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REVIEW

Plants on Islands: Diversity and Dynamics on a Continental Archipelago. By MARTIN L. CODY. 2006. University of California Press, Berkeley, CA. 315 pp. Hard Cover $49.95. ISBN 978-052024729-1.

Barkley Sound is a large embayment on the west side of Vancouver Island, British Columbia. It contains over 200 islands of various sizes. Based on a field study that extended nearly 25 yr, Martin Cody of UCLA has compiled an enormous data set on diversity and dynamics of some 300 species of plants that inhabit the islands of Barkley Sound. In this book, these data have been exploited in every imaginable way in order to test the concepts and theories of island biogeography. Four appendices at the back of the book include lists of plant species, bird species, and a gazetteer of Islands.

In his introduction, Cody reviews the history of island biogeographic studies beginning with Sir Joseph Hooker's presentation in 1846 to the Linnaean Society on the flora of the Galapagos Islands. Using Hooker's initial contributions to the understanding of islands, Cody lays out the framework for his studies on the plants of the islands in Barkley Sound, pointing out that these are continental islands, not oceanic islands, hence he will say little about endemism, radiations, and relicts. In the introduction, he also states that this book, "...is in no way intended to be a review, or overview, of island biogeography, ecology, or evolution, or of island plant biology." He then lists his "personal favorites" of all the literature he deems relevant to the science of island biology, a list in itself that should be useful to anyone interested in the biogeography of island plants.

Having made that disclaimer in the introduction, Cody then goes on, particularly in Chapter 3, to write an excellent overview of the theory, concepts, and analytical tools of island biogeography, emphasizing chiefly the aspects of colonization and extinction dynamics of continental islands. He pays tribute to the work of R. H. MacArthur and E. O. Wilson, who in the 1960s laid out the principles of the "equilibrium theory of island biogeography." This well know theory, referred to by Cody as the "M/W model," balances immigration and extinctions rates as a function of number of species. With a series of graphs, Cody clearly describes how the M/W model applies to islands of various sizes and distances from the mainland. This chapter, by itself, is a valuable contribution to the literature about island plants. It is illustrated with graphs and data, all of which are eloquently explained, and his use of statistics will not overwhelm the reader.

The rest of the book is specifically about the islands of Barkley Sound. Chapter 2 is an excellent introduction to the geography, geology, history, climate, and general ecology of the region. Of particular interest is his discussion of the flora and vegetation of the "Coastal Coniferous Forest." This community, distributed from southeastern Alaska to northern California, is also referred to by many authors as the "Temperate Rainforest," Many people think if these forests, which include the largest terrestrial organisms on earth, as one of North America's treasures. Readers who may not be familiar with wet coastal forests, will gain an appreciation for the diversity and significance of this community to the biota of the world.

Chapters 4 through 8 deal specifically with the islands of Barkley Sound. Each chapter analyzes the plants on these islands from a perspective of the M/W model of MacArthur and Wilson. Chapter 4 is about species numbers, island size, and isolation. Chapter 5 on "nestedness and assembly rules" analyzes the distribution of species within different habitats. Chapter 6 deals specifically with "turnover rates," in which the balance between colonization and extinction on these islands is described. Chapter 7 is about the various mechanisms and dynamics of dispersal responsible for the species on these islands. It is particularly interesting in its documentation that, over time, dispersal capacity on the islands becomes reduced in wind-dispersed members of the Asteraceae. Chapter 8 is about the impact and evolution of non-native species. He points out that "weedy aliens" colonize primarily edge habitats or disturbance sites, and they evolve rapidly, typically losing significant dispersal capacity over a period of decades. Here, Cody is able to generalize about the influence of non-native colonizations on depauperate island floras. Also in Chapter 8 he analyzes data that show evolutionary shifts in two species of animals, deer mice and banana slugs. Deer mice on Willis Island were almost 20% heavier than those on the mainland, an example of gigantism that often is demonstrated by rodents on islands in other parts of the world. The extensive discussion of evolution in spotting patterns of banana slugs is particularly interesting. Banana slugs, relict species which are virtually unable to cross seawater barriers, have evolved on these islands for about 10,000 yr. During that time, it appears that the unspotted morphs evolved in association with open habitats where they tend to be more suitably adapted to warm, dry conditions. In these five chapters, loaded with graphs and statistics, Martin Cody illustrates how a scientist can exploit his data. He does it wonderfully, never failing to explain how the data fit the concepts he is analyzing.

Chapter 9, the final chapter, is a synopsis subtitled "Lessons from a Continental Archipelago." In this chapter, Cody summarizes what he learned about the evolutionary and biogeographic picture of the islands in Barkley Sound. Once again, he generalizes about the relevance to biogeographic theories, particularly with respect to the M/W model. He talks about phenomena that fit his expectations and those that didn't. He finishes up by emphasizing what seemed most important to biogeographic theory of islands.

This book is an invaluable addition to biological literature. Based on nearly a quarter-century of research, it clearly depicts the flora of the islands in Barkley Sound and applies the data to processes of evolution and biogeography as they apply to continental islands in general. Furthermore, it is an important resource that characterizes one of North America's significant plant communities, the moist coastal coniferous forest of the Pacific Northwest. Every biologist with an interest in islands or the spectacular forests of the Pacific Northwest should own this book.

—ALLAN A. SCHOENHERR. Professor of Ecology, Emeritus Fullerton College, 321 E. Chapman Avenue, Fullerton, CA 92832. Aschoenherr@fullcoll.edu.