenia*, *Ixora*, *Rondeletia* etc.). It is the fourth richest flowering plant family in species (actually with about 13 800 species) in the world, the richest one in the flora of the West Indies and second richest in the flora of Cuba. The last taxonomic treatment of the family appeared in the 5th volume of the Flora of Cuba in 1960, written by H. Alain Liogier with the contribution of Julián Acuña and Juan Tomás Roig, including short descriptions and determination keys for 74 genera and 383 species. Since that time many taxa have been discovered and collected during a great amount of exploring expeditions, mainly organized by the Institute of Ecology and Taxonomy of the Cuban Academy of Science in the frame of the Vegetation Mapping of Cuba program and by the National Botanical Garden in the frame of the international New Flora of Cuba program and described in many publications as new for science. The rich collections accumulated in the Rubiaceae family have been studied by the authors using both traditional and more up to date methods (electron microscopy, molecular sequences) resulting a series of detailed monographic studies composed of 62 publications mostly products of the authors. In the actual synthesis 83 genera. 476 species, 28 subspecies and 21 varieties are treated with completely new analytic keys, descriptions, ecological characters and geographic distribution. In other words with this book the taxonomic knowledge of the family Rubiaceae in Cuba increased with 9 genera, 87 species and 49 subspecific taxa (32%), mostly endemic ones and new to science.

The authors were introduced into the knowledge of the family by Julián Acuña Galé, (contributor of the former Flora of Cuba, by Alain) which has been continued to develop by a 45 years long activity of the authors with exploring a collecting field works and taxonomic investigations between 1971 and 2016. In the book the senior author described the introductory chapters including the critical taxonomic notes, the final phytogeographic summary, the analytic keys and the taxonomic treatment of some genera (*Guettarda*, *Randia*, *Schmidtottia*, *Scolosantus*, *Shaferocharis*). Maira Fernandez's contribution is the monographic treatment of the largest genus (*Rondeletia*) and other several important genera with co-authoship of the senior author (*Ariadne*, *Exostema*, *Machaonia*, *Stenostomum*, and description of two genera *Roigella* and *Suberanthus* both new to science), Ramona Oviedo compiled the ecological and distributional characterization of the treated taxa and carried out the critical taxonomic revision of the conflictive *Psychotria–Palicourea–Heteropsychotria* complex in cooperation with the senior author. The detailed taxonomic descriptions are followed

by a rich collection of illustrations; the 140 figures are divided by 63 original drawings, 75 fototypes and two maps.

The book is useful for all who are interested in correct identification of the collected Rubiaceae examples in Cuba and in receiving up to date taxonomic informations related to the plants belonging to this highly diverse family in the Caribbean. Z. Botta-Dukát

John, J. (2018): The diatom flora of Australia. Volume 2. Diatoms from Tasmania: taxonomy and biogeography. – Koeltz Botanical Books, Oberreifenberg, 377 pp. (ISBN 978-3-946583-10-3)

I take any book from Jacob John from the shelf I always enjoy it with pleasure. It makes me feel like I am really there in the landscape he writes about. This second volume of The diatom flora of Australia does not disappoint either. Indeed, in comparison with Stradbroke and Fraser Island in the first volume, the author will now guide us even further south of the Tasmanian Island, the smallest state in Australia. Although, basically, the volume is a book on the diatom flora of Tasmania, it displays a real paradise for the readers. It is the island state of an island Continent. A series of plateau of various elevations characterise the landscape, studded with myriads of lakes and wild rivers, lush-green rainforests. Tasmania specifically the central southwest is the home of the tallest flowering trees in the world. This land is a treasure island for tourists, nature lovers and nature photographers. Why it is worth to turning over this book is that it gives an exciting overview about the history of Tasmania, the alteration of habitats over the last millennia. A total of 158 amazing photos only of landscapes are included in the first part of the book presented. Also, a huge amount of information have been shown about the climate, the vegetation, the wildlife of the Island. The state is covered by a network of rivers, lakes and reservoirs. Being an Island most rivers originate from the highlands and flow into the surrounding sea. The glaciation caused many of lakes by scouring bedrock troughs. Additionally, there are brackish lagoons in the coastal areas. Dams as formidable impediments to natural flow regimes of rivers and streams do interrupt the life cycle patterns of fish and invertebrates.

Diatom community structures are disrupted by dams. Gomphonemoid diatoms may start multiplying abundantly in response to changes in substrates, resulting in luxuriant growth of stalks affecting flow regime. *Gomphonema terraleaha* is a widespread species in Central Highlands. I highlight this species because, surely, many of algologists or conservationists remember the *Didymosphenia* problem in New Zealand. Well, this *Gomphonema* species became a nuisance diatom when its thick mats of stalks affected the efficiency of hydro energy generation.

The main aim of this volume is to produce an updated diatom flora of Tasmania, as part of The diatom flora of Australia series. Islands are very important in developing an understanding the taxonomy and distribution pattern of diatoms in the mainland. The reader can get an insight into the taxonomy of diatoms of the Island of Tasmania, encompassing all geographical regions of the Island; the distribution pattern of diatoms in relation to water quality and can read about the taxonomic and ecological significance of the diatom taxa in the context of known global distribution. Based on the whole 140 samples one can get a picture not only about the benthic diatoms of Tasmania but the planktonic ones, as well, a total of 609 taxa. According to the author an estimated total of ~120 are new records to Tasmania and probably ~116 are new to Australia and probably 100 are new to science. A host of photo tables (photos taken by light and scanning electron microscope) helps the

user in identification by detailed pictures on diatoms. I can assure that this book is a worthy memory for Dr Françoise Gasse, the renowned diatomist and paleoecologist.

Zs. Trábert

Lee, R. E. (2018): Phycology. Fifth edition. – Cambridge University Press, Cambridge, United Kingdom, 535 pp. (ISBN 978-1-107-55565-5)

Phycology (or algology) is the study of algae, photoautotrophic organisms that are not necessarily closely related. This group involves both prokaryotes (cyanobacteria) and eukaryotes. They most commonly live in water, from freshwater to marine being the primary producers in food chains. Moreover, algae can be found in almost every other environment on Earth, even in snow of mountains, in desert soils or in hot springs.

The first edition of this book was published in 1981. Since then a lot has changed in science of phycology. Research areas that were hot topics in that time, e.g. investigation of life cycles and cytology using electron microscopes have now matured.

Present edition has generally updated the field, besides certain areas have received more attention. It has been known for some time that algal chloroplasts evolved from endosymbiotic cyanobacteria. However, it is only recently that many of the transport issues involving control of division and metabolism of chloroplasts has been elucidated. This book discusses the evolution chloroplast in the light the results of recent researches.

An important ecological and economic impact of algae has been in the production of phycotoxins that can cause poisoning and degradation of municipal water supplies. This volume reviews the biochemistry, production and control of production of phycotoxins.

The production of biofuels from algae has got to the focus of number of investigations. Algae can produce both hydrogen and hydrocarbons that can be clean energy source for motors. This book discusses how many of the oil deposits in the world originated from algal blooms and gives an appraisal of the future of biofuels from algae.

In the past decade nucleic acid sequencing techniques have undergone a great development and their application in systematics and phylogenetics has become widespread leading to a greater understanding of the evolution of algal groups and their interrelationships.

This book consists of five main parts. Part I (Introduction) describes the basic characteristics of algae including the algal cell structure, nutrition, using DNA sequencing in systematics, classification and occurrence of algae in fossil record. The rest of the volume takes the algal groups arranged according to their evolution and describes their cell wall and cell structure, physiology and metabolic processes, e.g. production of toxins, motility, reproduction, resting cells, spores and cysts, ecology, intra- and extracellular associations, occurrence in fossil record, utilization as well as classification.

Cyanobacteria (Cyanophyceae, blue-green algae) are prokaryotes that putatively evolved in freshwater at some time before 2.50 billion years ago. Through photosynthesis they raised oxygen levels in the atmosphere enabling the evolution of aerobic life and dramatically changing life on the planet. This important group is the topic of Part II.

According to the endosymbiotic theory chloroplast of eukaryotic algae derived from a cyanobacterium that was taken up by a phagocytic organism but due to a mutation it avoided being digested and became an endosymbiont. Glaucophyta also have endosymbiotic cyanobacteria in the cytoplasm instead of chloroplasts. The endosymbiont evolved to a chloroplast via losing its cell wall and the transfer of most of its genes to the nucleus of the host. In Rhodophyta (red algae) and Chlorophyta (green algae) representing this

state of evolution chloroplast is surrounded by two membranes. These three groups are discussed in Part III.

Chloroplast endoplasmic reticulum evolved when a chloroplast from a eukaryotic alga was taken into a food vesicle by a phagocytic cell and remained in the cytoplasm of the host as an endosymbiont. Euglenophyta, Dinophyta and Apicomplexa have one chloroplast endoplasmic reticulum and these groups are reviewed in Part IV.

The algae with two membranes of chloroplast endoplasmic reticulum evolved by a secondary endosymbiosis that began when a phagocytic protozoan took up a eukaryotic photosynthetic alga into a food vesicle. It is probable that two membranes of chloroplast endoplasmic reticulum evolved at least three times, with one leading to the Chlorarachniophyta, a second to the Cryptophtya and the third (or more) leading to the Heterokontophyta and Prymnesiophyta. Of these Heterokontophyta is a very diverse group that can be divided into three clades and involves among others golden-brown algae (Chrysophyceae), diatoms (Bacillariophyceae) and brown algae (Phaeophyceae). These organisms are presented in Part V.

The last section (incorporated also in Part V) surveys the role of algae in the environment. In this part we can read about issues that generated the most interest in the past couple of decades. Such topic is about toxins produced by algae that can cause serious poisonings. Interestingly, during the middle to late Permian period the appearance of toxic eukaryotic algae paralleled the decline of attached, filter-feeding invertebrates that were possibly susceptible to these new algal toxins. From this chapter we can get to know also that algae can produce substances that are sunscreens protecting from ultraviolet radiation or material that passing through some chemical transformations contributes to cloud formation and ultimately to the cooling of the Earth. The upwelling area in the Antarctic provides nutrient-rich water for phytoplankton blooms, moreover, the sea ice surrounding the Antarctic continent also has algal communities that live on the bottom of ice or in the ice itself. This section tells the story of the grand experiment of fertilizing the Southern Ocean with iron to trigger the growth of phytoplankton that would decrease the atmospheric carbon-dioxide level. In Antarctica there are the only permanently ice-covered lakes on Earth that also have algal inhabitants and have similar conditions similar to Mars or the moon Europa of Jupiter some billion years ago.

Overall, this book is a multifaceted overview of the science of phycology. Light and electron micrographs as well as many drawings enhance the understanding of descriptions. This volume is a good textbook for learning about algae. M. Duleba

Moestrup, Ø. and Calado, A. (2018): Dinophyceae. – In: Büdel, B., Gärtner, G., Krienitz, L. and Schagerl, M. (eds): Süßwasserflora von Mitteleuropa (Freshwater flora of Central Europe), Vol. 6. Spektrum Akademischer Verlag, Heidelberg, 561 pp. (ISBN 978-3-662-56269-7)

The algologists have been waiting for years for the volume to come out that contains the summarized, newest taxonomic and systematical knowledge of the Dinophyceae group. Since the appearance of the last volume in 1991, there have been several taxonomic and systematical changes when it comes to dinoflagellates. A number of manuscripts have appeared containing important and novel information about this group, but there have not been any efforts in collecting this valuable information and putting the taxonomic knowledge in a systematical order whatsoever.

The book has two parts. The first one is an introduction part, that contains the main literary reference of the last 200 years, then we can find the morphological, ecological and toxicological knowledge and the knowledge on culturing as well. At the end of the chapter

we can find the classification of the freshwater Dinophyceae species. The more extensive, second part contains the taxonomic information. This book separates 12 orders, 25 families, 65 genera and 350 species. Two new orders, Amphidiniales and Tovelliales, three new families, Amphidiniaceae, Gyrodiniaceae and Sphaerodiniaceae, and two new genera, *Matvienkoella* and *Speroidium*, are proposed. Seven new species and one new variety are described. The taxonomic part of the book is fairly easy to use, and has easily interpretable information. The illustrations are based on old and classic descriptions and drawings that were combined with more recent figures, so the drawings help the identification as well.

In conclusion it can be proudly stated, that the readers have a book in their hands that is extremely helpful for everyone who wants to find their way in the world of Dinophyceae species.

I. Grigorszky

Peeters, V. and Ector, L. (2018) Atlas des diatomées des cours d'eau du territoire bourguignon. Volume 2: Monoraphidées, Brachyraphidées. – Direction Régionale de l'Environnement, de l'Aménagement et du Logement Bourgogne-Franche-Comté, Dijon, 271 pp. (ISBN 978-2-11-152787-4) (Available at: http://www.bourgogne-franche-comte.developpement-durable.gouv.fr/publications-r2759.html)

Since 2017 when the first volume of the Atlas was published we have been waiting for the next volume that we are now pleased to take in hand. In this book, the authors present nearly 100 taxa with high elaboration characteristic to them. These belong to the following genera: Monoraphidae – *Achnanthes* (2), *Achnanthidium* (20 + 8*), *Cocconeis* (10 + 2*), *Eucocconeis* (2), *Karayevia* (2), *Kolbesia* (3), *Lemnicola* (2), *Planothidium* (11 + 2*), *Platessa* (5), *Psammothidium* (8), *Skabitschewskia* (1); Brachiraphidae – *Eunotia* (31 + 5*), *Peronia* (1). In the genera marked with asterisk the authors illustrate possibly new taxa designated as sp. 1, sp. 2 etc. presenting them on photoplates. Taxonomic position of these taxa can be determined by further detailed studies.

For every species detailed morphological characterisation can be found with some important morphometric measurements and the most relevant literature regarding the given species. In addition, the Atlas provides ecological preferences, OMNIDIA code, IPS sensitivity and indicator value of the species; their distribution is presented on map with remarks on their frequency and abundancy. If it is needed for identifying a taxon, the first volume contains a very detailed and thorough glossary describing morphological features that are shown in light and scanning electron microscopy images. Naturally, description of each species is supplemented by one or two dozen, excellent quality LM and SEM micrographs.

Overall, this volume is a valuable work about diatoms of Burgundy (France); moreover, it represents an efficient identification book. It can provide a great help for ecological assessment required by Water Framework Directive. This book can be recommended to diatom taxonomists in any stage of their carrier. We are looking forward the next volume with great interest to get to know better the diatom flora of the waters of the area.

K. T. Kiss and M. Duleba