

BOOK REVIEW

***The Secret World of Lichens: A Young Naturalist's Guide.* Troy McMullin. 2022. Firefly Books, Buffalo, New York, USA, and Richmond Hill, Ontario, Canada. Pp 48, over 50 colour photographs and illustrations, 20 x 20 cm. ISBN 13:978-0=2281-0398-1, Soft-bound.**

In the beginning, all children are naturally curious and open to learning about the many living organisms that make up our world. Common wisdom among grown-up naturalists is that extensive time in the great outdoors is the key to nurturing that particular facet of curiosity and allowing it to survive to adulthood, resulting in adults who notice details of the natural world. Time outdoors is certainly important, but I think books can play a critical role in firing the imagination at any age, teaching us to notice and think about things we may otherwise overlook as simple background colour.

This is the first work of non-fiction for kids dealing with North American lichens. Like most non-fiction written for children and young adults it introduces the topic in a general way with a selection of fun facts and illustrated examples. The reader should not expect a field guide or exhaustive reference book. The writing is most appropriate for older elementary school children with strong reading skills or teens, however the images and some of the content could be of interest to younger children or even adults. The size and length are similar to other non-fiction picture books with a shorter spine than average, resulting in pages large enough to accommodate larger photographs than a field guide but small enough to fit neatly on most book shelves. The price is reasonable and will be affordable for many families and libraries.

The first section of the book provides an introduction to lichens broken into small manageable sections which are sensibly organized. This is the most text-heavy portion of the book but the liberal use of photographs and illustrations provides at least one focal point on every page that should help to catch and keep the reader's attention. The author introduces the concept that there are lichens right under our noses and defines what a lichen is, succinctly explaining its symbiotic and photosynthetic lifestyle. Then he introduces the basic growth forms followed by the most essential details of the structures

of a lichen. From there he moves on to lichen evolution, growth rates, ecology and human uses. Finally, he gives advice on finding and documenting lichens. Overall the content of the introduction is thoughtfully chosen, providing a solid grounding in lichen basics and a number of interesting facts about things like lichen-patterned camouflage for caterpillars and lichen-based dyes or medicines.

The main portion of the book presents a brief account of 38 lichens with most species getting a whole page to themselves. The species selected range from Arctic to tropical species and cover every major growth form. Only the best travelled young naturalists will be able to see all 38 species in person, but readers from every region of Canada will have a chance to find something from this book in their area. Each page is headed by the lichen name (common name listed first, then scientific name) followed by a brief block of text including a general description, notes on habitat and geographic range and sometimes an additional interesting fact about the lichen included in the main text or in a discrete fact box. A high-quality photograph dominates each page (sometimes with an additional inset photo of the underside) with beautiful results.

Throughout the book the text is simplified to avoid lengthy explanations and excessive jargon while attempting to maintain scientific accuracy. For the most part the author strikes a good balance here. Most scientific terms are presented in bold when first introduced and are defined in a glossary at the end of the book. This glossary could benefit from expansion to include some words that are likely unfamiliar to the target audience. For example, the terms “vegetative” and “sexual” appear in the introductory section on “Lichen Reproduction and Structure” as possible modes of reproduction and should ideally have been defined. Two lichen specific terms for vegetative reproductive structures—“soredia” and “isidia”—are also omitted from the glossary, which is unusual but reasonable since they are clearly defined on the only page in which they are mentioned.

Most of the details omitted for simplicity’s sake will not cause any confusion for young naturalists who decide to move on to more detailed lichen books. That said, the use of terminology relating to growth forms does deviate a little from that used in other works on lichens (e.g. Brodo et al. 2001; Hinds and Hinds 2007). Lichens composed of groups of small, discrete shingle-like or scale-like growths are often called “squamulose”; McMullin chose to omit this term,

referring to such forms as small “foliose” growths instead (e.g. *Cladonia chlorophaea* on p. 33). The term “fruticose” refers to three-dimensional stalked, bushy or thread-like growth forms without a clear upper and lower surface; most authors use this term in reference to the main lichen body (containing fungi and algae or cyanobacteria) while McMullin expands its use to some tall fruiting bodies composed of fungal tissue alone (*Calicium trabinellum* on p. 46, *Chaenotheca obscura* on p. 38 and *Lichenomphalia umbellifera* on p. 29). These choices make for easier reading but will require an adjustment in thinking for any reader who goes on to a serious study of lichens.

Apart from the stunning photography, my favourite thing about this book is the way the author frames learning to spot lichens as an invitation to a “Secret World”. Robin Wall Kimmerer (2003) wrote eloquently about her and her students’ experiences “learning to see”, drawing attention to the phenomenon of failing to notice organisms for which we lack a search image and the powerful interplay of words and perception. Although Kimmerer was writing mainly about bryophytes, McMullin’s aptly named book touches on the same themes. The way he talks about looking for lichens would resonate with most people who have fallen in love with the study of lichens or other small things. In the very first page, he encourages the reader to “look closely” at the substrates around them to discover a “secret world full of bright colours and interesting shapes that resembles a coral reef”. On the last page of the introduction he talks about knowing that this secret world has been revealed when you start seeing lichens everywhere.

Overall, this is a beautiful and informative book that will teach young readers to see and appreciate lichens, revealing their “Secret World” by providing the tools to make sense of the colours and textures that lichens form out in nature. I look forward to sharing it with my own children.

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