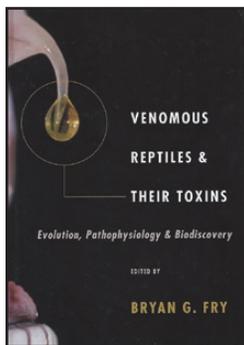


BOOK REVIEWS

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Venomous Reptiles & Their Toxins. Evolution, Pathophysiology & Biodiscovery

Bryan G. Fry (ed.). 2015. Oxford University Press, New York, New York (<https://global.oup.com>). 546 pp. 89 illustrations. Hardcover. US \$125. ISBN 978-0-19-930939-9.



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In the last 48 years, there have been numerous books on animal toxins of arthropods, marine organisms, amphibians and reptiles, particularly snakes (Russell and Saunders 1967; Bücherl et al. 1968; Thomas 1973; Ownby and Odell 1989; Tu 1991; Bailey 1998; Chippaux 2006; Mackessy 2010). The first books on venom toxins had an assortment of spider, snail cones, lizards and snakes (Russell and Saunders 1967; Bücherl et al. 1968; Tu 1977; Rosenberg 1978), but by far, snake toxins seem to have taken the center stage in the books that have been published in the last 25 years (Stocker 1990; Harvey 1991; Bailey 1998; Chippaux 2006; Kini et al. 2010; Mackessy 2010; Fry 2015). Their popularity is because snakebites are the most serious of envenomations regarding morbidity and mortality, which is due to the large volume of venom delivered by snakes as well as the numerous classes of toxin molecules present in their venom. Different families and sub-families of snakes produce venoms that differ in their major toxicological properties. Most snake venoms are complex mixtures of numerous protein and polypeptide toxins; however, the major proteins and polypeptide toxins in snake venoms belong to about 12 major molecular families. These toxin families include several classes of enzymes such as serine proteinases, metalloproteinases, phospholipases A₂, hyaluronidase, and L-amino acid oxidases. Venom also contains numerous bioactive polypeptides that lack enzymatic activity, such as the three-finger toxins, myotoxins (crotonamine), disintegrins, C-type lectins, CRiSPs (cysteine-rich secretory proteins), growth factors, and protease inhibitors such as cystatin and Kunitz-type protease inhibitors. Each of these classes of toxins has evolved by gene duplication events from host gene families, so each class has unique structural features. Individual toxins that belong to a class are usually highly homologous with one another, even though they are completely different structurally from toxins that belong to a different class.

Venomous Reptiles & Their Toxins—Evolution, Pathophysiology & Biodiscovery covers most of these abovementioned toxins along with their evolutionary concepts, some in dedicated chapters, whereas others are only mentioned briefly. The 546-page, 7 x 10.25", 1.3-kg book, edited by Bryan G. Fry and co-author of all 25 chapters, is one to include in your collection of toxin handbook references. The price is quite reasonable and comparable to similar books; however, I was surprised that the cover of the book was somewhat bland, not matching the editor's extrovert personality!

Most books on snake venoms include "typical" chapters dealing with the history of snakes, classification and distribution of snakes throughout the world, venom glands, snake envenomation treatments, manufacture of snake antivenoms, symptomatology and pathology of snakebites, followed by the "most popular" toxins, i.e., metalloproteinases, serine proteinases, PLA₂, disintegrins, C-type lectins, cysteine rich secretory proteins (CRiSPs), L-amino acid oxidases, sarafotoxins, three-finger toxins, hyaluronidases, myotoxins and Kunitz peptides. This book includes a range of topics, from the evolution of snakes, glands, fangs and toxins to reptile husbandry; thus, both herpetologists and toxinologists will appreciate it. As a toxin-oriented evolutionary biologist, it is not surprising that Fry's first chapter deals with the origin and evolution of the toxicofera reptile venom system, bringing in the contentious debates (Weinstein et al. 2010) of the definition of "venomous," and whether venom originated only once in the course of reptilian evolution. The book includes new chapters not found in other "venom toxin" books, such as "Maintaining Venomous Reptile Collections: Protocols and Occupational Safety," "Lesser-Known or Putative Reptile Toxins," and "Ineffective Traditional and Modern Techniques for the Treatment of Snakebites"—thank you for that last mentioned chapter! Although readers will not see a chapter on disintegrins (probably because it has been part of most books over the last 20 years), Fry covers the lesser explored toxins not generally discussed in other venom toxin books, such as exendin peptides and B-type and C-type natriuretics peptides found in anguimorph lizard venoms. In addition, the book includes a chapter on "poisonous" snakes and the Komodo Dragon's "weaponized bacteria." This last chapter explains the nuchal gland of the poisonous snakes in the genus *Rhabdophis* and debunks the "weaponized bacteria" hypothesis proposed 30 years ago.

I particularly appreciated the chapter entitled "Research Methods" where the methods of purification, characterization, bioassays and bioinformatics, among other techniques, are covered. Approximately five decades ago, venoms were studied primarily in their crude forms with some fractionation carried out with ammonium precipitation and an occasional size exclusion and ion-exchange chromatography. By the early 1980s, only a little more than 100 snake toxins had been purified and sequenced, and the mode of action for only a few had been elucidated. It

has been about 25 years since the last snake toxin book to come across my desk has covered "Research Methods," and at that time it was focused solely on protein purification (Hider et al. 1991). The advancement of venom research and technology, particularly molecular technologies, has catapulted our knowledge of venoms immensely within this time period.

The book further includes the tables (1.1–1.4), previously published by Fry in 2005, on the origin, bioactivity, and basal and derived toxicity of venom proteins, as well as a table (1.5) with novel venom gland secreted proteins that remain to be characterized. Although methods for determining lethal dose 50 (LD_{50}) were included in *Snake Venoms & Envenomation* (Chippaux 2006), it would have been nice to see a chapter dedicated to this topic in Fry's book, including effective dose 50 (ED_{50}) for antivenoms. Furthermore, a comprehensive table of the LD_{50} s available for the species of venomous reptiles to date would have been noteworthy. Perhaps we can expect to see such a chapter in the second edition. The book includes a five page glossary of scientific terms as well as terms used by collectors of venomous animals. Looking through similar books dating back to the late 1960s, a glossary has never before been included. It is an excellent addition, and should be a standard for similar publications in the future. The book also includes a comprehensive collection of colorful plates displaying molecular modeling, an array of evolutionary trees, toxin action illustrations, magnetic resonance images of lizard and snake glands, recently discovered species, and snakebites and veterinary techniques, among others.

If you are a herpetologist and/or toxinologist or are naturally curious about the world of venom toxins and the animals that possess them, this is a handy book to have on your shelf.

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Asian Pitvipers: Breeding Experience & Wildlife

Dick Visser. 2015. Edition Chimaira, Frankfurt am Main (www.chimaira.de). 571 pp., 647 color photos, 4 black-and-white photos, 34 color drawings, 27 line drawings, 25 diagrams, 2 tables and 81 distribution maps. Hardcover. US \$116. ISBN 978-89973-450-8.

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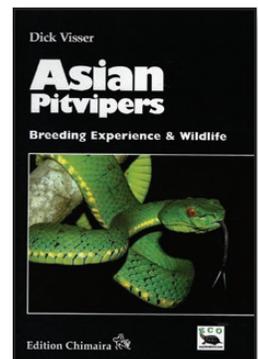
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Dick Visser was one of the first Europeans to breed Asian pitvipers successfully, according to the description on the back cover of the book. This book is then a distillation of his personal experience in breeding some of the 79 species included in this book, a good proportion of the 96 species listed in the up-to-date (as of 1 Sept 2015) checklist in the appendix. Not being involved in the captive breeding or hobbyist world myself, preferring to encounter the animals in the wild, I had not come across his name previously, but I found myself being rapidly engaged by the personal account of his journey into the fascinating world of pitvipers that comprises the Introduction.

Translated from his native Dutch, it is somewhat idiosyncratic in places, but none the worse for that. A bit of Googling might not have gone amiss, however, as some of the names mentioned in the account of his travels through India are misspelled; Hasaribach should be Hazaribagh, Nilgeri should be Nilgiri, Tiruchiapalli should be Tiruchirappalli. This laxness with translation of place names continues throughout the book, and the occasional word is mistranslated (e.g., one does not tear down one's greenhouse with much grievance but rather with much grieving). There are also some inconsistencies in the scientific names used in the Introduction and the main part of the book (e.g., both *Trimeresurus mucrosquamatus* and *Protobothrops mucrosquamatus*). The last part of the Introduction caught my attention in particular, however, as it contains a critique of the darker side of the hobbyist's enthusiasm for rare and hard-to-obtain species,

which sometimes turns a blind eye to the fact that the source of the animals may be dubiously legal. It is good to see an expert hobbyist being so open about the danger of creating an unregulated market for rare species, something that has driven many turtle species in Asia to the brink of extinction (van Dijk et al. 2000), and for some, perhaps beyond. As none of the Asian pitvipers (apart from *Protobothrops mangshanensis*, see below) are currently regulated by CITES, it is difficult to take an overview of the numbers being traded (Auliya 2003). Promoting breeding in captivity, once they have reached the West, will take the pressure off wild populations, but can equally be used as justification for turning a blind eye to what appears on traders' lists or what comes home in a tourist's suitcase.

The first part of the book is a section on the author's experience of how best to keep Asian pitvipers in captivity. As he frequently stresses, this is a personal preference and there may well be other ways to do it. There is heavy emphasis on safety and minimizing contact with the snakes, which seems entirely appropriate (if somewhat weakened by his constant description of Asian pitvipers as extremely lethargic during the day, which may lull keepers into a false sense of security). The automation of the systems also seems very sensible unless you want to be tied to your collection constantly. The instructions on how to furnish the terrariums, both for terrestrial and arboreal species, reveal artistry and attention to detail that is very inspiring. I have never seen the attraction of keeping snakes in racks of plastic boxes, although that may well be the most efficient means of keeping large numbers of specimens where the situation demands it, as when snakes are being kept for venom collection rather than for the joy of owning them. There are also brief sections on "venomousness" (toxicity) and nomenclature, taxonomy and systematics, although I wonder if they are necessary as this book is not aimed at beginners. Other sections cover feeding, the size of the ideal prey animal, the art of feeding neonates (which turns out to involve a great deal of patience and time), and how to administer medication (the latter accompanied by a series of informative photographs). Details of how to balance humidity management with proper ventilation of the terrarium, light levels for the needs of plants and snakes, how to manage mating and hibernation, are all very valuable and will be of interest to anyone starting out in keeping these species. If the book consisted of this section alone, I would have no hesitation whatsoever in recommending this book (assuming that it also cost somewhat less than 50% of its list price).

This first and extremely informative section of the book takes up a mere 83 pages, however, while the bulk of the book (another 460 pages) consists of species accounts. Beautifully illustrated as they are, they seem to largely repeat information from books that pitviper aficionados are already likely to have on their shelves, namely *Asian Pitvipers* (Gumprecht et al. 2004), and *Venomous Snakes of Asia* (Vogel 2006). An appendix by David and Vogel at the back of the book, giving an updated checklist of Asian pitvipers (as of September 2015), is a useful addition but hardly a reason to buy the book, given that such checklists are usually out of date as soon as they are printed.

The headings in the species accounts are: English name, Etymology, Habitat, Maximum size, Conservation status, My own experience, and Notes. Some accounts also have sections headed Adult length, General appearance, Habits, and Prey. Unfortunately, this sounds more informative than it often is. Conservation Status is almost invariably the same: "species XX is not included in IUCN lists and there are no CITES trade

restrictions." While this may be true, it is not particularly useful and I wonder why it is worth including in every single account. For the few species that do have a category listing on the IUCN Red lists, the information provided in the book is out of date, relying on v. 2.3 published in 1994, whereas the most recent version (v. 3.1) was published in 2012. Thus, for example, *Protobothrops sieversorum* is described in the book as "Data Deficient," whereas in fact it is currently listed as "Endangered, as it has an extent of occurrence less than 5000 km², is known from only two locations defined by a threat from logging and agriculture, and there is a continuing decline in the quality and extent of its forest habitat" (<http://www.iucnredlist.org/details/178708/0>). Similarly, *Trimeresurus (Cryptelyrops) honsonensis* is described as not being included in the IUCN lists, whereas in fact it is listed as "Vulnerable, on the basis that this species is endemic to a very small island, having an extent of occurrence of only 22 km², and there is a plausible future risk to this population from commercial collection for the international pet trade, which has the potential to rapidly drive this species to Critically Endangered or Extinct, as the snake's island home would represent a single location defined by a threat from overharvesting" (<http://www.iucnredlist.org/details/192001/0>). In this case, however, the Notes section at least contains a similar warning based on the species description (Grismer et al. 2008). An even more glaring error is the lack of recognition for the recent addition of the Mangshan Pitviper to Appendix II of CITES in 2013, the only species of pitviper to be so listed. Moreover, the species is here listed under *Zhaoermia*, although it was placed in *Protobothrops* by Guo et al. (2007) at the same time as *Triceratolepidophis sieversorum*, which is correctly listed. This information is easily and openly accessible on the internet, and the lack of incorporation of the latest available information into this book, published in 2015, is a shame.

The most useful sections in the context of this book are the sections headed "My own experience" and the "Notes," which are extensive in the case of some species. Where the author lacks personal experience, the subsequent Note section summarizes information available from other breeders and from the literature. There is information here that is valuable to the scientist, who rarely gets to see their study animals behaving naturally, as well as the breeder. I was fascinated to read, for example, that the eggshells of the Malayan pitviper, *Calloselasma rhodostoma*, are very thin. The reversibility of viviparity is a subject that has received a considerable amount of attention in squamates in general (Pyron and Burbrink 2014), and pitvipers in particular (Lynch 2009; Fenwick et al. 2012), and the ability to distinguish subtle shifts in one direction or the other along a continuum, rather than a broad-brush polarization into egg-laying or live-bearing, depends on observations like this one. In other cases, however, I question the reliability of the descriptions because of the constantly changing taxonomy and rampant confusion of names in the captive trade, and subsequent doubt about to which species they actually refer. Thus, for example, the entry for *Ovophis okinavensis* reads "like its congeners, this species produces eggs with thin, transparent shells, which hatch within a few days." However, it is fairly well accepted now that this species is not closely related to other species of *Ovophis* and may not belong in that genus at all. Its closest relative is a species formerly but equally erroneously placed in *Trimeresurus*, *T. gracilis*, which is viviparous (although this is not mentioned in this account). Moreover, when I searched the species accounts of other species of *Ovophis*, no mention was made of thin-shelled eggs.

The value of the individual species accounts is therefore mixed. It might be argued that by providing information on species' habitats and environment, the keeper might be spared having to do any of their own research should they happen to acquire any of the species included. The trouble is, that for many of the species, this does not seem likely to happen (legally, at any rate). Many countries, such as India and Vietnam, prohibit the collection, trade, and export of either all or specific species. In fact, many of the species share similar requirements, and it might have been more useful therefore to combine these into single chapters covering, for example, green arboreal species (such as the White-lipped Pitviper, the Large-eyed Pitviper, Medo's and Gumprecht's pitvipers, the Indian Bamboo Pitviper and Pope's Pitviper and its relatives), with others dealing with the terrestrial, moisture-loving species (such as the Malayan Pitviper and the mountain pitvipers), and the terrestrial/semi-arboreal *Protobothrops* species. It certainly seems unnecessary to deal with three doubtful (Guo et al. 2009) subspecies of *Protobothrops jerdonii* separately, claiming no knowledge of two of them, yet with copious information on the third. This condensation of pertinent information and a reduction in the huge number of photographs in the species accounts may have made the book more digestible and user-friendly in content, and a little more reasonable in price. This book seems unable to make up its mind about its intended audience, being half hobbyists' manual and half coffee-table book. Ultimately, it is a little too expensive for the first, and a little too idiosyncratic and unauthoritative for the latter.

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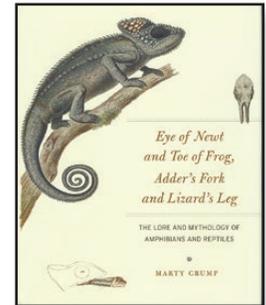
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Eye of Newt and Toe of Frog, Adder's Fork and Lizard's Leg, the Lore and Mythology of Amphibians and Reptiles

Marty Crump. 2015. University of Chicago Press, Chicago (www.press.uchicago.edu). 304 pp., 155 color plates, 1 table. Hardcover. US \$35. ISBN 9780226116006.

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Marty Crump's latest book took me on a marvelous journey, stirring memories and imagination and reminding me of what kindled my own interest in herpetology as an undergraduate at Auburn decades ago. Marty is one of a handful of exceptional story-tellers from whom I learned about amphibians and reptiles. The first was Bob Mount, who made me realize that snakes and toads held more fascination than the fuzzy mammals that first attracted me to the study of biology. The second was Archie Carr, whose peerless writing and teaching style remain an inspiration. Marty was my warm and wonderful graduate mentor at the University of Florida, and she had her own unique story-telling style, imparting information about her amphibian subjects in a way that compelled us to want to learn more. The myths and folklore surrounding amphibians and reptiles have held a fascination for Marty from her undergraduate days at the University of Kansas, and fifty years later she still has handwritten notes gleaned from her early exploration of that material. In the interim, she maintained her interest in herpetological folklore, and continued to explore the subject even as she pursued her academic career and travelled the world in pursuit of knowledge about living amphibians. *Eye of Newt and Toe of Frog* is a compilation of stories, ancient and contemporary, resulting from decades of investigation into the story-telling tradition surrounding creatures often loathed and feared. Such stories, which as Marty writes (p. 17), “plant seeds that encourage reflection,” are organized into chapters that place them in cultural contexts. The folklore is fascinating on its own, but is examined as to its possible influence on human attitudes toward amphibians and reptiles and their resulting treatment in various cultures. Of course the predominant human responses to snakes and other herpetofauna have long been fear and revulsion, and the folklore and biology behind these reactions underlie many of the book's entries. Toads, for example, are said variously to be witches in disguise, have breath that can cause children to convulse, and to poison water. Yet the utility of the same animals in medical practice, sexual potions, and magic are touted around the world, as are their roles in a variety of creation myths. Many of these myths are thousands of years old and have even inspired the naming of constellations (Bell 2005). It is fascinating to find that reptiles and amphibians loom large even in more recently developed human beliefs, and the book incorporates contemporary accounts such as David Icke's conspiracy theory that politicians are (literally and not metaphorically) reptiles in human form.

Marty applies her broad knowledge of the science behind the

stories and her own experiences—her mother valiantly attempted to instill a fear of snakes in her—giving the book a multilayered appeal. She does an excellent job of examining the roots of some of the myths by revealing the biological background (spadefoot toad populations boom quickly after torrential rains) related to the folklore (frogs arise from mud, frogs symbolize rebirth). Thus, the chapter titled “A Second Chance: Frogs, Snakes and Rebirth,” delves into folk stories such as those regaling the regenerative and rejuvenating powers of snakes. This chapter, as is the case throughout the book, is enriched by images from both folklore, e.g., artwork depicting the Chinese legend of a frog bestowing the gift of immortality, and from nature, e.g., a photo of a shedding snake, long a symbol of renewal. In *Eye of Newt and Toe of Frog*, the layout intrigues the reader visually with integrated images of folk art, craft items, and even entrées created from reptiles and amphibians. Animal images in art and illustrations are useful indicators of human attitudes toward their subjects, and the changes in the types and use of images of reptiles and amphibians provide a crude barometer for understanding how they were perceived at various points in Western history (Etheridge 2007). In this book, there are numerous arresting photos of live reptiles and amphibians, such as that picturing a glistening Darwin's Frog, and illustrative artwork is used to enhance a point when a photo will not suffice. The change in font type and intensity chosen by the book designer for figure captions seems to me an aesthetic mistake; the caption font is difficult to read in all but bright light, but that is a small quibble.

Throughout the book Marty relates folklore tales to human attitudes by reference to a quadrant system developed by James Serpell. His model examines human feelings about animals using a scale of utility from detrimental to beneficial and an intersecting scale of affect. The latter scale ranges from love, sympathy, and close identification (think baby or puppy) to the opposing responses of fear, loathing, and lack of identification (Serpell 2004). As Marty points out in various places in the book, many cultural factors including traditional folklore must be considered in applying this model. She emphasizes that there are individual differences in perceptions as well, such as age or knowledge about the animals in question. But the perception of societies rather than individuals is what underlies much of her interest, and Marty closes the book with a chapter that reflects on the influence of folklore on attitudes and the implications for conservation efforts. Protecting a threatened species is certainly more challenging when the creature to be conserved does not evoke sympathy or kinship, but instead is seen as detrimental, dangerous, or as in the case of the Ball Python (*Python regius*), unholy. Marty writes (p. 277) that people of the Edo State of western Nigeria kill Ball Pythons but hold Rock Pythons (*Python sebae*) to be holy and therefore treat them differently.

Eye of Newt and Toe of Frog is an entertaining and informative read, and will provide food for thought, particularly for those working in the areas of conservation, behavior, and anthropology. The stories and the background science as written are accessible for a broad audience. The material on folklore would make for lively insertions into biology, art, or writing courses, but will also be of interest to herpetologists curious about human perceptions of their study animals. We each know our subjects from a unique perspective, but particularly when working in the field, could perhaps benefit from an understanding of their storied history and status in their own land. The example of the Tuatara and its cultural importance to the Maori is offered, and as Marty writes (p. 279), the Maori elders desired to protect the Tuatara,

which they viewed as divine guardians, but felt no need to understand them “from a scientific perspective.”

This book was clearly a personal project for Marty. She recounts fieldwork that led to parasitic infections and her response to being met with open incredulity that a woman would handle venomous snakes. The book ends with a wistful story about a gift of spadefoot tadpoles Archie Carr personally delivered to celebrate the birth of Marty's daughter with a hope for repopulation of the species, which had all but disappeared from the habitat around her Florida home. The interwoven personal narrative makes the book all the more absorbing, because her chronicle is yet another story—that of a herpetologist on a journey through a world simultaneously corporeal and imagined.

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The Reptiles and Amphibians of the Dutch Caribbean: Saba, St. Eustatius, and St. Maarten. Second edition, revised and expanded

Robert Powell, Robert W. Henderson, and John S. Parmerlee, Jr. 2015. Dutch Caribbean Nature Alliance (DCNA), Bonaire, Dutch Caribbean (<http://www.dcnanature.org/>). 343 pp. Softcover. US \$20.00 in the three Park Head Offices, Dutch Caribbean; US \$40.00 (inclusive of shipping) from Info@dcnanature.org. ISBN 978-99904-1-842-2.

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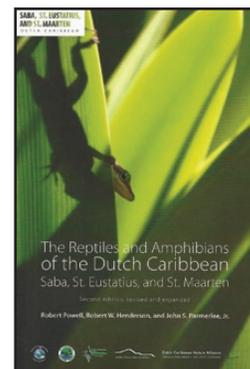
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The first edition of this book (Powell et al. 2005) was almost unusable, due to the shiny heavily-treated paper sticking together firmly, at least in the Caribbean climate. The second edition is a great improvement in production quality, and will be essential for all herpetological (and hopefully other naturalist) visitors to the Dutch Caribbean, where it is available at a very reasonable price. The authors are well known for their work on Caribbean herpetofaunas over decades, with hundreds of papers and articles and several large works, including Henderson and Powell's *Natural History of West Indian Reptiles and Amphibians* (2009). The present work on the Dutch Caribbean is a completely different type of book, a pocket-sized (18 x 12 cm) general introduction and field guide, now number 4 in the DCNA series on the biodiversity of these small islands.



Being part of a series may explain a discrepancy in the title, which is given as above on the cover, but with a different island order in the recommended citation details (and in the first edition).

The Dutch Caribbean comprises the Lesser Antilles islands of Saba (13 km²), St. Eustatius (20 km²), and St. Maarten (85 km² together with the French half of the island, St. Martin; it is the smallest land mass supporting two nations). The southern Dutch “ABC” islands of Aruba, Bonaire, and Curacao (which already have their own herpetofauna guidebook; van Buurt 2004) are continental islands, now independent of The Netherlands. The Lesser Antilles islands are oceanic, Saba and St. Eustatius being younger volcanic inner-arc islands, and St. Maarten an older, lower, and more eroded, limestone-capped, outer-arc island. Saba and St. Eustatius have more rainfall and more variable habitats due to their elevation; indeed Saba has the highest peak in the entire Kingdom of the Netherlands, at 877 m. The first hundred-odd pages of the book describe the history, ecology, and conservation of these islands, the ecology of amphibians and reptiles, and local beliefs and stories about them. This section includes tables of the distribution and status of the herpetofauna, which includes four amphibians (all introduced), 24 land reptiles (four endemic and six introduced), and four sea turtles. In addition there are five waif snake species (the Corn Snake and four boids), and the vagrant Loggerhead Sea Turtle.

The bulk of the book consists of the family (1–4 pages each) and species (4–10 pages each) accounts. The species accounts include scientific name (and derivation, sometimes notable—see *Anolis pogus*), a brief non-technical description (no scalation details are given), distribution within the Dutch Caribbean, origin (including global distribution), habitat, food, predators, reproduction, behavior, and conservation status. This larger section of the book is not designed to be read as a whole—many parts are (literally) generic, repeated from one species to the next. Nevertheless, it is not too dry; for example, the recently introduced *Anolis sagrei*, restricted to the cruise ship terminal on St. Maarten, is described as having “not yet cleared immigration.” Each account is headed with a “tile” summarizing the island occurrence, with more details in the distribution section, but no range maps. The waif and vagrant species are discussed more briefly in a final eight-page section. The book ends with a bibliography of about 300 items dated to 2013 (not individually referred to in the text), a list of taxonomic authorities for all species described, a glossary of about 150 semi-technical terms (from active dispersal, through larva and plastron, to Windward Islands), and an index to common and scientific names.

There are many excellent photographs, 307 numbered plus a few others. About half of them are very small (43 mm wide, side-by-side on the page); although they are clear enough, this is the only point in which the first edition was better, with its larger page size (23 x 15 cm)—if those pages could be opened. Habitat and species photographs in the general sections are referred to by number in the species accounts, which is often useful; for example, the Red-bellied Racer account lists 17 figures, 12 of which are in other sections. The authors and the DCNA are to be congratulated on bringing out a new and greatly improved edition of this work, which will be required by all interested visitors to the islands, even if they already have the first edition. Nevertheless, herpetologists not able to get there will find little not already available in the *Natural History of West Indian Reptiles and Amphibians*, apart from the photographs and brief local conservation details. It is a book to be bought for, and used in, the field rather than the library.

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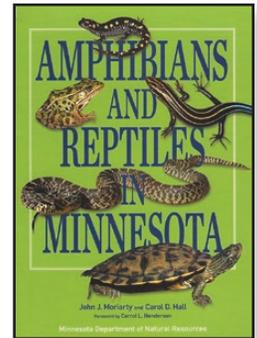
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Amphibians and Reptiles in Minnesota

John J. Moriarty and Carol D. Hall. 2014. University of Minnesota Press, Minneapolis, Minnesota (www.upress.umn.edu). xii + 372 pp. Softcover. US \$39.95. ISBN 978-0-8166-9091-6.

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In spite of its prevailing climactic conditions, Minnesota is inhabited by a surprisingly diverse herpetofauna, with 52 native and one introduced species. While a handful of these species, such as the American Toad, Painted Turtle, and Common Gartersnake, are familiar sights to all who have spent any amount of time outdoors in most parts of North America, many more, due to their cryptic natures or rarity, are not. In many cases, the amphibian and reptile rarities of Minnesota are species surviving at the extreme northwestern edge of a broader “Eastern U.S.” range. As a result, these species’ natural history within the state may differ from what is considered typical. For example, in Minnesota the Common Five-lined Skink is nearly exclusively associated with rock outcrops, rather than fallen timber in woodlands. Describing these sorts of local differences from the norm and providing other regionally-relevant information such as seasonal activity periods or the local prevalence of color phases in polytypic species are where a standard “state herpetology” treatment really comes into its own.

For Minnesota, there already exist several available published resources that provide some of these data, including a small pocket guide (Tekiel 2003), a popular guide (Sheldon 2006), and government-produced pamphlets (e.g., Parmelee et al. 2002; Christoffel et al. 2010). These are all fine resources, but due to limitations of size, scope, or intended audience, do not fill the role of Minnesota’s standard herpetology text. Instead, for the past 20 years the definitive state text has been Oldfield and Moriarty’s *Amphibians and Reptiles Native to Minnesota* (1994) that itself was a similarly formatted replacement for the out-of-print but still useful *Reptiles and Amphibians of Minnesota* (Breckenridge 1944). Now, John Moriarty and Carol Hall have authored *Amphibians and Reptiles in Minnesota*, which will undoubtedly be the go-to Minnesota herpetological reference for

the foreseeable future. The authors are both excellent candidates to pen an updated comprehensive herpetology of Minnesota. Each has extensive field experience with Minnesota's amphibians and reptiles, Moriarty as a wildlife manager and Hall as herpetologist for the Minnesota Biological Survey. Moriarty has also maintained and periodically updated a bibliography of Minnesota herpetology (Moriarty and Jones 1988; Moriarty 2004; Moriarty 2007), giving him a unique perspective on the development of Minnesota-specific herpetological research.

The similar title and partially overlapping authorship between this book and *Amphibians and Reptiles Native to Minnesota* (Oldfield and Moriarty 1994) should clue in readers that *Amphibians and Reptiles in Minnesota* is not an entirely new work. In reality, the new book is a revised edition of Oldfield and Moriarty; the content is very similar, and a rough estimate of about 80% of the text first appeared in the 1994 volume. The subtle change in title reflects the fact that the single established exotic species of Minnesota reptile is now included. Given the relative stasis in the book text itself, the change in authorship is a bit curious, but this is described in the Preface as being precipitated by former co-author Barney Oldfield's move to New Mexico, away from Minnesota herpetology; fortunately, some of his more striking photographic contributions have been maintained in the new volume.

Some states have gone many decades between comprehensive statewide herpetological treatments, while others, including neighboring North Dakota, still have none. So what has changed in Minnesota herpetology since 1994 to necessitate an updated volume? A surprising amount, it turns out. Taxonomic changes are of course reflected in updated names, both scientific and common, which follow Crother (2012). Determination that Tiger Salamanders form a multi-species complex has resulted in the inclusion of one additional species; both *Ambystoma marvortium* and *A. tigrinum* occur within Minnesota borders. Perhaps more surprisingly, two additional species of amphibians and a reptile have been documented as native to the state: the Spotted Salamander (*Ambystoma maculatum*), Four-toed Salamander (*Hemidactylium scutatum*), and Common Musk Turtle (*Stenotherus odoratus*). These two salamanders have proven to be relatively widespread in Minnesota, with each now documented in multiple counties (Hall and Carlson 2004). In contrast, documentation for the musk turtle is apparently limited to only two individuals recovered from a single trap (LeClere 2010), suggesting their status as a Minnesota native may not yet be established. In addition, the Pond Slider (*Trachemys scripta*) has become Minnesota's first established exotic reptile species, bringing the total number of new species treated in the book to five. Much of the documentation for these new species is the result of the work of the Minnesota Biological Survey (MBS). For the many species already known to occur in Minnesota, the MBS has also been responsible for providing much better documentation of range extent. These are reflected in the range maps provided in *Amphibians and Reptiles in Minnesota*, which depict the existence of county-level records for each species and have many fewer gaps than were present in Oldfield and Moriarty (1994).

The overall structure of *Amphibians and Reptiles in Minnesota* is akin to that of most regional or state guides; the main text is divided between a shorter introductory section and a longer series of species accounts. Preceding the introduction are a short foreword as well as a combined preface/acknowledgments. It is unfortunate that the foreword to this edition could not be contributed by the late herpetologist/ornithologist Walter

Breckenridge, who was perhaps the foremost 20th century Minnesota naturalist, former longtime director of the Bell Museum of Natural History, and author of Minnesota's first comprehensive herpetological work. Instead, Carrol Henderson, supervisor of the Minnesota Department of Natural Resources nongame wildlife program, is an able replacement and in his foreword he touches on both why Minnesota's amphibians and reptiles are interesting and why this new edition is important. The preface and acknowledgments that follow name many of the individuals who have contributed to increasing knowledge of the Minnesota herpetofauna in recent years.

The Introduction proper follows, and contains all the expected background material on basic organismal biology and physical setting that such sections typically have. Some of this material, including a short section on "What is a Herp" and on field methods and captive care can be safely skipped by informed readers, although they provide factually accurate explanations for a general reader. The best regional guides manage to incorporate additional, unique material into the Introduction that oftentimes reflects the interests of the authors. In *Amphibians and Reptiles in Minnesota*, this includes a significant section on the history of herpetology in Minnesota. This is the type of information that can be difficult or impossible to track down in other sources, and the coverage is varied, including mentions of Native American petroglyphs depicting reptiles, reptiles reported by early European settlement explorers and travelers, studies conducted by scientists (especially University of Minnesota scientists) on the local herpetofauna, and contributions by the Minnesota Department of Natural Resources and Minnesota Herpetological Society. Only about seven pages are given over to this historical material, so individual topics are necessarily concise, but fortunately relevant citations are provided in all cases.

Another significant portion of the Introduction covers habitats found in Minnesota. Included are numerous maps and photographs showing examples of major local habitat types such as sedge meadow, bottomland forests, and ridge prairie. The associated text describes these habitats and lists some of the amphibian and reptile species that utilize each. This section also includes a pair of useful tables showing occurrences of all Minnesota amphibian and reptile species by ecological section and by habitat type. My one complaint with this portion of the book is that some of the maps are reproduced at too small a size to be of much use, while others are probably extraneous. For example, watershed boundaries do not exert any strong influence on reptile or amphibian species ranges in Minnesota, so there is no compelling reason to map them here. This is followed by sections on conservation and on interactions with humans, which will likely be of more interest to readers. Especially notable in this portion is an up-to-date report on what is known of amphibian diseases in Minnesota, and a description of harvest pressures faced by Minnesota's amphibians and reptiles. Unlike in most states, many of Minnesota's snakes, lizards, and salamanders receive no official protection, while some turtles and frogs are taken by licensed harvesters.

The Introduction closes with a section on identification, including text on how to use species accounts as well as a checklist of species, but most importantly includes keys to all species. For amphibians, both adults and larvae are included. In a holdover from Oldfield and Moriarty, these keys are graphical, arrayed in a circular pattern such that a user of the key starts in the middle and works outward until identifying the species themselves, which are arrayed around the outside of the ring. This form of

key is not frequently encountered, but it works well when the number of potential species is relatively few and these keys are probably intuitively easier to use than a traditional dichotomous key. The true test of a key is of course whether it works. The keys here are generally good, and typically use easily observed traits, but there are cases where they fail. For example, a Burnsi morph Northern Leopard Frog will key out as a Green Frog, and adult male Common Five-lined Skinks will key out as Prairie Skinks.

The heart of *Amphibians and Reptiles in Minnesota* is the species accounts. These accounts have a common format, which includes entries on (physical) description, distribution (both inside and outside Minnesota), habitat, life history, and remarks. Each account includes one or more photographs and a range map with county-level records (except that the largest counties have been divided into smaller regions). The physical descriptions are provided in enough detail to positively identify any of Minnesota's native amphibians or reptiles, and do a fine job of describing phenotypic variation within each species. Habitat and life history entries give Minnesota-specific information for many species, such as preferred local hibernacula or basking sites and details of breeding seasons. Remarks include snippets of information that do not easily fit under other headings, such as explanations of recent taxonomic changes, colloquial names, and conservation concerns. Photographs accompanying each account minimally include a diagnostic photo of an adult. Most potential phenotypic variants are illustrated. Thus, the Northern Leopard Frog account includes photos of both the Burnsi and Kandiyohi morphs, and the Racer account includes a photo of a blotched juvenile, for example. Amphibian accounts also typically include photos of larvae and egg masses.

In addition to full accounts for all documented species, shorter accounts are provided for three species of possible occurrence with documented records adjacent to Minnesota. These are an excellent idea for inclusion, as evidenced by the three "possible occurrence" species from Oldfield and Moriarty that have subsequently been upgraded to Minnesota natives. Other than these changes, one species included in Oldfield and Moriarty, the Slender Glass Lizard, has been dropped, and the Plains Leopard Frog added. The book closes with a Glossary, Resources, Literature Cited, and Index. These sections are all comprehensive and easy to use.

There are a few aspects of the book that could use improvement. The book as a whole is heavily illustrated with color photographs. Many of these are excellent, but others are too small to discern detail, and it would have been more useful to include fewer, larger photographs. In a photo of depredated turtle nests on page 39, for example, the nest sites and scattered egg shells are barely visible. While species-level taxonomy has been updated, higher-level taxonomy has not. As a result, nearly all included snakes are lumped in Colubridae, lizards and snakes are placed in suborders Lacertilia and Serpentes, and the family Emydidae is stated to occur globally across all temperate and tropical regions except Australia. Also, species-level taxonomic changes did not always translate to corresponding text changes. Amphibian accounts have generally been carefully updated to reflect taxonomic changes, but outdated text slipped through in some reptile accounts: the Western Ratsnake is stated to range to Florida, and the Western Foxsnake to Michigan and Ontario, for example. These are relatively small concerns, though. The biggest hindrance from a professional herpetologist's perspective is that the maps only indicate presence/absence at the county level. Point locality maps would be more informative, and being able

to quickly access the records on which the maps are based would be beneficial. For these types of data, it turns out that Breckenridge (1944) is still the best source. Moriarty and Hall at least list the museums that hold specimens on which county records are based, so it is possible to track down many of these records with a bit of effort.

Even with a few minor flaws, *Amphibians and Reptiles in Minnesota* has much to offer. For the general audience at whom this book is aimed, it provides an excellent introduction to Minnesota's herpetofauna. For professionals, it is a reasonably comprehensive synthesis of herpetology in Minnesota, and backed by Moriarty's separate bibliography of herpetology in Minnesota, provides a logical starting point for future lines of inquiry, especially related to filling remaining gaps in knowledge of species' geographic ranges and natural histories within Minnesota's borders. This book belongs on the shelf of all who have an interest in Minnesota natural history. Beyond that audience, it is of use to anyone interested in the herpetology of central North America. I've found my copy to be helpful even in Michigan.

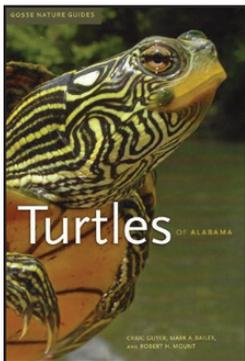
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Turtles of Alabama

Craig Guyer, Mark A. Bailey, and Robert H. Mount. 2015. The University of Alabama Press, Tuscaloosa, Alabama (www.uapress.ua.edu). xiii + 267 pp., 66 photographs, 56 illustrations, 42 color maps. Flexible cover. US \$39.95. ISBN 978-0-8173-5806-8.



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Turtles of Alabama is the first significant account of a major herpetofaunal group in Alabama since the publication of *The Reptiles and Amphibians of Alabama* (Mount 1975) 40 years ago. This seminal work by Robert Mount has served as a valuable resource and reliable reference for both amateur and professional herpetologists alike for these many years.

However, with recent taxonomic changes, habitat alterations, expanding suburbia, and indications of a changing climate since Mount's 1975 publication, a revision and update of the herpetofauna of Alabama was clearly needed. *Turtles of Alabama* is the first installment of an eagerly-awaited series of four volumes that will document the current distribution and biology of the state's reptiles and amphibians. These volumes, produced by the University of Alabama Press, are part of the Gosse Nature Guide Series, which honors Phillip Henry Gosse, a naturalist who nicely described and documented the natural history of Alabama wildlife and plants in the early to mid-1800s. It is also fitting that the first volume in this herpetofaunal series is about turtles, as Alabama is home to more turtle species than any other state in the nation, and its Mobile River Basin is the center of the world's greatest biodiversity of turtles.

The authors of *Turtles of Alabama* are easily at the top of a small handful of people who have years of field experience and vast knowledge of the reptiles and amphibians that occur in Alabama from the Tennessee border to the Gulf of Mexico. Craig Guyer has taught herpetology and has been the Curator of Herpetology at Auburn University since 1987, replacing the then-retiring Robert Mount. Mark Bailey was Assistant Curator of the Auburn University herpetology collection and for several years was a zoologist for the Nature Conservancy's Natural Heritage Program in Alabama. There, he initiated the Alabama Herp Atlas Program. He now owns a resource management firm that specializes in southeastern species and habitats. Robert Mount, Emeritus Professor at Auburn University, started his studies of Alabama reptiles and amphibians in 1961 and has continued to document distributions and conservation concerns. It is clear to me that these authors are certainly the most appropriate scientists to bring us up-to-date on the status and distributions of Alabama reptiles and amphibians.

Following the intent of Mount (1975), the authors clearly state right off that the intended audience is the layman interested in nature as well as the serious student of southeastern biology. Thus, the book is admittedly a compromise of providing too little or too much information for any particular audience.

As pointed out in the following paragraphs, while not necessarily totally satisfying either group, the authors have generally struck a fairly reasonable balance.

The various sections of the book generally follow the format of Mount (1975) and frankly that of most state or regional field guides. There is a brief listing of the species within the state, the recent taxonomic changes (discussed later in this review), and then a very nice succinct summary of the climate, geography and river systems of the state, including some well-selected photographs of several regional river habitats which give the reader a great idea of the type of environment that each species occupies. There is a rather short six-page summary of everything you wanted to know about turtles, from anatomy to behavior to history. This general discussion is certainly less detailed than many field guides dedicated to major groups, but may do the job for a general audience. This is followed by a quick key to the turtle families of Alabama. Keys to distinguish species and subspecies within families are also found embedded within the species accounts that comprise the majority of the book. These keys are nicely illustrated by fine line drawings and generally use characteristics that most turtle binomial keys have used. Overall, I found the keys to be accurate, functional and relatively easy to use even if an individual has relatively little experience with anatomy and morphology. Of course, we all know that individual pattern variation within the aquatic emydids sometimes makes definitive determinations by keys rather difficult.

The species accounts section is organized into recognizable, descriptive, and common name groups (e.g., Sea Turtles, Snapping Turtles, Mud and Musk Turtles, etc.), with families sub-noted, making it relatively easy for an inexperienced observer to locate individual species accounts. I found the brief descriptive and natural history paragraph for each group to be quite useful for general information. Species accounts are further subdivided into sections for the subspecies. Overall, the organization of the accounts makes for logical sense.

Following the format of Mount (1975), individual species/subspecies accounts are organized into Description, Alabama Distribution, Habits, and, where appropriate, Taxonomy sections. Guyer et al. have also added an additional section on Conservation and Management. This is a very important addition to complement Mount's previous work, as many turtles now face an increasing list of challenges. Potential threats are discussed for each species, any official state, national or world-wide listings are given, and recommendations for management and recovery are discussed as appropriate. Hopefully, this gives the reader useful information to promote a conservation ideology and a greater appreciation for turtles as a group.

Each account also has one or two representative color photographs of the animal. In most cases, the photographs show the characteristics necessary for visual identification, and an additional photograph is included if the juvenile appearance or coloration is significantly different than that of the adult. Color photographs are the most obvious and useful changes when compared to Mount's original work, which included only black/white pictures. Each account also has a map of the estimated geographic range within Alabama, with museum records and verified picture locations included as dots on the map. A small insert map shows the animal's range within the United States. The map of Alabama is divided into ten distinct physiographic units, termed as herpetofaunal units by Mount (1975), which are shown as different colors on the map for each species. Although Mount (1975) divided the state into such units and discussed this

in relation to the distribution of many species, he did not include the herpetofaunal units as background on the distribution map of each species. This is a great improvement to me and gives the reader a further understanding of the habitat requirements (or lack of it) for certain species.

The authors do an excellent job in dealing with the ever-changing and often confusing world of turtle taxonomy. Following the general philosophy of de Queiroz and Gauthier (1992), they have avoided use of terms associated with the Linnean hierarchy above the level of the family because these vary substantially among schemes. Hence, they retain the family level as the basis of the organization of the species accounts. For the serious herpetologist, they include a section in the introduction on the changes in the taxonomy of forms originally listed in Mount (1975) and an appendix listing the forms then considered subspecies that now have been elevated to species status. The introductory section also includes a well-reasoned discussion of why they adopted some name changes and why some forms were added, combined, or removed from the state list. In addition, for the many species/subspecies for which this has been the case and/or for which there have been some historical taxonomic problems, the authors have included a sometimes detailed section on taxonomy at the end of each species account.

One aspect of the book that is clearly a compromise is the literature cited. Serious or professional herpetologists or herpetology students wishing to do a literature search will be disappointed. Generally, less than a handful of citations occur for each taxon, and in some cases none. The natural history information (labeled as "Habits" subsection) is particularly skimpy in referencing citations. As a result, many publications that I might consider rather significant are not noted. Whether this is a book size restriction by the publishers, I do not know. However, in the authors' defense, their stated target audience is people interested in the natural history of their local biota, the majority of which are likely to be laymen who may have little or no interest in following up on specific references.

There are some features of the book that I thought could have added some visual clarifications or could have been improved from a technical standpoint. Even though pointed out in the text, additional or substitute photographs demonstrating the sexual differences in head sizes of map turtles would have reinforced this major morphological feature for the layman. In addition, the pictures selected for the softshells only partially show carapace pattern differences among juveniles, adult males, and adult females. Further, the photograph of the adult Gulf Coast Spiny Softshell on p. 80 should have been labeled as an adult female to help demonstrate this. Also, although probably not the authors' call, it would have been nice to recognize the contributors of the photographs of the various turtles underneath each picture itself. Of a more technical production method, many of the geographic range maps state that purple dots indicate hybrids (red dots are used to indicate valid records of the species). Unless I am color blind, I cannot distinguish purple from red dots on these maps. Finally, for those herpetologists who might be interested in details of some of the distribution records, these sometimes interesting notes are placed as a group in the rear of the book, thus being essentially lost and likely ignored.

For the quality of the paper, the color photographs, and the sturdy cover, this book is very reasonably priced. Although larger in physical size than some nature field guides, the book is certainly portable and tough enough to survive many trips in a backpack. Overall, *Turtles of Alabama* is a welcome and useful

guide to the great diversity of turtles in the state for both the layperson and the herpetologist alike. Because many of the turtles in Alabama are also found in other areas of the southeast, its utility goes beyond Alabama's borders. Those of us who are familiar with and interested in the exceptional diversity of Alabama reptiles and amphibians enthusiastically await the next three herpetofaunal volumes by these three knowledgeable biologists.

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Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America

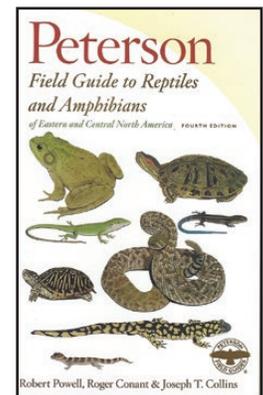
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The long-awaited and much-anticipated revision of Conant and Collins' (1998) 3rd field guide (expanded version compared to their 1991 edition) to reptiles and amphibians of eastern and central North America has finally appeared on the book market (e.g., Amazon.com [US \$14.09]; Barnes and Noble.com [US \$13.80]). This is the latest updated version of the original pocket guide to these animals (Conant 1958) and is intended for general use by people of all ages and interests in herpetology. The 4th edition carries on a tradition of excellence with new color illustrations of animals in addition to the praiseworthy original drawings by Isabelle Hunt Conant and later additions by Tom R. Johnson (and now by Errol D. Hooper, Jr. in this 4th edition).

The overall layout and format of the 4th edition is generally similar to the previous books in this series; still, the book is actually shorter in length than the 3rd edition (616 pp.) even though the number of species covered within the geographical area increased from 379 to 501. This dramatic increase is primarily due to the naming of new species based on the latest phylogenetic inferences, often aided by molecular tools, and the text is further supplemented by the inclusion of 60 established non-native species. Many of the accounts on introduced species benefit especially by accompanying photos. Some minor sections, such as the tadpole plates (black and white line drawings by T. R. Johnson), were removed from this edition possibly because of the availability of live images found on the Internet or elsewhere



(e.g., Dodd 2013). In contrast to the 3rd edition's unusual order of herpetological groupings (i.e., crocodylians, turtles, lizards, snakes, salamanders, and anurans), the 4th edition is organized starting with salamanders, followed by anurans, crocodylians, turtles, lizards, and snakes. In addition, the bottom and side edges of pages within the clusters of animal plates have been color enhanced for easy retrieval and referencing.

The latter two co-authors are deceased and were not active participants in the construction of this updated 4th edition. Consequently, in the following comments, I will refer to Powell as the "author" when mentioning changes and/or additions found in this edition. Nearly all of the species' range maps have been restructured to reflect the most recent distributions (documented using voucher specimens) in contrast to previous maps that typically shaded regions using presumptive swaths of land/water as a range. Several of the maps, however, have been printed too small (e.g., pp. 31, 160, and 291), making it somewhat difficult to interpret fine details of species distributions [Ed. note: the small maps were the result of a publisher's error, and will be corrected in subsequent printings]. In some cases, gaps that occur in an otherwise continuous distribution may actually reflect an unnatural exclusion of a species within its range (e.g., range of the Rough Earthsnake [*Haldea striatula*] in southwestern Arkansas) simply because no voucher specimens are currently available in that region.

Not all range maps in the new edition coincide with currently known or established distributions in some species or subspecies. And, because I am most familiar with the herpetofauna of Arkansas (Trauth et al. 2004), my comments here pertain to several distributional discrepancies I found for that state. For instance, the mapped range of the Black-masked Racer (*Coluber constrictor latrunculus*) in Arkansas (p. 369) only covers Chicot County of the extreme southeastern part of the state. The omission of this distinctively colored racer from the rest of the Delta of eastern Arkansas is contrary to previous reports on its existence there (Trauth 1997; Trauth et al. 2004); I provided dot maps as well as snake images in those publications to support the presence of this racer. In addition, an inaccurate modification of a previous distributional map found in the 3rd edition is shown for the Central Newt (*Notophthalmus viridescens louisianensis*) in Arkansas (p. 101), as it ignores the previously published range map for the subspecies, especially in eastern Arkansas (Trauth et al. 2004). In this particular case, historic localities from Crowley's Ridge and surrounding areas have been omitted from the map of the 3rd edition, leaving a large, irregular gap for its distribution in the state. Incidentally, I recently captured this newt on several occasions while collecting Western Lesser Sirens (*Siren intermedia netting*) in baited traps in ditches along railroad tracks from Greene County just east of Crowley's Ridge—a historic area excluded in the current map. I also noticed that the range of the Plains Leopard Frog (*Lithobates blairi*; p.160) was not included from Mississippi County of eastern Arkansas, although its presence has been documented there (Trauth et al. 2004). Strong evidence for the presence of the Eastern Box Turtle (*Terrapene carolina carolina*) in extreme southeastern Arkansas was published by Tumison and Rocconi (2000) and mentioned by Trauth et al. (2004). The box turtle map (p. 221) does not show its presence there. The northernmost extension of the American Alligator (*Alligator mississippiensis*) also is shown following the St. Francis River northward in eastern Arkansas rather than following documented records in the Cache River area (over 50 km to its east). Lastly, the well-documented presence of an invasive salamander

species, the Seal Salamander (*Desmognathus monticola*) in extreme northwest Arkansas was omitted from this species' distributional map (p. 47).

I noticed that Powell has dropped the snake's terminal ventral scale descriptor, "anal plate," a snake characteristic illustrated in all previous editions of the field guide (e.g., see p. 139—Fig. 24—in Conant and Collins 1998), and replaced it with "cloacal plate" (p. 358; fig. 169) in referring to its physical condition of being either divided or undivided. I agree with Powell that the replacement term is a much better suited descriptor; however, in all snake accounts he uses the terminology "cloacal divided" or "cloacal undivided" in reference to this scale condition. The glossary only provides the definition of "cloaca;" therefore, I suspect a snake novice might question the difference between cloacal plate (illustrated on p. 386; fig. 180) and cloacal scale while reading the text on snakes. In his *Dictionary of Herpetology*, Lillywhite (2008) does not include a definition for either anal plate or cloacal plate.

Misspellings always seem to crop up in books, and the current guide is no exception. For example, on p. 83, *Plethodon* is misspelled twice, and on p. 441, *lepidus* is incorrectly spelled. Another on p. 464 ("constrictors") should be changed to "constrictor."

Overall, this latest field guide will be an invaluable reference for hands-on identification of amphibians and reptiles by all laypersons as well as serious herpetologists in the field, in the lab, and at home. Suffice to say that future generations of herpers will continue to resort to this book when identifying species and documenting and/or verifying any changes in a species' distribution. One can only ponder how quickly the multitude of biotic and nonbiotic factors currently altering species' ranges will necessitate changes to be seen in the next edition of this book.

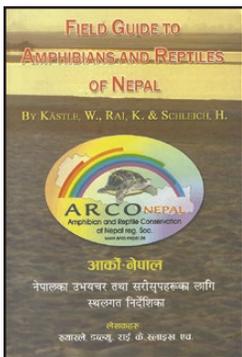
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PUBLICATIONS RECEIVED

Field Guide to Amphibians and Reptiles of Nepal

W. Kastle, K. Rai, and H. Schleich. 2013. ARCO-Nepal, Society for Amphibian and Reptile Conservation of Nepal (www.arco-nepal.de). 625 pp., 52 color plates, 156 color photos, 180 maps, > 1000 text illustrations. Softcover. 68 Euros + 24 Euros postage to North America. ISBN 978-3-9814938-4-9.

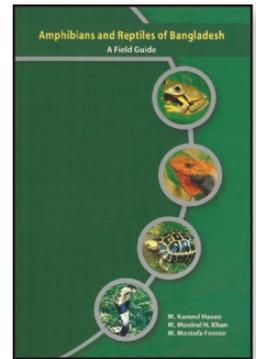


A *Field Guide to the Amphibians and Reptiles of Nepal* is a dual language (English and Nepali) guide to the amphibians (1 salamander, 54 frogs, 1 caecilian) and reptiles (2 crocodylians, 18 turtles, 42 lizards, 83 snakes) known from or suspected to occur within this Himalayan nation. The book includes extensive background information on the biology of amphibians and reptiles, snakebite, biogeography, collecting, taxonomy, a checklist, and keys to identification. This section occupies the first 225 pages,

followed by 52 color plates (156 species, pp. 226–283), range maps (pp. 284–315), and species accounts (pp. 316–565). It concludes with a glossary of terms, references, and an index. Each species account provides information on identification, natural history (e.g., food, frog voice calls, reproduction, and habitats, when available), and distribution (including elevation range) within Nepal. Photographs are of good quality, and the book is profusely illustrated with black and white drawings of scale patterns, tadpole mouthparts, morphological variation, turtle shells, and even behavioral sequences. The authors state that the book is not intended for professional scientists as much as it is for the people of Nepal and for visitors to this country. The book is laid out with Nepali text on the left page and English on the right; this avoids needless duplication of figures. The importance of this book is not so much for foreigners (although its manageable size and weight make it an ideal field guide), but for Nepali biologists and students since it is the first academic herpetological text in this language. Biologists who want a more detailed but earlier review of Nepali herpetology might consider Schleich and Kastle's previous text (*Amphibians and Reptiles of Nepal*, 2002, A.R.G. Gantner Verlag, Germany), but this updated field guide is everything most residents and visitors will need to appreciate Nepal's diverse herpetofauna. The stated price from ARCO-Nepal in Germany is steep, but the book can be ordered from Pilgrims Book House in Kathmandu (<https://www.pilgrimsonlineshop.com>) for US \$37.65 plus postage.

Amphibians and Reptiles of Bangladesh—A Field Guide

M. K. Hasan, M. M. H. Khan and M. M. Feeroz. 2014. Arannayk Foundation, Dhaka (info@arannayk.org). 191 pp., numerous color photos. Softcover. ISBN 978-984-33-7766-1.



Amphibians and Reptiles of Bangladesh—A Field Guide is an English language guide to 45 amphibians (44 frogs, 1 caecilian) and 92 reptiles (2 crocodylians, 17 turtles, 23 lizards, 50 snakes) known from Bangladesh. As such, the book covers most species documented from this South Asian nation, but omits one caecilian, three frogs, 11 turtles, seven lizards, and 26 snakes known definitely to occur within the country. The book includes a brief introduction to amphibian and reptile biology, regional biogeography and threats to amphibians and reptiles, and a short history of herpetofaunal research in Bangladesh. Color photographs are used effectively to illustrate important identifying characters (i.e., anuran morphology, foot webbing patterns, reptile scale and scute patterns, how measurements are taken on various taxa, and how scale rows are counted on snakes). Each account has two good-quality color photographs, a range map, and brief sections on identification, habits and habitats, and status and distribution. A most interesting part of the book is the bibliography, although it only references works in English and not, unfortunately, those of M.A.R. Khan published previously in Bengali. There are several appendices, including a complete checklist of all species of herpetofauna reliably documented from Bangladesh and another checklist of species that may be expected to occur there but have not yet been documented. The checklists give the scientific, English, and Bengali names, as well as conservation status, distribution, and various remarks. The book ends with information and color photos of nine individuals that are undescribed or of unusual appearance and needing further investigation. This field guide, the first for Bangladesh, will be useful for both amateur and academic English-speaking residents and visitors to the country who are interested in its fauna. Hopefully, the authors will follow up with a Bengali version. No price is provided on the web site of the Arannayk Foundation, but the book can be ordered from DK Agencies Ltd., New Delhi, India (<https://docinfo@dkagencies.com>) for US \$48.25 plus postage.