BOOK REVIEW

Emily B. Sessa, *Ferns, Spikemosses, Clubmosses, and Quillworts of Eastern North America*. Princeton University Press, Princeton, New Jersey. 527 pp. paperback (flexibound) $29.95. ISBN 978-0-691-21945-5; e-book $20.97. ISBN 978-0-691-22044-4.

Certain groups of plants that have a special interest for nature enthusiasts and professionals alike often engender special guidebooks, unlike the majority of plants that are treated only in more general floras or popular guides. These special groups include taxonomic groupings such as orchids, growth form groupings such as trees and/or shrubs, or even those that fall into both categories, such as graminoids (grasses, sedges, and rushes or sometimes just grasses or sedges alone). Prominent among the subjects of such specialized guidebooks are the pteridophytes, more commonly referred to as ferns and lycophytes (or, in older guides, "ferns and fern allies"). In eastern North America, numerous pteridophyte guides cover a particular state or national park. Examples include Louisiana (Thieret 1980), Michigan (Palmer 2018), Kentucky (Cranfill 1980), Great Smoky Mountains National Park (Evans 2005), Minnesota (Smith 2023), and many others. Cobb (2005) covers a larger area—northeastern and central North America. For those wishing a single volume covering the ferns of a broader area, within the last few decades two works covered all the then known species of pteridophytes in North America north of Mexico. The first of these (Mickel 1979) was a semi-popular guide that provided identification keys, useful line drawings, and very brief descriptions of all species. More recently, and geared to a more professional audience, Smith and Wagner (1993) provided a comprehensive treatment of pteridophytes of North America north of Mexico as the first published volume (other than an introductory volume) in the Flora of North America project. Moran (2004) also provides a delightful general natural history of ferns on a world-wide basis without purporting to be a floristic guidebook or classification.

Since most of the works cited here were published, the pteridophytes have undergone dramatic revisions to their classification. Perhaps the most radical to those who first learned about plants more than a couple of decades ago has been the recognition that two groups once thought to be among the most primitive extant vascular plants and formerly included among the "fern allies"—the whisk-ferns (*Psilotum*)[1] and the horsetails (*Equisetum*)—should actually be classified among the true ferns (Pryer et al. 2004). Since the remaining groups formerly encompassed within the "fern allies," the families Lycopodiaceae (clubmosses), Isoetaceae (quillworts), and Selaginellaceae (spikemosses), form a monophyletic

[1]*Psilotum* is in the family Psilotaceae, which also includes the extra-territorial genus *Tmesipteris*.

clade that separates at the base of the clade that includes all other vascular plants, the ferns and the seed plants, they are now generally considered to be a separate group referred to collectively as lycophytes. But even within the ferns themselves, there have been many recent taxonomic adjustments, including changes to family and generic circumscriptions, with concomitant changes in the names of some species. Following in the footsteps of Smith et al. (2006), Christenhusz et al. (2011), and Christenhusz and Chase (2014), the generally accepted current classification of lycophytes and ferns is presented by the Pteridophyte Phylogeny Group (PPG 2016).

Emily Sessa has now given us a magnificent field guide to all of the pteridophytes of eastern North America that for the first time employs this most recent classification. The coverage includes the entire eastern United States east of the Mississippi River and contiguous portions of Canada, not including Newfoundland, Labrador, and northern Quebec. Dr. Sessa, who received her doctorate at the University of Wisconsin-Madison, is an expert in the ecology and evolution of ferns and lycophytes, especially of eastern North America and Africa, at the New York Botanical Garden, where she is also the Director of the Herbarium, one of the largest in the world.

The introductory material of the book contains a valuable discussion of the biology of these interesting plants, including detailed discussions of morphology and identification, as well as a brief discussion of the life cycles of these plants and their evolution, especially hybridization and reticulate evolution, which is a common feature of several genera represented in eastern North America. There is also an extensive glossary of technical terms.

The main part of the book, which contains treatments of the individual genera and species, is arranged first in two major sections—Lycophytes and Ferns—then, within each of these major sections, alphabetically by genus. Within each generic treatment, the species are arranged alphabetically. A key to genera is provided at the outset. Families are downplayed, however. There is no key to families, family descriptions are absent, and the genera are not grouped by family. The treatment of each genus indicates the family to which it belongs and incudes one or two informative paragraphs. If there is more than one species in the genus, there will be a key to species as well as comparative side-by-side photographs of the fronds and/or other distinguishing characters. Genera with extensive hybridization or reticulate evolution based on ancient hybridization, such as *Dryopteris* or *Asplenium*, are provided with explanations and a useful chart of the complex relationships among the species. Each species is treated on a single page that includes the scientific name, one or more common names, a statement of whether it is native or introduced and its frequency of occurrence, a brief statement of its habitat and distribution, and a distribution map. In addition, a detailed description is provided along with several photographs showing the overall habit as well as critical identifying characters. Most of the photographs are by the author, though a few are credited to others.

At the end of the book is a checklist of all species in the book indicating the presence of each in one or more of the four main geographical areas—Florida, South, Central, and North (these are also indicated in each species treatment). There is also a useful list of general references, relevant scientific papers, and

web-based resources. Finally, an index to scientific names, including synonyms, will be particularly useful to many users who are familiar with names that have only recently been displaced by generic splitting, such as in *Woodsia*/*Physematium*, or *Osmunda*/*Claytosmunda*, among others, that would otherwise be difficult to find by those unfamiliar with the newer names.

A few sophisticated users may be disappointed by the lack of author citations for the scientific names and perhaps by the presence of fewer synonyms than one might like. But such users have ready access to other resources for this information. Somewhat more troublesome is the fact that while most of the distribution maps are reasonably accurate, a few seem to have serious discrepancies. Some (e.g., *Adiantum capillus-veneris*, *Cystopteris fragilis*) show a distribution covering significantly larger territory than can be found in other sources. Others (e.g., *Asplenium montanum*) do not include all areas where the species is known.

Despite these few shortcomings, Emily Sessa's book is a superb guide to the ferns and lycophytes of eastern North America. It contains a wealth of information about each species and genus occurring in this large area; it provides excellent tools for identification in the form of well-written keys, full descriptions, and detailed illustrations; and, for the first time, it provides a useful guide to the ferns and lycophytes of this entire region that employs the most recent classification and nomenclature. It can be used with confidence by anyone seeking to learn more about these fascinating plants or who simply wants to learn the identity of a particular specimen found in the field. We can only hope that a similar volume covering the species of western North America will appear before too long.

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