*J. Phycol.* **46,** 626–627 (2010)

DOI: 10.1111/j.1529-8817.2010.00847.x

## BOOK REVIEW

Kraft, G. T. 2009. **Algae of Australia: Marine Benthic Algae of Lord Howe Island and the Southern Great Barrier Reef, 2. Brown Algae.** Australian Biological Resources Study, Canberra; CSIRO Publishing, Melbourne, Australia, vi + 364 pp. Hard-bound, AU $140.00. ISBN 978 0 643 097377.

This handsomely produced book is the second in an ongoing series by Gerald T. Kraft, the first being his 2007 volume 1 on the green algae of this same classic region of the southern Great Barrier Reef, along with remote Lord Howe Island in the southwestern Pacific Ocean. The material is introduced with a section on the geographic location of the habitats investigated and a perspective on how the brown algal flora contrasts with those of comparable regions. A mandatory key to genera is presented, followed by a comprehensive systematic treatment of each genus and species provided by a technical description and abundant illustrations, combined with a detailed discussion containing relevant references to pertinent literature. Where available, reference information on contributions from gene-sequencing data is included. A wealth of appropriate illustrative material is incorporated throughout, consisting mostly of black-and-white photographs of habits, as well as excellent photomicrographs of cross-sections, reproductive structures, and other informative details. Many of the black-and-white plates are collections of multiple separate images. Midway through the book is a welcome 12-page section of color plates, including landscape photographs of marine habitats as well as in situ images of living specimens, both macroscopic and microscopic. A total of 92 species in 38 genera (covering seven orders and 12 families) are described and illustrated in this volume. Two genera and 29 of these taxa are newly described from Lord Howe Island or the southern Great Barrier Reef by Kraft (and colleagues, one species; or colleagues, one genus). The study appears to be quite synoptic, as indicated by the impressive number of specimens collected and examined (>2,500 herbarium specimens, 100 formalin-preserved samples, and 800 hundred microscopic slides) taken from depths down to 50 m.

The Australian seaweed flora first became known through the classic series of works of William Henry Harvey (Phycologia Australica) first published over 150 years ago. These now have been supplanted by Bryan Womersley's outstanding six volumes of the Marine Benthic Flora of Southern Australia (1984–2003). This in turn may now be complemented by the new series Algae of Australia. The Australian government has been at the forefront of funding traditional taxonomic studies to discover and document the wealth of the country's unique flora and fauna. In doing so, they have begun to provide basic systematic data necessary for issues relating to conservation, biological diversity, and the management of aquatic ecosystems. This Australian Biological Resources Study, Algae of Australia, will cover a broad geographic and taxonomic range, including both marine and freshwater macro- and microalgae.

Kraft has been exceedingly precise and productive in the field of algal systematics, devoting decades to the study of seaweeds in and outside of Australia. In addition to his major floristic account of the marine benthic green algae of Lord Howe Island and the southern Great Barrier Reef, he has now produced this seminal treatment on brown algae from the same region.

The introduction deals with the phycological history of Lord Howe Island and the Capricorn Group of the southern Great Barrier Reef, and detailed descriptions of the study region and the marine habitats are provided. A brief biogeographic analysis of the affinities of the brown algae from this unique area are included, ranging from groups that are localized to pantropical to those that are virtually cosmopolitan.

The systematic arrangement largely follows the classical morphological phylogenetic concepts, although footnotes to ordinal classifications based on inferences drawn from *rbc*L and LSU rDNA sequence data depict some differences. For the purpose of this identification guide, we agree with Kraft's emphasis on more classical concepts, since that logically follows anatomical characters, which aid in identifications necessary for molecular studies.

The dichotomous key to genera seems to work very well, and the genus page number following is a definite plus, although the colon after the second choice in each key pair is a bit confusing as is the colon following the reverse key feature. This mysterious colon use also applies to the individual keys to the species.

The taxonomic section is based on an excellent format useful to specialists. Detailed descriptions provide a wealth of information for the genera within orders, along with other information, such as the number of recognized species, diagnostic characters for species identification, geographic distribution, and phylogenetic relationships. Similar to

volume 1, *Green Algae,* the description of each species includes the currently accepted name, type information, the basionym, and important synonyms with relevant references. The morphological descriptions are clear and concise. Additional information for each species consists of notes on ecology, morphological variation, biogeography, taxonomy, and phylogenetic affinities, often with large lists of voucher specimens examined. The benefit of these large lists of specimens is the wealth of additional information provided about habitats and distributions of the taxa; this is especially useful for the new species proposed. The systematic discussions are informative, and the abundant additional references add a depth of detail seldom encountered in other taxonomic works. Also, the discussions are not restricted to only Australasian taxa, which makes them valuable to a worldwide audience. All species are illustrated with excellent photographs showing diagnostic vegetative and, where possible, reproductive structures. There are 107 black-and-white plates and 12 beautiful color plates depicting the intertidal and subtidal habitats as well as in situ images of various species. A few minor preferences that we feel would have augmented the usefulness of the images include (1) using size scales on the color in situ species images and (2) avoiding the confusing and difficult to locate scales on the black-and-white plates—far better to have the measurements directly above the scale bars on individual images. We do realize some publishers find that difficult to achieve considering the differences in individual image reductions within a single plate.

Two new genera are described: *Herringtonia* in the Dictyotales and *Lucasia* (by N. Yee and A. Millar) in the Sporochnales. There are 29 newly described species, assigned to *Discosporangium, Hincksia, Hecatonema, Myriactula, Myrionema, Streblonema, Compsonema, Sphacelaria, Dictyota, Distromium, Lobophora, Padina, Spatoglossum, Stypopodium,* and *Sargassum.* The description of new species based solely on morphological grounds may sometimes be questioned (given the high morphological variability that is often encountered and the possibility of DNA sequence data); however, we believe that it is still useful and necessary to describe the obvious unidentified taxa. Molecular work can be undertaken eventually. Observations by competent field biologists (such as Kraft) can often determine differences in species that may be overlooked by molecular-oriented workers in the laboratory, if not first revealed by subtle external and morphological characteristics.

The main body is followed by an appendix with rare or doubtful records, an extensive bibliography of 12 pages, new taxa, combinations and lectotypification, a great glossary, a list of abbreviations and contractions (extremely helpful), and an index to all taxa and their synonyms. The index might have been a little more useful in having the specific epithets indexed independently from the generic epithets.

Kraft has created an exceptional treatment on the brown algae that is well written and amply illustrated as the second volume in the Marine Benthic Algae of Lord Howe Island and the Southern Great Barrier Reef series. This book will be a must-have guide for specialist phycologists and marine biologists (thanks to its many illustrations) working not only on the southern Great Barrier Reef or Lord Howe Island, but worldwide owing to the detailed discussions. This volume, as in the case of volume 1, will be an important technical taxonomic reference work for many years to come. Although priced somewhat expensively, this book, which is printed on good-quality paper and nicely bound, should find its way onto all phycology and marine laboratory library shelves.

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