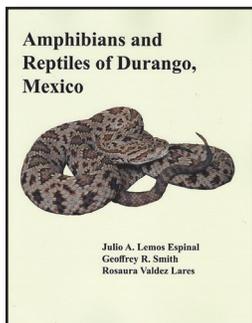


BOOK REVIEWS

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Amphibians and Reptiles of Durango, Mexico

Julio Lemos-Espinal, Geoffrey R. Smith, and Rosaura Valdez-Lares.
2019. ECO Herpetological Publishing and Distribution, Rodeo, New Mexico (www.ecouniverse.com). xii + 416 pp. Softcover. US \$69.00. ISBN 978-1-938850-27-1.



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There is no doubt that during the last several decades, Mexico has become a world leader in herpetological studies allied with biodiversity and conservation.

A major reason for this reflects a notable expansion of groups of Mexican herpetologists and their foreign collaborators, especially those from other countries in North America and Europe. Within Mexico, a major trend to initiate large-scale studies and resultant publications focused on state and regional herpetofaunas that have been published by a variety of sources including book publishers, academic institutions, professional societies, national and state governments, and by international organizations such as The World Wildlife Fund. Since the early 2000s, one of the groups to publish books and large journal articles has been linked primarily to northern Mexico and led by Julio Lemos-Espinal.

The latest state-oriented book by the Lemos-Espinal group is entitled *Amphibians and Reptiles of the State of Durango, Mexico*, coauthored by three experienced herpetologists. Julio is a Research Professor in the Laboratorio de Ecología of the Unidad de Biotecnología y Prototipos, FES-Iztacala UNAM; Geoffrey Smith is a Professor of Biology at Denison University in Granville, Ohio; and Rosaura Valdez-Lares, who received a Master's Degree in Management of Natural Resources from the Institute of Ecología-IN-ECOLA. C., lives in Guadalupe Victoria, Durango. Much of the information used in the Durango book came from a series of articles beginning principally with Valdez-Lares et al. (2013a, b) and ending with an update of the herpetofauna and summary of the literature by Lemos-Espinal et al. (2018).

Amphibians and Reptiles of the State of Durango, Mexico is softbound and reasonably constructed for durability as a desk copy, but less so for use under field conditions. Unlike some of the other similar-themed books on Mexican states and regions, it is not bilingual but rather English only. I found only a few typographical errors in the text, but none caused confusion for

the reader. After the table of contents, there are photographs of a lizard and a snake, the acknowledgments, and two satellite images, one showing topographic features of Mexico and the other a topographic image of Durango, although neither depict specified physiographic areas discussed later. Next in order is a short Introduction; then what the authors call a brief history of herpetology in Durango, but what I consider a thoroughly written account; a listing of type localities of species and subspecies described from the state (table 1); and by sometimes confusing sections on physiographic characteristics of Durango, including a depiction of municipalities (map 1), a listing of four physiographic provinces and subprovinces (map 2), climate (map 3), hydrology, vegetation types in general (map 4), and a description of vegetation in warm tropical and temperate regions. The most confusing instances in the book include occasionally imprecise placement of figure topics and items on maps detailing some of the sections identified above. In my opinion, it would have been much easier to follow if all topographic and other maps, figures, and photos of landscapes and the herpetofauna had been given separate figure numbers positioned in order of sequence as they appear in the book. Confusing examples of the above include: 1) unnumbered topographic map of Durango on page xii is referenced as fig. 1 in the text on p. 18, but the actual fig. 1 is a picture in the anuran key on p. 40. 2) Map 2 has its legend and listings positioned within the map that supposedly identify physiographic provinces (enumerated as four provinces in the text on page 15), but the actual areas shown on the map are nine subprovinces with Spanish names. In addition, some of the subprovinces listed in the text have English spellings that may confuse some readers during translation. 3) In the text on pp. 18 and 19, three climate types are listed, but on map 3, six types are recognized. 4) The vegetation types discussed in the text on pp. 19, 21, and 23 do not relate well with vegetation categories listed on map 4.

The next section, species list compilation, recognizes institutions whose collections were used to find voucher specimens and localities; sources for nomenclature; sources used by three conservation classifications (IUCN, Environmental Vulnerability Score [EVS]; Wilson et al. 2013a, b, and SEMARNAT), and one of their own recognizing global classes identified only in table 2 in another section on pp. 25–32; and publication citations of records for the herpetofauna of adjacent states in Mexico used to compare with Durango. It seems odd that the list of institutions did not include the University of Texas at El Paso (UTEP) and Michigan State University (MSU), where Robert G. Webb deposited most of his extensive Durango material.

The next section, recent taxonomic changes, is followed by a unit on the currently known amphibians and reptiles of Durango, which is primarily composed of table 2 followed by a written summary. Corrections to and comments on the current taxonomic list of species include: 1) *Agalychnis dacnicolor*

is found under Hylidae, but it is now in Phyllomedusidae (Frost 2019). 2) *Scincella lateralis* is placed in Scincidae, but it should be in the family Sphenomorphidae based on Hedges (2014). 3) They recognize the often-used taxonomic Suborder Lacertilia for lizards in many of the tables and text sections throughout the book, although this is not a valid phylogenetic taxon because it is not monophyletic (Zheng and Wiens 2016, among others). 4) There is a preserved voucher specimen of *Coleonyx reticulatus* in the UTEP Biodiversity Collections (UTEP 4453) from 7 mi. SW of León Guzman, Durango, and is a first record for the state but is not included in the book. 5) The latest taxonomic study on the *Sceloporus magister* complex by Leaché and Mulcahy (2007) subsumed *S. bimaculosus* back into *S. magister*. 6) *Aspidoscelis scalaris* is not included, even though it is listed in Webb (2014) and voucher specimens are deposited in UTEP and MSU collections. 7) A surprising oversight relates to the book not containing *Lampropeltis greeri*, whose type locality is in Durango (Webb 1961). The book considers it a subspecies of *L. mexicana* (Table 1), but Hansen and Salmon (2017) clearly point out that it is allopatric (genetically separated) from the other forms of the *L. mexicana* complex and was recognized by them as a full species. 8) O'Connell and Smith (2018) elevated *Masticophis mottovariatus striolatus* to *M. lineatus* for populations whose ranges include Durango. 9) It would have been helpful if a taxonomic cut-off date had been designated in the introduction section to clear up any confusion on what literature sources were available for citing.

Next is table 3 and its summary recognizing numbers of higher taxonomic groups from the state, including suborders of Squamata. After that, there is a section on general distribution discussing spatial patterns found in table 2; a section on conservation status explaining more about IUCN, EVS, and SEMARNAT classifications; a section on habitat types included in table 4; and a section comparing the herpetofauna of neighboring states with Durango that include tables 5, 6, and 7. Inaccuracies and comments about those tables are: 1) In the text on p. 35, the authors state that the surface areas of states are found in table 4, but those values are found in table 5. 2) In the text on p. 35, the authors say that table 5 contains the number of shared species between the states, but those values are actually found in table 7. 3) Table 6 contains the number of species in neighboring states, but that information is not discussed in the text. 4) Also on p. 35, the authors briefly discuss a cluster analysis, but depend on Lemos-Espinal et al. (2018) for depicting the dendrogram. In my opinion, it would have been much easier to discuss and explain the results of that tree if they included the dendrogram at that point.

Like any book of this type, the majority of the information is contained in the species accounts, which include material on the following: title (scientific name, authority, and standard common name), identification, morphology, coloration, distribution, habitat, natural history, diet, taxonomy, and protection status. Helpful support for the species accounts are the illustrated dichotomous keys positioned before each taxonomic group at the levels of Class (Reptilia and Amphibia), Order (comprising Squamata for lizards and snakes, Testudinata for turtles, Caudata for salamanders, Anura for frogs and toads, Suborder for lizards (Lacertilia) and snakes (Serpentes), and Family. This is a traditional classification of amphibians and reptiles, but the phylogenetically based taxonomic arrangement of some groups of amniote vertebrates is still being refined, although as indicated earlier the taxon Lacertilia is not monophyletic and probably

should not be used, or if it is, reasons why must be thoroughly discussed in a section addressing taxonomic positions of the authors. The literature cited section follows the species accounts. While examining for inclusion of literature sources in both text and literature cited segments, I discovered 15 citations that are present in the text only and 24 citations that were found only in the literature cited section.

The following four appendices also notably support species accounts: 1) Appendix 1 includes photos of natural areas in Durango and those of included herpetofaunal species; 2) Appendix 2 contains a map of the sites (map 5) where specimens were collected, alongside a gazetteer listing municipalities and specific localities surveyed; 3) Appendix 3 shows distributional maps of Durango with small colored circles locating individual sites of each species; 4) Appendix 4 lists locality sites for each species by municipality and specific area.

The 296 photos (all except for one salamander are in color) in Appendix 1 are of reasonable quality and many of the species have more than one photo from same or different localities. Of the 281 photos depicting amphibians and reptiles, only 24 represent Durango animals and 52 have no locality listed. Of the non-Durango images, the one with a locality furthest from the state is a *Masticophis flagellum* from Liberty County, Florida. One photo (photo 294) supposedly shows a *Trachemys gaigeae* from Texas, but it is obviously an image of a species belonging to *Kinosternon*. There are no photographs of four species, although I suspect some for each of those are available from other sources. It would have been most favorable to use photos representing individuals from Durango for depicting geographic variation in local populations, but I also realize the potential difficulties locating subjects to photograph, especially rare or seldom-observed species.

In summary, the book includes much information on the herpetofauna of Durango, and even with the unfortunate shortfalls, I think it can be useful to anyone, professional or not, who is interested in learning about the amphibians and reptiles of Durango. The US \$69.00 cost is comparable to other books of this type. Regarding the deficits, I can only assume that there was a breakdown of some sort when reviewers examined the publisher's proof copy before it went to press. Still, the book has its merits and can be a useful treatise on the herpetofauna of Durango, Mexico.

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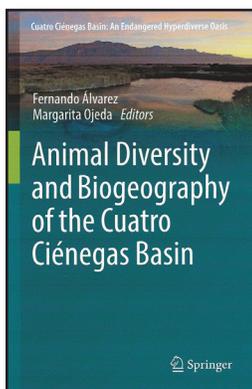
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Animal Diversity and Biogeography of the Cuatro Ciénegas Basin

F. Alvarez, and M. Ojeda (editors). 2019. Springer International Publishing (www.springer.com). 231 pp. Hardcover and e-book. €135.19/\$150.00 (hardcover); €109.99/\$122.00 (e-book). ISBN: 978-3-030-11261-5 (hardcover); 978-3-030-11262-2 (e-book).



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Mexico harbors 4.92% and 8.72% of the total global diversity of amphibians and reptiles, respectively (CONABIO 2017). This high diversity is the result of the confluence of the Nearctic and Neotropical regions, as well as the great variety of ecosystems within the country, including an extensive semi-desert ecosystem that covers more than 50% of the national territory (González-Medrano 2012). Within this region, certain areas containing habitats, fauna and flora of international importance stand out for their biological and landscape uniqueness. Cuatro Ciénegas is recognized as a biodiversity hot spot for its distinct taxonomic diversity, and it has been likened by some authors (Souza et al. 2012) to an island in the central Chihuahuan Desert. Indeed, its diversity has been compared with that contained in the Galapagos Islands. In addition, it is considered a relict of the

Precambrian because of the existence of certain bacterial species and other organisms whose metabolism evolved under conditions similar to those on Earth 4500 million years ago under conditions of scarce nutrients and low oxygen concentrations. The richness and biological distinctiveness of Cuatro Ciénegas has been the subject of much research, and there is an extensive body of literature on the region. However, none of the existing works encompasses the diversity of subjects on the Basin now available in *Animal Diversity and Biogeography of the Cuatro Ciénegas Basin*.

This book embraces topics on the most representative taxonomic groups of the Basin, among which amphibians and reptiles are conspicuous, as well as invertebrates, which are distinguished by a series of adaptations displayed in order to survive the typically extreme conditions of the Chihuahuan Desert. Cuatro Ciénegas is a closed basin surrounded by several mountain ranges. As a result, resident species with limited vagility (such as reptiles) have evolved in isolation, which has resulted in 4.3% of the fauna being endemic to the Basin. *Animal Diversity and Biogeography of the Cuatro Ciénegas Basin* is an invitation to immerse yourself in the diversity of the animals of this place, and information contained within the book will surely be of great interest to individuals interested in semi-desert ecosystems far beyond the basin's geographic limits. Throughout 15 chapters, the authors help the reader to understand its intricate history and ecology, as well as to appreciate the interactions and threats that biodiversity faces.

The book is part of a series of three books (sold separately) from a collection entitled *Cuatro Ciénegas Basin: An Endangered Hyperdiverse Oasis*. The first volume, entitled *Cuatro Ciénegas Ecology, Natural History and Microbiology*, consists of nine chapters summarizing the natural history of Cuatro Ciénegas. In addition, it provided a detailed description of the climate of the area, the mutualistic relationships between different organisms, and how the bacteria and microbiota created an ideal environment for development and maintenance of life millions of years ago that continues to the present day. Cuatro Ciénegas is located within an arid zone, and the diversity of animals it harbors surprises researchers because of its obvious lack of nutrients. To understand its ecology, a second volume entitled *Ecosystem Ecology and Geochemistry of Cuatro Ciénegas*, with 12 chapters, explored hypotheses concerning the acquisition of nutrients from alternative primary sources, the role of fungi and stromatolites within the ecological processes of the Basin, and the adaptations of bacteria to survive in oligotrophic environments.

The third volume of the series, *Animal Diversity and Biogeography of the Cuatro Ciénegas Basin*, provides information on the faunal richness of the area in 15 chapters. The first chapter, entitled "The Fauna of the Cuatro Ciénegas Basin, a Unique Assemblage of Species, Habitats, and Evolutionary Histories," summarizes the content of all subsequent chapters, highlighting important observations that stand out for each taxon discussed. Further, it contains a series of predictions regarding the fate of the most vulnerable species within the region. Since habitat degradation and anthropogenic disturbance are high in most natural areas of México and have different impacts according to each taxon, some of the individual chapters of the book probe more extensively into these topics. As mentioned, the Cuatro Ciénegas region is recognized for its high species richness among taxa. As such, the remaining chapters of the book are devoted to the diversity and distinctiveness of certain groups of particular interest: fish parasites (Chapter 2); soil micro-arthropods (Chapter 3);

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