

them “weird.” The well-written introduction is a clear and concise description of deep-sea habitats and animal adaptations, followed by a description of how the photographs in the book were created: a challenge involving collecting the organism using nets or ROVs and photographing them against black backgrounds in chilled seawater aquaria below decks on the research vessel. The introduction is deceptively short. Only four pages, it provides brief but excellent descriptions of deep-sea conditions, currents, and animal adaptations such as echolocation, photophores, chromatophores, deep-sea predators, and the use of light in deep-sea animal communication. The photograph of each of the 50 animals that follow is accompanied by a paragraph of discussion. Adaptations to deep-sea existence are emphasized and explained, such as the huge eyes of the hatchet fish (that use any light available), “Dumbo” the octopod’s reddish coloring (which makes it invisible in the deep sea), and the bioluminescent escape mechanism of the mesopelagic copepods, among many others. The photographers – David Shale, Solvin Zankl, and Jeff Rotman – should be commended, as each image is exquisite, demanding that the reader slow to examine and savor the amazing adaptive details of each organism.

Overall, *Owls of the World* is a very fine introduction to the wonders of deep-sea adaptations. Younger readers will find it a very useful overall reference or a wonderful nonfiction exploration of the dark world far below the waves. Even older readers will enjoy this slim text for the beauty of the photographs and the biological wonders of the animals presented.



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## PLANTS: MOSSES

*Common Mosses of the Northeast and Appalachians*. By Karl B. McKnight, Joseph R. Rohrer, Kirsten McKnight Ward, and Warren J. Perdrizet. 2013 Princeton University Press. (ISBN 9780691156965). 391 pp. Paperback. \$20.

This book is a new member of the Princeton Field Guides series. At a size of

11.5 × 19 × 3 cm, it can fit in a large field-coat pocket. It comes with a vinyl (and moisture!) cover, so it is suitable for taking into the field.

Inside the front cover is a map indicating the biogeographic distribution of the species covered in the guide. It indicates full coverage for the Great Lakes, New England, and Appalachian states south to Georgia and South Carolina, and north of these states in neighboring provinces of Canada. There would be at least reasonable overlap with mosses in neighboring areas as well.

The book opens with a very helpful guide to using the book. It explains the color coded swatches and icons printed on the page margins that help you rapidly identify the mosses you may find in the field. The first level and upper swatch on the pages separates the mosses by axis architecture: acrocarp, pleurocarp, and peat mosses. Within each part of this trichotomy, the mosses are grouped with a second color swatch lower on the page marked by a phyllid (leaf) shape icon: lanceolate, tongue-shaped, ovate, sickle-shaped, hair-like, leafless, and then each with or without a midrib. It also shows some of the tricky cases of intermediate or variable forms. This very useful organizational feature allows you to fan open the book to the subgroup you seek in three selections looking only at the page edges. This greatly speeds making field identifications! These three key-feature levels (axis, phyllid, midrib) group the structurally-similar mosses together for convenience.

The opening text reminds you that you will need to take along and use a hand lens to observe the leaf shapes and the presence or absence of a midrib. It provides good instructions for collecting and preserving mosses for laboratory or home study. There is also a nice reminder of the structural features and life history of mosses, as well as the limitation of the book to coverage of mosses only. This guide covers the true mosses and clearly distinguishes the many plants commonly called “moss” that are not covered (Spanish moss, Reindeer moss, Club moss, algae, liverworts, hornworts, etc.).

Each of the common mosses is shown in a two-page spread with a beautiful full-color photograph and usually outstanding sketches of the moss showing the distinguishing features on the left page. There is a full description of the plant and its likely habitat, as well as suggestions for “look-alikes”

that could be mistaken identities and suggestions for distinguishing them. It also provides features to verify field identifications by microscopic examination of collected specimens in the laboratory. These moss descriptions provide the bulk of the book’s content from page 32 to 339, which means that 153 taxa are fully covered in this guide, with perhaps another 50 mentioned as distinguishable “look-alikes.”

The rest of the book (pages 340–379) contains 12 formal dichotomous keys for the subgroups partitioned by the axis, phyllid, midrib features, and corresponding color-coded swatches and icons. You can quickly locate the group of keys from the page edges because the key pages all have a handy and reasonably accurate 20-mm metric rule printed at the edge and visible on the pages of the closed book (as are all the color swatches). The 12 keys are each marked at their start with the corresponding color-icon combination to help you quickly find the beginning of the pertinent key. The keys are illustrated with line sketches to assist in their use.

The keys are followed by a few pages listing the major moss habitats and their associated mosses, with the taxa indexed by page numbers to their descriptions. This is very helpful when visiting a particular habitat to remind you of taxa you might be finding on your field trip. The book ends with an appropriate index including both common and scientific names.

I am thrilled that *Common Mosses of the Northeast and Appalachians* is available for teachers, naturalists, and botanists. While there have been some earlier moss field guides, such as the “How to know the...” series, this one is brilliantly organized, rapid to use in the field, includes more extensive descriptions, and the color photos of each taxon are of very high quality. This is an outstanding field guide that makes me consider it the first choice for mosses. It sets a new high standard for field guides. The current price for this book is amazing given the high quality. This is definitely an excellent choice for a university Bryophytes course. I will be taking it with me on the field trips with my General Botany class as well. Moreover, this guide should help increase instructor awareness of mosses among the land plants that they discuss in the field with their high school and university students. In the covered northern states, spring-semester biology field trips really should be

focusing on mosses and allies as the major group of visible green organisms in deciduous forests in that season; this book will help with that.

In summary, I find this to be an outstanding contribution to the genre of field guides for faculty and students. I hope that other guides will follow this lead and aim for this high quality in their next editions! I would also note that the Princeton Field Guide series has a long list of animal-focused books, and this is perhaps its third plant field guide and the first one not focused on the tropics. I hope this is a portent of more to come from Princeton!



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