# BOOK REVIEWS

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**Venomous Reptiles of the United States, Canada, and Northern Mexico Vol. 2: *Crotalus*.** C. H. Ernst and E. M. Ernst. 2012. Johns Hopkins Press. ISBN 0801898765. 391 p. $75.00 (hardcover).—This is a thorough compilation of information on the biology, ecology, and behavior of rattlesnakes from the United States, Canada, and northern Mexico. The accounts cover the 21 species of rattlesnakes from that region. The book is larger than a typical field guide but smaller than the average textbook. This makes it possible to take in the field for those who are interested in carrying more information with them than the average pocket field guide. This book will be useful to a wide range of readers, from scientists to the everyday hiker.

The book opens with an introduction to the biology of pit vipers. This focuses mostly on the venom-delivery system of these snakes, and the features associated with it. Following the introduction, there is a key for identifying species. The characters in the key are better suited for preserved specimens, as many of them involve close examination of the head and scale counts. The species accounts contain detailed descriptions, geographic variations, similar and confusing species, karyotypes, range based on fossil records, geographic distributions, habitats where species are found, detailed accounts of behavior and ecology, reproduction, growth and longevity, diet and feeding behaviors, venom-delivery systems, predators and defensive behaviors, parasites and pathology, and some extra remarks. All of these sections are well documented with citations to original sources. In addition, each species account contains a distribution map and at least one black and white photograph of the snake. The behavior and ecology sections are particularly informative, with careful attention to detail. Following the species accounts there is a glossary of snake scientific names and associated etymology that is useful additional information to have on hand and would help non-biologists to understand the meaning behind the scientific names of species of rattlesnakes. The center of the book contains a set of color plates with photographs of each snake and some subspecies.

While a number of books on the biology and natural history of the rattlesnakes have been published over time, this book provides insight gained from the recent research on these snakes. The book obviously does not have the level of detail and information found in Klauber's two volume set on rattlesnake (Klauber, 1956); however, this book does include more concise information on the basic biology and natural history of rattlesnakes, building on decades of research. Overall we highly recommend this book. It has the potential to be a useful tool for both students and established researchers alike.

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**Trout**. James Owen 2012. Reaktion Books LTD. London. ISBN 978 1 86189 877 7. 190 p. $19.95 (soft cover).—This little book is one of a large series with a common purpose, ''to explore the historical significance and impact on humans of a wide range of animals.'' The book at hand, by James Owen, focuses on trout.

Owen begins with a discussion of trout diversity. While he seems to understand the individuality of different species of salmoniformes, he writes elsewhere in the book in terms of 'troutness.' Also in the first chapter, in keeping with the common purpose of this series of books, the place of trout in science is taken up. Not too surprising, their use in molecular research is covered, although briefly. More interesting, at least for me, was the discussion of the long-studied hydrodynamic aspects of trout and how those physical phenomena have been used to explain how water and wind vortices can be more efficiently exploited as sources of turbine energy.

Next, there is a chapter on trout in mythology, including examples from modern religions. As might be expected, we learn that trout have long been treated as sacred. In this chapter, Owen explains how the consumption of trout by those early humans who colonized Europe led to their success over the Neanderthals, who more narrowly focused on the diminishing herds of large herbivorous mammals. Also included in this chapter is a scientific explanation for the 'hairy trout' that once excited cryptozoologists.

Chapter three provides a review of the how, why, when, and where some trout species were introduced outside their native range. As a fisherman these are things I may want to know, say, when I have a choice of fishing for brookies or browns, but everyone has to be discouraged by the negative impact most of these introductions have had on native species.

Chapter four has to do with trout as a much sought after food, and how they have been cultivated for that purpose, at least since the time of Romans. The author describes how efforts to meet those needs has led to our current trout farming practices that produce ever increasing numbers of deformed individuals and a product that is not fit for human consumption. If you doubt me, do a blind taste test between a wild-caught and farmed raised rainbow. I have seen domestic cats refuse the latter!

The next chapter is for the fisherperson (my wife makes just as good a cast, with a 5 weight fly rod, to a rising trout as I can). As Owen points out, fly fishing for trout has long been a favorite activity of those who want to participate in a sport, as opposed to watching it on TV. He identifies a few such personalities, such as Ernest Hemingway and President

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Barack Obama. As far as I am concerned, what makes fly fishing attractive to many has never been satisfactorily put into words, including the current author. Some describe it as a zen-like experience, being one with nature. Others make reference to it as an 'art,' as when it comes to making the perfect cast with an artificial fly that the caster has spent hours learning to tie. Still others find excitement casting in total darkness to large browns that seem to explode on the water's surface when taking a large artificial mouse. Whatever it is that draws a person to fly fishing, you can usually see it registered on their face some time during their fishing experience. A good example, well-illustrated in this book, is the expression on President Obama's face when fishing the East Gallatin River, near Bozeman, Montana. I am told that he didn't even catch a fish that day, but had a great time nonetheless.

The sixth, and last, chapter largely concerns wild trout in music and art. Many have tried to capture the nature of trout in verse and on canvas. My favorites among the artists discussed by Owen are John Singer Sargent and Winslow Homer. Homer is said to have never been fully satisfied with his attempt at capturing on canvas the acrobatics of a jumping trout.

I enjoyed the book. I can even recommend it to the academic, particularly to those who want to see what life can be like beyond teaching and doing research. Read it and lighten up.

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**A Contribution to the Herpetology of Northern Pakistan**. R. Masroor. 2012. Society for the Study of Amphibians and Reptiles/Chimaira Buchhandelsgesellschaft mbH. ISBN 9780916984830. 217 p. $45.00 (hardcover).—''Pakistan covers the desert frontier of the Subcontinent. British civilian administration extended only to Lahore, in the fertile Punjab, near Pakistan's eastern border with India. But the rest of Pakistan—the rugged border regions of Baluchistan and the North-West Frontier Province, the alkaline wastes of Sindh away from the Indus, and the Hindu Kush and Karakorum Mountains embracing Kashmir—has never really been subdued by the British or anyone else.'' Robert D. Kaplan, 2011.

Following the departure of the British and the resultant political upheaval, biotic diversity surveys have not been a top priority for countries of the Indian subcontinent, and perhaps as a result of this and the troubled history of the land, conducting biological inventories in this vast region continue to prove challenging.

The herpetofauna of Pakistan has had its local as well as foreign scholars, following independence from British rule in 1947. The latter include Germans (notably, Robert Mertens), as well as Americans (Sherman Minton and Walter Auffenberg). Several volumes published in the second half of last century are testimony to their efforts (e.g., Minton, 1966; Mertens, 1969). Among the local herpetologists of the contemporary era, mention must be made of Mohammed Sharief Khan, formerly of the Herpetology Laboratory, Rabwah, Pakistan, and now a resident of the U.S. He has published extensively on the herpetology of his native country, including several book-length manuscripts (see Khan, 1993, 2006). Another significant contemporary was Khalid Javed Baig (1956–2006) of the Pakistan Museum of Natural History, who received his doctorate in zoology for his work on the systematics of the genus *Laudakia* jointly from the Quaid-e-Azam University of his native country and University of Bonn (under the supervision of Wolfgang Böhme). Baig, together with his wife and mother, tragically passed away in an auto accident in 2006 (see Masroor, 2007, for an obituary), leaving the substantial collections he had amassed in Islamabad to the care of his former assistant/mentee, Rafaqat Masroor (born 1978). The volume being reviewed is the work of Masroor and his colleagues, based on their long-term (2003–09) observations and opportunistic sampling of the herpetofauna of the Margalla Hills National Park (MHNP) in northern Pakistan. Masroor is a Research Associate with the Pakistan Museum of Natural History, and is currently working on his M.Phil./Ph.D. at the Department of Zoology, University of Peshawar. During this period, a project titled ''Faunal diversity of Margalla Hills National Park, Islamabad,'' funded by Pakistan Science Foundation provided Masroor the opportunity to survey the MHNP in the summer of 2005. Both the title of the book and format appear inspired by Minton's (1966) classic (which covered the entire contemporary state of Pakistan, which, at that time, included the eastern sector of Bangladesh). The volume is dedicated to Baig, and contains a foreword by Böhme.

The volume is intended as a guide to the relatively small herpetofauna of the MHNP, a part of the lesser Himalayas, situated on the outskirts of Pakistan's capital, Islamabad, within which lies Masroor's host institution. The etymology of the park's name is worthy of remark, one explanation being Persian for ''Mar'' (=snake) and ''Galla'' (=herd), implying a site where snakes are abundant. The total area of the park, whose limestone–sandstone rocks date to the Miocene, is 12,605 ha, and the maximum elevation is Tilla Charouni, a 1604 m snow-clad peak. The total species counts are nine for amphibians and 32 for reptiles (Masroor, 2011), and comprise elements from Eurasia and the Indian subregions, such as *Daboia russelii*, an image of which adorns the dust jacket over the front cover.

The technical contents of the work are preceded by the dedication, foreword, acknowledgments, and an introduction (including location, climate, and conservation aspects of Pakistan's natural resources, a listing of 26 national parks, details of the author's primary study site, the Margalla Hills, and an enumeration of previous studies), scope of the present study, and methods employed. These preliminaries are followed by checklists of the amphibians and reptiles recorded (Chapter 1), as well as illustrated keys to the fauna (Chapter 2). Well-reproduced images of different habitats present in Pakistan are presented, which range from the starkly arid lower ranges of Margalla to the subtropical regions at its higher elevations.

Chapter 3 deals with the amphibians of the study site (exclusively anuras), including accounts for nine species. Chapter 4 describes the three species of turtles known from Margalla Hills. Chapter 5 covers the 13 lizard species, including three that the author adds to the known fauna (*Asymblepharus himalayanus*, *Laudakia agrorensis*, and *Ophisops jerdonii*). Chapter 6 completes the herpetofaunal inventory, with 17 snakes recorded from Margalla. None are endemic to Margalla or Pakistan, and most can be characterized as either the easternmost representatives of Palearctic, or westernmost representatives of Oriental, lineages. The last two chapters deal with the distribution of amphibians and reptiles as classified by habitat types and site-specific threats to the local herpetofauna arising from

human activities. A glossary of technical terms and a bibliography rounds out the volume. An appendix presents a checklist of the herpetofauna of Pakistan. A listing of vernacular names (in Pakistan's state language, Urdu, and perhaps others) would have been a nice addition here: currently, indigenous names appear for some species in the Remarks section under the respective species accounts.

As expected of a marriage of Europe's premier publisher of herpetological books (Chimaira Buchhandelsgesellschaft mbH) and one of America's oldest herpetological societies (Society for the Study of Amphibians and Reptiles, founded in 1958), the work is produced to the highest technical quality, hardbound with dust jacket, printed on art paper, and with color images throughout the text. The images of *Naja oxiana* alone are worth the price of the book, especially what must be rare images of their attractive, banded hatchlings emerging from eggs (fig. 101A–B).

A pleasing aspect of the work is the up-to-the minute (generic) taxonomy, including *Saara* for *Uromastyx hardwickii*, *Eurylepis* for *Eumeces taeniolatus*, *Eutropis* for *Mabuya dissimilis*, *Myriopholis* for *Leptotyphlops macrorhynchus*, and *Platyceps* for both *Coluber rhodorachis* and *C. ventromaculatus*. The text has been read well for typos, and the only ones I found were a lower case ''r'' in the first word of the locality name Rahim Yar Khan (p. 128) and a missing letter ''c'' in the species name *Bungarus caeruleus* (p. 148). Taxonomic judgments are sound (with perhaps the exception of the choice of Boidae for Pakistan's sole species of *Python*, rather than Pythonidae; the usage of the catchall family name Colubridae for a number of genera now allocated to other families; and the recognition of Hydrophiidae as a family distinct from Elapidae). Perhaps some of these taxonomic revisions were too recent for the author to consider while finalizing the book, or were deemed radical.

To me, this is a fine checklist and field guide, specific for the site, rather than the whole of northern Pakistan, which should have been reflected in the book's title. The often great detail provided in the species accounts make the work more suitable for comparison with faunal monographs, approaching the celebrated series, *Handbuch der Reptilien und Amphibien Europas*, edited by Böhme. This likeness may be indicative of the influence of Böhme, via Baig, to the young author of this volume.

If there are any criticisms, it is the insufficient citations to the relatively better-known fauna of western India. This shortcoming may be attributable to the rather poor interpersonal linkages between these two countries, and is a grim reminder of political realities.

Young Rafaqat Masroor stands on the shoulders of giants, such as his departed mentor, and we can expect substantial work on Pakistan's unusual herpetofauna by him in the years to come.

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**The Chromosomes of Terraranan Frogs: Insights into Vertebrate Cytogenetics.** M. Schmid, J. P. Bogart, and S. B. Hedges (eds.). 2010. Karger. ISBN 9783805596077. 568 p. $797.00 (hardcover).—Amphibian cytogenetics has had a long and noble history with interesting twists and turns. It is a little known fact, for example, that the diploid chromosome number of the Eastern Red-backed Salamander, *Plethodon cinereus*, was published before we knew the correct chromosome number for *Homo sapiens*! Rapid progress in amphibian cytogenetics was partly the result of the discovery that the so-called ''squash'' technique, originally developed to study the large chromosomes of plants, worked even better for the large chromosomes of amphibians (Sessions, 1996). Amphibian cytogenetics is notorious for being labor-intensive relative to the amount of useful phylogenetic information gained, primarily because most groups of amphibians have proved to be karyologically homogeneous (Green and Sessions, 2007), and some of the banding techniques used so successfully in other organisms just don't work in amphibians. Nevertheless, the field has attracted a few stalwart researchers who (1) love chromosomes, and (2) discover that it is by painstaking examination of details that you find, as the late amphibian cytogeneticist Jim Kezer would say, ''cytological treasures,'' even among amphibians.

One of the most indefatigably productive of the modern amphibian cyogeneticists is Michael Schmid, and one of the major foci of his work has been the Neotropical frogs now known as the Terrarana. And for this, he really does need to be indefatigable, because the Terrarana is not only the largest and most geographically widespread assemblage of Neotropical frogs (Hedges et al., 2008; Gonzales-Voyer et al., 2011), but are also the most cytogenetically diverse amphibians (and even stand out among all vertebrates in this regard) by far.

Schmid has teamed up with two other titans of terraranan taxonomy, cytogenetics, and systematics: J. P. Bogart and S. B. Hedges. Together they have assembled and co-edited a massive tome of terraranan cytogenetics. Aside from the editors, contributors to the volume include other top Neotropical amphibian biologists and cytogeneticists: S.-H. Chen, L. M. Diaz, W. Feichtinger, E. La Marca, P. León, A. Sanz, and C. Steinlein. As is fitting for the largest Neotropical amphibian radiation, the book is truly massive, heavy for its size with small font on heavy-duty paper, running to 568 pages with 2071 figures! The vast majority of those figures, not surprisingly, are of karyotypes representing detailed cytogenetic analyses of 261 species (approximately 28% of the 924 described species) of terraranan frogs: karyotype after karyotype after karyotype, taking up more than half the book, including standard karyotypes, unusual karyotypes (e.g., ones showing chromosomal rearrangements, B-chromosomes, etc.), and a variety of stained and banded preparations.

The book is an ambitious attempt to present all available information about the cytogenetics of these frogs, most of which was generated by the contributors themselves. The contributors present terraranan cytogenetics in the context of what is known about vertebrate cytogenetics in general, and amphibian cytogenetics in particular, so there is much more of potential interest in this book than the terraranans or even amphibians. As far as I know, there is really nothing else out there like it.

The book is organized very much like an enormous paper in proper scientific format, with an Introduction, Materials and Methods, and a combined Results and Discussion section. (In fact, it is a reprint of an article originally published in Cytogenetic and Genome Research 2010, Vol. 130–131, No. 1–8.) The sheer range of topics is prodigious. After a brief introduction (16 pages) to the Terrarana in terms of morphology, developmental biology, ecology, and biogeography, the book delves right into the main cytogenetic issues. The authors point out that, in terms of general appearance, such as body form and coloration, '' . . . there is nothing distinctive that unites these frogs into a single group or sets them apart from other groups of frogs'' (p. 16). Within the context of this generalized anuran morphology, they are small frogs and possess structural/functional specializations of the terminal phalanges, plus they are characterized by having direct development (no aquatic larval stage). At the same time they are staggeringly species rich, with over 900 species representing more than 33% of Neotropical frogs and 16% of anuran species worldwide.

Cytogenetically, the Terrarana show high variation in chromosome shape and number, and extraordinarily high rates of chromosomal evolution. The patterns of cytogenetic variation in these frogs reveal apparent trends, primarily involving centric fusions and/or fissions. The central role of centric fusions (and/or fissions) in karyological evolution in the Terrarana is beautifully summarized in fig. 25, which uses selected karyotypes to illustrate a hypothetical transformation series between a karyotype consisting of all uniarmed telocentrics to one consisting of all biarmed meta- or submetacentric chromosomes. The key to understanding what is going in this transformation series is the relationship between chromosome number and the total number of chromosome arms (the ''Fundamental Number'' or FN). A completely uniarmed karyotype consists of 36 (18 homologous pairs) of telocentrics with FN = 36, while a completely biarmed karyotype consists of 18 (9 pairs) of meta-submetacentric chromosomes, again with FN = 36. In between these two extremes are karyotypes representing every possible intermediate condition, forming a smooth transition, or continuum, of gradually decreasing chromosome number but unchanging FN. These cytogenetic differences are thus most simply explained by centric fusions, by which telocentrics fuse at their centromeres to form biarmed (metacentric or submetacentric) elements, or vice versa, where biarmed elements undergo centric fission to generate telocentrics.

Overlain on this general trend of ''centric fusion cycles'' are a dizzying array of different kinds of chromosomal changes including different kinds of inversions, reciprocal translocations, tandem fusions, chromosome loss, B-chromosomes, etc., some of which appear to be sporadic or idiosyncratic, and some of which have become fixed as species differences. In addition to these overt chromosomal mutations, the authors also review the available information on the molecular structure and evolution of the chromosomes, including euchromatin, heterochromatin, ribosomal genes, telomeric sequences, ribosomal genes, and silver-stained nucleolar organizer regions (AgNORs), as well as a detailed review and discussion of the evolution of sex chromosomes.

And so what? What does it all mean? The authors consider various possibilities, such as implications of the fact that fusions reduce the number of genetic linkage groups, or that chromosome number and/or shape may have some other kind of adaptive significance. They conclude that the flurry of chromosomal mutations seen in the Terrarana, as interesting as it may be to cytogeneticists, appears to be neutral in respect to adaptive significance at the organismal level. Curiously, little is said about the possible relationship between the extraordinarily high rates of chromosomal change and the equally extraordinary high rates of speciation. Still, at the cytogenetic level, an interesting evolutionary story can be told.

Mapping the karyological diversity in the Terrarana onto a phylogenetic tree based on molecular data suggested that a 2n = 36, FN = 36 all-telocentric karyotype characterizes basal groups and is, therefore, the probable ancestral karyotype from which most of the different karyotypes in extant species were derived mainly via centric fusions. Subsequent lineages are characterized by ''basic karyotypes'' that become modified in different species via a variety of chromosomal mutations. But where did this original uniarmed karyotype come from? Based on cytogenetic comparisons with marsupial frogs (Hemiphractidae), a closely related outgroup, the authors suggest that the basal terraranan uniarmed karyotype probably originated from a ''major breakdown'' of a 2n = 26 karyotype. All of this suggests, according to the authors, that the putative common terraranan ancestor was characterized by mutations that caused a deficient repair system for chromosomal breaks, leading to extraordinarily high rates of chromosomal evolution in this group of frogs.

One of the most useful aspects of the book is the comprehensive Materials and Methods section in which all of the techniques used to study cytogenetics (especially in amphibians) are described in detail. In this section, one can learn how to prepare mitotic and meiotic chromosomes from frogs and other amphibians, and how to analyze the chromosomes in terms of basic karyology and various kinds of banding, including C-banding, Quinacrine banding, and R-banding. Techniques are also described to locate specific sequences and functional regions on the chromosomes, such as silver staining to visualize active NORs and certain other sites, how to use fluorescence *in situ* hybridization (FISH) to localize telomeric and ribosomal sequences, and so forth. Another important aspect of this section is that the authors provide a detailed list of specimens, dates, and collection localities.

For all of its strengths, the book (representing as it does a long-term study of monumental proportions) does have some weaknesses, most of which are acknowledged by the authors. First of all, despite this truly massive work, most species (including whole genera and families) of terraranan frogs have not yet been examined cytogenetically. As the authors point out, this information, when it becomes available, is almost certain to alter the currently perceived patterns of chromosomal change. One curious thing about the book is how the authors handle the cytogenetic information vis-à-vis phylogenetic systematics. Rather than using the cytogenetic data to construct their own ''chromosome tree,'' the authors chose instead to map the cytogenetics to a ''procrustean'' phylogenetic tree constructed using molecular data (mitochondrial DNA sequences). I'm not sure whether or how their conclusions would differ, but given the amount of cytogenetic data presented here, I wonder if it could be done.

A surprising omission to me is a chapter devoted to possible relationships between the high rates of chromosomal

evolution and the high rates of speciation. These are discussed separately, but the authors do not explore the possible relationship. The authors are clearly focused on proximate causes of chromosomal mutation, but it seems that this prodigious body of data begs for big picture speculation along these lines, if for no other reason than to set up hypotheses for future research. How are the rates of cytogenetic change and speciation related to other outstanding aspects of their biology/ecology, such as direct development and propensity to invade high-elevation habitats, for example?

Also considering the enormous amount of information presented concerning basic karyology, banding, and nucleic acid hybridization, it almost seems superfluous to point out something that the contributors know full well. That is the conspicuous absence of the sort of whole ''chromosome painting'' using FISH that has been used so successfully to study karyotype evolution in mammals, for example (Ferguson-Smith and Trifonov, 2007). Chromosome painting could be used to identify homologous chromosome segments (synteny) and allow some of the hypotheses about the patterns and directions of cytogenetic evolution to be tested in terraranan frogs. This is just one of several potentially productive paths for future research on terraranan cytogenetics in particular, and amphibian cytogenetics in general, future investigations for which this monumental achievement serves as a solid foundation.

Anyone who is seriously interested in terraranan frogs will want to have access to this book. Given its broad and deep coverage of basic cytogenetics, the same goes for cytogeneticists, especially those working with amphibians. Unfortunately, given the price of the book (nearly $800.00 US), it is probably effectively out of reach of all but institutional libraries and the most dedicated cytogeneticists and herpetologists.

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**Herpetofauna of Armenia and Nagorno-Karabakh**. M. S. Arakelyan, F. D. Danielyan, C. Corti. R. Sindaco, and A. E. Leviton. 2011. Society for the Study of Amphibians and Reptiles. Contributions to Herpetology. ISBN 9780916984847. iv + 149 p. $40.00 (hardcover).—This book provides a detailed account of the amphibians and reptiles that occur in the southern part of the Caucasus Mountains in the former Soviet Union. The two regions covered are Armenia and Nagorno-Karabakh. The latter is a self-declared country that lacks international recognition, which was established following conflict between Armenia and Azerbaijan that took place during the collapse of the USSR in the early 1990s. The majority of the human population of Nagorno-Karabakh is of Armenian descent. The two regions are separated by a sliver of Azerbaijan that is occupied by the Armenian military.

The introduction of the book presents detailed accounts of the geography, climate, biodiversity, and habitats of the region. A useful table lists the seven amphibian and 51 reptile species by zone, habitat, and elevational range. The introduction ends with a detailed historical account of Armenian herpetological studies from Carl Eichwald's Fauna Caspio-Caucasica published in 1841 through the present. Much of the literature during the Soviet era was written by authors who are not well known outside of the region. An exception is Ilya Sergeevich Darevsky, who published widely outside of the Soviet Union. Much of his career was spent studying the herpetofauna of what is now Armenia, and that is reflected in the 38 Darevsky publications listed in the bibliography. The book is dedicated to Darevsky who died in 2009.

Following the introduction there are nine pages of identification keys with photographs that illustrate many of the key features. These photos will be helpful to those who are not familiar with some of the key characteristics of the region's herpetofauna. The layout of the key is nicely organized into boldface headings listing families, genera, and species within a genus. The only difficult key is that for the genus *Darevskia,* a group of lacertid lizards with nine species occurring in the region covered by this book. The scales referred to in Key Figure 17 (p. 31) are so small that they cannot be distinguished. Also, some of the scale characters used to identify species of *Darevskia* are not illustrated requiring readers not familiar with lizard squamation to use other literature for reference. This is a minor criticism of an otherwise very well prepared identification key.

The bulk of the book is the species accounts. Each account contains sections for type locality, taxonomy, general distribution, distribution in the study area, general information, and conservation status. ''General Information'' is used to summarize additional information about the species based on data from populations living in Armenia and Nagorno-Karabakh. This section varies among the species accounts. For poorly studied forms, such as the Persian Dwarf Snake (*Eirenis persicus*), only a single specimen is known from Armenia and the account only reports size, squamation, and the habitat where the snake was collected. The Eurasian Marsh Frog (*Pelophylax ridibundus*) has been the subject of many regional studies and general information includes size, karyotype, habitat, life history, biological notes, and skeletochronology. Each category within the heading of general information is referenced within the text, at the end of each species account, and in the bibliography.

One of the best features of this book is the section of 32 color plates that illustrate the species and habitats. The first 15 color plates show photos of living individuals of every species, alongside a small dot-distribution map for each species. The main omission of this book is the lack of a gazetteer or reference to the location of the dots on each map. Obviously the authors knew where to place the dots, so the extra pages needed to list the locations would not

have been difficult to prepare. The final 11 plates illustrate the different habitats in Armenia and Nagorno-Karabakh. The book concludes with 27 pages of bibliography followed by an index of geographic names and taxa.

The team of authors consists of two Armenians (MSA and FDD), two Italians (CC and RS), and a herpetologist from the United States (AEL). Marine Arakelyan and Felix Danielyan have spent many years conducting research in their country. Claudia Corti and Roberto Sindaco have worked in the field with the Armenians for nearly a decade. Alan Leviton, from the California Academy of Sciences, is an expert on Asian herpetology and the historical aspects of the field.

As is the case with other SSAR publications, the overall quality of the book is excellent and the price of $40.00 US is modest. I recommend that all researchers who have an interest in the Caucasus region consider purchasing this volume. Even though the accounts are about a limited geographic region, most of the species are found elsewhere in Europe, Turkey, and West Asia.

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