

VICARIANCE BIOGEOGRAPHY: THEORY, METHODS, AND APPLICATIONS

Introduction to the Symposium

Historical biogeography is a key element in our attempts to analyze evolutionary pattern and process. Aspects of historical biogeography are critical at nearly all spatial and temporal scales of evolutionary analysis. Current theories of speciation, for example, rely upon an understanding of the historical pattern of spatial relationships among differentiated populations. At a higher scale, reconstructing the history of biotas and community assemblages, and seeking to explain large-scale patterns of diversity through space and time, are dependent upon knowledge of the historical biogeography of their component taxa.

Introduced in the late 1970s, vicariance biogeography has provided a major conceptual advance within systematic biology by facilitating the development of a more rigorous and testable framework for biogeographic analysis. Chief among the architects of vicariance biogeographic theory and methodology was Donn Eric Rosen, President of the Society of Systematic Zoology during the years 1976-1977. Rosen's contributions to systematic biology, in general, and systematic ichthyology, in particular, have been substantial (see Nelson et al., 1987), but it is perhaps his series of papers on biogeography that have reached a wider audience. In 1974, he examined the biogeographic history of salmoniform fishes, postulating that their pattern of distribution was best interpreted as vicariance rather than long-distance dispersal (Rosen, 1974). That theme was pursued in detail in another paper, co-authored with Leon Croizat and Gareth Nelson, in which many of the conceptual foundations and assumptions of traditional biogeographic thinking were called into question (Croizat et al., 1974). Rosen's primary venue for exploring theoretical and methodological issues in biogeography was

the biota of the Caribbean and Central America, and his key papers on vicariance biogeography were a mixture of insightful commentary on theory and method, on the one hand, and empirical applications, on the other (Rosen, 1976, 1978, 1979, 1985).

Donn Rosen's death in December of 1986 has deprived systematic biology of one of its most forceful thinkers. He was intellectually challenging to both friend and adversary. Most of the contributors to this symposium directly benefitted from his friendship, and all have been nurtured by his ideas. Because of Rosen's inestimable contributions to systematic biology, the Society of Systematic Zoology and the participants in this symposium dedicate these proceedings to his memory.

The goals of the symposium were (a) to provide a critical discussion of previously developed theory and method within the discipline of historical biogeography, (b) to provide a form for new theory and methods that can be used to reconstruct biogeographic patterns, and (c) to present new data on the historical biogeography of the Caribbean region and North America. A total of 16 participants presented papers at the 1987 meetings of the Society. All but four of the papers are included in this issue.

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The presentations at the symposium were extensive and of exceptional interest to that segment of the scientific community interested in biogeography. The same is true of the manuscripts submitted for this special issue. Therefore, two numbers, Vol. 37 (3) and (4) have been devoted to publication of the symposium proceedings.

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