Symposium on the "Magnitude of Molluscan Diversity — the Known and the Unknown"

Author: Richling, Ira

Source: American Malacological Bulletin, 32(2) : 223-224

Published By: American Malacological Society

URL: https://doi.org/10.4003/006.032.0214

Amer. Malac. Bull. **32**(2): 223–224 (2014) http://www.bioone.org/toc/malb/32/2

Symposium on the "Magnitude of molluscan diversity – the known and the unknown"

Ira Richling

Stuttgart State Museum of Natural History, Rosenstein 1, 70191 Stuttgart, Germany
Correspondence, ira@helicina.de

The symposium formed part of the 78th Annual Meeting of the American Malacological Society in Cherry Hill, New Jersey, and was held on 19th and 20th June 2012. While everyone talks about biodiversity we asked the basic question: What do we know about molluscan diversity? Or even more simply: How many species of molluscs exist today? A simple question to ask but difficult to answer. Of course, this question is not a new one, but ever rising threats to our environment and thus, habitats of molluscs render it more urgent than ever to know what lives on our earth and what will we lose. Land and freshwater molluscs are among the most endangered groups worldwide (Lydeard *et al*. 2004, Régnier *et al*. 2009).

More recent comprehensive estimates of molluscan diversity suggest the number of described species at 31,000 non-marine and 52,500 marine, but the number of yet unknown diversity may be roughly one third to more than an equal amount (Lydeard *et al*. 2004, Bouchet 2006).

The symposium title reflects these two aspects while the "known" refers to described species rather than implies that their number is known considering the often unknown share of synonyms among available names. The goal of the symposium was to gather new data to narrow down a realistic estimate of the diversity of this second largest phylum in the animal kingdom and to reveal the progress made during the last few years.

The 22 talks presented in Cherry Hill encompassed studies on special taxonomic groups, geographic areas as well as theoretical approaches like analyzing saturation curves, the portion of valid species versus synonyms, correlation to rarity, sampling methods, the amount of undescribed species in collections versus discovery by new fieldwork, and last but not least elucidated the potential of new methods. The "unknown" stood for what remains to be discovered in terms of species not yet found in underexplored habitats and regions, species not yet recognized due to the lack of taxonomic expertise, revisionary works, and cryptic species.

If the title was mirrored in two talks, Gary Rosenberg's analyses of databases reducing the estimated diversity of described species to 70,000–76,000 represented the "known" (this issue) while Philippe Bouchet certainly took the audience to the frontier of the "unknown". Based on his tremendous exploration efforts in the tropical Indo-Pacific Bouchet assumed that only 30% of the molluscan diversity of this area is known. This already anticipates that despite some detailed approaches the latter aspect remains not only as undescribed diversity but still unknown in its extent.

In terms of marine species, Rüdiger Bieler questioned our knowledge of the molluscan fauna in the well known Florida Keys. Philippe Bouchet, as mentioned above, characterized the tropical Indo-Pacific as a treasure trove for new species and highlighted the phenomenon of a high percentage of species occurring in low abundances. Janet Voight evaluated the exploration of hydrothermal vent habitats (this issue). John Taylor, co-authored by Emily Glover, gave insight into the enormous diversification of Lucinidae triggered by their obligate chemosymbiosis.

Continuing with bivalves, Paul Valentich-Scott dug deep into the hyperdiverse group of Galeommatoidea which not only amaze us with their previously unexpected species diversity but even more by their range of unusual lifestyles. Patrick LaFollette described the attempt to catalogue the published taxa of the megadiverse family Pyramidellidae resulting in an estimated 10,000 names regardless of status. James McLean's review of the Liotiidae and Areneidae more than doubles the known diversity and sampling still seems far from complete. Exposing the most cryptic groups, Timea Neusser and colleagues gave insights into the mesopsammic fauna and their underestimated diversity and ability to colonize unusual habitats (this issue, Jörger *et al.*). Moving from the least known to the best known, Fabio Moretzsohn reviewed the progress of cataloging the Cypraeidae (this issue). An equally attractive group but less popular among shell collectors, Terrence Gosliner described nudibranch exploration. Greatly supported by citizen scientists like scuba divers, Gosliner feels their role is not only in accelerating the discovery of new species but also in helping to monitor environmental changes.

The contributions focusing on advances by the application of molecular techniques identified significant numbers of so-called cryptic species: Ellen Strong estimated the diversity of Cerithiidae two to three times higher than currently recognized. John Slapcinsky deduced equal ranges from his analyses of the land snail genera *Tropidophora* and *Daedolochila* (this issue, on *Tropidophora*). To the relief of less well-equipped biologists both pointed out that after recognizing the hidden species differentiating morphological characters

Figure 1. Speakers at the Symposium "*Magnitude of molluscan diversity – the known and the unknown.*" Front row, left to right: Philippe Bouchet, Adrienne Jochum, Timea P. Neusser, Ira Richling, John Slapcinsky, Arthur E. Bogan, John D. Taylor, and Fabio Moretzsohn. Second row, left to right: Eike Neubert, Janet R. Voight, Ellen E. Strong, Jeffrey C. Nekola, Rüdiger Bieler, Jan Johan ter Poorten, and Terrence Gosliner. Back row, left to right: Gary Rosenberg and Philip J. Fallon, Jr. Missing from photo: Frank Köhler, Patrick I. LaFollette, James H. McLean, Paul Valentich-Scott, and Francisco Welter-Schultes. Photo by Klaus Groh.

were usually found as well. In contrast, Adrienne Jochum, co-authored by Alexander Weigand, favored molecular identification for Carychiidae to deal with high intraspecific morphological plasticity in combination with a general conchological uniformity among taxa (this issue, Weigand *et al.*).

Regarding terrestrial diversity Jeffrey Nekola discussed the land snails of North America north of Mexico (this issue), Eike Neubert summarized the current knowledge for the continental molluscs of the Western Palaearctic. Frank Köhler provided an overview for Australia and estimated another 67% of still undescribed species. Ira Richling gave a critical estimate for the family Helicinidae as example for mainly forest dwelling tropical land snails that are faced with dramatic habitat loss (this issue). Arthur Bogan discussed freshwater molluscan diversity worldwide and elaborated on the topic of vanishing diversity.

Besides the scientific questions, Jan Johan ter Poorten (on Cardiidae) and Philip Fallon (on Drillidae) presented a perspective from the amateur's side, citizen scientists who provide the main taxonomic workforce in describing new species. Finally, Francisco Welter-Schultes brought it back to the practical basics with an overview of available databases and advantages versus shortcomings of the different nomenclators compiled over time with the insider view of a provider of such data.

I thank Gary Rosenberg for the invitation to organize the symposium along with Philippe Bouchet who took the lead for the marine portion. We are thankful to all contributors for sharing their insights and results during the symposium and I would like to acknowledge especially those who contributed papers to the proceedings published in this issue of the *American Malacological Bulletin*. A great thanks also goes to Colleen Winters for her advice and patience. The symposium was financially supported by the American Malacological Society.

LITERATURE CITED

Bouchet, P. 2006. The magnitude of marine biodiversity. *In:* C. M. Duarte, ed., *The exploration of marine biodiversity: scientific and technological challenges.* Fundación BBVA, Bilbao, Spain. Pp. 31–62.

Lydeard, C., R. H. Cowie, W. F. Ponder, A. E. Bogan, P. Bouchet, S. A. Clark, K. S. Cummings, T. J. Frest, O. Gargominy, D. G. Herbert, R. Hershler, K. Perez, B. Roth, M. Seddon, E. E. Strong, and F. G. Thompson. 2004. The global decline of non-marine mollusks. *BioScience* **54**: 321–330.

Régnier, C., B. Fontaine, and P. Bouchet. 2009. Not knowing, not recording, not listing: Numerous unnoticed mollusk extinctions. *Conservation Biology* **23**: 1214–1221.