

BOOK REVIEW

Delmarva Lichens: An Illustrated Manual. By James C. Lendemer and Nastassja Noell. *Memiors of the Torrey Botanical Society*, Volume 28. 386 pages. Torrey Botanical Society and New York Botanical Gardens, 2900 Southern Boulevard. Bronx, New York 10458-5126. USD \$30. Hard cover. ISBN 978-0-9996525-2-7

Another great reference to lichen identification was introduced to the public in 2018. *Delmarva Lichens: An Illustrated Manual*, by James C. Lendemer and Nastassja Noell is an impressive piece of work. They have condensed an immense amount of lichen knowledge into this 386-page book. Their thoughtful guidance in the introduction pages, keys, description, and discussion gives aide to identifying lichens with newfound confidence. The two authors conducted a first of its kind, 4-yr survey of this region, cataloging 399 species. All of these species are included in the dichotomous keys and most are depicted in photographic plates near the end of the book.

Delmarva is an area of the east coast near the Chesapeake Bay and Delaware River where three states (Delaware, Maryland, and Virginia) meet. This book immediately enlightens the reader about the history, biogeography, geology, land use, physiography, vegetation, and other features of the entire region. This paints a large-scale picture of the habitat of the area discussed in this book, which gives important background data as to why and where some of this lichen flora survives. A map in the front of the book showcases the region of the country surveyed in the book, but as the authors mention, this guide could be a useful reference for most of the eastern coastal states from New York to Virginia and well into the interior until one reaches the mountains.

Following the background information about the Delmarva region, the authors share their research methods and explain how they devised a ranking system of conservation status for each species. There are checklists of all species included in the book, followed by dichotomous keys. The bulk of the book contains the species accounts. Each includes a description, a dot map showing where the species was collected pre- and post-1950, information on distribution, ecology, and conservation, and some discussion. After all the

species accounts, there are color plates of almost every lichen. Full, natural shots of macrolichens are displayed, whereas shots of microlichens might display close-ups of the fruiting bodies. The photographs seem purposefully taken, exhibiting the structures one needs to see for identification. This is helpful because other field guides contain no photos at all, or pretty pictures of lichens that are not realistic in the field. At the end of the book is an impressive list of citations, which is an important reference for anyone interested in lichen study.

This is not a beginner's guide to lichens. Novice lichenologists might need some practice understanding the "parts and pieces" of lichens. Morphological experience is needed to use the keys in this book. But someone with minor knowledge of lichen identification and terminology should find the keys and species descriptions helpful for determinations. The keys are clear and concise. The authors exhibit superb organizational skills needed to separate species with their microscopic features. Well-thought-out descriptions of the organisms are included with each species account, and I found the discussion portion beneficial to confidently determining the correct species when in doubt of the keyed results. As with many field guides containing keys, the descriptions of species and color plates can also help the reader learn some of the subjects without using the keys. But with lichens, minute feature comparison is generally a must to determine species.

To test the dichotomous keys, I keyed out one lichen that I knew (*Parmelia sulcata*), and one lichen about which I was not positive (*Cladonia strepsilis*). It was nice to see that the keys were separated into different structural sections (*i.e.*, foliose chlorolichen, crustose pyrenolichens, *etc.*), instead of one large key. I knew my first lichen was a foliose chlorolichen, which eliminated many other lichen forms, saving time with the other keys. Having some experience with lichen keys, I easily identified my two specimens correctly using the book. I have not tried the crustose lichen key yet. Upon reading the species pages of my two lichens, I could use the pictured plates and descriptions to verify my determinations. Included in the keys are species that have been found near the Delmarva region, but not in the Delmarva

region, and could possibly be found there in the future. Although this book covers a specific region of the eastern coastal states, a large number of species included are found in most of the eastern USA.

I found the discussion paragraphs most helpful, and the conservation status rankings the authors devised for these organisms were refreshing. I do not believe lichens get the attention needed for management decisions. This part of the country was one of the first landscapes completely altered during European settlement. The changes in lichen biota will never be known, but after hundreds of years of revegetation, a book of this magnitude documents the species that have survived and thrived after large-scale manipulation. By using New York Botanical Gardens lichen collections, all specimens collected since 1800 were used to

configure a systematic equation to rank each species. To know a species' abundance is a very valuable tool for managers.

As the authors mention in this book, lichens are not "unknowable." This book adds to the new push to understand these important multispecies organisms that are found on almost every substrate of the globe. This book can be used in the Delmarva region, or in one's own back yard. Anyone curious about their natural surroundings is lucky to have taxonomists, like the authors, who are willing and available to accumulate, document and share their knowledge. They are opening the door to make lichens as popular as birds, butterflies, and wildflowers!—MARK H. ZLOBA, Ecological Manager, Cincinnati Museum Center's Richard and Lucile Durrell Edge of Appalachia Preserve System, West Union, Ohio 45693