

*Book review***In the Land of the Iguana**

***Iguanas: Biology and Conservation.*** Edited by A.C. Alberts, R.L. Carter, W.K. Hayes & E.P. Martins. 2004. 356 pages, 42 contributors, 20 chapters. University of California Press, Berkeley. US\$65 (hardcover) ISBN 0-520-23854-0.

The first edited volume on iguana biology (Burghardt & Rand 1982) appeared 23 years ago. That we now have a second edited volume on the same group of lizards, is testament not only to the spectacular diversity and appeal of iguanas, but also to the level of attention devoted to this group. With the notable exception of the anoles, no other lizard group has attracted so much attention.

The book is divided into three parts: *Diversity, Behavior and Ecology*, and *Conservation*. The *Diversity* section is a slightly strange mismatch of chapters that begins with a useful overview of the evolutionary relationships of iguanines and a checklist; includes two specialised chapters on systematics and population genetics (including conservation implications); a chapter on the evolutionary history of marine iguanas; and a final chapter on salt glands. Although the three sections created by the editors make good sense for a book of this nature, I wondered whether a lack of contributions to “*Diversity*” necessitated the inclusion of the two genetic chapters with their conservation angle, and the physiology chapter on salt glands. The salt gland chapter could easily have been included under “*Behavior and Ecology*”, with the simple addition of “*Physiology*” to this section. This is a small gripe, but perhaps more chapters incorporating aspects of evolution, biogeography, and systematics, would have filled this void.

Space constraints prevent detailed accounts of the majority of chapters, but Chapter 5 on Galápagos iguanas is worth mentioning, and will be of general interest to students of biogeography and/or the Galápagos. Rassmann *et al.* sampled both land (*Conolophus*) and marine (*Amblyrhynchus*) iguanas to test which came first: the lizards or the islands, and to establish the genetic relationships of the different island populations. The present day Galápagos islands are numerous but young (1-5 Ma). However, immunological studies (refs in Rassmann *et al.*) place the split of these two sister taxa of iguanas at 15-20 Ma ago, long before the formation of the currently existing islands. These estimates are based on molecular clocks, which have their own inherent problems, nicely outlined by the authors of this chapter (p 75). Nevertheless, there is utility in molecular clocks and the authors independently, but conservatively, calculated a divergence time for Galápagos iguanas that supported the hypothesis of a split prior to the formation of the current Galápagos Islands. That the lizards pre-date the islands has long been suspected. To explain their current presence on the islands has been complicated: the source population was thought to originate on the mainland and then later go extinct. This was unsatisfactory for many, and less than parsimonious. New geological findings suggest that ancient islands existed in the Galápagos chain (up to 90 Ma; refs in chapter). These islands were gradually eroded and sunk below sea level. Therefore, the

most parsimonious explanation is that a single ancestor colonised the islands and speciated into the current forms without any extinction of mainland forms. Both marine and land iguanas were able to disperse across relatively short distances and colonize new islands as the old islands disappeared below sea level. Interestingly, as old as the split was (between land and marine iguanas), and as different as the two forms are, hybridisation has been reported from one island (Plaza Sur). The second part of the chapter deals with relationships between island populations and reports that island populations were very similar in genetic structure. I found this chapter reminiscent of a good detective story: all the parts fitted together neatly in the end, to everyone's satisfaction.

Part II: "*Ecology and Behavior*" consists of seven chapters that feature a variety of taxa with a good mixture of ethological elements (e.g., display behaviour) and ecology. In her introduction to this section, Emília Martins makes the case for iguanas as a promising system for understanding the origins and selective pressures generating the behaviours we see today. In contrast to lizards that fit a particular paradigm, iguanas consistently prove to be the exception to the rule. For example, many iguanas are herbivorous whereas most lizard species are insectivorous; and many lizards are territorial, whereas many iguanas are colonial. According to Martins, much of lizard behaviour can be explained by phylogeny (e.g., many lizard species are territorial because their ancestors were territorial). However, iguanas consistently show diversity despite their shared history. Therefore, Martins notes that by documenting the exceptions, we are also able to understand the rule. In a similar vein, marine iguanas emerge as notable because they lek, a form of mating system most commonly seen in birds such as grouse. The authors (Hayes *et al.*) thought that leks are probably far more common among reptiles than previously believed.

For me, the major feature of this volume is the coverage devoted to conservation. Not only does the conservation section consist of seven chapters, but conservation emerges as a theme repeatedly in other chapters in the book (particularly in genetics studies under *Diversity*). As Burghardt notes in the *Introduction*, the coverage given to conservation in the 1982 book was scant in comparison, and likely reflects the rise of conservation biology as a *bona fide* branch of biology. I found the attention devoted to conservation both reassuring and alarming at the same time. Reassuring because much is being done to both highlight and conserve the large number of taxa of conservation concern; alarming because so many taxa are either vulnerable, endangered, or critically endangered (see p 275). Indeed, some iguana species number only several hundred individuals, giving them the dubious distinction of being among the most endangered of all animals. The conservation section is particularly strong and highlights the efforts of scientists to ensure that the appropriate genetic units are conserved.

Overall, this is an enormously useful volume that is of interest not only, to lizard biologists but particularly to conservation biologists and behavioural ecologists.

## LITERATURE CITED

BURGHARDT, G.M. & A.S. RAND. 1982. Iguanas of the World: Their Behavior, Ecology, and Conservation. Noyes, Park Ridge, New Jersey.

### MARTIN J. WHITING

Animal, Plant and Environmental Sciences  
University of the Witwatersrand  
Private Bag 3  
Wits 2050  
South Africa

[martin@gecko.wits.ac.za](mailto:martin@gecko.wits.ac.za)

Received: 9 November 2005