Book Review

Evolutionary Biology of Orthopteroid Insects. B. Baccetti, ed. John Wiley & Sons, New York. 612pp. 1987. $120.00.

This volume is the proceedings of an international conference on the evolution and phylogeny of Orthopteroidea, held in Siena, Italy, January 1986. The occasion for the conference was the 90th birthday of Dr. Felice Capra, of the Museo di Storia Nutrale di Genova. The proceedings consist of 53 papers, in English, ranging in length from 111 pages (Baccetti) to less than one page of text (Carlberg). Their subject matter is similarly diverse — as one would expect if more than 50 orthopterists were invited to give papers at a conference of this title.

The editor has done little to integrate the volume. Rather than clustering papers of like subject matter, he has arranged them alphabetically by surname of first author (from Baccetti to Willey). Consequently, in logic of arrangement, the book resembles a volume of Annals of the Entomological Society of America. Each paper begins with an abstract and ends with references. Other than the table of contents, the only index to the volume is taxonomic.

The following papers are among those worthy of special note:

- In "Spermatozoa and phylogeny in orthopteroid insects," Baccetti summarizes studies of sperm ultrastructure in more that 200 species representative of all major groups of orthopteroids and many of the minor ones. With drawings and optical and electron photomicrography, he illustrates in exemplary detail the sperm of orthopteroids (348 figures!). He constructs a phylogeny based solely on sperm structure and confirms some of the groupings that other orthopterists accept. For example, the sperm of Caelifera, including Tridactyloidea and Cylindrachetidea, share features that set them apart from other groups. On the other hand, Ensifera are not united in their sperm morphology: Gryllacridoidea and Gryllodea constitute an independent group as do Cooloolidea and Tettigonioidea. Isoptera, with its peculiar aflagellate or multiflagellate sperm [and monogamy], show no special affinity to Blattodea or any other taxon. Baccetti classes variations in sperm structure as primitive or highly evolved but assigns no functions. Surely the mechanics of sperm transfer (temporarily attached spermatophore vs. insertion) and the females' sperm receiving/allocating structures interact with sperm evolution in intriguing ways.
- L. Bullini and G. Nascetti describe eight instances of speciation by hybridization in Orthoptera. In each case the parent species are bisexual and the resulting species is thelytokous. They attribute the success of hybrid species in competition with parent species to demographic and heterotic advantages.
- D.K.McE. Kevan reports on the saltatorial Orthoptera of Micronesia and concludes that they are of mixed origin, though largely Oriental, and that about half of the 90 species are endemic.
- S. Masaki and three co-authors discuss the evolutionary differentiation of right and left tegmina in crickets. In most crickets the right tegmen overlaps the left at rest, and males that stridulate do so by stroking the file on the underside of the right tegmen with the scraper on the inner edge of the left tegmen. The file on the left tegmen is often poorly developed in comparison with the one on the right tegmen. Evolutionary reduction in the left file has apparently occurred independently in several groups of crickets. Conversely, some crickets, such as the mogoplistine *Ornebius kanetataki*, have the two files equally developed and no bias in tegminal overlap.
- V. Sbordoni and four co-authors, in a commendable first synthesis of a long-term project, discuss microevolution in dolichopodine cave crickets. They report on life cycles (ca. 2 years), age struc-

ture (heterogeneous in natural caves), population numbers (100 ,000), and a variety of studies of population genetic structure. Electrophoretic analyses of enzyme loci revealed a higher level of heterozygosity in these isolated, relatively small populations than predicted by the neutralist hypothesis of molecular evolution. Comparison of DNA-DNA hybridization and allozyme relationships showed high correlation, but morphometric variation and allozyme variation were poorly correlated.

R.B. Toms concludes, via. comparative studies of tree crickets (Oecanthidae), that changes in cricket calling songs can arise as incidental consequences of changes in stridulatory mechanisms. His coupling of structure and call even leads him to speculate that some features of the calling songs of extinct insects may eventually be read from the fossils of their files and tegmina. However, the fact that the pulse rate of a cricket call changes markedly with temperature shows that the same apparatus can be driven to produce different calls. Furthermore, intraspecific variability in temperature-specific pulse rates is substantially less than intraspecific variability in file length and tooth number, indicating that pulse rates are maintained in the face of variations in file structure.

This volume has many valuable contributions to orthopterology. It should be purchased by research libraries and those orthopterists who can afford the price.

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