

BOOK REVIEWS

Amphibians and Reptiles of Portugal, Madeira and the Azores-Archipelago. Malkmus, Rudolf (2004). Distribution and Natural History Notes. A.R.G. Gantner Verlag, Ruggell, Liechtenstein Pp. 448. ISBN 3-904144-89-8. Euros 80.00 (cloth).

The new book by Mr Rudolf Malkmus on the 'Amphibians and Reptiles of Portugal, Madeira and the Azores-Archipelago' brings to a splendid conclusion what is nothing less than a life's work. Malkmus relentlessly surveyed the amphibians and reptiles all over Portugal, over a period spanning nearly three decades, starting in 1976. This is one of the first national atlases of a continental European country to be published in the English language. Previous works by the same author on the Portuguese herpetofauna published in 1982 and 1995 are now superseded. In the first extensively illustrated chapter, the environment and landscape, climate and vegetation are described, followed by short accounts on the systematics, evolutionary history and palaeoherpetology of the Portuguese amphibians and reptiles. The natural history information is brief, but if more background information is required the reader may consult García-París *et al.* (2004) for amphibians. As before, the focus of presentation is on the distribution maps (17 for the amphibians and 31 for the reptiles). The maps make use of the 10×10 km UTM-grid system, with a 5×5 km scale representation of records, therewith doubling or tripling the information content of previous atlases (Malkmus, 1995; Godinho *et al.*, 1999), to over 15,000 observations. The information density is such that one may start to discover real distribution gaps, were previously such were mere interpretations (Ferrand de Almeida *et al.*, 2001). The reverse is also true; some ranges that appeared disconnected are now linked up (e.g. *Salamandra salamandra* and *Hyla meridionalis*). A word of caution is in place for the map projection over the UTM-grid that is not completely congruent to the earlier version. For example, the island of Berlenga, off the coast near Peniche, is currently situated at the bottom of UTM grid cell MD65 whereas it was positioned at the top of that grid cell previously (Malkmus, 1995). The consequences of this small inconsistency will hopefully be addressed in the production of the 'Atlas Nacional Herpetologia', a work undertaken by us in Porto at CIBIO and our colleagues at the University of Lisbon, under the administration and funding of the Portuguese Institute for Nature Conservation.

The printing and production of the hardbound volume is good. The book includes a large number of high quality colour photographs: about 80 full colour photographs of landscapes are well chosen and highly illustrative and nearly 200 attractive photographs of the species - about half of them made by the author - include the larvae of some amphibian species. What has not improved over the 1995 version is the referencing. I found a couple of flawed citations among the few that are in-

cluded in the main text. More importantly, most references are just listed at the end of the respective species chapters, which makes it difficult or impossible to know what statements stem from the personal knowledge of the author, or are derived from existing data. Finally, those who are familiar with the Portuguese situation know that the strong complaints about lack of care, outright neglect and wide-scale degradation of the landscape are by no means exaggerated.

This book is a must for anyone with an interest in the Iberian herpetofauna. The listed selling price of 80 euros is a fair price given the high quality production of the book. However, under the small margins for profit provided by the distributor and with the addition of shipping costs most bookshops will charge you around 110 euros.

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The Venomous Reptiles of the Western Hemisphere. Jonathan A. Campbell and William W. Lamar, with contributions by Edmund D. Brodie III, Edmund D. Brodie Jr., Ronald L. Gutberlet Jr., Michael B. Harvey, Robert Norris, David Warrell, and Vinícius Xavier Da Silva. (2004). Cornell University Press, Ithaca, New York, USA. Volume I: xviii+1476+28 pp. Volume II: xiv+477-870+28 pp. Hardcover. UK £86.95; US \$149.95. ISBN 0-8014-41-41-2 (cloth).

Of the many books published during the last few decades on venomous reptiles, perhaps none have been more widely acclaimed than *The Venomous Reptiles of Latin America*, by Jonathan Campbell and William Lamar (Cornell University Press, 1989). With its detailed coverage of all the dangerously harmful species known at the time from Latin America and the Caribbean, it was greeted with universal praise and is now regarded as something of a herpetological classic that

paved the way for many subsequent studies. This new book from Campbell and Lamar is essentially a revised and updated version of the first, but in covering a much broader geographical range – expanded to include the United States and Canada – it deals with a larger set of species (192), among them all of the rattlesnakes and an additional 14 species from Latin America described since 1989.

The Venomous Reptiles of the Western Hemisphere (hereafter VRWH) is published in two volumes, each of them strikingly presented with glossy dust jackets featuring magnificent photographs of a Langsdorff's coralsnake (Vol. 1) and Central American bushmaster (Vol. 2). Volume 1 opens with a contents page, list of tables, preface, and introductory section on the overall scope of the book, including a reasoned statement on species concepts and explanation of why the authors have chosen to adopt certain taxonomies but not others. As in the original Latin American opus (VRLA), there then follows a series of regional accounts with information on the occurrence of species in particular countries, including keys to their identification. For most countries the keys are given in both English and Spanish (or Portuguese for Brazil), but in several notable cases they are not. Why Canada and the United States for example are provided with Spanish versions but not Guatemala, Honduras, Costa Rica and some of the other traditionally Spanish-speaking countries is a little puzzling. Descriptive accounts of the major taxonomic groups are then provided, beginning with the venomous lizards, coral snakes, and sea snakes, and continuing in the first part of Volume 2 with the pitvipers. Each of these sections are complimented with keys in both English and Spanish (also Portuguese for the coral snakes and species of *Bothrops*) and include a list of generic synonyms, etymology, characteristics, and an extensive summary of natural history with detailed information on activity, behaviour, conservation, prey and feeding ecology, parasites, predators, venom, reproduction, and longevity. Accounts of the species themselves include synonyms, lists of vernacular names, etymology, distribution, habitat, detailed information on lepidosis and colour pattern, comparisons to similar species, and a final 'Remarks' section with comments relating mostly to taxonomy. The remaining part of Volume 2 is comprised of equally authoritative sections on venomous snake mimicry (by E.D. Brodie III and E.D. Brodie Jr.), evolutionary relationships (R.L. Gutberlet Jr. and M.B. Harvey), venom poisoning by North American reptiles (R. Norris) and the features and treatment of snakebites in Central and South America (D. Warrell). A Glossary, Literature Cited section, and Index (usefully repeated in Volume 1) complete the work.

Both volumes are lavishly illustrated with a combined total of 1500 colour photographs. Most of these are of the venomous species described or their harmless mimics, but there are also a considerable number (135) showing the consequences of snakebite. Some of the images in the latter category are by their nature grie-

somely explicit, but they serve an important purpose in illustrating just how variable and unpredictable the effects of snakebite can be, and are also a graphic reminder of the kinds of injuries that some of these animals are capable of inflicting. Medical practitioners will find them especially useful in comparing the symptomatic features of bites from different species. There are also 161 black and white photographs, 109 ink drawings, eight full-page colour maps of physiography, topography, and vegetation, and 113 completely revised distribution maps. All of the illustrations are of excellent quality.

Advances in venomous snake systematics have resulted in many changes over recent years, none more so than with regard to the neotropical pitvipers. Several new genera have been erected (e.g. *Atropoides* for the jumping vipers and *Cerrophidion* for some of the terrestrial montane species, both previously contained within *Porthidium*) and a number of taxa previously considered as subspecies have been elevated to full species rank (e.g. the cantil *Agkistrodon taylori* and bushmasters *Lachesis melanocephala*, *L. muta* and *L. stenophrys*). Numerous other forms have been subsumed within synonymy. All of these changes have been implemented in VRWH, and the authors themselves also recognise a number of additional forms, including a fourth species of bushmaster from eastern Panama, *Lachesis acrochorda*, and two new tropical rattlesnakes in the *Crotalus durissus* complex, *C. simus* and *C. totonacus*. A conservative approach has been adopted throughout the book concerning the recognition of subspecies, but there is no consistency in their treatment within the text. While a full account of salient characters are provided for the subspecies of certain forms, for example (e.g. *Micrurus dumerili*, *Crotalus oregnaus*), only the basic details of distribution are provided for others (e.g. *Micrurus diastema*, *Crotalus simus*). Since the appearance of VRLA our understanding of relationships among venomous snakes from the Americas has increased considerably, but it is clear from reading through the accounts in VRWH that for many, particularly the coral snakes, a considerable amount of work still remains to be done. For some of the pitviper groups the taxonomic arrangement followed in VRWH is also unlikely to be the last word on the subject, a case in point being the recognition of *Bothriopsis* as a genus distinct from *Bothrops*.

An outstanding feature of VRWH is the remarkable depth of coverage provided in the taxonomic accounts, which together make up over half of the total page complement (95–475 in Vol. 1 and 477–616 in Vol. 2). For some species they extend over more than five pages (e.g. *Bothrops asper*, *Crotalus durissus*). All of the information is supported by numerous references and the author's own research or extensive field experience. Having accumulated a large data set over the years during the course of herpetofaunal studies in Belize, I subjected the descriptions of the eight species of dangerously venomous snakes known from this country to particular scrutiny, and found them to contain no con-

flicting information. Some of the comments were also revealing, particularly the identity of a pitviper specimen from west–central Cayo (USNM 61781), on which has hinged the disputed occurrence in Belize of *Porthidium yucatanicum*, a species otherwise known only from the northern part of the Yucatan Peninsula. Since its first citation by Schmidt (1941), USNM 61781 has been variously attributed to *Porthidium nasutum* and *P. yucatanicum*, but on the basis of its seven enlarged supralabials and the presence of a lacunolabial is, according to Campbell and Lamar, a misrepresented example of *Bothrops asper*. Of the genus *Micrurus* in Belize, the authors remark on the spurious distinction between *M. hippocrepis* and *M. diastema*, stating “were it not for the report by Gutiérrez *et al.* (1988) of differences in chromosomal morphology we would be inclined to consider them conspecific” (page 172). In respect of this it is interesting to note that the study by Gutiérrez *et al.* was restricted to material of *diastema* from Guatemala and did not include examples from near the range of *hippocrepis* in Belize, where specimens exhibit an intermediate (or at least similar) condition in having a reduced number of black bands (14–20 on body and 5–8 on tail) with little or no dark pigment on the red dorsal scales (pers. data). Notwithstanding the similarities noted by Gutiérrez *et al.* between *M. d. sapperi* and *M. d. apiatus*, it also seems reasonable to wonder if the various component populations of ‘*diastema*’ are as different from each other in karyotype as they are from *hippocrepis*. The authors’ inferred suspicion that *hippocrepis* may represent nothing more than another localised variant of *diastema* may well turn out to be true, but whatever its status the entire species group is clearly in need of further investigation and should benefit greatly from phylogenetic analysis using molecular data (currently in hand at the University of Texas, Arlington). The distribution of ‘*hippocrepis*’ in Belize appears to be restricted to the eastern versant of the Maya Mountains, not extending west of the divide as suggested by the map in VRWH; a possible example from Mountain Pine Ridge on the western side (MPM 7679), cited in Stafford (2000:81), has the usual low number of black body bands (11) but is somewhat anomalous in also having irregular black spotting on the red dorsal scales, and may instead represent an aberrant *diastema*. A further minor inaccuracy was detected also in the regional account of Belize, where the highest point is given as Victoria Peak (1122 m), but is in fact a little known ridge in the south of the country informally known as ‘Doyle’s Delight’ (1160 m).

As the largest and most exhaustive treatment of the subject available, VRWH is an essential reference for anyone involved in research on venomous reptiles of the Americas, or animals of medical importance in general. It deserves the highest recommendation and will almost certainly achieve the exalted status of its predecessor. Professional academics needing a comprehensive and up-to-date reference on the species of this region will find it especially useful, but with its

detailed information on natural history and snakebite it will undoubtedly appeal to many other potential users, from clinicians and field biologists to ecotourists and snake keeping enthusiasts. It is not without the occasional inaccuracy, but given its ambitious size and scope these are all relatively trivial and of little consequence. To everyone involved in the production of VRWH congratulations are in order for a phenomenal achievement.

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Incubation of Reptile Eggs. Gunther Köhler (Original German edition 1997, English edition 2005). Translated by Valerie Haecky. Krieger Publishing Company, Malabar, Florida, USA, 214 pp. ISBN 1-57524-193-5 US\$38.50 (cloth).

Eight years after his original German edition, Gunther Köhler has updated this book on incubation of reptile eggs and there has been an English translation by Valerie Haecky. This, and the American publisher, undoubtedly brings this work to a much wider audience. The result is an attractive hardback book that can be broadly split into three parts. The text is illustrated throughout with lots of colour photographs as well as half-tone photographs and line drawings.

The first part deals describes the biology of incubation of reptile eggs in both the natural situation and under artificial conditions. Hence, after a brief introduction there are chapters on egg morphology, egg development prior to laying and development of embryos up to and including hatching. A chapter is devoted to the “Physiological foundations of reptilian incubation”, i.e. temperature, humidity, gas exchange, egg movement and defence mechanisms against microbes. Unfortunately, some this information – particularly for the last category – is lifted directly from that we know for birds and is not applicable to reptile eggs. Not that you would think this from reading the text, which rather misleads the uninitiated. A chapter then deals with natural nests and incubation. The remaining chapters in this

part of the book deal with maintenance of breeding reptiles in captivity and techniques for artificial incubation. There is a useful section on the various methods for building incubators, which will appeal to the hobbyist and researcher alike. Finally, various problems associated with development and incubation are discussed.

The second part is a series of descriptions of the specific incubation conditions for various types of reptiles as contributed by a variety of authors. These tend to be rather brief, partially through necessity given our general lack of understanding of reproduction in many species, but mainly because there are often no special conditions for specific reptile types. The resulting text is not very enlightening although it does tend to highlight specific scientific references for each type of reptile.

The last section, which forms a whole third of the page count, consists of three Appendices. The first is a brief and incomplete table on the effect of incubation temperature on sex determination in reptiles. We know so much more than what is presented – nowhere in the book does Köhler state that to date no snakes exhibit temperature-dependent sex determination. The second table gives details of the pattern of weight change for a small number of species. Again, so much more is known on this topic than is presented. The final table runs for around 50 pages and gives species accounts for clutch size, incubation temperatures and duration, together with the appropriate references. Unfortunately, this table has not been carefully prepared and checked in production so errors are common. For many species the information is limited to clutch size. As a result I find it hard to understand why this table is included. As a researcher I will find the list of references useful but the

data included in these Appendices would have been better presented by some kind of analysis that provided a general description of the incubation conditions for a particular family.

My initial impression of the book was quite favourable but reading it through I became uneasy about the content. The data presented seemed to be patchy in detail and accuracy, and at times there seemed to be a lot of emphasis on data presented from a review book published back in 1991 despite the wealth of information that has been collected since then. Köhler has made little attempt to bring together all of the available data and summarise it in a meaningful way. There is too much emphasis on presenting information without much explanation of what it means.

The target audience is probably the amateur herpetologist keeping and breeding pet reptiles but I feel the errors and the omissions in the text mean that this was a lost opportunity to bring good scientific understanding to a wider audience. If the book is aimed at the professional herpetologist then it fails to deliver a coherent review of available knowledge. People like myself are forced to revert to the original source references to ensure that the data are presented correctly. I am forced to conclude that whilst *Incubation of Reptile Eggs* is an attractive book and its main appeal is to those people breeding reptiles as a hobby, it could have been a lot better.

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