

BOOK REVIEW

***The Caribbean Land Snail Family Annulariidae: A revision of the higher taxa and a catalog of the species* by G. T. Watters (2006). Backhuys Publishers, Leiden, The Netherlands. vii + 557 + 9 + 4 pp. With 9 black-white-figures and 57 maps. ISBN: 90-5782-155-9.**

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Although the Annulariidae immediately attract the attention of every naturalist visiting the Caribbean region by their beauty and amazing diversity, the tremendous number of taxa - Watters accepts half of the about 1,400 described names as valid species or subspecies - and the difficult access to reliable information prevent the enthusiast from entering deeper into the subject. It would certainly be too high an expectation to find all these problems answered in this new book, but Watters' bulky 577-page hardcover contribution presents the most comprehensive compilation on the Annulariidae to date, including all traceable taxa from subspecies to family level. It intends "... to bring all available information on the family together, to provide an overview of the group including their morphology, zoogeography, evolution, and systematics" (p. 1). The aim is certainly met with regard to the annotated taxonomic list, which comprises the lion's share of the book with about 540 pages. On the other hand, the claim - if carefully read - also makes clear what might not be expected and consequently will not be found: substantial new research results on the topics mentioned. So, except for the historical and nomenclatural section (6 pages), the remaining 13 general pages are not ambitious and give the impression that the book results from diligent library and museum collection work, but lacks the inspiration of fieldwork. Who else could overlook to tell about the exceptional "walking" of Annulariidae in a general account and only mention it by chance in a discussion of phylogenetic relationships? The very little but precious information cited on anatomy remains similarly isolated when, in another context, the author seriously discusses the published speculation ("deserves further consideration") that decollation might provide a breathing device at the very top of the shell by a more porous closure (Rees 1964) which, concluding from general anatomy, would require that the digestive gland or parts of the reproductive system spontaneously take up a function as respiratory epithelium!

Apart from some weaknesses in the section of general information, the strength and value of Watters' contribution consists in the immense bibliographic work, the hunt for type material in museum collections and accompanying historical information, and the clarification of entangled, often-nightmarish nomenclatural problems.

The species account (with 434 pages about 75% of the book) includes data on the original reference; the type locality and known range, the depository of type material, if located; the current systematic assignment; and widely accepted synonyms. Herein it stays in the correctly given limits of a pure catalog, which is appreciated as the most realistic way to approach a review at the family level, added by the "extra" of etymological information for the reader interested in history of science. The listing of species by country under each genus is a most helpful addition for students of specific geographic areas.

Unfortunately, and this being inexcusable for author and publisher, the alphabetical arrangements of genera and species fail to compensate for the lack of an index to the thousands of names included in the text, rendering all synonyms, subgenera, and subspecies not searchable. The "Outline of higher taxa" provides only limited help at the supra-specific level.

The lack of figures is most unfortunate. Especially in times of digital photography, it is astonishing that not a single (!) member of the Annulariidae is figured on these 577 pages. Only the character that is least necessary to figure is illustrated, with images of 9 opercula hidden at the end of the book instead of accompanying the respective text, while characters that are difficult to describe - such as hidden breathing devices of astonishing shapes and details of radular teeth - remain to the imagination of the reader. At the very least, illustrations of the type species or typical representatives of the 56 genera (and perhaps 31 subgenera) would have greatly improved the contribution, especially because

almost all descriptions and delineations of the supraspecific taxa refer to conchological characters.

The "revision" as announced in the misleading title disappoints in the sense of a new scientific analysis. Without intention to judge the currently proposed classification of the Annulariidae and despite thorough reading I was unable to find any clear systematic concept on which the separation into three subfamilies is based. Not even the descriptions would allow one to attribute a genus to one of the subfamilies. The extensive use of conchological characters, many of which are known to be or should be suspected to be the result of convergent evolution, restricts the study to the level of knowledge of earlier contributions. Phrases like "is closely related" often have to be understood as "is most similar [conchologically]." The same applies to the recognition of the genera. The descriptions of the randomly selected Cuban genera *Blaesospira* Crosse, 1890 (p. 89) and *Guajaibona* Torre and Bartsch, 1941 (p. 91), for example, are identical to the word, except for the addition in the latter of "Whorls nearly adnate," a character that is not described for *Blaesospira*. No further remark is given. Another example: the genus *Parachondria* Dall, 1905 is said to be "similar to *Colobostylus* [which belongs to another subfamily] but usually has a higher spire, a non-sinuate lip, and rarely tufts" (p. 42). To add a last example and hereby provoke future research: I failed to find any argument for why breathing devices should have "inexplicably" evolved several times independently in all three subfamilies in Cuba and in a few annulariids in the Bahamas instead of questioning the reliability of the currently-applied system.

As to the general remarks on zoogeography, I am perhaps too curious to find clues to understand what really happened in the geological formation of the Caribbean region and the development of its flora and fauna to be satisfied with an account on biogeography and endemism that only tries to match the geologic evidence with the annulariid distribution. While this distribution pattern results from a systematic concept that constantly appears to have incorporated the geological evidence it remains simple story telling instead of searching for independent characters and patterns in the Annulariidae for reasoning and concluding.

Despite some drawbacks, the book will inevitably serve as a source for future workers on the subject and will certainly be helpful for students of local faunas as an excellent summary of all nomenclatural issues in Annulariidae. Real progress in understanding the phylogeny and evolution of the family in the Caribbean region has been made elsewhere (e.g., Thompson 1978) and will be greatly stimulated by Watters' contribution.

To end with Watters: "It is hoped that it will be the basis for detailed anatomical and genetic studies" (p. 1).

LITERATURE CITED

- Rees, W. J. 1964. A review of breathing devices in land operculate snails. *Proceedings of the Malacological Society of London* **36**: 55-66, pls. 3-5.
- Thompson, F. G. 1978. A new genus of operculate land snails from Hispaniola with comments on the status of family Annulariidae. *The Nautilus* **92**: 41-54.

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