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BOOK REVIEW

Harvestmen: the Biology of Opiliones. Edited by Ricardo Pinto-da-Rocha, Glauco Machado and Gonzalo Giribet. 2007. Harvard University Press, Cambridge, Massachusetts. 597 pp. ISBN 13:978-0-674-02343-7. US$125.

Except for some of the very small orders, nearly all arachnids have now received at least a first book on "The Biology of…" It is a curious question why it took so long for such a book to appear on the third most diverse order, Opiliones. But here it is at last, and it proves to be well worth the wait. Twenty-five authors have contributed to 15 chapters which summarize virtually everything that is known about harvestmen up to 2006. The organization of the book follows the general pattern: there are chapters on morphology, phylogeny and biogeography, systematics and paleontology, ecology, feeding, enemies and defense, reproduction, development, and social behavior. Each of the chapters is meticulously researched and, rather than simply recounting what is in the literature, the authors have synthesized and analyzed what they found. The result is that each chapter is an original review article that in itself is a significant contribution. Henceforward it will not be possible to write about or research harvestmen without referring to this book. And interestingly, the preponderance of South Americans among the chapter authors signals an important shift: the center of research on this group of arthropods has moved south, perhaps propelled by the enormous diversity in the group to be found in tropical America.

A number of the chapters were of particular interest to this reviewer, especially the one on systematics by Pinto-da-Rocha and Giribet (it is also worth noting that one or the other of the editors has co-authored nine of the fifteen chapters in the book). This chapter is extraordinarily complete. Not only are keys to taxa included, but each described family is discussed in detail and abundantly illustrated. Keys are useful especially in the suborder Laniatores, where much reshuffling of families has taken place in the last decade. Reference is frequently made in these discussions to advances in our understanding of harvestmen systematics using phylogenetic data based on new molecular evidence. Areas requiring attention, such as the possibly paraphyletic family Ceratolasmatidae, are clearly pointed out. An overview of the current state of classification is given in a four-page table, covering the subfamily level, which also gives the numbers of genera and species currently included in each. Readers with long memories will recall that Ernst Mayr, in a text on taxonomy, used Opiliones as an example of an "over-split" group with, on average, less than two species per genus. The problem still exists in some places; the subfamily Tricommatinae has 51 species in 29 genera! Only one small quibble with this chapter—some of the many scanning electron micrographs used for illustrations are printed too small.

The chapter on defense mechanisms is another gem, especially the section on chemical defenses, a signature feature of harvestmen biology. Here again, a useful chart puts in one place all the molecules and the species that produce them (except for the 22 gonyleptids studied by Hara et al. [2005]), and a quick perusal of that chart points the way for future work. Why, for example, does the single phalangiid studied so far (*Phalangium opilio* L. 1761) produce naphthoquinones, while the supposedly closely related sclerosomatine *Leiobunum* species produce long-chain alcohols and ketones? Research in the ecological chemistry of harvestmen has so far been focused on gonyleptomorph Laniatores, all of which produce a mixture of benzoquinones (at least 37 different molecules), while the chemistry of the defensive secretion is not known for even a single member of the Dyspnoi and is known for only one travunioid, *Sclerobunus nondimorphicus* Briggs 1971. Clearly this is an area of research where discoveries are waiting to be made, and one which I am currently exploring with a chemist colleague.

Finally, it was fun to read the table on pp. 2–3, which lists vernacular names for harvestmen from more than 30 countries. Predominant are names that refer to harvest time, the long legs of the most obvious members of the order, and their perceived similarity to spiders. We also learn that it is only in Finnish in which the name for a species of Opiliones, *lukki*, means exactly that.

This is an important and excellent book which should be in every arachnologist's library, and which will be indispensable for university and departmental libraries.

LITERATURE CITED

Hara, M.R., A.J. Cavalhiero, P. Gnaspini & D.Y.A.C. Santos. 2005. A comparative analysis of the chemical nature of defensive secretions of Gonyleptidae (Arachnida: Opiliones: Laniatores). Biochemical Systematics and Ecology 33:1210–1225.

William A. Shear: Biology Department, Hampden-Sydney College, Hampden-Sydney, Virginia 23943 USA. E-mail: wshear@hsc.edu