

INTRODUCTION TO THE SPECIAL ISSUE: A CELEBRATION OF ALAN J. KOHN

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This special issue of *Malacologia*, paying tribute to Alan Kohn's contributions to malacology, includes a biography and bibliography and papers from researchers who have benefitted from his pioneering work on the biology of the gastropod family Conidae and his studies of the mass mortality and recovery of limpets in Western Australia. Alan Kohn was an inspiration to many who work on cone snails because he provided critical insights on their taxonomy, ecology, evolution, and history that stimulate further study and provide a context for interpreting results. His knowledge of natural history is expressed throughout his publications and serves as an example of how important a good understanding of one's study system is for addressing key questions about its biology.

Two of the articles in this volume address varied themes concerning the biology of cones and their venoms. Zahrim Ratibou and coauthors describe what is known about the venoms and functions of venom components of *Conus striatus* Linnaeus, 1758, a piscivorous species of cone snails. Although Yoshio Kondo was the first to detect the remains of a fish in the digestive tract of a specimen of this species (Clench & Kondo, 1943), Alan was the first to report it. *Conus catus* Hwass, 1792 also feeds on live fishes based on observations of their hunting behaviors in aquaria (Kohn, 1956). Maren Watkins and coauthors provide a summary of characteristics of members of the subgenus *Pionoconus* Mörch, 1852, a group of fish-eating cones that includes *C. catus*, *C. striatus*, as well as several additional species. The article includes details about the biology, including aspects of their taxonomy, prey capture mechanisms, life history, and venoms of members of *Pionoconus*, and also provides interesting insights on the pharmaceutical applications of cone-snail venom components, cone snails as a delicacy, and an episode involving a researcher who had been stung by a *Pionoconus* species.

Two articles in the volume address taxonomic concerns and provide important insights on the

diversity of two genera of the family Conidae. Felix Lorenz and coauthors review the taxonomy and report on the unique morphological characters of *Pygmaeonus* Puillandre and M. Tenorio, 1927, a recently recognized genus that includes species of diminutive size, and describe a new species based on morphological and molecular characteristics. Alexander Fedosov and coauthors utilize species delimitation approaches to evaluate the taxonomy of the *Conasprella orbignyi* complex, identify two new species, and show remarkable patterns of morphological variation across locations in the Indo-West Pacific. Gustav Paulay, Alan's former Ph.D. student, and Chris Meyer, Alan's former postdoc, provide an impressive study of the cone-snail fauna of Oman. Through field surveys and DNA sequencing, they show that the fauna includes a mix of widespread Indo-West Pacific species, species unique to the Indian Ocean, and endemics from the Arabian sea and Oman, and identify several cases of cryptic species complexes and genetic differentiation at Oman that might represent new species.

Three articles focus on other aspects of the biology of members of the family Conidae: their color patterns, genes associated with their chemosensory abilities, and how their characteristics are influenced by where they occur. Cone snails have presumably long been collected or used in display articles by humans given the engaging and diverse color patterns that they exhibit on their shells. Jonathan Hendricks not only provided the cover art for this volume that shows some of this tremendous beauty and variation but also contributed an article that gives an overview of cone-snail color patterns, a means to classify and describe the types of patterns that cone snails exhibit, and a brief discussion of their possible functions. Given Alan's observations of the responses of *Conus striatus* to fishes that are introduced into their aquaria (Kohn, 1956), he inferred that a predatory response was initiated by chemosensory detection of po-

tential prey. Moreover, his Y-tube experiments that revealed that *Conus* species are attracted to their preferred prey (Kohn, 1959) support the use of chemosensation in prey detection. In this volume, Andrew Wood and I describe patterns of variation of olfactory receptor genes of two closely related vermivorous species (*Conus ebraeus* Linnaeus, 1758 and *Conus judaeus* Bergh, 1895) that co-occur in the Indian Ocean and western Pacific and exhibit preferences for very different prey (i.e., errant versus sedentary polychaetes). We show that the olfactory gene repertoires of these species are quite diverse, and some genes show differences in sequence or expression that could be associated with their distinct diets. In several papers, Alan evaluated and made predictions about how characteristics of cone snails are influenced by the habitat types in which they occur. In our article, Diana Vergara-Florez and I show that Alan's prediction about the effect of habitat on body size holds true for species of cone snails that occur in subtidal reefs of lagoons and intertidal platforms of seaward sides of atolls in French Polynesia. We also reveal that the larger body size of individuals in lagoons of atolls is likely due to the migration of individuals from the seaward side into the lagoon.

Finally, Fred Wells and coauthors expand from Alan's previous studies of a massive die off and subsequent recovery of limpets in Western Australia that was associated with a combination of low tides and hot weather (Kohn, 1993, 1999). They report on past and recent surveys of intertidal mollusks on intertidal platforms in Perth, Western Australia, and infer that although the recovery of species from previous instances of mass mortalities has

been relatively quick, increased frequencies of heat waves due to climate change will contribute to greater mortality and slower recovery.

ACKNOWLEDGMENTS

I am humbled to serve as the guest editor of this special volume for Alan and greatly appreciate the invitation from the Editor-in-Chief, Rebecca Rundell, to serve in this role as well as the many colleagues who contributed manuscripts. I also thank Alan Kabat who assembled the biography and bibliography. Alan Kohn was an excellent teacher, advisor, colleague, and scientist who always based his comments, criticisms, and responses with great humbleness and was always eager to help students; he is deeply missed.

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