

BOOK REVIEWS

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FREY, W. (ed.) (2017): Syllabus of plant families, A. Engler's Syllabus der Pflanzenfamilien, 13th edition, Part 2/2. Photoautotrophic eukaryotic Algae: Rhodophyta. – J. Cramer in der Gebrüder Borntraeger Verlagsbuchhandlung, Stuttgart, Germany, 171 pp. (ISBN 978-3-443-01094-2).

Adolf Engler's *Syllabus of plant families* has been published since 1887 with the aim to provide a concise survey of plants and fungi, presenting all higher systematic units down to families and genera. The 13th edition is published in five parts and contains not just morphological information but also considers up-to-date molecular data. This volume is Part 2/2 providing a basic treatise of the worldwide morphological and molecular diversity of the Rhodophyta, i.e. red algae.

The Rhodophyta belongs to the kingdom Plantae, which involves the chlorophytes and the land plants among others. This lineage evolved via the endosymbiotic association between a heterotrophic eukaryote host cell and a cyanobacterial endosymbiont. Having some unique features regarding their cell structure, intercellular connections and life history the red algae form a monophyletic lineage within Plantae.

The majority of the red algae are marine, distributed from the upper intertidal to deep sublittoral zones. Their diversity is high in the pantropical regions and relatively low in the polar seas. About 200 of the total of more than 7,000 species live in freshwater habitats mainly in small to mid-sized streams. Some species inhabit brackish regions. The ecological preferences of red algal taxa are various, some species can tolerate extreme environmental conditions, like low pH or high temperature.

The organisation of red algae varies from unicells to thalli with different morphology. These algae show diverse life forms including epilithic, epiphytic and planktonic taxa. Some of them are obligate epiphytes occurring on specific hosts, e.g. macroalgae. Over 80 species live as endophytes within the tissues of other seaweeds. More than 100 species have been described as parasites occurring exclusively on red algal hosts. There are

also epi- and endozoic taxa living with sponges, bryozoans, sertularians, crustaceans, foraminifera or even sloth as hosts.

At the beginning of this book a general characterisation of cell structure, motility, life history, ecology, taxonomy and phylogeny of red algae is given. In the main part of the volume the forty currently existing orders with 106 families of seven classes in two subdivisions are described following the system provided in the chapter "Synopsis of their classification". The characterisation of the classes gives information on the organisation, cell structure (including chloroplast and mitochondrion ultrastructure, photosynthetic pigments, association between Golgi and endoplasmic reticulum, storage polysaccharide, low molecular weight carbohydrate), motility, life history, life form, distribution, ecology and phylogeny of the algae ranked into the class. The orders are mostly characterised by short descriptions of the families involved. These delineations touch the organisation, chloroplast ultrastructure, low molecular weight carbohydrate and the habitat. The most important genera and species along with their main morphological features are also listed in the characterisations of the orders.

The book is illustrated with colourful photographs and light micrographs on various taxa helping the understanding of the descriptions.

Overall, this volume provides valuable information about an interesting group of algae based on up-to-date knowledge. It can be recommended to both students and researchers interested in these organisms.

M. DULEBA

GRUBE, M., SECKBACH, J. and MUGGIA, L. (eds) (2016): *Algal and cyanobacteria symbioses*. – World Scientific Publishing Europe, Ltd., London, 680 pp. (ISBN 9781786340597).

Present book gives outstanding and comprehensive summary about algae and cyanobacteria as symbiotic partners. The book is organised in four main sections covering (1) Aerion-terrestrial symbioses; (2) Freshwater symbioses; (3) Marine symbioses; and (4) Stress tolerance and secondary metabolism. Each section contains several chapters written in an article style and therefore contains a detailed introduction section, conclusions and outlooks, as well as a relevant list of references for all parts.

Algal and cyanobacteria symbioses summarises recent state of knowledge of the field highlighting diverse perspectives and case examples. It focuses on general assessments of biodiversity in algal symbioses; reviews recent ecological and physiological perspectives in connection with algal symbioses; and covers recently developed topics such as the algal entry into animal cells or the biosynthetic capacity of cyanobacteria.

Algal and cyanobacteria symbioses is a high standard, valuable source of knowledge recommended for researchers, lecturers and students interested in the field of algal and cyanobacteria symbioses, plant–microbe or plant–animal interactions, with several excellent drawings, photos and micrographs.

A. ABONYI

HERRERA-CAMPOS, W., PÉREZ-PÉREZ, R. E. and NASH III, Th. H. (eds) (2016): *Lichens of Mexico. The Parmeliaceae – keys, distribution and specimen descriptions*. – Bibliotheca Lichenologica, Band 110. J. Cramer in der Gebrüder Borntraeger Verlagsbuchhandlung, Stuttgart, 723 pp. (ISBN 978-3-443-58089-6).

The volume contains systematic treatments of 450 species and 3 main introductory chapters on geology and vegetation (by Herrera-Campos *et al.*), on phylogenetic structure

(by Lücking *et al.*) and a synopsis (with a key to genera) based on molecular data (by Crespo *et al.*). Seventeen contributors worked on these topics. R. S. Egan, T. L. Esslinger, Th. H. Nash and R. E. Pérez-Pérez had the major roles in generic treatments (39) working together with their co-authors. Each generic treatment includes an abstract, a key to species, detailed characterisation of species and list of specimens examined.

Taxa described as new for science are as follows: *Alectoria brodoana* Essl., *Alectoria ochroleuroides* Essl., *Hypotrachyna guerrensis* T. H. Nash et Elix, *Parmotrema neodiffRACTAICUM* R. S. Egan, *Parmotrema submoreliense* R. S. Egan, *Pseudevernia alectoronica* Egan, *Pseudevernia mexicana* Egan, *Tuckermanella rickiae* Essl. Two new combinations are introduced: *Kaernefeltia iberica* (A. Crespo et Barreno) A. Crespo et Barreno, and *Parmotrema niasense* (C. W. Dodge) R. S. Egan. Among excluded taxa 9 *Xanthoparmelia* species are listed. Several new floristical records are mentioned throughout the text.

There are relatively few illustrations in the volume, 1–5 by chapters or sometimes none. These are maps, black-and-white micrographs on morphological details (by SEM) or colour habit photos of type specimens. There is a 31 pages list of literatures at the end of the volume.

The lack of an index to treated taxa (including also synonym names) makes the usage of this otherwise complete and excellent volume rather difficult and uncomfortable.

Still it is a very useful work both locally and globally. Parmeliaceae is a diverse taxonomic group containing large foliose, fruticose taxa providing applications in biodiversity assessments, nature conservancy studies. Therefore the volume is important for academic specialists and various other workers or amateurs interested in these fields or carrying out voluntary activities, field studies.

E. FARKAS

JKLITSCH, W., BARAL, H.-O., LÜCKING, R., LUMBSCH, H. T. and FREY, W. (eds) (2016): Syllabus of plant families, A. Engler's Syllabus der Pflanzenfamilien, 13th edition, Part 1/2. Ascomycota. – Gebrüder Borntraeger Verlagsbuchhandlung, Stuttgart, Germany, 322 pp. (ISBN 978-3-443-01089-8).

The first edition of "A. Engler's Syllabus der Pflanzenfamilien" was published in 1892 (soon after "Die Natürlichen Pflanzenfamilien" by Karl Anton Prantl 1887 – cf. Engler and Prantl 1887–1915). The 13th edition is in English following the previous 12 editions from 1982 to 1954. In contrary that the kingdom Fungi is not part of the Plant Families, it is treated in the present Syllabus following the traditions.

Part 1/1 of 2012 containing Chytridiomycota, Zygomycota and Glomeromycota. The current Part 1/2 is about phylum Ascomycota, a group characterised by the presence of asci producing ascospores by meiosis. The vast majority of lichenised taxa are also included here. Other groups are mutualistic in mycorrhizas or parasites, saprophytes, chemoorganotrophs, endophytes or endolichenic. The Syllabus is about the higher taxonomic ranks. There is detailed description on families – based on characters of vegetative and reproductive hyphae, ecological and distributional aspects – with lists of genera belonging to the particular family. However the estimated number of species are also in brackets after genera – altogether *ca* 57,000.

The text consists of six chapters: 1. Introduction; 2. Ascomycota (including introduction, characterisation and systematic arrangement); 3. Synopsis of classification of the Ascomycota; 4. Systematic arrangement of taxa; 5. Taxonomic novelties; 6. Appendix. There are detailed lists of references also after each class within chapter 4. There is a 32 pages Index to taxa from subphylum to genus level.

The volume illustrated with 7 ink-drawings (anatomical details, life cycles), a micrograph of the thalline structure of a lichen (section) and 16 plates of colour views from various taxa of Dothideomycetes, Eurotiomycetes, Lecanoromycetes, Leotiomyces, Orbiliomycetes, Pezizomycetes, presenting characteristic details. All are very high quality. Those of lichenised groups are all with scale, taken by Robert Lücking. The views from non-lichenised groups were taken by several colleagues (e.g. H.-O. Baral, H. Bender, S. Blaser, Stip Helleman, H. A. Hujiser, Walter Jaklitsch, R. Kristiansen, G. Marson, J. F. Moreno, J. H. Petersen, T. Richter, E. Rubio, P. Thompson, I. Wagner), the scales are missing at some places.

The new edition became necessary because the rapidly changing and increasing knowledge due to the molecular genetic studies of the last decades (cf. multigenetic studies, including also non-ribosomal loci) available additionally to the anatomical, morphological (such as ascoma morphology, ascomata development, ascus type, cellular ultrastructure) and chemical characters (secondary chemistry).

This is an outstanding summary of our present knowledge on the higher ranks of ascomycetous fungi. The 406 families containing *ca* 6100 genera are treated. Taxonomic novelties introduced are the Thelocarpaceae Lücking et Lumbsch ord. nov. and the Vezdaeales Lumbsch et Lücking ord. nov.

It is to be used by researchers, specialists in the field of biodiversity, as well as in nature conservancy, highly important for university professors and students. However, I am afraid a new edition will soon be necessary if introducing new methods and marker is going to be continued with an acceleration.

E. FARKAS

VILLAC, M. C., KACZMARSKA, I. and EHRLMAN, J. M. (2016): Diatoms from ship ballast sediments (with consideration of a few additional species of special interest). – In: WITKOWSKI, A. (ed.): Diatom Monographs, Vol. 18. Koeltz Botanical Books, Germany, 557 pp. (ISBN 978-3-946583-04-2).

Biological pollution differs from any other sorts of pollution of our environment (physical or chemical) in the respect that it cannot be removed. Consequently, what the reader is taking in hands now it is not an ordinary guide book. It is an out-of-the-way, exciting 'collection' on diatoms from the sediments of ballast tanks of ships arriving at Canadian ports on the West coast, East coast and the Great Lakes during a three-year-period. An extra value to this volume is that according to this book a recent search by title in Web of Science revealed 472 publications with the term 'ballast water' as opposed to only 30 with 'ballast sediment'. Hence, the data of this monograph must give a new aspect to the complexity of our current understanding of diatom biogeography. Altogether 254 have been displayed on 234 plates from which 17 have been known as aliens, invaders or toxin-producers – it is true that the latter 17 taxa were not found in the sediment but only from the ballast water. The majority of the taxa has proved to be marine (50%) and marine-brackish (25%), and only a small proportion has been freshwater (11%) and fresh-brackish water (7%) ones. The 55% of all the 254 taxa were planktonic.

These taxa are presented on beautiful micrographs mostly based on scanning electron microscopic investigations, and only a few illustrations are taken by light microscope. It makes the book easy to use that plates and figure captions immediately follow the species descriptions. The reader will also find some ecological information about these diatoms stowaways detected during their brief stop in Canadian ports, coming from and going to a wide variety of locations in the world's oceans and freshwater systems.

The goal of this work (as a part of the Canadian Aquatic Invasive Species Network (CAISN, phase 2006–2011)) is to show the existing aquatic invasive species which enter Canada. When a ship takes on ballast water from the environment, organisms and other suspended particles are also picked up, especially if ballast uptake is in turbid and/or relatively shallower waters closer to the continental margins. During the voyage some of the living and non-living matter settles or becomes the sediment biota of the ballast tank. Even when ballast water is exchanged, large quantities of the residual sediment biota remain undisturbed by the pumping. The composition and abundance of the sediment biota is, therefore, a composite of the assemblages of the various bioregions from which ballast water was taken up over the months or years of vessel operation, depending on the time elapsed since the ship was last dry-locked and tanks cleaned. The organisms that can survive the challenging conditions in ballast sediments (e.g. fluctuating temperature and salinities, anoxia, etc.) are likely hardy, opportunistic biota, particularly apt to establish themselves in a wide range of non-native bioregions.

Although this volume is quite specific, it can be useful for those who are interested in identifying species which can be targeted in future bio-invasion studies, or for general floristics and biogeography of diatoms.

Zs. TRÁBERT