

Review

Microlichens of the Pacific Northwest: Volume 1 and 2

Reviewed by

JAMES LENDEMER

Institute of Systematic Botany, New York Botanical Garden, Bronx, NY 10458-5126, U.S.A.
e-mail: jlendemmer@nybg.org

McCune, B. 2016. *Microlichens of the Pacific Northwest: Volume 1 (Key to the Genera) and Volume 2 (Key to the Species)*. iv + 218 pp. (Vol. 1), iv + 755 pp. (Vol. 2), with 623 (Vol. 1) and 497 (Vol. 2) illustrations. Wild Blueberry media LCC, Corvallis, Oregon. [ISBN: 9-780998-710808 (Vol. 1); ISBN: 9-780998-710815 (Vol. 2)]. Price: \$98.00 (both volumes combined) or \$120.00 (both volumes separate) + shipping. Available from <https://www.wildblueberrymedia.net/publications/microlichens-of-the-pacific-northwest-volumes-1-and-2>



North America covers an extensive area, full of contrasting ecosystems: tropical mangrove swamps and wetlands in the south, cold tundra in the north, temperate rainforests along the northeastern and northwestern coasts, hot, sun-baked deserts in the west, vast grassland prairies and conifer forests, a sprinkling of rugged mountain chains cloaked in clouds or capped in glaciers. One feature that ties together these landscapes is the presence, and often abundance, of lichens. Likewise, a feature that ties North American lichens together is the general lack of comprehensive, modern floras along the lines of those that exist for vascular plants and bryophytes. The *Lichen Flora of the Greater Sonoran Desert Region* (Nash et al. 2002, 2004, 2007) is one such monumental work, and yet it is already a decade old.

Anyone who has ever wondered at the beauty of crustose lichens in nature and then taken them back to the laboratory for identification knows what they are up against: trying to interpret spot tests or blunder through keys without clear guidance as to the diagnostic colors and shapes they should be looking for. These issues are, however, not isolated to the beginner. Many of the same problems that stymied me when I tried to identify *Amandinea polyspora* nearly twenty years ago still abound today. Advances in the ease with which color micrographs can be both produced and reproduced have helped things considerably, as is evidenced by the beautiful treatments that have rendered accessible such groups

as *Xylographa* (Spribille et al. 2014), Polish *Micarea* (Czarnota 2007) and *Verrucaria* (Krzewicka 2012), North American members of the *Lecanora dispersa* group (Śliwa 2007) and perhaps even *Lepraria* (Lendemmer 2013). Nonetheless, many species are still very difficult to identify, certainly for the beginner.

Enter the *Microlichens of the Pacific Northwest*, authored by Bruce McCune and published locally by Wild Blueberry Media. This new work comes in two volumes, both of which are useful and worth purchasing in their own right. Since the second volume relies upon the first, I'll start with the first volume, the *Keys to Genera*, consisting of three distinct parts. The main portion is a series of identification keys that aim to get the user to a genus or taxonomic working group that can then be identified to species by using the second volume. This series of first-level identification keys is impressive because it illustrates that the author is well familiar with the lichens of the covered region (i.e., there are many places where the keys are intentionally structured to avoid the so called "user error" that occurs when a character is frequently misinterpreted). More importantly, however, the keys are supplemented by numerous excellent high-quality color photographs that illustrate essential characters referred to in the keys. These photographs alone will go far to alleviate the difficulty and ambiguity that often leads one astray in such keys.

As if keys to the genera and taxonomic working groups of a major North American biome were not enough, the other sections of this first volume are outstanding. The first 20 pages of the volume are devoted to an introduction that includes sections on how to perform spot tests and thin layer chromatography, both also fully illustrated with excellent color photographs. A brief story illustrates the value of this introduction. While preparing this review, a colleague called me and mentioned that his lab was trying to distinguish gyrophoric acid from lecanoric acid, and this was proving somewhat difficult with chromatography because in the different solvents, the substances run very close together. I asked him whether he had purchased *Microlichens*, and pointed him to pages 11 and 12 where the crystal tests for those two substances were so elegantly illustrated and explained. I strongly suspect there is now at least one copy in his lab.

The icing on the cake for the *Keys to Genera* is the glossary at the end of the volume. While any reader would have hoped for a glossary in a work like this, the author has gone above and beyond by providing one with photographic illustrations. As is the case for the keys and the introductory chapters, it is really the inclusion of photographs that sets this contribution apart from the rest in terms of usability and accessibility.

The second volume, or *Keys to the Species*, has about twice the heft of the first and tops out at 755 pages. I certainly noticed the difference in weight while carrying it to work on the train. Referring to this volume as “*Keys to the Species*” is a bit inaccurate because it includes more than just “a bunch of keys.” The volume consists of genus accounts that are arranged alphabetically, with each account organized to include a description of the morphology of the genus, the chemistry of the genus, its substrate and evolutionary position, a key to the species, and relevant references.

The treatments of the genera also include “ID tips,” but in reading these sections I would consider them to be more along the lines of “helpful notes and discussion.” Randomly looking at the tip for *Absconditella* for instance, we learn that the species are rare or overlooked, there are four species reported from the Pacific Northwest, and only one of those species occurs in “drier, warmer parts of western North America.” To me the most relevant tip for identification would have been to highlight that species of *Absconditella* look like *Coenogonium*

or *Gyalecta* but can easily be distinguished by their coccoid rather than trentepohloid photobiont, and in having an I– rather than I+ blue hymenium. The comparison to those genera and the information on photobionts is provided in the “relationships” section of the *Absconditella* treatment, but that is not where I think most readers would look for it. While such things are more or less a matter of taste, and are part of learning how to use any taxonomic work, I do think this is an example of where *Keys to the Species* could have benefitted from some feedback. From the perspective of an editor and a user, I would have hoped that evolutionary relationships and generic delimitations would have been discussed strictly under one heading, similar or confusable taxa under another heading, and that helpful tips would have been restricted to very brief and synoptic snippets.

At this point most readers are probably wondering about the keys themselves. There certainly are a lot of them in these volumes, and they are well-designed with the user in mind. How exactly one organizes and formats an expansive set of keys is always a matter of taste. Overall, I found them well formatted and the author has used what I consider to be the optimal presentation, namely indented with couplets numbered as well as lettered so that the reader knows whether they are in the first or second lead. Most importantly, the couplets are sequential and nested rather than forced together in strict pairs. While this format can be a bit burdensome in long keys, it tends to help users keep their place.

In many places of the keys in both volumes, particularly the *Keys to the Species*, the author has placed a lot of information into each couplet. As is explained on page 7 of the first volume, for species entries the first part of a couplet contains the salient characters for identification and the second part includes supplemental information. The benefit of this is that the keys are effectively a synoptic treatment of each species, including more than the essential information required for identification. The downside, however, is that it makes the reader wish for the kind of full length treatments that would be present in a flora. This leads to the only criticism that I have of this work. It seems to me that the keys would be more accessible to the non-specialist if they had been strictly contrasting so that all the couplets directly paralleled one another. For example, the key to genera of gelatinous, blackish, non-filamentous lichens begins with “plants aquatic or in rocky

intertidal areas” versus “plants mostly not aquatic, although sometimes in persistently damp places; lower surface not veined or easily inspected; thallus form various minute to large.” In this scenario the only dichotomy is between whether your “plant” is aquatic or mostly not, which leaves quite a bit open to interpretation. One would infer from the rest of the second lead that the aquatic species are all treated as macrolichens, but it would have been helpful to know whether all such species were veined or with easily inspected lower surfaces, and whether all have large to very larger thalli. Although a relatively minor point, I do believe that providing the opposite statements to every character would aid in addressing many questions that a reader could come up with while using the keys.

Notwithstanding the above, the treatments in the *Keys to the Species* include vast quantities of useful information, numerous line drawings and annotated photographs, and references to relevant work. It should also be mentioned that from a taxonomic perspective, the author has taken a conservative approach in following current delimitations of genera in groups such as *Caloplaca*. For a work that is intended to be broadly read and used, I think this decision is the right one and will help the treatments withstand the ravages that time tends to have on taxonomic systems.

If you have read this review and not yet decided to purchase these books, it is worth reiterating that

the nominal cost for both volumes is US\$120 and they are currently on sale for US\$98 when bought together. Anyone who has purchased a volume of *Bibliotheca Lichenologica* knows the value here!

LITERATURE CITED

- Czarnota, P. 2007. The Lichen Genus *Micarea* (Lecanorales, Ascomycota) in Poland. Polish Botanical Studies No. 23. W. Szafer Institute of Botany, Polish Academy of Sciences.
- Krzewicka, B. 2012. A revision of *Verrucaria* s.l. (Verrucariaceae) in Poland. Polish Botanical Studies 27: 3–143.
- Lendemer, J. C. 2013. A monograph of the crustose members of the genus *Lepraria* Ach. s. str. (Stereocaulaceae, Lichenized Ascomycetes) in North America north of Mexico. *Opuscula Philolichenum* 12: 27–141.
- Nash, T. H. III, B. D. Ryan, C. Gries & F. Bungartz (eds.). 2002. Lichen Flora of the Greater Sonoran Desert Region. Vol. 1. Lichens Unlimited, Arizona State University, Tempe, Arizona.
- Nash, T. H. III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.). 2004. Lichen Flora of the Greater Sonoran Desert Region. Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona.
- Nash, T. H. III, C. Gries & F. Bungartz (eds.). 2007. Lichen Flora of the Greater Sonoran Desert Region. Vol. 3. Lichens Unlimited, Arizona State University, Tempe, Arizona.
- Śliwa, L. 2007. A revision of the *Lecanora dispersa* complex in North America. *Polish Botanical Journal* 52: 1–70.
- Spribile, T., P. Resl, T. Ahti, S. Pérez-Ortega, T. Tønsberg, H. Mayrhofer & H. T. Lumbsch. 2014. Molecular systematics of the wood-inhabiting, lichen-forming genus *Xylographa* (Baeomycetales, Ostropomycetidae) with eight new species. *Symbolae Botanicae Upsalienses* 37: 1–87.