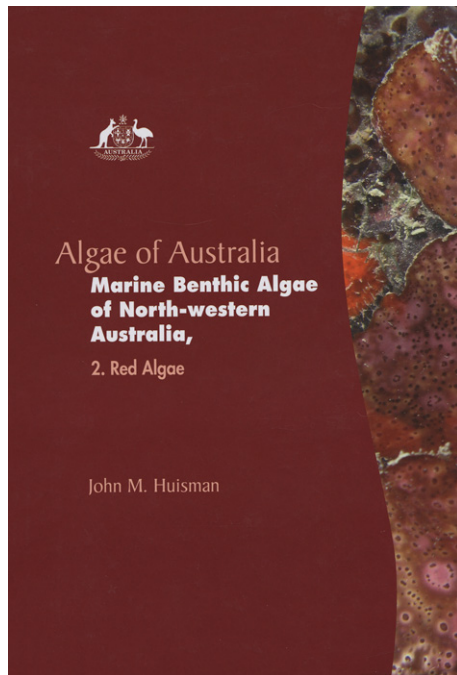


BOOK REVIEW

Huisman, J. M. 2018. **Algae of Australia: Marine Benthic Algae of North-western Australia, 2. Red Algae.** ABRS, Canberra; CSIRO Publishing, Melbourne, Australia, xii + 672 pp.



This book represents a truly impressive accomplishment on the part of the author, who has, for a few decades, been gradually going about the business of becoming familiar with the macroalgae of the western and northwestern coasts of Australia, collecting specimens, making determinations, publishing his findings paper by paper, and gradually amassing a tremendous amount of knowledge and understanding of the flora of this relatively unknown region. This book is a major contribution, one that will have a significant impact for years to come. It is Huisman's third book in the series *Algae of Australia*, the second on the northwestern Australia region (Huisman 2006, 2015).

John Huisman has been associated with the School of Veterinary and Life Sciences of Murdoch University as well as more recently with the Western Australia Herbarium and the Department of Biodiversity, Conservation and Attraction of Western Australia. It is the stretch of the northwestern coast of Australia that has up to now been relatively

neglected floristically. Figure 1 in the book is a map of the 24 collection localities running from Coral Bay in the west and south to Ashmore Reef and Hibernia Reef offshore of northwestern Australia, representing both intertidal and subtidal habitats as well as intertidal reef platforms and drift material. Most of these collecting sites were sampled by Huisman himself but at times with diving partners or made by other personnel, as indicated in Table 1 of the book. Huisman has solo-authored the greater part of this book, but for certain sections he has enlisted help from eleven specialists to coauthor selected genera or families. Kyatt Dixon took sole responsibility for the family Etheliaceae and the order Peyssonneliales. But for the rest of this monumental book, Huisman was involved with the treatments.

A total of 158 genera and 351 species of red algae are included. There are carefully constructed keys to the families within the orders, to the genera within the families, and to species within the genera. A number of changes are proposed by Townsend and Huisman in their coauthored treatment of the order Corallinales. The following taxa, which were formerly subfamilies, are raised to family level: Hydrolithaceae, Mastophoraceae, and Porolithaceae. Although the Lithophyllaceae is proposed as a new family, Athanasiadis (2016) had already described that family.

The flora is surprisingly rich, with several genera being newly described. These include *Campylosaccion* Huisman (Rhodymeniaceae), *Cryptocallis* Huisman & G.W. Saunders (Sebdeniaceae), *Floiophycus* R.A. Townsend & Huisman (Porolithaceae), *Pentocladia* Huisman (Rhodomelaceae), *Pseudocaulacanthus* Huisman (Caulacanthaceae), and *Seiria* K.R. Dixon (Peyssonneliaceae).

Oztralia, a new genus in the Porolithaceae proposed in the volume, included the species *Oztralia conica* (E.Y. Dawson) R.A. Townsend & Huisman. Due to the length of time in printing the final version, fully 2 months earlier, Caragnano et al. (2018) had described the new genus *Dawsoniolithon*, which included this same species. Therefore, the new genus *Oztralia* R.A. Townsend & Huisman must be treated as a superfluous name (*nom. illeg.*). The proposed new subfamily Oztraliioideae, being based on *Oztralia nom. illeg.*, is likewise illegitimate. Townsend and Huisman (2018) have already proposed the new tribe Floiophycoideae because of that issue.

A total of 88 new species is described by Huisman either solo-authored or with his coauthors. Genera and the number of new taxa that are described in each are the following: *Asteromenia* (2), *Ceramium*

(5), *Dasya* (4), *Champia* (3), *Chondria* (2), *Griffithsia* (2), *Halymenia* (3), *Incendia* (2), *Polysiphonia* (2), *Porolithon* (3), *Wrangelia* (3) and a single new species is described for the following: *Aglaothamnion*, *Amansia*, *Antithamnionella*, *Aphanta*, *Areschougia*, *Botryocladia*, *Campylosaccion*, *Centroceras*, *Cladurus*, *Contarinia*, *Corallophila*, *Cottoniella*, *Crouania*, *Cryptocallis*, *Dotyophycus*, *Dudresnaya*, *Erythroclonium*, *Floiophycus*, *Galaxaura*, *Ganonema*, *Gayliella*, *Gelidiella*, *Gracilaria*, *Herposiphonia*, *Hommersandiophycus*, *Hypoglossum*, *Izziella*, *Lithophyllum*, *Lophocladia*, *Martensia*, *Millerella*, *Melanothamnus*, *Pentocladia*, *Platoma*, *Predaea*, *Pseudocaulacanthus*, *Ptilocladia*, *Ptilophora*, *Rhodogorgon*, *Seiria*, *Sonderophycus*, *Spirocladia*, *Titanophycus*, *Tricleocarpa* and *Tsengia*. In addition to his new genus *Seiria*, Kyatt Dixon described an impressive eight new species of the red crustose genus *Peyssonnelia* as well as two new species in *Polystrata* and one in *Ramicrusta*. There are also many nomenclatural adjustments, such as *combs. nov.* and *stats. nov.* Known taxa are transferred into *Colaconema*, *Gayliella* (2), *Macrocarpus* (2), *Melanothamnus* (2) and *Tricleocarpa*. I find it noteworthy that Huisman has found additional new species in relatively newly delineated genera such as *Aphanta* (*A. ligulata*), *Millerella* (*M. corallophila*), *Incendia* (*I. cryptica* and *I. homosorora*), *Rhodogorgon* (*R. flagellifera*) and *Yoshizakia* (*Y. indopacifica*). For *Macrocarpus*, a genus segregated from *Liagora* by Lin et al. (2011), two additional species of *Liagora* are transferred into it.

For the order Gelidiales, authored by Huisman along with Ga Hun Boo and Sung Min Boo (son and father, respectively), a maximum-likelihood tree of the order, based on *rbcl* sequence data, is rich with taxa from the four families recognized, including the recently recognized family Orthogonacodiaceae.

For several of the new species, gene-sequence data are provided to support these delineations, such as for *Martensia millari* (by S. M. Lin and Huisman), with a *rbcl* phylogenetic tree including many species of *Martensia*. A phylogenetic tree, constructed using maximum likelihood data, also accompanies the genus *Asteromenia* with two new species. Kyatt Dixon has provided a COI-5P DNA barcode distance tree that contains all the sequenced northwestern Australian specimens in the order Peyssonneliales.

When some of these red algal genera are species-rich, it might appear to be reckless to add new species to the pool (when so many of the species are poorly known). For example, *Ceramium* is said to have “c. 212 species (Guiry and Guiry 2017),” and five species are newly described in this book. Then there is *Dasya* with 86 accepted species and four new species being assigned to this genus. *Chondria* has 80 currently recognized species, and two new species are added to that total. Huisman’s descriptions are detailed and

accompanied by excellent images to support the descriptions. The fact that the new species *Ceramium pseudoaffine* and *Gayliella choi* each have only three periaxial cells per node certainly separates them from the rest of the species in their respective genera, where 4–6 periaxial cells per node is the usual pattern.

This book was printed in 2018. With the rapid rate of recent taxonomic and nomenclatural proposals, it is inevitable that changes will be happening, such as the reinstatement of *Hydropuntia* Montagne, based on *H. urvillei*, and also including *H. eucheumatoides*, as (again) distinct from *Gracilaria* (Gurgel et al. 2018). The Rhodomelaceae, the largest family of red algae, is in a state of tremendous taxonomic flux. Savoie and Saunders’ (2016) recent segregation of *Xiphosiphonia* (*X. ardreana*) from *Pterosiphonia* was included. But the transfer of *Polysiphonia constricta* Womersley to *Vertebrata* by Díaz-Tapia & Maggs (in Díaz-Tapia et al. 2017) happened later. That is inevitable for all floras.

A very helpful 24-page glossary is a welcome inclusion, as well as 3+ pages of an impressive list of all the names of the new taxa. Before the Index comes a three-page section listing the “Abbreviations and Contractions” that have been used in the book. This included the accepted abbreviations for the herbaria that are listed, all of which are based in Australia.

This volume is handsomely hard-bound and solidly so. There is a total of 16 plates in color with from 4 to 6 images per plates all in decent size and not reduced to postage-stamp size as so often happens in such books. Plates of half-tones are generously distributed throughout the book, occasionally with line-drawings of critical reproductive stages, such as Fig. 103 G, H, I for the new species *Aglaothamnion endostolon*. It is rare that figures are not provided, for example, for *Gelidiella fanii*, *Caloglossa ogasawarensis*, *Spyridia hypnoides*, and for three of the four species of *Bostrychia*. But in those cases, references with figures of those species are cited. I commend the author(s) for citing the “Specimens examined,” indicating collection data and in what herbarium (or herbaria) those specimens are located. That will be very helpful for posterity.

Is there anything to be critical of? Really not much. My own preference would be to have all the cited references to appear at the end of such a book, the traditional format, but instead they are arranged in a somewhat congested pattern after the description of each taxon (class, order, suborder, family, and genus). Furthermore, references dealing with individual species appear right after the descriptions of the species or infraspecific taxa being recognized. It took some time to get used to such a pattern. But all things considered, I can only sing the praises of such an excellently produced book by the highly productive John Huisman.

MICHAEL J. WYNNE

*Department of Ecology and Evolutionary Biology and
University Herbarium, University of Michigan, Ann Arbor
Michigan 48109, USA*

e-mail: mwynne@umich.edu

- Athanasiadis, A. 2016. *Phycologia Europaea Rhodophyta*, Vol. I. pp. [i]-xxxviii, 1-762. Thessaloniki: Published and distributed by the author.
- Caragnano, A., Foetisch, A., Maneveldt, G. W., Millet, L., Liu, L. C., Lin, S. M., Rodondi, G. & Payri, C. E. 2018. Revision of Corallinaceae (Corallinales, Rhodophyta): recognizing *Dawsoniolithon* gen. nov., *Parvicellularium* gen. nov. and *Chamberlainioideae* subfam. nov. containing *Chamberlainium* gen. nov. and *Pneophyllum*. *J. Phycol.* 54:391-409.
- Díaz-Tapia, P., McIvor, L., Freshwater, D. W., Verbruggen, H., Wynne, M. J. & Maggs, C. A. 2017. The genera *Melanothamnus* Bornet & Falkenberg and *Vertebrata* S.F. Gray constitute well-defined clades of the red algal tribe Polysiphoniae (Rhodomelaceae, Ceramiales). *Eur. J. Phycol.* 52:1-20.
- Gurgel, C. F. D., Norris, J. N., Schmidt, W. E., Lee, H. N. & Fredericq, S. 2018. Systematics of the Gracilariales (Rhodophyta), including new subfamilies, tribes, subgenera, and two new genera, *Agarophyton* gen. nov. and *Crassa* gen. nov. *Phytotaxa* 374:1-23.
- Huisman, J. M. 2006. *Algae of Australia. Nemaliales*. Australian Biological Resources Study/CSIRO Publishing, Canberra/Melbourne, viii + 153 pp.
- Huisman, J. M. 2015. *Algae of Australia: Marine Benthic Algae of North-western Australia. 1. Green and Brown Algae*. Australian Biological Resources Study/CSIRO Publishing, Canberra/Melbourne. [i]-viii, 1-320 pp.
- Lin, S. M., Yang, S. Y. & Huisman, J. M. 2011. Systematics of *Lia-gora* with diffuse gonimoblasts based on *rbcL* sequences and carposporophyte development, including the description of the new genera *Neoizziella* and *Macrocarpus* (Liagoraceae, Rhodophyta). *Eur. J. Phycol.* 46:249-62.
- Savoie, A. M. & Saunders, G. W. 2016. A molecular phylogenetic and DNA barcode assessment of the tribe Pterosiphoniae (Ceramiales, Rhodophyta) emphasizing the Northeast Pacific. *Botany* 94:917-39.
- Townsend, R. A. & Huisman, J. M. 2018. Transfer of *Oztralia gabrielsonii* and *Oztralia orbiculata* to *Dawsoniolithon* (Corallinales, Rhodophyta). *Notulae Algarum* 78:1-2.