



PROCEEDINGS

of the
California Academy of Sciences
(Series 4)

December 29, 2016 * Volume 63 * Numbers 13–16

Institute for Biodiversity Science & Sustainability



CALIFORNIA
ACADEMY OF
SCIENCES

CALIFORNIA ACADEMY OF SCIENCES

PROCEEDINGS SERIES

INSTRUCTIONS TO AUTHORS

Authors planning to submit papers for consideration for publication in the Academy's *Proceedings*, *Occasional Papers*, or *Memoir* series must follow the directions given below in preparing their submissions. Under some circumstances, authors may not be able to comply with all the computer-based requirements for submission. Should this be the case, please contact the Editor or Associate Editor for guidance on how best to present the materials.

The Scientific Publications Office of the Academy prepares all materials for publication using state-of-the-art, computer-assisted, page-description-language software. Final copy is sent to the printer for printing. The printer does not modify the files sent for printing. Therefore, it falls to the authors to check carefully page proof when it is returned for approval. Ordinarily, all communication with authors is done via email and galley and page proofs of manuscripts, including figures, are transmitted as attachments to email communications. Again, exceptions to this will be made in the event that an author is unable to communicate in this way.

Authors are expected to provide digital copies of both manuscript text files and images, as well as a paper printout of their manuscript. Please note the following:

TEXT: Text can be in Microsoft Word, as a Word document file, WordPerfect, also as a WP document file, or, best of all, as an "rtf" (rich text format) file, which can be produced by most word processors. Authors who use non-standard fonts must include file copies of those fonts so that their symbols can be reproduced accurately. However, it is strongly recommended that the type style "New Times Roman" be used throughout and that the Symbols and Bookshelf Symbol 1 and 3 fonts be used for such items as σ , φ , μ , etc. Note, words must not be typed in all capital letters either in the text or bibliography; small caps are acceptable.

IMAGES: Images should be in either JPG (JPEG), or TIF (TIFF) format. Resolution for grayscale images should be at least 600 ppi (1200 ppi if possible, especially for photomicrographs), and 300 ppi (600 ppi acceptable) for color. All images should be sized so that none exceeds a maximum print size of 5.5"×7.875" (140 mm × 200 mm).

TABLES: Our processing software allows for direct importation of tables. This reduces the chances for errors being introduced during the preparation of manuscripts for publication. However, in order to use this feature, tables must be prepared in Microsoft Excel or in Microsoft Word using Word's table feature; do not prepare tables using tabs or space bars. Complex tables not prepared as described above will be returned to the author for revision.

DIGITAL FILES: IBM or MAC formatted disks will be accepted subject to the following conditions: (a) floppy disks must not exceed 1.4 mb and (b) zip disks, preferably IBM format, must not exceed 100mb. Authors are encouraged to submit their digital files on CD-ROM (CD-R formatted disks NOT CD-RW) inasmuch as these can be read by nearly all CD-ROM drives.

FILE NAMING PROTOCOLS: To facilitate the handling of digital files submitted by authors, the following file-naming conventions are to be followed: text files should bear the author's last name (in the case of multiple authors, only the first author's name) followed by a space and a date in the format mmyy (e.g., 0603 for June 2003) to yield a file name such as **Gosliner 0603.doc** or **Williams 0603.rtf**. If an author has submitted two or more manuscripts and must distinguish between them, then the naming should include an additional numeral: **Gosliner1 0603.doc** for the first manuscript, **Gosliner2 0603.doc** (or .rtf) for the second. Figures should follow similar conventions, as follows: **Gosliner F1 0603.tif**, **Gosliner F2 0603.tif**, for figures in the first manuscript and, if more than one manuscript, then **Gosliner1 F1 0603.tif** etc. for the figures associated with the first manuscript and **Gosliner2 F1 0603.tif** etc. for those with the second. Following these conventions will insure that figures submitted by one author are always maintained distinct from those submitted by another. Tables submitted as Excel files should follow the same naming conventions except the file type designation will be ".xls": e.g., **Gosliner T1 0603.xls**. Please note that extraneous periods are omitted in file names.

BIBLIOGRAPHY FORMAT: Three bibliographic styles are accommodated in the Academy's scientific publications, one commonly used in scientific journals publishing papers in systematic and evolutionary biology, a second used mainly in the geological literature, and lastly, the format most commonly used in the humanities by historians of science. On request, the author will be sent a style sheet that includes samples of the three formats. Authors are also encouraged to examine a copy of the latest published *Proceedings*. In all instances, however, authors should not abbreviate journal names but spell them out completely. For books, the reference must include the publisher and city of publication. It is recommended that the total number of pages in the book also be given.

SUBSCRIPTIONS/EXCHANGES

The *Proceedings* series of the California Academy of Sciences is available by exchange or subscription. For information on exchanges, please contact the Academy Librarian via regular mail addressed to the Librarian, California Academy of Sciences, 55 Music Concourse Drive, Golden Gate Park, San Francisco, CA 94118 U.S.A. or via email addressed to hyaeger@calacademy.org. Subscription requests, including information on rates, should be addressed to Scientific Publications, California Academy of Sciences, 55 Music Concourse Drive, Golden Gate Park, San Francisco, CA 94118 U.S.A. or via email to the Editors at aleviton@calacademy.org or gwilliams@calacademy.org

Subscription price for 2010: \$75 (US) includes mailing to U.S. and Canadian addresses and \$85 to all others.

The *Occasional Papers* and *Memoirs* are not available by subscription. Each volume is priced separately. *Occasional Papers*, *Memoirs*, and individual issues of the *Proceedings* are available for purchase through the Academy's Office of Scientific Publications. Visit us on the web at <http://research.calacademy.org/research/scipubs/>.

COMMENTS

Address editorial correspondence or requests for pricing information to the Editor, Scientific Publications Office, California Academy of Sciences, 55 Music Concourse Drive, Golden Gate Park, San Francisco, CA 94118 U.S.A. or via email to the Editor, Scientific Publications, at aleviton@calacademy.org or gwilliams@calacademy.org

A Checklist of the Amphibians and Reptiles of Afghanistan* Exploring Herpetodiversity using Biodiversity Archives

Philipp Wagner^{1,2,7}, **Aaron M. Bauer**^{2,3,4}, **Alan E. Leviton**^{3,4},
Thomas M. Wilms⁵, and **Wolfgang Böhme**⁶

¹ *Zoologische Staatssammlung München, Münchhausenstr. 21, D81247 München, Germany;*

² *Department of Biology, Villanova University, 800 Lancaster Avenue, Villanova, Pennsylvania 19085, USA;* ³ *Department of Herpetology, California Academy of Sciences, 55 Music Concourse Drive, San Francisco, California 94118, USA;* ⁴ *Research Associate, Division of Amphibians & Reptiles, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560, USA;*

⁵ *Allwetterzoo Münster, Sentruper Str. 315, D48161 Münster, Germany;* ⁶ *Zoologisches Forschungsmuseum Alexander Koenig (ZFMK), Adenauerallee 160, D53113 Bonn, Germany;*

⁷ *Corresponding author.*

The composition and distribution of the vertebrate fauna of Afghanistan remain poorly documented and in recent decades little new data have become available due to a series of wars and the resulting unstable security conditions. As Afghanistan returns to some semblance of normalcy, baseline faunistic data will be particularly important for establishing national conservation priorities as well as for placing Afghan taxa into their broader phylogenetic and zoogeographic contexts. We here provide an updated checklist of the herpetofauna of Afghanistan based in part upon biodiversity archives of specimen records from several museum and private collections as well as literature references and field research. The herpetofauna of Afghanistan consists of 118 species and subspecies belonging to 58 genera and 21 families. Seven species are endemic to the country, whereas 18 taxa have to be deleted from previous lists of the Afghan herpetofauna. Afghanistan's primary zoogeographic relationship to the Palearctic Region is reaffirmed but with secondary influence from the Oriental Region. Immediately following the checklist, two sections provide information about species probably occurring in Afghanistan and previously mentioned species that are now recognized as absent.

KEYWORDS: Amphibia, Reptilia, Checklist, Central Asia, Southwest Asia, Afghanistan.

Afghanistan is, without doubt, one of the most challenging countries in the world in which to collect faunistic data. Yet such data are critical for scientific research regarding not only nature conservation but especially zoogeography and, therefore, also systematics. Following the zoogeographic definitions of Kreft and Jetz (2010), the country lies at the border between three important large-scale zoogeographic regions: the Oriental, African *s.l.*, and Palearctic. It is the aim of this study to present a revised checklist of the amphibians and reptiles, including distributions of the respective species, for further herpetogeographical research and conservation in this country. After four decades of more or less continuous war, field research in the country is now possible, but remains difficult. Therefore, we used “biodiversity archives”, i.e., museum and private collections as well as literature resources, to compile a comprehensive checklist of species known from

* This contribution is dedicated to Clas M. Naumann, former Director of the Museum Koenig, in recognition of his many exceptional contributions to our knowledge of the Afghan fauna and his enthusiasm for this extraordinary country.

Afghanistan. This underlines the importance of museum collections as data resources for politically unstable areas and demonstrates that systematic and biogeographic research can progress, even if field work is not possible.

PHYSIOGRAPHY.— Afghanistan has an area of about 652,090 km² (National Geographic Society 2011) and it is, therefore, slightly larger than France. It lies roughly between latitudes 30°25' and 38°31'N and longitudes 60°45' and 72°00'E, but a finger-like projection, the Wakhan Corridor, extends northeast to 74°51'E. Afghanistan is bordered to the north by Turkmenistan, Uzbekistan and Tadjikistan, to the east and south by Pakistan, to the west by Iran, and at the far east of the Wakhan Corridor by China (Fig. 1).

Geographically, the lower elevational parts of Afghanistan, together with Balochistan in Pakistan, constitute the easternmost extension of the Iranian Plateau. This geological unit rises between the Indus River Valley in the east, the Tigris River Valley in the west, and the Amu Darya (Oxus River) in the north, and is bordered by the Zagros Mountains of southwestern Iran and by the Gulf of Oman and Arabian Sea to the south and southeast, respectively. The Caucasus Mountains are the northwestern-most extension of this plateau. The mountains of Western and Central Afghanistan, e.g., Paropamisus and the Hindu Kush, link the plateau with the Pamir and the Himalayas. Northern Afghanistan, north of the Hindu Kush and south of the Amu Darya, is an extension of the Central Asian steppe. Afghanistan can, therefore, be generally characterized by three major topographical regions: (1) the Central Hindu Kush range with its outliers the Paropamisus and Koh-i-Baba; (2) the barren and rugged foothills of these ranges; and (3) the lower steppes and deserts.

The highest elevations are in the Wakhan Corridor (between 6000 and 7500 m), with the highest mountains between the west end of the Wakhan and the beginning Hindu Kush. Here, Mount Noshak (7485 m) and the nearby Pakistani Tirich Mir (7708 m) are the highest peaks and the Hindu Kush range declines to the Salang Pass (3627 m) north of Kabul and disappears between 1000 and 500 m in the northwest and the low plains and deserts in the southwest. The Hindu Kush continues to western (Paropamisus Mountain Range) and Central Afghanistan (Koh-i-Baba), with peaks as high as 5090 m. Approximately 27% of the country lies above 2,500 m elevation (UNEP 2003).

Major rivers of southern and southwestern Afghanistan (e.g., the Helmand, Khash, Farah and Harud Rivers) have no outlet to the sea and flow into a desert depression of a former lake bed known as Sistan at the Afghan-Iranian border area. The largest rivers of northwestern Afghanistan (Murghab, Hari Rud) end in the sands of the Kara Kum desert in Turkmenistan. An exception is the Amu Darya (Oxus River) system in northern and northwestern Afghanistan. It originates in the Wakhan region, receiving as tributaries the Kunduz and Kokcha Rivers, and finally flows into the Aral Sea. The Kabul River of eastern Afghanistan, and its tributaries, the Alingar and Kunar Rivers, drain through a geologically complicated mountain range (Safed Koh) in Nuristan and finally empty into the Indus in Pakistan.

CLIMATE.— Afghanistan has a semi-arid to arid continental climate, characterized by hot summers and cold winters with large daily and seasonal temperature fluctuations. The magnitude of these characteristics is influenced by four main factors (Hassinger 1968): (1) High plateaus in eastern Afghanistan and the high mountains of the Hindu Kush and Wakhan that have permanent snow and ice; (2) Indian monsoons, which extend to about 30 km west of Kabul; (3) desiccating winds, e.g., the 'hot and dry wind of 120 days', which blow between May and September from Herat across the Sistan Basin; and (4) the Kara Kum, Jalalabad, and Sistan Basins with sporadic rainfall (up to 250 mm per year), mean January temperature just above freezing and a mean July temperature above 32°C. Moreover, riparian vegetation and oases have an influence on microclimate such that in the height of summer they can have ambient temperatures three degrees cooler than those in the surrounding deserts or steppes.

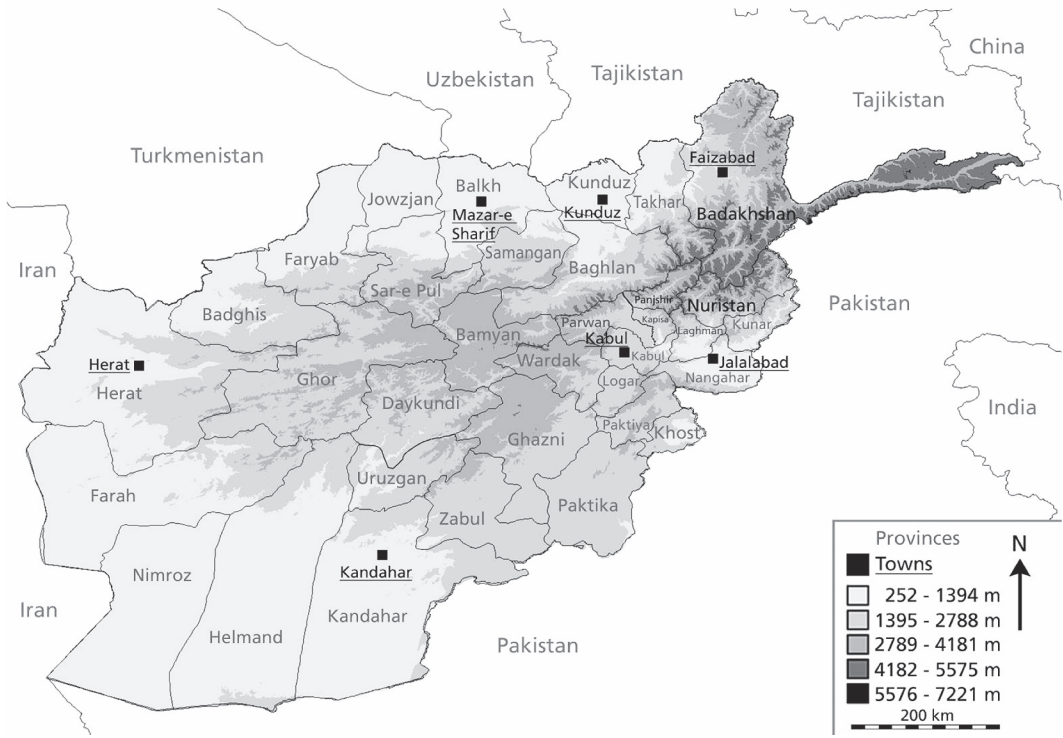


FIGURE 1: Map of Afghanistan, showing major towns and provinces.

Stenz (1946) recorded a mean temperature at Kabul (1790 m, 13-year record) of 11.5°C with a mean minimum of 3.8°C and a mean maximum of 19.6°C. Within these 13 years the absolute limits of variation were between -25.8°C and 37.7°C, resulting in a range of 63.5°C. Generally, the coldest temperatures in Afghanistan are found in the Wakhan region (-17.2°C mean temperature for the coldest month) (Stenz 1946). North and South Afghanistan are equally hot, with 33°C at Girishk (South Afghanistan) and 32°C at Termiz (Uzbekistan near the northern Afghan border) as mean temperatures for the hottest month (July) (Hassinger 1968).

Precipitation is markedly seasonal with almost none during summer and mainly snow during the winter and early spring. Snow is also the source of most of Afghan surface water (UNEP 2008). However, precipitation is also influenced by elevation with the highest at Salang (3,366 m a.s.l.) and the lowest at Farah (700 m a.s.l.) (UNEP 2008).

VEGETATION.— Most of the Afghan fauna and flora is of Eurasian origin, whereas Pakistan is dominated by species of the Indo-Malayan Realm (UNEP 2008). Some of these elements have dispersed to Afghanistan and even the lower Kabul Valley is considered to be part of the Indo-Malayan “Indus-Ganges Monsoon Forest” Province (UNEP 2008). Twelve eco-regions of four biomes are present in the country and five of these regions are considered as critically endangered (Olson et al. 2001, Fund 2012, Wagner 2014a, b). The Afghan flora has been affected by people and their livestock for thousands of years and there is virtually no part of the country, apart from high alpine areas, that has not suffered anthropogenic impacts (UNEP 2008). Freitag (1971) suggested that under natural conditions Afghanistan would be dominated by oak woodlands. Today, the largest expanses of dense vegetation are the forests along the Kunar-Nuristan border, whereas in other parts of the country dense vegetation is limited to watercourses and cropland. Moderately

dense vegetation can be found in the central and northern Hindu Kush, whereas the rest of the country is sparsely vegetated (UNEP 2008). The eastern part of the country has monsoon-influenced forests, whereas extensive deserts can be found in southwestern areas.

HISTORY OF AFGHAN HERPETOLOGY.—Research on the Afghan herpetofauna began with Boulenger (in Aitchison 1889) and Alcock and Finn's (1897) "Afghan Boundary Commission" publication and several other works of this time. A second period of intensive research started with Smith (1940) who was followed by Knut Lindberg from Sweden who traveled several times (1947, 1957–60, 1962) to Afghanistan and collected material that was later partly published in a series of papers with the title "Contribution à l'étude de la faune d'Afghanistan" (see, e.g., Pisarski 1967, Wettstein 1960). At the same time, Alan Leviton (1959) reported on a reptile collection from Chahi-Angir (Dasht-i-Margo Desert) made by John Gasparetti in 1950, and this was followed by several additional field studies until 1970. Prior to these works, references to Afghan amphibians and reptiles were to be found in a number of more general publications (e.g., Günther 1864, Boulenger 1890, 1921, Smith 1945, Terent'ev and Chernov 1949) and a few expedition reports (e.g., Murray 1892). For a complete bibliography see Leviton and Anderson (2010, 2012, 2013) and Appendix 2 herein.

In addition to his 1950 collection, John Gasparetti made two further collections during the spring and autumn of 1961 in areas north of Kandahar and south of Kabul; both are mentioned by Leviton and Anderson (1961, 1963). In the years that followed, several important expeditions, namely the Richard and Erica Clark Expeditions and the Street Expedition, collected a large number of amphibian and reptile specimens in Afghanistan. The first of these, the Clark Expedition in July and August 1964, obtained 236 specimens representing 26 species, which included two new species, *Eremias aria* Anderson and Leviton, 1967 and *Phrynocephalus clarkorum* Anderson and Leviton, 1967, and four new country records (Clark et al. 1969). The second was the Street Expedition of 1965 with a focus on mammals, but which also collected 247 amphibians and reptiles. This collection comprised 43 species and included seven new country records and two new taxa, *Agama badakhshana* Anderson and Leviton, 1969 and *Agama nuristanica* Anderson and Leviton, 1969. In 1968, Richard and Erica Clark made a second collection in Afghanistan but only published the report 22 years later (Clark 1990). The materials of these expeditions are mainly housed at the California Academy of Sciences and the Field Museum of Natural History (see Material and Methods for details).

Others also made contributions to the Afghan herpetofauna but based on smaller field excursions (see, for example, reports by Wettstein 1960, Mertens 1966, Brück 1968). At about the same time as the second Clark Expedition, Bohumil Král also collected in Afghanistan and published three new country records (Král 1969).

As an outgrowth of these collecting efforts, somewhat over 100 species of amphibians and reptiles were documented in the first herpetofaunal checklist of Afghanistan (Leviton and Anderson 1970). Additionally, Clas Naumann, former director of the Zoologisches Forschungsmuseum Koenig in Bonn, was professor in the Faculty of Science at the University of Kabul from 1970 to 1972, during which time he conducted several field surveys and established a university-based zoological museum. The herpetological specimens collected by him were identified by herpetologists at the Museum Koenig and subsequently shared equally between the museums in Bonn and Kabul. The Kabul Museum was destroyed during the Taliban regime but some remaining lists still document the material accessioned there, here published for the first time.

Since 1970 only a few publications referring to the Afghan herpetofauna have been published. These include solitary published first records, e.g., *Bungarus sindanus* Boulenger, 1897 (Kuch 2004), as well as publications based on expeditions before 1970 (e.g., Clark 1990) and summariz-

ing works like the checklist published by Sayer and van der Zon (1981). But additional new taxa have been described from Afghanistan since 1970 (e.g., Böhme and Szczerbak 1991, Nilson 1983). More recently, Theodore Papenfuss from the University of California at Berkeley (USA) and Research Associate at the California Academy of Sciences, and, independently, the first author of this publication (PW) were able to obtain material from western (Herat), northeastern (Kunduz, Faizabad), and southern Afghanistan. Most recently, Sindaco and Jeremčenko (2008) and Sindaco et al. (2013) provided distribution maps of western Palearctic reptile species that summarize records from Afghanistan, whereas Das (2014) presented a checklist of the amphibians of the country.

Despite the efforts recorded above, it must be noted that for Afghanistan most of the species are still known from very few specimens and localities and, moreover, large parts of the country, e.g., the central mountain massif stretching from Herat to Kabul, are virtually unexplored.

MATERIAL AND METHODS

Material from the following museum or private collections (sorted by their underlined acronyms) was used in assembling this checklist: AFG: Bohumil Král, private collection [based on publications, the current whereabouts of this collection are unknown]. AMNH: American Museum of Natural History, New York, NY, USA. BMNH: The Natural History Museum [formerly British Museum (Natural History)], London, United Kingdom. CAS: California Academy of Sciences, San Francisco, CA, USA. CM: Carnegie Museum of Natural History, Pittsburgh, PA, USA. CUMV: Cornell University Museum of Vertebrates, Ithaca, NY, USA. FLMNH: Florida Museum of Natural History, Gainesville, FL, USA. FMNH: Field Museum of Natural History, Chicago, IL, USA. J: O. Jakeš, private collection [based on publications, the the current whereabouts of this collection is unknown]. LC: Lindberg Collection [material mentioned in literature and only partly inventoried at the MZLU]. MCZ: Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA. MHNG: Muséum d'Histoire naturelle, Genève, Switzerland. MMB: Department of Zoology, Moravske Muzeum, Brno, Czech Republic. MNHN: Muséum national d'Histoire naturelle, Paris, France. MNKNU: Museum of Nature of the Kharkiv National University, Kharkiv, Ukraine. MSNG: Museo Civico di Storia Naturale 'Giacomo Doria', Genoa, Italy. MSNM: Museo Civico di Storia Naturale, Milano, Italy. MTKD: Senckenberg Naturhistorische Sammlungen (formerly Museum für Tierkunde), Dresden, Germany. MVZ: Museum of Vertebrate Zoology, University of California, Berkeley, CA, USA. MZLU: Zoologiska Museet, Lunds Universitet, Lund, Sweden. MZUF: Museo di Storia Naturale (former Museo de Zoologico "La Specola"), Università di Firenze, Florence, Italy. NHMB: Naturhistorisches Museum Basel, Switzerland; NMW: Naturhistorisches Museum Wien, Austria. PWC: Philipp Wagner private collection, Germany (later deposited in Munich [ZSM] or Bonn [ZFMK]). RMNH: Naturalis Biodiversity Center [formerly Rijksmuseum van Natuurlijke Historie], Leiden, Netherlands. SMF: Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany. SNM: Department of Zoology, Slovakian National Museum, Bratislava, Slovakia. USNM: United States National Museum of Natural History, Washington, DC, USA. ZFMK: Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany. ZIK: Zoological Museum, National Museum of Natural History, National Academy of Sciences of Ukraine, Kiev, Ukraine. ZISP: Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia. ZMB: Museum für Naturkunde [formerly Zoologisches Museum], Berlin, Germany. ZMK: Zoological Museum of Kabul, Kabul, Afghanistan [entire collection destroyed as a result of war or Taliban activity]. ZMUC: Københavns Universitet, Zoologisk Museum, Copenhagen, Denmark. ZSI: Zoological Survey of India, Kolkata [Calcutta], India [incorporating collections of the Indian

Museum, and former Museum of the Asiatic Society of Bengal]. ZSM: Zoologische Staatssammlung München, Munich, Germany.

In the checklist that follows, species accounts herein include (a) the citation of the first description, (b) details on primary type material if available and secondary type material if relevant, (c) synonyms, if important for a possible reconsideration of Afghan specimens, (d) Afghan localities (including the province name if necessary) referring to a specific specimen, a photograph or a traceable citation, and (e) remarks, if required, including vague Afghan localities, those with imprecise identification or those referring to topics other than those noted above. The orthography of Afghan locality names is variable and such names are, if used without quotes, herein provided in English translation.

References to places that are in international dispute are placed in the jurisdictions in effect as of the time of the publication. Province names are given if more than one town with the same name can be found within Afghanistan. Specimens from the BMNH collection often cannot be linked to a literature citation as Boulenger and other authors most often did not provide collection numbers.

CHECKLIST OF THE AMPHIBIANS AND REPTILES OF AFGHANISTAN

Amphibia: Anura

Family Bufonidae

Following their phylogenetic results within the genus *Bufo*, Frost et al. (2006) included the complex of the green toads in their new genus *Pseudepidalea*, which is the sister genus to *Epidalea*. Later, Dubois and Bour (2010) regarded *Bufotes* Rafinesque, 1815, as the oldest available name for this group, but placed it as a subgenus of *Bufo*, which is inconsistent with our current understanding of the Bufonidae. However, *Bufotes* is often used at the generic level, although its status is still under discussion. We here retain a more inclusive genus *Bufo*, incorporating several genetic lineages recognized by Frost et al. (2006) within a larger monophyletic genus.

***Bufo viridis* Laurenti, 1768:27, 111, pl. I, fig. 1 - complex**

1768 *Bufo viridis* Laurenti, Specimen Medicum, Exhibens Synopsin Reptilium Emendatum cum Experimentis Circa Venena et Antidota Reptilium Austriacorum. Joan. Thomae. nob. de Trattnern, Vienna, Austria. (8) + 214 + (3) pp., 5 pls. [thesis version]; (2) + 214 + (1) pp., 5 pls. [published version].

TYPE(S).— Including a specimen illustrated on pl. 1, fig. 1 of Laurenti's original publication from "inter fissuras, seu cavernas murorum obscuras Vienna," Austria.

LOCALITIES.— "Bamian" (BMNH 1938.2.4.3; Smith 1940:383); "Doab" (BMNH 1938.2.4.2; Smith 1940: 383); "Paghman" (BMNH 1940.3.1.10–13; Smith 1940: 383); "Tirphul, Afghanistan" (ZSI 13114–13122; Sclater 1892:26 as "*Bufo viridis*").

REMARKS.— Four species of the green toad complex are known to occur in Afghanistan (see below and Das [2014]). However, some historical records cannot be assigned with surety to those species and are here treated as *incertae sedis* within the *Bufo viridis* complex. Boulenger (1889: 105) mentioned two specimens as "*Bufo viridis*" from "Bala-morghab" [= Balal Murghab, Badghis], several specimens of the same taxon from "Tirphul", "Karez-badak", "Kishmaru", "Puza-gish [NW Kilki]" and several tadpoles "from streams of Mt. Do-Shakh [North of Kilki]", which should be, at least partly, present in the BMNH collection. Uéno and Nakamura (1966) also noted a specimen of "*Bufo viridis*" from "Ishkashim, Wakhan, N. Afghanistan" and seven specimens of the same taxon from "Kabul". Specimens of the complex from Afghanistan are shown in Fig. 2.



FIGURE 2: Specimens of the *Bufo viridis* complex from Faizabad, Afghanistan. Photos by F. Joisten.

***Bufo oblongus oblongus* Nikolskii, 1896:372**

1896 *Bufo oblongus* Nikolskii, Diagnoses Reptilium et Amphibiorum novorum in Persia orientali a N. Zarudny collectorum. Annuaire du Musée Zoologique de l'Académie Impériale des Sciences de St.-Petersbourg 1(4):369–372.

LECTOTYPE.— ZISP 1952.1 (designated by Stöck et al. 2001), from “Persia orientali” according to the original description, but subsequently given more precisely as Ssaman-Shahi mountains in eastern Iran (Nikolskii 1897). Later restricted by reference to the collection itinerary to the city of Birjand (about 32°55'N, 59°10'E) by Stöck et al. (2001).

LOCALITIES.— 40 km S of Herat (CAS 120517–26, CAS 120656–75, CAS 120963–72); Juwain (CAS 120529–31, CAS 120680); Kara Bagh (CAS 90795); SE of Zehak (along the Iran-Afghanistan border, Agricultural College) (1450 ft.) (MVZ 243504–05) [see pl. 1, fig. 1 for distribution].

REMARKS.— Stöck et al. (2001) recorded the species only for Iran, but mentioned that an occurrence in western Afghanistan is possible.

***Bufo pseudoraddei baturae* Stöck, Schmid, Steinlein, and Grosse, 1999:221**

1999 *Bufo pseudoraddei baturae* Stöck, Schmid, Steinlein and Grosse, Mosaicism in somatic triploid specimens of the *Bufo viridis* complex in the Karakoram with examination of calls, morphology and taxonomic conclusions. Italian Journal of Zoology 66:215–232.

HOLOTYPE.— ZSM 103/1998, from “a plain above the right bank of the Hunza River near the mouth of the Shimsal River, north of the village of Pasu, 2700 m a.s.l., Karakoram, Pakistan.”

LOCALITIES.— Baraki Barak [Logar Prov.] (USNM 194958–62); Culangor [Logar Prov.] (USNM 194595–97); Feyzabad (ZFMK 95001–02); 20 mi. from Jalalabad [towards Kabul] (CAS 147443); Kabul (CAS 92325–28, CAS 120705, CAS 151241, ZFMK 14458–59, ZFMK 15695); Kabul Seh Carte (CAS 151214–15); 10 mi E Kabul (CM 49535–44); 70 km S Kabul (CAS

120534, CAS 120681); Marshy area along Logar River, 7–8 mi from Kabul (CAS 92337); Mukur (halfway btwn Kabul and Kandabar) (CAS 90779–93); Paghman [34°36'N, 68°56'E] (CAS 115911–12, CAS 151235–39); ca. 4 km above Paghman (7950 ft.) (MVZ 237418–237420) [see pl. 1, fig. 2 for distribution].

REMARKS.— Stöck et al. (2001) recognized this subspecies only for Pakistan, but mentioned that an occurrence in Afghanistan is possible. Hemmer et al. (1978) mentioned three specimens as “*Bufo viridis*” from Kabul collected by Seuffer. However, one of the specimens (ZFMK 14457) is actually a snake (*Spalerosophis diadema*).

***Bufo turanensis* Hemmer, Schmidtler and Böhme, 1978:378**

1978 *Bufo viridis turanensis* Hemmer, Schmidtler, and Böhme, Zur Systematik zentralasiatischer Grünkröten (*Bufo viridis*-Komplex) (Amphibia, Salientia, Bufonidae). Zoologische Abhandlungen. Staatliches Museum für Tierkunde in Dresden 34(24):349–384.

HOLOTYPE.— MTKD D 11195, from “Duschanbe (Stadttrand), Tadshikische SSR/UdSSR” [Duschanbe (outskirts), Tajikistan, about 38°38'N, 68°51'E].

LOCALITIES.— 12 mi E Eshksham Wakhan (Ishkamish [36 43 N, 71 34 E]) (CAS 115909); 19 km E Ishkamish (FMNH 161091); Kunduz (ZFMK 8541–43, ZFMK 95003); Maimana [35°54'N, 64°43'E] (CAS 115910, FMNH 161065–68, FMNH 161071, FMNH 161171); Mazar-i-Sharif (FMNH 161110); 12 km NW Samangan (CAS 120704); 24 km E Taliqan (CAS 120973) [see pl. 1, fig. 3 for distribution].

REMARKS.— None.

***Bufo zugmayeri* Eiselt and Schmidtler, 1973:206**

1973 *Bufo viridis zugmayeri* Eiselt and Schmidtler, Froschlurche aus dem Iran unter Berücksichtigung ausseriranischer Populationsgruppen. Annalen des Naturhistorischen Museums in Wien 77:181–243.

HOLOTYPE.— ZSM 211/11–2, from “Pishin (P), Pakistan” [about 30°35'N, 67°00'E, Balochistan, Pakistan].

LOCALITIES.— Ghazni (CAS 91603–09); 15 km N Ghazni (CAS 120532–33, CAS 120678–79, CAS 120702–03); Kandahar [31°36'N, 65°47'E] (CAS 115913–14); 35 km NW Lashkargah (CAS 120527–528, CAS 120676–77); Sharisafa, 60 km NE of Kandahar (CAS 90761); Foot of hills 10 km NW of Sharisafa (CAS 90778) [see pl. 1, fig. 4 for distribution].

REMARKS.— Although details of the distribution of this species are as yet unknown, Stöck et al. (2001) suggested that the northern limit of its distribution reaches the *B. pseudoraddei* populations in eastern Afghanistan and western Pakistan. This species is not mentioned in the checklist by Das (2014).

***Duttaphrynus stomaticus* (Lütken, 1864:305)**

1864 “1863” *Bufo stomaticus* Lütken, Nogle ny krybyr og padder. Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i Kjøbenhavn, ser. 2, 4:292–311.

SYNTYPES.— ZMUC R 131136–37, from “ostindiske” [= East Indies], incorrectly restricted to “Assam”, India, by Boulenger (1891).

SYNONYMS.— *Bufo andersonii* Boulenger, 1883 from “Ajmere [Ajmer, Rajasthan, India]” by lectotype (BMNH 83.11.26.105) designation (Balletto et al. 1985). *Bufo andersonii* Murray, 1884 from “Sind (Tatta [= ponds] and Joongshai)”, Pakistan (types in the Karachi Museum, but presumed lost).

LOCALITIES.— Jalalabad (Spinlar Hotel) (1950 ft.) (MVZ 236862, 237421–29); 30 km W Jalalabad (CAS 120535–37); 20 km SW Jalalabad (CAS 120535); Jalalabad [34°26'N, 70°25'E] (CAS 115908, FMNH 161040); Kandahar (FMNH 161266); Khost [Paktia Prov.] (CAS 96172, ZFMK 8668); Paghman [34°36'N, 68°56'E] (CAS 115904–07, FMNH 161038–42, FMNH 161044–46, FMNH 161048–50); 16 km S Qala-i-Kang [30°58'N, 61°54'E] (CAS 115902–03, FMNH 161037) [see pl. 1, fig. 5 for distribution].

REMARKS.— For comments about the Karachi Museum see next species account.

Family Dicroglossidae

Chrysopaa sternosignata (Murray, 1885:120)

1885 *Rana sternosignata* Murray, A new frog (*Rana sternosignata*) from Sind. *Annals and Magazine of Natural History*, ser. 5, 16:120–121.

SYNTYPES.— Unknown number in the “Kurrachee Municipal Museum” (presumably the Karachi Museum), most likely now lost. BMNH 1947.2.1.21–22 from “Mulleer [= Malir] near Kurrachee [= Karachi (Sind)]; Zandra and Quetta [Baluchistan], in South Afghanistan”; all localities actually in Pakistan.

LOCALITIES.— Arbarp [10 mi. W Kabul, 7000 ft.] (according to Smith [1940:383], probably BMNH 1940.3.1.6–9); Baraki Barak [Logar Prov.] (USNM 194964–65, USNM 194967–70); Culangor [Logar Prov.] (USNM 194591–94); vicinities of Kabul (ZFMK 18981); Kabul Seh Carte (CAS 151216–19); Kandahar (FMNH 161279); Kargha stream, nr Kabul (CAS 133828); Marshy area along Logar River, 7–8 mi from Kabul (CAS 92330–36); Khost (CAS 96171); Kurdkabul Dam (CAS 151223–26); Paghman [34°36'N, 68°56'E] (CAS 115917–18, FMNH 161221, FMNH 161224); ca. 4 km above Paghman (7950 ft.) (MVZ 237438); Sinjui (MNHN 1985.3000) [Fig. 3; see pl. 1, fig. 6 for distribution].

REMARKS.— At the time of the description, Murray was librarian and curator of the Kurrachee Municipal Library and Museum (Adler 2012). Therefore, he most probably deposited type specimens in this collection. However, he was also in good contact with Albert Günther and donated specimens, including the syntypes, to the British Museum. Moreover, material collected by Murray as well as material from the “Karachi Museum”



FIGURE 3: *Chrysopaa sternosignata* from Logar River, Afghanistan. Photo by R. Maroor.

were sent to the Indian Museum in Calcutta (Sclater 1891, 1892).

***Euphlyctis cyanophlyctis* (Schneider, 1799:137)**

1799 *Rana cyanophlyctis* Schneider, *Historiae Amphibiorum naturalis et literariae*. Fasciculus Primus continens Ranas, Calamitas, Bufones, Salamandras et Hydros in genera et species descriptos notisque suis distinctos. Vol 1. Friederici Frommanni, Jena. xiii + (1) + 264 + (2) pp., pls. 1–2.

SYNTYPES.— ZMB 3197–98 (*vide* Peters [1863]), from “India orientali” (probably from Tranquebar [Tharangambadi, Nagapattinam District, Tamil Nadu, India] *vide* Bauer 1998).

SYNONYMS.— *Rana cyanophlyctis* var. *seistanica* Nikolskii, 1899 from “Neizar in Seistano” [Neizar, Kerman, Iran] (Holotype: ZISP 2503). *Euphlyctis cyanophlyctis microspinulata* Khan, 1997 from “side pool of a stream on the southwest of Khuzdar (southeast Kalat Division, Balochistan, Pakistan; lat. 27°53'N, long. 66°36'E),” (Holotype: BMNH 1990.8; see remarks).

LOCALITIES.— 48 km W Dilaram (FMNH 161982); Geresk Basic Health Center (CAS 147433); Helmand River, Chah-i-Angir (CAS 133827); Jalalabad (CAS 103776–77, ZFMK 7937–40); 10 mi W of Jalalabad [34°30'N, 70°22'E] (CAS 96179–88); 20 km SW Jalalabad (CAS 120515); 20 mi from Jalalabad [towards Kabul] (CAS 147438–42); ca. 25 km SE (by air) Jalalabad (2020 ft.) (MVZ 236870–75, MVZ 237434–35); 45–15 km W of Jalalabad (CAS 120505–14); Khost (CAS 96168–70); Lashkargah (CAS 120682, CAS 147434–36); Oarya-e-Matun, vic. of Khost [Paktia Prov., 1160 m] (ZMK 2731) [see pl. 1, fig. 7 for distribution].

REMARKS.— Clark (1990) mentioned specimens from Lashkargah that were collected from irrigation channels and in steep-sided pools. A specimen with the number “1990.8” does not now and never existed at the BMNH (pers. comm. F. Tillak). Therefore, the type specimen was never inventoried in the BMNH and is probably still in a private collection or lost.

***Hoplobatrachus tigerinus* (Daudin, 1803:64)**

An XI (1803) *Rana tigerina* Daudin, *Histoire Naturelle des Rainettes, des Grenouilles et des Crapauds*. Quarto version, Levrault, Paris. 108 pp., col. pls. 1–38 [see pl. 20].

HOLOTYPE.— Animal figured on pl. 20 of the description (now presumably lost), from “Bengale” [India].

LOCALITIES.— Khost, close to Khyber Pass [Paktia Prov., 1200 m] (ZFMK 15984) [see pl. 1, fig. 8 for distribution].



FIGURE 4: *Hoplobatrachus tigerinus* from Afghanistan. Photo by W. Böhme.

REMARKS.— In Afghanistan, this species is known from a single record (Fig. 4) (Kullmann 1970) and has so far not been found again.

Family Ranidae

Pelophylax terentievi (Mezhzherin, 1992:150)

1992 *Rana terentievi* Mezhzherin, Novij vid zelenikh zhab *Rana terentievi* sp. nova (Amphibia, Ranidae) z pivdnennogo Tadjhikistanu [A new species of green frog *Rana terentievi* sp. nova (Amphibia, Ranidae) from South Tajikistan]. Dopovidi Akademii nauk Ukraïni. Matematika, Prirodnavstvo, Tekhnichni Nauki. Zoologiya 5:150–153.

HOLOTYPE.— ZIK 25441, from “Tadjhikistan, Komsomolabadskij r-n, smt Obi-Garm” [Obigarm, Roghun District, Tajikistan]. In the original description (Mezhzherin 1992) ZIK 25441 is given as holotype, but according to Pisanets (2001) this specimen is now “Amph A3” of the NNHM NASU.

LOCALITIES.— Baghlan (USNM 194986); Bokan (MZLU L957/3078); Doshi, 2700ft (Smith 1940, probably BMNH 1938.2.4.1); Hari Rud, under Malan Bridge, nr Herat (CAS 133829–30); Herat area [34°20'N, 62°10'E] (CAS 115915, FMNH 161114–15); ca. 25 km SE (by air) Jalalabad (2020 ft.) (MVZ 236876); 24 km E Khanabad (CAS 120699); Khenjan (CAS 120516, CAS 120683–98, CAS 120979–81); Kunduz, 400 m. (ZFMK 8535–40); Paghman (FMNH 161055); 24 km E Taliqan (CAS 120982–86); 65 km NE Taliqan (CAS 120700–01); Zebak, 64 mi by rd E Faizabad (CAS 115916, FMNH 161124–25) [see pl. 2, fig. 1 for distribution].

REMARKS.— Although Afghan specimens (Fig. 5) were previously recognized as *Rana ridibunda* and more recently as *Pelophylax ridibundus*, we believe that they should be referred to the species above. Previously, *Pelophylax terentievi* was recognized only from southern Tajikistan and northwestern Xinjian in China, thus this is the first mention of this taxon for Afghanistan. Uéno and Nakamura (1966) mentioned one additional specimen from Khanabad, N. Afghanistan, but without providing a reference or voucher specimen. Clark (1990) mentioned this species (as *R. ridibunda*) as very abundant at Khenjan where specimens occurred in streams, ponds and irrigation ditches.



FIGURE 5 *Pelophylax terentievi* from Feyzabad (Badakshan Province), Afghanistan. Photo by Frank Joisten.

Amphibia: Caudata
Family Hynobiidae

***Afghanodon mustersi* (Smith, 1940:382)**

1940 *Batrachyperus mustersi* Smith, Contributions to the herpetology of Afghanistan. Annals and Magazine of Natural History, ser. 11, 5:382–384.

HOLOTYPE.— BMNH 1946.9.6.59 (formerly BMNH 1940.3.1.1), from “mountain streams of the Paghman Range, above Paghman [= 17 mi. W Kabul], at between 9000 and 10,000 feet altitude,” Afghanistan. *Paratypes.*— BMNH 1946.9.6.60–63 (formerly 1940.3.1.2–5), same locality as the holotype.

LOCALITIES.— Darrahe Pain Stream, 3 mi N Paghman (9000 ft.) (MVZ 232869); 20 km NW of Kabul, Paghman, Pain tributary of Paghman stream (USNM 216262–63); 20 km NW of Kabul, “dans cuvette d’un torrent à Paghman” (MNHN 1981.2081); Paghman (ZFMK 8515–34, 7933–34); Paghman, 1800 m. (ZFMK 5375); Paghman Mts. (KU 194380–83, MCZ A–99124–26, MNHN 1988.7183–85); Paghman, Paghman stream (CAS 151240); 3 mi N Paghman in Darrahe Pain Stream (CAS 149128–9); Paghman, Paghman Stream, Darrehe Cape tributary (CAS 146996–031); Paghman, Paghman Stream, Darrehe Pain tributary (CAS 146985–95, CAS 147044–67, CAS 147084–108, CAS 152088); Paghman, Paghman Stream, Darrehe Raste tributary (CAS 147032–43, CAS 147068–83); ca. 4 km above Paghman (7950 ft.) (MVZ 236802–25); 4 km from Paghman (ZISP 6838.1–3); Pengachon, ca Kabul (KU 194385, KU 194387); Salang pass, 2700 m. (KU 194384, ZFMK 13343); Sanglakh, 60–80 km W of Kabul (MNHN 1987.478, MNHN 1987.652, MNHN 1993.827) [see pl. 2, fig. 2 for distribution].

REMARKS.— This species (Fig. 6) is endemic to Afghanistan where it is known from three tributaries of the Paghman Stream drainage (appr. 4 km above the town of Paghman) 2,440–3,750 m elevation. The stream, which is fed by melting glaciers and is about 4 km long, provides the sole known habitat for this species.

CONSERVATION.— *Afghanodon mustersi* is impacted by irrigated cultivation, overgrazing and physical disturbance by livestock and pedestrians (Stuart et al. 2008). Moreover, there is a potential for damming the stream as a water source for Kabul, that would likely have a strong negative impact on this salamander. As it is endemic to Afghanistan and does not occur within protected areas, it should be considered a high priority in conservation management of Afghanistan.



FIGURE 6: *Afghanodon mustersi* from the Paghman Range. Photo by W. Böhme.

Reptilia: Squamata

Family Agamidae

Calotes versicolor farooqi Auffenberg and Rehmann, 1995:27

1995 *Calotes versicolor farooqi* Auffenberg and Rehman, *Calotes versicolor nigrigularis* Auffenberg and Rehman 1993 a junior primary homonym. Asiatic Herpetological Research 6:27.

HOLOTYPE.— FMNH 79470, adult male from “rocky hillside Shargal, 20 km S of Balakot Manshera Dist., Northwest Frontier Province (lat. 34.3°N, long. 73.4°E), Pakistan.”

LOCALITIES.— Alikhel [2200 m, Prov. Paktia] (ZFMK 8631); Jalalabad (MMB 28465–66); 30 km SW Jalalabad (CAS 120557, CAS 120720); 40 km SW Jalalabad (CAS 120721–22); 45 km W Jalalabad (CAS 120558); Btwn Kabul and Sarobi, nr rd, 30 mi E of Kabul [34°33'N, 69°35'E, Prov. Kabul] (CAS 96257); Nimla [1000 m, Prov. Nangerhar] (ZFMK 8630) [see pl. 2, fig. 3 for distribution].

REMARKS.— This taxon was described by Auffenberg and Rehmann (1993) as *Calotes versicolor nigrigularis* but the authors overlooked *Calotes nigrigularis* Ota and Hikida, 1991 and, therefore, their name is a junior primary homonym. Somewhat later, the same authors introduced *Calotes versicolor farooqi* as a new name for the previous taxon (Auffenberg and Rehmann 1995). Clark et al. (1969) and Clark (1990) collected several individuals on stone walls near streams, on earth banks, bamboo thickets and amongst vegetation. The BMNH collection holds a number of specimens labeled as “*Calotes emma*, BMNH 1946.8.11.26 [type]”, “*Calotes jerdoni*, BMNH 1860.3.19.1021”, “*Calotes maria*, BMNH 1860.3.19.1020, BMNH 1946.8.11.24 [type]” and “*Calotes versicolor*, BMNH XXIV.29.k, BMNH XXIV.29.t, BMNH 1860.3.19.1022” from “Afghanistan” most of which have not been examined but likely could represent this taxon.

Laudakia Gray, 1845 — *sensu lato*

The genus *Laudakia* was recently subdivided into three genera (*Stellagama*, *Paralaudakia*, and *Laudakia*) by Baig et al. (2012). Although Pyron et al. (2013) used *Laudakia* in the more inclusive sense, we here follow the more integrative concept by Baig et al. (2012) because of the strong differences in morphology, anatomy, dentition, and cranial anatomy among the three monophyletic lineages within the laudakian agamas.

Laudakia agrorensis (Stoliczka, 1872:128)

1872 *Stellio agrorensis* Stoliczka, Notes on some new species of Reptilia and Amphibia collected by Dr. W. Waagen in north-Western Punjab. Proceedings of the Asiatic Society of Bengal 1872:124–131.

SYNTYPES.— ZISP 4206, from “Sussel Pass, at the entrance into the Agror Valley, 6000 feet, Hazara district, N.W. Punjab”; NMW 16754 and BMNH [not located, probably BMNH 1880.11.10.9], from the same locality.

LOCALITIES.— Jalalabad (FMNH 161161); Lindai-Sin Valley [1700 m, Prov. Nuristan] (ZFMK 8637); Nuristan (ZFMK 8633–35); Petsch-Tal [1600 m, Prov. Nuristan] (ZFMK 8638); Petsch-Valley, Zunsail [1400 m, Prov. Nuristan] (ZFMK 8636) [see pl. 2, fig. 4 for distribution].

Laudakia melanura melanura Blyth, 1854:738

1854 *Laudakia (Placoderma) melanura* Blyth, Proceedings of the Society. Report of the Curator, Zoological Department. Journal of the Asiatic Society of Bengal 23 [1854]:737–740.

TYPE(S).— Not located (see remarks), from “Kashmir”.

SYNONYMS.— *Stellio liratus* Blanford, 1874 from “Gedrosia, Baluchistan” interpreted as “Saman, Dasht Province, Baluchistan” by Smith (1935).

LOCALITIES.— Ali Khel, southern side of Safed-Koh [Paktia Prov., 2200 m] (ZFMK 8627); Darunta near Jalalabad [Nangahar Prov., 650 m] (ZFMK 8544) [see pl. 2, fig. 5 for distribution].

REMARKS.— Sindaco and Jeremčenko (2008) recognized this taxon only from the border area between Pakistan and Afghanistan; ZFMK specimens provide the first record of *L. melanura* from Afghanistan. Blyth (1868:32) himself recognized his *L. melanura* as synonym of *L. tuberculata* and mentioned a juvenile female from “Simla” from the collection of the Asiatic Society of Bengal that had been donated by W. Theobald. Even though Simla is quite distant from Kashmir, this specimen could be a type specimen, as we now know that the species has a relatively extensive distribution.

***Laudakia nupta nupta* (De Filippi, 1843:407)**

1843 *Agama nupta* De Filippi, Intorno ad alcune specie di rettili. Giornale del VI. R Istituto Lombardo e Bibliotera Italiana 6:407–415.

HOLOTYPE.— Not located [Milan], from “Persepolis,” Iran.

SYNONYMS.— *Stellio carinatus* Duméril, 1851 from “Aucher-Eloy, Perse.”

LOCALITIES.— Bamian (on rd to Saigon), along Kunduz River (CAS 147444–52); 40 km NW Delaram (CAS 120736); 65 km NW Delaram (CAS 120734–35); 48 km W Dilaram (FMNH 161077); 20 km E Farah (CAS 120732–33); 55 km W Girishk (CAS 120556, CAS 120731); Jalalabad area (Brück 1968); 30 km SW Jalalabad (CAS 120730); Nimla [Nangarhar Prov., 1000 m] (ZFMK 8628); 2 km SE Jalalabad (MMB 28467); 8 km ESE Jalalabad (MMB 28470); 45 km W Jalalabad (CAS 120554–55); Kabul (ZMUC R-36210); 67 km E (by Jalalabad Rd.) of Kabul at Puli Churkhi suburb (MVZ R-236883); Kaikay (ZMUC R-36189); Kandahar (CAS 115936–38, FMNH 161257–58, FMNH 161260, FMNH 161262–63, ZFMK 2682, ZFMK 7924); ca. 15 km SSW Kandahar (by Panjuai Rd.) (MVZ 237456); 107 km ENE (by Kabul Rd.) of Kandahar at junction of Quetta Rd. and Kabul Rd. (MVZ 237457); Kouh-Bachio [= Kouh-Bachtou near Farah] (MZLU L958/3240); 5–10 mi ENE of Nimla, on old Kabul-Jalalabad rd, and about 10 mi SW of Balabagh [34°19–21'N, 70°10–15'E] (CAS 96196–97, CAS 96210); 4 km S [by air] Paghham (MVZ 236884–85); Pirezada (ZMUC R-36190); Somarkhel [banks of Kabul River], about 15 km E Jalalabad (MMB 28478–69) [see pl. 2, fig. 6 for distribution].

REMARKS.— The holotype was present in the Milan collection at the time of Jan’s catalogue (Jan 1857) but it now seems to be lost and was not mentioned by Scali (2010).

***Laudakia nuristanica* (Anderson and Leviton, 1969:39)**

1969 *Agama nuristanica* Anderson and Leviton, Amphibians and reptiles collected by the Street expedition to Afghanistan, 1965. Proceedings of the California Academy of Sciences, ser. 4, 37:25–56.

HOLOTYPE.— FMNH 161136, adult male from “Kamdesh, eastern Afghanistan [1342 meters elevation]”.

LOCALITIES.— Kamdesh [35°25'N, 71°26'E] (FMNH 161136, CAS 115939); Lindai-Sin Valley [Nuristan Prov., 2200 m] (ZFMK 8624–25); Nuristan (ZFMK 8618–23) [see pl. 2, fig. 7 for distribution].

***Laudakia tuberculata* (Gray, 1827:218)**

1827 *Agama tuberculata* Gray In Hardwicke and Gray, A synopsis of the species of saurian reptiles, collected in India by Major-General Hardwicke. Zoological Journal, London 3:213–229.

HOLOTYPE.— BMNH 1946.8.28.17 (formerly BMNH 60.3.19.1377) from “India,” probably incorrectly restricted to “Bengal” by Smith (1935). Although not explicitly stated, the description appears to be based on a single specimen and Gray (1845) noted only a single specimen from Hardwicke in the BMNH collection.

SYNONYMS.— *Stellio indicus* Blyth, 1853 from “Mirzapore [= Uttar Pradesh, northern India] and Wuzeerabad [= in North-West Frontier Province, northern Pakistan]”; *Barycephalus sykesii* Günther, 1860 from “Simla, Himalaya”.

LOCALITIES.— Afghanistan [without detailed locality] (ZFMK 8615, ZMB 12477) [see pl. 2, fig. 8 for distribution].

REMARKS.— Brück (1968) provided a record of *L. tuberculata* (referenced in Sindaco and Jeremčenko [2008]) from “dem Gebiete um Djelalabad” [= vicinity of Jalalabad], so maybe the specimens mentioned herein also originate from this area. However, as this is not a precise locality it is not mapped here.

***Paralaudakia badakhshana* (Anderson and Leviton, 1969:33)**

1969 *Agama badakhshana* Anderson and Leviton, Amphibians and reptiles collected by the Street expedition to Afghanistan, 1965. Proceedings of the California Academy of Sciences, ser. 4, 37:25–56.

HOLOTYPE.— FMNH 161108, from “Mazar-i-Sharif, northern Afghanistan, 36°34'N, 67°05'E, 457 m elevation.”

LOCALITIES.— Dashit-e-Nawar (ZFMK 13315–16); Pass to Dashit-e-Nawar [Ghazui Prov., 3000 m] (ZFMK 8608–12); 64 mi by rd E Faizabad (CAS 115924); Farakhlum near Garandewal [Prov. Wardak, 2500 m] (ZFMK 54796); southern side of Kotal-e-Sha-tu, vic. Pandjao [Bamian Prov., 2500 m] (ZMK 2828); Kotal-e-Unai: [Prov. Wardak, 2800 m] (ZFMK 54795); Mazar-i-Sharif (FMNH 161108); Paghman [34°36'N, 68°56'E] (CAS 115925, FMNH 161175); Paghman stream (CAS 147423); 4 km S [by air] Paghman (MVZ 237442–48); Pari Kham near Darwāz [Prov. Badaksha, 2700 m] (ZFMK 8552); Salang Pass [Kabul Prov., 3000 m] (ZFMK 5377–81); Salang Pass, N of, road to Pulikumri [= Pol-e Khomri, Prov. Baghlan] (USNM 194973–76); Wakhan near Sarhad [Prov. Badakshan, 2900–3100 m] (ZFMK 52029–51, ZFMK 52056); Shipun (ZFMK 8550–51); Wakhan, Zemestani Baharak [Prov. Badakshan, 3300 m] (ZFMK 52052–55) [see pl. 3, fig. 1 for distribution].

REMARKS.— There is an additional series of specimens from unknown localities in Afghanistan in the FMNH (161132, 161172). Baig (1992), Sindaco and Jeremčenko (2008), and Baig et al. (2012) only provide two confirmed records and expressed doubt about the type locality of Mazar-i-Sharif.

***Paralaudakia caucasia* (Eichwald, 1831:187)**

1831 *Stellio caucasius* Eichwald, Zoologia Specialis quam Expositis Animalibus tum Vivis tum Fossilibus Potissimum Rossiae in Universum, et Poloniae in Specie, in Usu Lectionum Publicarum in Universitate Caesarea Vilnensi Habendarum. Pars Posterior; Specialem Expositionem Spondylzoorum Continens, Pars Posterior [= Vol. 3]. Josphehi Zawadski, Vilnae [Vilnius], Russia [now Lithuania]. (3) + 404 pp., 2 folding pls. (Decima Classis. Amphibia [pp. 116–197]. Explicatio Tabularum [pp. 395–396]. Index Generum [pp. 397–404]).

TYPE(S).— Not located, from “Hab. in Caucaso, prope Tiflisium [= Tbilisi, Georgia], Bacuam [= Baku, Azerbaijan].”

SYNONYMS.—*Lacerta muricata* Pallas, 1814 “1827” from “in deserto Magno”; *Stellio persicus* Anderson, 1872 from “Teheran” (holotype ZISP 4830); *Agama reticulata* Nikolskii, 1912 from “Tschubek, Ost-Buchara”.

LOCALITIES.— Ajar Valley (RMNH 25954–58); Bamiyan 8000 ft. (Smith 1940: 384; probably BMNH 1938.2.4.7–9); Bamiyan, NW of Kabul MCZ R-97297–98); 1–8 km East of Bamiyan Hotel, Bamiyan (MVZ R-97302–05); road N of Band-e-Amir [ca 35°05'N, 67°47'E] (CAS 243989); Baraki Barak [Logar Prov.] (USNM 194605); 1/2 hr E (by car) Chacharan on Shina River (CAS 147407); 40 mi S Characharan (CAS 147465); Chinkiloh (Boulenger 1889: 96); Chudjomborak [Maidan Prov., 2500 m] (ZFMK 20983); NE Dashi-Doab (on road to Kundus) n. of Kabul (MCZ R-97300); Doab 5000 ft. (Smith 1940: 384; probably BMNH 1938.2.4.4–6); Kharzar ou Tang-Djungal Baz (MZLU L957/3052); Khwadja Ghar (ZFMK 8546); Pass to Dasht-e-Nawar [Ghazni Prov., 2700–3000 m] (ZFMK 8600, ZFMK 8607); Gardez (ZMUC R-36136); 40 km S of Herat (CAS 120747–49); Kundus R. NE Dashi-Doab N of Kabul (MVZ R-97300); 15 km N Ghazni (CAS 120551–53); 20 mi N of Ghazni [33°40'N, 68°30'E] (CAS 98969); NW of Kabul (MVZ R-97297–98); 80 km S Kabul (CAS 120750); Kharzar (LC, Wetsstein 1960); 1 mi N Kurdkabul Dam (CAS 151227); 4 mi from Kurdkabul Dam towards Buthak (CAS 151229); Masdjed-Tchoubi (MZLU L959/3051); Meiden Khula, about 30 mi ENE Gardez [33°40'N, 69°50'E] (CAS 96246–47); Narai (NW of) [31°31'N, 70°04'E] (CAS 96248–49); Obeh [= Owbi, Herat Prov.] (ZMUC R-36137–44, 36187–88); Paghman (CAS 151231–34, FMNH 161058–62, FMNH 161174, FMNH 161176, FMNH 161209–12, FMNH 161214–15, FMNH 161219, ZFMK 5382–83); Paghman [34°36'N, 68°56'E] (CAS 115926–31); above Paghman (Smith 1940: 384; probably BMNH 1940.3.1.18); nr Paghman River, 10 km SW of Kabul (CAS 92329, CAS 92338); Paghman, 15 mi W of Kabul [34°36'N, 68°56'E] (CAS 96251–52); Paghman, Darrehe Cape (CAS 147424); Paghman, Kohe Katasang (CAS 147421–22); Pari Kham (ZFMK 8547); Pini Share Valley, 150 mi NE of Kabul [Kapisa Prov.] (USNM



FIGURE 7: *Paralaudakia caucasia* from Feyzabad (Badakshan Province), Afghanistan. Photo by Frank Joisten.

194981–85); Pul-e-Khumeri [1300 m] (CAS 120324, 120738–41, ZFMK 8588); Rabatak (ZFMK 8548); Shibar Pass (RMNH 25962); 20 km W. of Shibar Pass, road from Bamiyan to Kabul (MCZ R-97301); Southern side of Safed-Koh [Prov. Paktia, Ali Khel, 2100 m] (ZFMK 8626); Toward Ghazni, a few km from village of Shash Gao (CAS 91590–98); 20 km W. of Shibar Pass, road from Bamiyan to Kabul (MVZ R-97301); 24 km E Taliqan (CAS 120745–46); Tang-e-Tashaurghan, Khuin [Samangan Prov., 700 m] (ZFMK 8601–03); 10 km W of Tashkurgan (CAS 120742–44); Urgun (ZFMK 8549) [see pl. 3, fig. 2 for distribution].

REMARKS.— Sindaco and Jeremčenko (2008) recognized *P. caucasia* (Fig. 7) only from north-western and northeastern Afghanistan whereas our records show that this species is widespread at higher elevation across the country. Wagner and Dittmann (2014) mentioned that dried individuals of *Paralaudakia caucasia* were sold in a Chinese market in Kabul as medicine (Fig. 8), and have a use similar to that of *Gekko gekko* in East and Southeast Asia.



FIGURE 8: Dried individuals of *Paralaudakia caucasia* sold as medicine in a Chinese market in Kabul. Photo by A. Dittmann.

***Paralaudakia erythrogaster* (Nikolskii, 1896:370)**

1896 *Stellio erythrogaster* Nikolskii, Diagnoses reptilium et amphibiorum novorum in Persia orientali a N. Zarudny collectorum. *Annuaire Musée Zoologique de l'Académie Impériale des Sciences de St.-Petersbourg*, 1(4):369–372.

SYNTYPES.— ZISP 8759 and 8760, from “Persia orientali.”

SYNONYMS.— *Stellio erythrogastra* var. *pallida* Nikolskii, 1897 from “prope urbem Mesched”. *Agama caucasia mucronata* Guibe, 1957 from “Langarak, 60 km E of Meched, on road to Sarakhz [Iran]”; *Stellio erythrogaster nurgeldievi* Tuniyev, Atayev, and Shammakov, 1991 from “eastern Kopet-Dagh, Turkmenistan.”

LOCALITIES.— Khost [Paktia Prov., 1200 m] (ZFMK 8632); Maimana [Maimana Prov., 850 m] (CAS 115933, FMNH 161195, ZFMK 8614); Murghat Prov. [without detailed locality] (ZFMK 8613); vic. of Paghman [34°36'N, 68°56'E] (CAS 115932, FMNH 161187, FMNH 161189–90) [see pl. 3, fig. 3 for distribution].

REMARKS.— Sindaco and Jeremčenko (2008) also recognized this species from northwestern Afghanistan but without mentioning the source of their data.

***Paralaudakia himalayana* (Steindachner, 1867:22, plate 1, fig.8)**

1867 *Stellio himalayanus* Steindachner *In Reise der Österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859 unter den Befehlen des Commodore B. von Willerstorff-Urbair* (Zoologie), Vol. 1, part 3 (Reptilien p.1–98, 3 plates). K. Gerold's Sohn/Kaiserlich-Königl. Hof- und Staatsdruckerei, Wien.

SYNTYPES.— NMW 16752: 1–12, NMW 16753: 1–2, from “Lei [= Leh]” and “Kargil,” Ladakh Prov., Kashmir. According to Grillitsch et al. (1996), a skull (NMW 578) from the same area and collector could also be part of the syntype series.

LOCALITIES.— Ajdaha, vic. of Bamyan (MNHN 1948.330–37); Btw. Bamian and Panjao (CAS 147454–64); 12 mi E Eskhsham Wakhan (Ishkamish, Ishkamish = 36°43'N, 71°34'E] (CAS 115934–35); Khandout, 148 km E of Ichkachin, Vakhan (MZLU L960/3045); 2 km NW Panjao (CAS 147453); Shipun (ZFMK 8550–51) [see pl. 3, fig. 4 for distribution].

REMARKS.— Sindaco and Jeremčenko (2008) only provide records from northern and northeastern Afghanistan.

***Paralaudakia lehmanni* (Nikolskii, 1896:XIV)**

1896 *Stellio lehmanni* Nikolskii, Sur deux nouveaux reptiles du Turkestan. *Annuaire Musée Zoologique de l'Académie Impériale des Sciences de St.-Petersbourg*, 1:XIII–XV.

SYNTYPES.— ZISP 2367, from “Oalyk-tau” [= Oalyk mountain, Samarqand province, Uzbekistan]; ZISP 8664, from “Nuratau montains, Zerbent” [= Zerbent River, Nuratau mountains, Jizzakh province, Uzbekistan]; ZISP 8665, from “Nuratau mountains, Temur-Kauk well,” Jizzakh province, Uzbekistan; ZISP 8666.1, 8666.2, 8689.1, 8689.2, from “Southern Kyzylkum, Kum-Kuduk well,” southern part of Kyzylkum desert, Uzbekistan; NMW 23485 from “Baba-tau” (donated by the St. Petersburg Museum *vide* Tiedemann and Häupl [1980]).

SYNONYMS.— *Agama borstschewskyi* Elpatjewsky and Sabanejew, 1907 from “area of Buchara [= Buxoro]”, Uzbekistan.

LOCALITIES.— Badakshan (BMNH 1968.1301); Darrah-e-Andarab, vic. of Bani [Baghlan Prov., 2100 m] (ZFMK 9063, ZMK 2754); Faizabad (BMNH 1968.1302, ZFMK 96708–715, 97203–208, 97992; see also Fig. 9); Mazar-i-Sharif (FMNH 161109); 50 km E Taliqan (CAS 120737); 50 km NE Taliqan (CAS 120325) [see pl. 3, fig. 5 for distribution].



FIGURE 9: *Paralaudakia lehmanni* from Faizabad (Badakshan Province), Afghanistan. Photo by F. Joisten.

REMARKS.— Sindaco and Jeremčenko (2008) only provide records from northern and northeastern Afghanistan, however, the records from Darrah-e-Andarab are here confirmed by us.

***Paralaudakia microlepis* (Blanford, 1874:453)**

1874 *Stellio microlepis* Blanford, Descriptions of new lizards from Persia and Baluchistān. Annals and Magazine of Natural History, ser. 4, 13:453–455.

SYNTYPES.— BMNH 1946.8.28.74–77 “in montibus Persiae meridionalis” [invalidly restricted to Kushkizard, north of Shiraz by Boulenger 1885].

LOCALITIES.— 21 km N of Ghazni [by Kabul Rd.] (MVZ 237452–54); 50 km N Hirat (RMNH 25966); Murghab (ZFMK 8599, 8604); 6 km E Nawar Pass (RMNH 25959–61); Noburtscha, on road to Dascht-i-Nawar [Prov. Ghazni, 2400 m] (ZFMK 8605–06); Paghman, nr. Kabul (ZFMK 8598); 75 km E Shindand (RMNH 25965); 40 km S Tarin Kot (RMNH 25953) [see pl. 3, fig. 6 for distribution].

REMARKS.— Sindaco and Jeremčenko (2008) mention records only from central and eastern Afghanistan whereas our specimens confirm its occurrence in western parts of the country as well.

***Phrynocephalus clarkorum* Anderson and Leviton, 1967:228, fig. 1**

1967 *Phrynocephalus clarkorum* Anderson and Leviton, A new species of *Phrynocephalus* (Sauria: Agamidae) from Afghanistan, with remarks on *Phrynocephalus ornatus* Boulenger. Proceedings of the California Academy of Sciences, ser. 4, 35(11):227–234.

HOLOTYPE.— CAS 97989 (female), from “20 miles southeast of Kandahar, Afghanistan, 31°20'N, 65°50'E.”

LOCALITIES.— 10 km NE of Darweshan (CAS 120211–16); 56 km S and 10 km E of Darweshan (CAS 120217–24); btw. Nushki (Pakistan) and Helmand (BMNH 1946.8.28.22, BMNH 1946.8.28.25); 20 mi SE Kandahar [31°20'N, 65°50'E] (CAS 97989, CAS 103787); 40 km SE of Kandahar (CAS 120225–38); 5 km (by air) of Takhteh Pol (Rigestan Sand Dunes at W side of Kadeney Rud [river]), ca. 40 km SSE Kandahar (by road to Quetta) [3350 ft.] (MVZ 236886–88) [see pl. 3, fig. 7 for distribution].

REMARKS.— This species is endemic to firm sand pockets and dune margins of deserts in southern Afghanistan. Clark (1990) also reported it as occurring in sympatry with its close relative, *P. ornatus*.

***Phrynocephalus euphilopus* Alcock and Finn, 1897:556, pl. XII**

1897 “1896” *Phrynocephalus euphilopus* Alcock and Finn, An account of the Reptilia collected by Dr. F.P. Maynard, Captain A.H. McMahon, C.I.E., and the members of the Afghan-Baluch Boundary Commission of 1896. *Journal of the Asiatic Society of Bengal* 65:550–566, pls. XI–XV.

SYNTYPES.— BMNH 1946.8.28.39, ZSI 14070, ZSI 14072; MCZ R-7227 [ex ZSI 14074], from “near Darband, elevation 3000 feet” northern Balochistan.

LOCALITIES.— 56 km S and 10 km E of Darweshan (CAS 120205–07) [see pl. 3, fig. 8 for distribution].

REMARKS.— This species occurs exclusively in deep dune areas (Clark 1990). Sindaco and Jeremčenko (2008) provide a record from the Pakistani side of the border, which corresponds to the type locality Darband in northern Balochistan.

***Phrynocephalus interscapularis sogdianus* Chernov, 1948:135**

1948 *Phrynocephalus interscapularis sogdianus* Chernov, Reptiles—Reptilia. Pages. 127–161 *In* Pavlovsky, E.N. and B.S. Vinogradova, eds., *The Animals of the USSR. Vol. 2. The Desert Zone* [in Russian]. USSR Academy of Sciences, Moscow-Leningrad.

HOLOTYPE.— ZISP 16887, from “Tajikistan, vicinity of the Pjandzh village” [translated from Russian].

LOCALITIES.— Ag Chah (SNM 21–34); Andkhoy (CAS 120107–10); Anhoy, 25 km E of (USNM 194972); 20–32 km S of Andkhoy (CAS 120095–106); btw. Aqtchah and Andkhoy (MNHN 1948.169–70); Imam Sahib, nr. Amu-Darya [Kundus Prov.] (ZFMK 8691–93); Dasht-e Leila, nr. Seberghan [Djauz-Djan Prov., 390 m] (ZFMK 20976–79, ZMK 2613); 20 km E of Mazar-i-Sharif (CAS 120061–78); 30 km NW of Sheberghan (CAS 120079–94); Qizil Qala, nr. Amu-Darya [Kundus Prov., 400 m] (ZFMK 8581–82) [see pl. 4, fig. 1 for distribution].

REMARKS.— Clark (1990) mentioned this lizard from non-sandy areas, hiding among clumps of coarse grasses.

***Phrynocephalus luteoguttatus* Boulenger, 1887:497**

1887 *Phrynocephalus luteoguttatus* Boulenger, *Catalogue of the Lizards in the British Museum (Natural History) Vol. III. Lacertidae, Gerrhosauridae, Scincidae, Anelytropsidae, Dibamidae, Chamaeleontidae*. Trustees of the British Museum (Natural History), London, United Kingdom. xii + 575 pp., pls. I–XL.

SYNTYPES.— BMNH 1946.8.28.44–49, BMNH 1946.8.28.36–38, and ZISP 7363 [ex BMNH specimen], from “between Nushki and Helmand.”

LOCALITIES.— 12 km SE (by air) of Daruishan (Rigestan Sand Dunes) (2350 ft.) (MVZ 236904–10); 10 km NE of Darweshan (CAS 120008–25); 35 km S of Darweshan (CAS 120001–07); 56 km S and 10 km E of Darweshan (CAS 120026–48); 20 mi SE Kandahar [31°20'N, 65°50'E] (CAS 97980, CAS 103786); 48 km SE of Kandahar (CAS 120049–60); 5 km (by air) of Takhteh Pol (Rigestan Sand Dunes at W side of Kadeney Rud [river]), ca. 40 km SSE Kandahar (by road to Quetta) [3350 ft.] (MVZ 236889–903) [see pl. 4, fig. 2 for distribution].

REMARKS.— Clark (1990) mentioned the species as abundant in the sand desert margins of Darweshan and Kandahar. Sindaco and Jeremčenko (2008) provide an additional record from the

Sistan area, but this is in error because of wrong coordinates (Sindaco, pers. comm. Nov. 2013), whereas the original records refer to Helmand Province (Boulenger 1889).

***Phrynocephalus maculatus maculatus* Anderson, 1872:389**

1872 *Phrynocephalus maculatus* Anderson, On some Persian, Himalayan, and other Reptiles. Proceedings of the Zoological Society of London 1872:371–404.

HOLOTYPE.— ZISP 4825, from “Awada, Shiraz, Persia.”

SYNONYMS.— *Phrynocephalus spiniventris* Nikolskii, 1896 from “Persia oriental.”

LOCALITIES.— 1/2 hr S Dareweshan (CAS 147437); 10 km NE of Darweshan (CAS 120209); 56 km S and 10 km E of Darweshan (CAS 120208); Dasht-e-Margo, 70 km NE of Zarandj [Nimruz Prov.] (ZMK 2601); estuary of the Farah-ruds River (ZMUC R-36133); estuary of the Farah-ruds River (ZMUC R-36134); 40 mi W Lashkaragah [Dashtimargo] (CAS 147420) [see pl. 4, fig. 3 for distribution].

REMARKS.— Boulenger (1889:97) mentioned several specimens of “*Phrynocephalus maculatus*” and figured one (pl. 9, fig. 3) from the “great gravel plains between Nushki and the Helmand” that is probably a member of the series BMNH 1886.9.21.59–61.

***Phrynocephalus mystaceus galli* Krassowsky, 1932:225**

1932 *Phrynocephalus mystaceus galli* Krassowsky, Beitrag zur Systematik von *Phrynocephalus mystaceus* (Pall.). Zoologischer Anzeiger 97:225–228.

LECTOTYPE.— ZMMU Re–6413, from “Aus Repeteka andetriff” [= vicinity of Repetek station, approximately 38°35'N, 63°11'E, Lebapsky Region, Turkmenistan] designated by Semenov and Shenbrot (1990)

LOCALITIES.— Ag Chah [Mazar-i-Sharif Prov.] (SNM 35–40); 32–50 km S Andkhoy (CAS 120723–28); 50 km S of Andkhoy (CAS 120140); btw. Aqchah and Andkhoi (MNHN 1948.168); 20 km E of Mazar-i-Sharif (CAS 120141, CAS 120729); 30 km NW of Sheberghan (CAS 120139) [see pl. 4, fig. 4 for distribution].

REMARKS.— Clark (1990) mentioned this species as abundant in northern Afghan deserts.

***Phrynocephalus ornatus ornatus* Boulenger, 1887:496**

1887 *Phrynocephalus ornatus* Boulenger, Catalogue of the Lizards in the British Museum (Natural History) Vol. III. Lacertidae, Gerrhosauridae, Scincidae, Anelytropsidae, Dibamidae, Chamaeleontidae. Trustees of the British Museum (Natural History), London, United Kingdom. xii + 575 pp., pls. I–XL.

LECTOTYPE.— BMNH 1946.8.28.20, from “between Nuski and Helmand” designated by Anderson and Leviton (1967).

LOCALITIES.— 12 km SE (by air) of Daruishan (Rigestan Sand Dunes) (2350 ft.) (MVZ 236913); 10 km N of Darweshan (CAS 120175–80); 32 km S of Darweshan (CAS 120165–74); 50 km S of Darweshan (CAS 120194–95); 56 km S and 10 km E of Darweshan (CAS 120196–203); Dibaram, 60 km Seranj (ZFMK 7930–32); 35 km S of Farah (CAS 120181–91); 18 km E of Girishk (CAS 120142–46); 20 mi E of Girishk [31°43' N, 64°45' E] (CAS 103788–90, CAS 97974–73); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84650–53, CAS 84660–62); 45 km N of Juwain (CAS 120192–93); Kandahar (BMNH 1964.1137–43); 65 km W (by Herat Rd.) of Kandahar (3320 ft.) (MVZ 236914–26); 30–75 km S of Lashkargah (CAS 120147–64); 50 km S of Lashkargah (CAS 120204); ca. 50 km SSW (by air) of Lashkar Gar (edge of Dasht-e Margo on W side of Helmund River) (2320 ft.) (MVZ 236912); between

Nushki and Helmand (ZISP 7362, paralectotype); Yaktchal [= Yakhchal] (MZLU L958/3241) [see pl. 4, fig. 5 for distribution].

REMARKS.— Clark (1990) mentioned this species as very abundant and could not identify any ecological difference between this species and its close relative *P. clarkorum*. Both species occur mainly on firm sandy terrain. *Phrynocephalus ornatus* seems to be less sand dependent than *P. clarkorum* and was also recognized from local sandy tracts. Golubev (1998) only mentioned the typical subspecies from Afghanistan but suggested the presence of *P. ornatus vindumi* in western parts of the country (see list below). Boulenger (1889:97) mentioned several specimens of “*Phrynocephalus ornatus*” from “between Nushki and the Helmand” (12 specimens) and “along the Helmand” (two specimens), the latter could refer to BMNH 1886.12.12.3–4.

***Phrynocephalus raddei* Boettger, 1888:262**

1888 *Phrynocephalus raddei* Boettger, Über die Reptilien und Batrachier Transcaspiens. Zoologischer Anzeiger 11:259–263.

LECTOTYPE.— SMF 10247 from “Perewalnaja an der transcaspischen Bahn [= Perevalnaja railroad station, southwestern Turkmenistan]” designated by Mertens (1967).

SYNONYMS.— *Phrynocephalus raddei* var. *bilkewitschi* Nikolskii, 1915 from “Kelifa”; *Phrynocephalus raddei* var. *zardunyi* Nikolskii, 1915 from “Kelifa”; *Phrynocephalus raddei* var. *boettgeri* Bedriaga in Nikolskii, 1905 from “Schirabad.”

LOCALITIES.— Ag Chah [Mazar-i-Sharif Prov.] (SNM 41–53); 10 km SE of Andkhoy (CAS 120133–38); 20 km E of Mazar-i-Sharif (CAS 120116–22); 30 km NW of Sheberghan (CAS 120123–28); between Sheberghan and Andkhoy (CAS 120129–32); 10 km W of Tashkurgan (CAS 120111–15) [see pl. 4, fig. 6 for distribution].

REMARKS.— The Afghan specimens mentioned here were previously identified as *P. raddei boettgeri* von Bedriaga, 1906 or *P. reticulatus boettgeri*. But recently, Barabanov and Ananjeva (2007) treated *P. raddei boettgeri* as a synonym of *P. raddei*. Clark (1990) mentioned this species as typical inhabitant of firm to loess clay in non-sandy steppe regions in northern Afghanistan.

***Phrynocephalus scutellatus* (Olivier, 1807:196 [octavo ed.], 110 [quarto ed.], pl. 42, fig. 1 [Atlas])**

1807 *Agama scutellata* Olivier, Voyage dans l’Empire Othoman, l’Egypte et la Perse, fait par ordre du Gouvernement, pendant les six premières années de la République, octavo edition, Tome Cinquième. H. Agasse, Paris, France. (4) + xv + 458 + (1) pp. and 1807 *Agama scutellata* Olivier, Voyage dans l’Empire Othoman, l’Egypte et la Perse, fait par ordre du Gouvernement, pendant les six premières années de la République. quarto edition. Tome Troisième. Henri Agasse, Paris, France. vii + 566 + (11) pp.; 1807 *Agama scutellata* Olivier, Atlas pour servir au Voyage dans l’Empire Othoman, l’Egypte et la Perse, fait par ordre du Gouvernement, pendant les six premières années de la République. Toisième Livraison. H. Agasse, Paris, France. viii pp., pls. 34–50.

HOLOTYPE.— MNHN 6947, from “au pied de la montagne (nommée Sophia ou Sophissar, en vue d’Ispahan) [= Mt. Sophia, near Esfahan, Esfahan Province, Iran].”

SYNONYMS.— *Phrynocephalus tickelii* Gray, 1845 from “Afghanistan.” *Phrynocephalus olivieri* var. *brevipes* Nikolskii, 1906 from “Naim-abad [Damysan] in Chorosano occidentale; Descht-i-Kewir; Dshandak in Kuchistano occidentale”. *Phrynocephalus olivieri* var. *carinipes* Nikolskii, 1906 from “Pudschk-Kupa; Dschandak in Kuchistano occidenatli”.

LOCALITIES.— Btw. “Cia-i-Baloch [= Robat-i-Shah Baloch] and Cia-i-Lagun, camp 1” (MZUF 24006–12); btw. Ghazni and Mukur [32°53’N, 67°48’E] (CAS 97992); 35 mi downstream from

Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84654–59, CAS 84663–68); btw. Ghazni and Dasht-e-Nawar (ZFMK 41341); 20 mi SE of Kandahar [31°23'N, 65°53'E] (CAS 97978–79); 32 km N of Kandahar (CAS 120210); 35 mi NW Kandahar, on desert plain just east of Helmand River (CM 49545–47); N edge of village of Kara Bagh (CAS 97992, CAS 90794, CAS 90796–7); Seistan [Faizabad Prov.] (ZMUC R-36207) [see pl. 4, fig. 7 for distribution].

REMARKS.— Boulenger (1889:96) mentioned 22 specimens of “*Phrynocephalus olivieri*” from “Nushki to Helmand” and six from “Helmand.” Bauer and Adler (2003) provided bibliographic details for Olivier’s “Voyage.” The quarto and octavo versions of the work were apparently published simultaneously and a single version of the “Atlas” complemented both text editions.

***Trapelus agilis agilis* (Olivier, 1804:394 [octavo ed.], 1804:428 [quarto ed.], pl. 29, fig. 2 [Atlas])**

An XII (1804) *Agama agilis* Olivier, Voyage dans l’Empire Othoman, l’Egypte et la Perse, fait par ordre du Gouvernement, pendant les six premières années de la République, octavo edition, Tome Quatrième. H. Agasse, Paris, France. iv + 456 + (1) pp. and An XII (1804) *Agama agilis* Olivier, Voyage dans l’Empire Othoman, l’ordre du Gouvernement, pendant les six premières années de la République, quarto edition. Tome Second. Henri Agasse, Paris, France. ii + 466 + (1) pp.; An XII (1804) *Agama agilis* Olivier Atlas pour servir au Voyage dans l’Empire Othoman, l’Egypte et la Perse, fait par ordre du Gouvernement, pendant les six premières années de la République. Deuxième Livraison. H. Agasse, Paris, France. vii pp., pls. 18–33.

SYNTYPES.— MNHN 5708 (2 ex), from “neighborhood of Baghdad [translated from French],” Iraq.

SYNONYMS.— *Agama isolepis* Boulenger, 1885 from “between Bampur and Magas, Iran”. *Agama kirmanensis* Nikolskii, 1899 from “Kurin, Kerman Province, Iran”. *Agama kirmanensis* var. *brevicauda* Nikolskii, 1907 from “Kochrud, Irak-Adschemi, Iran.”

LOCALITIES.— Ab-i-Istada (ZFMK 5376); 20 km SE Andkhoy (CAS 120272); 50 km S of Andkhoy (CAS 120269–71); 25 km SW of Aqcha (CAS 120263–66); Aqtscha [Djauz-Djan Prov., 500 m] (ZFMK 8590–91); btw. Aqtscha and Anakhoi (MNHN 1948.165–66); Bala Murghab, Herat province (Brück 1968); Bala Murghab, confluence of Darya-i-Murghab and Darya-i-Chapchel Rivers (MMB 28471, 2 ex.); Baqrabad (ZMUC R-36146–48, 36157); btw. “Cia-i-Baloch [= Robat-i-Shah Baloch] and Cia-i-Lagun, camp 1” (MZUF 24030–36); btw. Chuagat and Dukot [?] (ZFMK8594–97); Dahlah (MZLU L958/3239); 10 km NE of Darweshan (CAS 120280–81); 35 km S of Darweshan (CAS 120552); 56 km S and 10 km E of Darweshan (CAS 120281); Faisabad (ZMUC R-36160–61, 36133, 36204–05); Faisabad, Kobt af indjodle (ZMUC R-36149); 20 mi E of Farah [32°20'N, 62°15'E] (CAS 96271); 30 km S Farah (CAS 120245); Farah-ruds Udlot (ZMUC R-36145, 36158–59); Ghazni (Smith 1940: 384; probably BMNH 1940.3.1.19–24); 30 km S Ghazni (CAS 120276–77); 20 mi E of Girishk [31°43'N, 64°45'E] (CAS 97972, CAS 97975, FMNH 161117–19); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84640–47); 50 km E of Girishk (CAS 120240–41); Herat (ZISP 7361); Helmand (BMNH 86.9.21.17–18, BMNH 86.9.21.23–25); 30–70 km E of Herat (CAS 120246–50); Herat town (ZFMK 92804–06); Herat area [34°20'N, 62°10'E] (CAS 115919); Herat to Islam Qala [34°22'N, 62°10'E to 34°47'N, 61°05'E] (CAS 98117–18); 20 km SE Islam Qala (CAS 120239); Egnen af Kabul (ZMUC R-36208–09); Kandahar (ZMUC R-36206); 20 mi SE Kandahar [31°23'N, 65°53'E] (CAS 97990); 40 km SE of Kandahar (CAS 120242–43); Jawzan, Seberghan, Dasht-e-Leila [390 m] (ZFMK 20980); 12 km S Lashkargah (CAS 120244); Maimaneh (MNHN 1948.164); Paghman vic [34°36'N, 68°56'E] (CAS 115921, FMNH 161191–92); Pirzada (ZMUC R-36306); 24–50 km S Qalat (CAS 120278–79); Seistan [Faizabad Prov.] (ZMUC R-36133, ZMUC R-36161, ZMUC R-36150–55, ZMUC R-36204–05);

Seistan [Baqrabad Prov.] (ZMUC R-36145–48); Sharisafa, 60 km NE of Kandahar (CAS 90762–75); 30 km NW of Sheberghan (CAS 120267–68); Slam Quala (MHNG 1591.20); Spin Buldak, 102 km SSE Kandahar (by Quetta Rd.) (MVZ 236939); 5 km (by air) of Takhteh Pol (Rigestan Sand Dunes at W side of Kadeney Rud [river]), ca. 40 km SSE Kandahar (by road to Quetta) (MVZ 236940); Seistan [Faisabad Prov.] (ZMUC R-36133); 10 km SSE Takhteh Pol (by Quetta Rd.) (MVZ 236933–37); nr Tarnak River, 75 km NE of Kandahar (CAS 90777); nr Tarnak River, 90 km NE of Kandahar (CAS 90765–66); Uden Merke (ZMUC R-36156); Zebak, 102.4 km on road E Faizabad (FMNH 161133) [see pl. 5, fig. 2 for distribution].

REMARKS.— Boulenger (1889:96) mentioned this species as “*Agama isolepis*” from “Nushki to Helmand” (five specimens), from “Helmand” (five specimens) and “north of Herat” (nine specimens).

Bauer and Adler (2003) provided bibliographic details for Olivier’s “Voyage”. The quarto and octavo versions of the work were apparently published simultaneously and a single version of the “Atlas” complemented both text editions.

This is probably the most ubiquitous agamid lizard in Afghanistan (Fig. 10) and most typically is an inhabitant of semi-desert plains with some vegetation. Clark (1990) mentioned it as tolerating extremely high temperatures and being active during the hottest part of the day with ground surface temperatures higher than 60°C. *Trapelus agilis* was previously reported as occurring throughout the entire country, except for the Kabul Valley River system (Clark 1990). However, many of these records may actually refer to *T. sanguinolentus* inasmuch as Rastegar-Pouyani (2005) differentiated two subspecies, *T. a. agilis* and *T. a. sanguinolentus*, as present in Afghanistan. However, as do many other authors, we consider the latter taxon as a full species (see below).



FIGURE 10: *Trapelus agilis* from Tobagay, Afghanistan. Photo by R. Masroor.

***Trapelus megalonyx* Günther, 1864:159, pl. XIV, fig. C**

1864 *Trapelus megalonyx* Günther, The Reptiles of British India. The Ray Society, London, United Kingdom. xxvii + 452 pp, 26 pls.

HOLOTYPE.— BMNH 1946.8.11.34, from “Eastern Afghanistan”.

SYNONYMS.— *Agama ruderata baluchiana* Smith, 1935 from “Quetta District, Baluchistan”.

LOCALITIES.— Baraki Barak (USNM 194979); Char-e-Kar nr. Kabul (CAS 96234–44, ZFMK 13317–19); Feyzabad (see Fig. 11); Ghazni, Qa-la-Baqaul [2300 m] (ZFMK 54797–800); 31 km N Ghazni (by Kabul Rd.) (8100 ft.) (MVZ 236947–48, 23650–51); vic. of Jalalabad (Brück 1968); vic. Jalalabad in direction to Somarkhel (MMB 28473); Kabul (ZFMK 54801, ZFMK 15694); Kabul, Chairkana [1740 m] (ZFMK 20982); Kabul, Koh-el-Tschel Zetun (ZFMK 20981); Kabul, Logar Valley, 10 km S of Kabul [2000 m] (ZFMK 54802); 70–80 km S Kabul (CAS 120547–50); 71 km SSW Kabul (by Kandahar Rd.) (6230 ft.) (MVZ 236949, 236952); Kapua, Dargh-e-Nedjrab near Nedjrab [2000 m] (ZFMK 54803); Karisimia (ZFMK 7926–29); Kotal-e-Khair-Khana (ZFMK 8589); Orozgan (MZLU L960/3046); 50 km S Qalat (CAS 120551); Qala Nau, just N of Ghazni [“33°35’N, 68°28’E”] (CAS 97991) [see pl. 5, fig. 3 for distribution].

REMARKS.— Specimens of this species were previously reported from Afghanistan as *T. ruderata* or *T. ruderata baluchiana* by e.g., Brück (1968), Král (1969), Clark and Clark (1969) and Leviton and Anderson (1970). Clark (1990) noted that it prefers barren habitats. Smith (1940) mentioned “*Agama ruderata*” from “Ghazni 7000 ft.” that probably refers to BMNH 1934.3.1.14–17. Two numbers (ZFMK 8684–90) can be found in the collection catalogue of the Museum Koenig referring to *T. megalonyx* from Afghanistan and collected by Clas Naumann. As the labels are still unused and available in the catalogue, it seems that they had been reserved for a dona-



FIGURE 11: *Trapelus* aff. *megalonyx* from Feyzabad (Badakshan Province), Afghanistan. Photo by F. Joisten.

tion from the Zoological Museum in Kabul, but were never accessioned in the collection in Bonn.

***Trapelus sanguinolentus sanguinolentus* (Pallas, 1827:23)**

1827 *Lacerta sanguinolenta* Pallas, Zoographia Rosso-Asiatica, Sistens Omnium Animalium in Extensio Imperio Rossico et Adjacentibus Maribus Observatorum Recensionexu, Domicilia, Mores et Descriptiones, Anatomem atque Icones Plurimorum. Volumen Tertium [= Volume 3]. Typis Academiae Caesareae Scientiarum, Petropoli (= St. Petersburg). vii + 428 + cxxv pp., 6 pls.

TYPE(S).— Most probably lost; from the hilly country Kum-Ankatar at the Terek River in Caucasia [= Terek River Valley]; translated from Latin.

SYNONYMS.— *Agama aralensis* Lichtenstein, 1823 from “in dem ganzen Strich östlich vom Aralsee (= East of the Aral Sea),” Kazakhstan.

LOCALITIES.— Agtsha [Djanz-Djan Prov., 500 m] (ZFMK 8590–91); 64 mi by rd E Faizabad (CAS 115920, FMNH 161133); 25 km E Khanabad (CAS 120275); Khulm, Mazar-i-Sharif [700 m] (ZFMK 14320); Maimana [Maimana Prov.] (CAS 115922–23, FMNH 161197–99, FMNH 161201, ZFMK 8592–93); Mazar-e-Sharif (ZFMK 15693); 20 km E of Mazar-i-Sharif (CAS 120255–57, CAS 120274); 45 km W Mazar-i-Sharif (CAS 120258–60); 50 km W Mazar-i-Sharif (CAS 120273); 65–75 km W of Mazar-i-Sharif (CAS 120261–62); Pol Khomri (MNHN 1948.167); 25 km NW Pul-i-Khumri (CAS 120251); Qizil Qala [Kunduz Prov., 400 m] (ZFMK 8587); 10 km W of Tashkurgan (CAS 120252–54) [see pl. 5, fig. 4 for distribution].

REMARKS.— Boulenger (1889:96) mentioned one specimen of “*Agama sanguinolenta*” from “old Gulran” which probably refers to BMNH 1889.9.21.26.

Pallas, who was born in Berlin, Germany, sold most parts of his collection in 1795 to the Russian Academy of Sciences before he moved to the Crimea area, but some years later, in 1831, Johann Friedrich von Brandt (director of the zoological department at the time) was not able to trace this part of the Pallas collection and his specimens were not mentioned in publications of e.g., Eichwald, Strauch or Nikolskii. In 1810, when Pallas moved back to Berlin, he left parts of his collection in Crimea whereas other parts were donated to the Zoological Museum in Berlin. Therefore, only a few specimens of his collections, and especially very few of the type specimens, appear to have survived, and this has resulted in a cluster of taxonomic problems with respect to many of the species he described.

The date of the work by Pallas has been contentious. The title page of the work indicates that the work was printed 1811–1813, but it is widely held that publication was not until 1831. This latter date is almost certainly incorrect as J.E. Gray cited details from the “Zoographia Rosso-Asiatica” in a work that went to press in October 1830 (Gray 1831). The date used here, 1827, is that suggested by Stresemann (1951).

Family Anguidae

***Pseudopus apodus apodus* (Pallas, 1775:435, pl. 9, fig. 1)**

1775 *Lacerta apoda* Pallas, *Lacerta apoda* descripta. Novi Commentarii Academiae Scientiarum Imperialis Petropolitanorum 19:435–454, pls. IX–X.

HOLOTYPE.— Most probably lost [but imaged in Pallas (1775)], type locality not given in original description, but according to Wermuth (1969) from “habitat in conuallibus herbidis deserti Naryn [= Naryn steppe] et ad Sarpam Kumam, Terekum fluuios”, probably based on Pallas (1776).

LOCALITIES.— Bala-Murglab (Boulenger 1889: 98, probably BMNH 1886.9.21.74–75); On road

to Bala-Murglab [Maimana Prov., 850 m] (ZFMK 8629); Doshi 2700 ft., N of Hindu Kush and Dana Ghon 2400 ft. (Smith 1940, probably BMNH 1938.2.4.10 and BMNH 1938.2.4.11); Gulran (Boulenger 1889:98, probably BMNH 1886.9.21.72); near Laman, SE of Qalah (MNHN 1948.175); Zebak, 102.4 km on road E Faizabad (FMNH 161121–22) [see pl. 5, fig. 5 for distribution].

Family Eublepharidae

? *Eublepharis afghanicus* Börner, 1976:10

1976 *Eublepharis afghanicus* Börner, Second contribution to the systematics of the southwest Asian lizards of the geckonid genus *Eublepharis* Gray 1827: materials from the Indian subcontinent. *Saurologica* (No. 2) 1976:1–15 + 22 unnumbered pages.

HOLOTYPE.— FMNH 161142, from “Jalabad [*sic*, = Jalalabad], Afghanistan”; *Paratype.*— AMNH 57594).

SYNONYMS.— *Eublepharis gracilis* Börner, 1974 (see Remarks) from an unknown locality [*nomen dubium*].

LOCALITIES.— Char-e-Kar [35°05'N, 69°10'E] (CAS 96245); Rig-Revan (cave) near Golbahar, 65 km N of Kabul (LC, Wettstein 1960); Jalalabad (FMNH 161142, MMB 28451–53); vic. of Jalalabad (Brück 1968); Kandahar (MZLU L959/3050); Khoast (CAS 133826); 5–10 mi ENE of Nimla, on old Kabul-Jalalabad rd, and about 10 mi SW of Balabagh [34°19'–21'N, 70°10'–15'E] (CAS 96212) [see pl. 5, fig. 6 for distribution].

REMARKS.— Afghan populations were described by Börner (1976) as “*Eublepharis afghanicus*” (see Fig. 12), which has subsequently often been recognized as a synonym or subspecies of *E. macularius* (e.g., Grismer *in* Estes and Pregill 1988). This taxon now seems to be distinct from *E. macularius*, but it must be clarified if the description was published according to the criteria of Article 8 of the International Code of Zoological Nomenclature (ICZN 1999). The diagnostic characters of *Eublepharis afghanicus* (*vide* Börner 1976) are: transversally enlarged lamellae under the toes tuberculated; first postmental always in contact with the first labial; body



FIGURE 12: “*Eublepharis afghanicus*” from an unknown locality. Photo by H. Seuffer.

pattern consists of transverse bands (in juveniles and adults) and spots (in subadults and adults); no sacral band; body pattern bands tend to a pentagonal, rhombic, or triangular shape (tip always pointed toward the tail) in adults, and to a rectangular shape in juveniles; body pattern bands never tend to converge; spots on occiput subcircular and/or confluent. In these characters it is similar to *Eublepharis fuscus* Börner (1981), which may also not be validly published under Article 8 of the code (ICZN 1999).

Two years before the description of *E. afghanicus*, Börner (1974) described *Eublepharis gracilis*, referring to a single female specimen from an unknown locality (obtained from pet trade) living at the Cologne Zoo. In a subsequent publication (Börner 1976), Börner mentioned, without any information about further material, the range of *E. gracilis* as “inner or coastal [*sic*] Afghanistan”. From the description, the only striking difference between the taxa, *afghanicus* and *gracilis*, is the lack of “body pattern bands” in the latter species. But as the holotype is most probably lost and no typical locality is given, this taxon needs a revision to clarify its status. Meanwhile, we recognize it as a *nomen dubium* and a likely synonym of *E. afghanicus*.

Family Gekkonidae

Agamura persica (Duméril, 1856:481)

1856 *Gymnodactylus persicus* Duméril, Description des reptiles nouveaux ou imparfaitement connus de la collection du Muséum d’Histoire Naturelle et remarques sur la classification et les caractères des reptiles. Deuxième Mémoire, Troisième, quatrième et cinquième familles de l’ordre des sauriens (Geckotiens, Varaniens et Iguaniens). Archives du Muséum d’Histoire Naturelle de Paris, 8:438–588, pls. XVII–XXIV.

SYNTYPES.— MNHN 6761 (two specimens), from “la Perse” [= Iran].

SYNONYMS.— *Agamura cruralis* Blanford, 1874 from “Bahi Kalat and Askan, Baluchistan”. The syntypes of *A. cruralis* are (*vide* Das et al. [1998]): ZSI 3487 from Ras Malan, Baluchistan; ZSI 3501 from Mand, Baluchistan; ZSI 6811 from Askan, near Bampusht, Baluchistan; ZSI 6812 from Zamoran, Nihing R., Baluchistan. The original description gives the type locality as “Gedrosia [= Balochistan]”, restricted to “Bahu Kalat and Askan, Baluchistan” [= Balochistan Province, north-western Pakistan] by Smith (1935:61). According to Constable (1949), an additional syntype is in the MCZ; however, this specimen (MCZ R-7136) is a syntype of *Agamura cruralis*, which is today a synonym of *A. persica*.

LOCALITIES.— Cha-i-Angir (CAS 84690–91); between “Cia-i-Baloch [= Robot-i-Shah Baloch] and Cia-i-Lagun, camp 1” (MZUF 24005); 50 km W Girishk (CAS 120282); Hassan Gilan (Djilan) [Hassan Gilan, between Delaram and Gereskh] (MZLU L957/3791); Helmand (ZISP 7360); north of Herat (Boulenger 1889: 95); Paghman (FMNH 161053–54) [see pl. 5, fig. 7 for distribution].

REMARKS.— Boulenger (1889:95) additionally mentioned several specimens of “*Agamura persica*” from “along the Helmand” (three specimens) and from “between the Hamun and Khusan” (four specimens).

Altiphylax levitoni (Golubev and Szczerbak, 1979:309, fig. 1)

1979 *Tropiocolotes levitoni* Golubev and Szczerbak, Novij vid roda *Tropiocolotes* Peters, 1880 (Reptilia, Sauria, Gekkonidae) iz Afghanistana [= New species of the *Tropiocolotes* Peters, 1880 genus (Reptilia, Sauria, Gekkonidae) from Afghanistan]. Dopovidi Akademiyi Nauk Ukrayins’koyi RSR Seriya B Heolohichni Khimichni ta Biolohichni Nauky 1979 (4):309–312.

HOLOTYPE.— CAS 120283, from “Afghanistan: Kabul 6000 ft. elevation” [translated from Russian and according to the museum label].

LOCALITIES.— Baraki Barak [Logar Prov.] (USNM 194601–4); Kabul (CAS 91613–14, 96214–17, 120283, 121035–44); Kabul Seh Carte (CAS 151212–13); Kabul, Cartehseh (CAS 151192); Kart-e-Tshahar [Kabul Prov., 1800 m] (ZFMK 8679–83); Oukak, Valle de Boum (MZLU L962/3731); nr. Paghman River, 10 km SW of Kabul (CAS 92339) [see pl. 5, fig. 8 for distribution].

REMARKS.— This species is only known from Afghanistan (Fig. 13). Specimens previously recognized as *Alsophylax pipiens* from Afghanistan are now considered as this species. We follow the proposed transfer of *A. levitoni*, type species of *Asiocolotes*, to *Altiphylax* (see Sindaco and Jeremčenko [2008] and Bauer et al. [2013]).



FIGURE 13: *Altiphylax levitoni* from Kabul. Photo by H. Seuffer.

***Bunopus tuberculatus* Blanford, 1874:454**

1874 *Bunopus tuberculatus* Blanford, Descriptions of new lizards from Persia and Baluchistan. Annals and Magazine of Natural History, ser. 4, 13:453–455.

LECTOTYPE.— BMNH 1946.8.22.84, from “Baluchistan”, SW Iran (lectotype designated by Szczerbak and Golubev 1986). *Paralectotypes.*— Das et al. (1998) referred to several “syn-types”, which have to be recognized as paralectotypes: ZSI 3428, 3429, 3431, all from “Baluchistan [= Balochistan Province, north-western Pakistan]”; ZSI 3432 from “Bahukelat, Baluchistan”; ZSI 3434 from “Nigau, Nurmashu, S.E. Persia”; ZSI 3436 from “Bampur, Baluchistan”; ZSI 3437 from “Persian Gulf”; ZSI 3458, 5271 from “Bahu Kalat, Baluchistan”; ZSI 3459 from “Isfandak, Baluchistan”; ZSI 5273–77 from “Pishin, Baluchistan”; ZSI 5278 from “Mand, Baluchistan”; ZSI 5279–80 from “Pishin, Baluchistan”. The original description gave the type locality as “Gedrosia Persiaque [in Baluchistan, north-western Pakistan]”. According to Constable (1949) another paralectotype is in the MCZ, however, no type of this species was traceable in this collection.

SYNONYMS.— *Bunopus gabrielis* Werner, 1936 from “Leb-eKal und Halwan, Persien”. *Bunopus biporus* Werner, 1938 from “Zierat, Baluchistan”.

LOCALITIES.— Baqrabad, Seistan (ZMUC R-34125–26); 10 km NE of Darweshan (CAS 120284); 56 km S and 10 km E of Darweshan (CAS 120286–87, CAS 121067); 35 km S of Farah (CAS

120285); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84690–92); Herat town (ZFMK 92807); Kandahar (FMNH 161248); Kash-Rud Valley near Lashi, Dasht-i-Margo [Nimruz Prov.] (ZMK 2619); Ghaomi-Faringi, approx. 20 mi S Mukur [32°38'N, 67°30'E] (CAS 96277); Lashkargah (CAS 151211); Pirzada (ZMUC R-34129–30); Uruzgan [Oruzgan], Kandahar (ZFMK 94893–94) [see pl. 6, fig. 1 for distribution].

REMARKS.— Boulenger (1889: 95) additionally mentions one specimen of “*Alsophylax tuberculatus*” from “down the Helmand between Hadj-ali and the Hamun,” which probably refers to BMNH 1886.9.21.9.

***Crossobamon eversmanni eversmanni* (Wiegmann, 1834:19)**

1834 *Gymnodactylus eversmanni* Wiegmann, Herpetologia Mexicana, seu descriptio amphibiorum novae hispaniae, quae itineribus comitis de Sack, Ferdinandi Deppe et Chr. Guil. Schiede im Museum Zoologicum Berolinense Pervenerunt. Pars prima, saurorum species. Lüderitz, Berlin. iv + 54 pp., pls. I–X.

HOLOTYPE.— ZMB 435, from “Agetema, Zentral-Asien” [= Agytme, Uzbekistan].

SYNONYMS.— *Crossobamon atropunctatus* Lichtenstein and von Martens, 1856 from “Tartarei”.

LOCALITIES.— 20 km S of Andkhoy (CAS 120297–301); 30 km NW of Sheberghan (CAS 120288–96, CAS 121070) [see pl. 6, fig. 2 for distribution].

REMARKS.— Clark (1990) suggested that this species is an obligate sand dweller.

***Crossobamon eversmanni lumsdeni* (Boulenger, 1887:479)**

1887 *Stenodactylus lumsdeni* Boulenger, Catalogue of the Lizards in the British Museum (Natural History) Vol. III. Lacertidae, Gerrhosauridae, Scincidae, Anelytropsidae, Dibamidae, Chamaeleontidae. Trustees of the British Museum (Natural History), London, United Kingdom. xii + 575 pp., pls. I–XL.

HOLOTYPE.— BMNH 86.9.21.8 [1946.8.23.51], from Afghanistan-Baluchistan frontier “between Nushki and Helmand”, N Balochistan. The type specimen is additionally figured in Boulenger (1889, pl. IX, fig. 1).

SYNONYM.— *Stenodactylus maynardi* Smith 1933 (syntype ZSI 13944) from “Baluchistan near the Afghanistan frontier”; syntype (most probably BMNH 1946.8.23.36) from the same locality.

LOCALITIES.— In Afghanistan only known from the two above mentioned imprecise localities. However, Aitchison (1889:95) explicitly mentions “in Northern Baluchistan” and therefore the type specimens were most probably collected in an area which is today Pakistan.

REMARKS.— The status of *Stenodactylus lumsdeni* Boulenger is still under discussion. Szczerbak and Golubev (1986, 1996) regarded it as closely related to *Crossobamon eversmanni*, whereas Anderson (1999), who examined the name bearing type, recognized it as conspecific with *B. tuberculatus*. Later, Bauer et al. (2013) again followed Szczerbak and Golubev (1986, 1996).

Leviton and Anderson (1970) and also Szczerbak and Golubev (1986, 1996) recognized *C. eversmanni* from northern Afghanistan (see above). However, Leviton and Anderson (1970) additionally mentioned *C. lumsdenii* and *C. maynardi* as distinct species from other localities in the country, whereas Szczerbak and Golubev (1996) recognized *C. lumsdenii* as a subspecies of *C. eversmanni* and *C. maynardi* as synonym of *C. lumsdenii*. As we follow Szczerbak and Golubev (1986, 1996) in their taxonomic concept, we summarize all localities known as *C. lumsdenii* and *C. maynardi* together under the specific subspecies *lumsdenii* of *C. eversmanni*.

***Cyrtopodion scabrum* (von Heyden, 1827:15, pl. 4, fig. 2)**

1827 *Stenodactylus scaber* von Heyden, Reptilien. Pages (1–2) +. 1–24, pls. 1–6 in Rüppell, E., ed., [1826–1828] Atlas zu Reise im nördlichen Afrika. Vol 1, Zoologie. H.L. Brönnner, Frankfurt am Main, Germany,

(6) + vi + (2) + 78 pp., 30 pls.; (2) + 55 pp., 36 pls.; (2) + 24 pp., 6 pls.; 47 + (3) pp., 12 pls.; (2) + 141 + (3) pp., 35 pls.

LECTOTYPE.— SMF 8180, from “aus der Gegend von Tor [= vicinity of Tor], an steinigen Orten [= in rocky areas]”, designated by Mertens (1967).

SYNONYM.— *Gymnodactylus brevipes* Blanford, 1874 (holotype ZSI 3465) from “Gedrosia (Baluchistán) [in north-western Pakistan]”. Synonymized with *Cyrtopodion kachhensis* (Stoliczka, 1872) by Szczerbak and Golubev (1986), who nonetheless mentioned that the holotype is intermediate between *C. kachhensis* and *C. scabrum*.

LOCALITIES.— Band-e-Kadjak, Kadjaki [Kandahar Prov., 1050 m] (ZMK 2737); Bost, vic. Lashkargah [Helmand Prov., 1000 m] (ZMK 2744–5); Dilaram (ZMUC R-34127); Jalalabad [34°26'N, 70°25'E] (CAS 115948); Kandahar [31°36'N, 65°47'E] (CAS 115946–47, FMNH 161226, FMNH 161249, FMNH 161251); Kandahar, 3 km SE (by Quetta Rd.) at junction with Kabul Rd. (3500 ft.) (MVZ 236959–64, 23672–74); Sharisafa, 60 km NE of Kandahar (CAS 90767); Khost, 1200 m (ZFMK 8669–70) [see pl. 6, fig. 3 for distribution].

REMARKS.— Sindaco and Jeremčenko (2008) also mapped a record from northwestern Afghanistan.

Cyrtopodion watsoni (Murray, 1892:68)

1892 *Gymnodactylus watsoni* Murray, The Zoology of Beloochistan and Southern Afghanistan. (Reptiles and Batrachia). Education Society's Press, Bombay, India, 83 pp.

TYPE(S).— Not located, from “Quetta”, Pakistan.

SYNONYMS.— *Gymnodactylus ingoldby* Procter, 1923 from “Ladha”, South Waziristan, Pakistan.

LOCALITIES.— Dar-e-Nur, vic. Shewrak [Nangarhar Prov., 1200 m] (ZMK 2583); Khost [32°21'N, 69°57'E, Paktia Prov.] (CAS 121045–53, CAS 96174–78, ZFMK 8669–71); Jalalabad (CAS 115948, FMNH 161165–66, FMNH 161168); Jalalabad, University ground (AFG 01–07, MMB 28456–57) [see pl. 6, fig. 4 for distribution].

REMARKS.— The species is known only from Afghanistan and Pakistan. Brück (1968) mentioned “*Gymnodactylus kachhensis kachhensis* Stoliczka, 1872” from “dem Gebiete um Djelalabad [vic. of Jalalabad]” referring to a specimen of the Jakeš collection. Inasmuch as *Cyrtopodion watsoni* was recognized as subspecies of “*Gymnodactylus kachhensis [sic]*” at this time and as no other specimens of *C. kachhensis* are known from Afghanistan, and as it is not possible to verify the identification because the whereabouts of the Jakeš collection is unknown, we refer this record to *C. watsoni*. However, there is also specimen catalogued as *C. kachhensis* in the BMNH collection (BMNH 1887.6.17.1) that seems to be referable to *C. watsoni*.

Hemidactylus cf. brookii Gray, 1845:153

1845 *Hemidactylus brookii* Gray, Catalogue of the Specimens of Lizards in the Collection of the British Museum. Trustees of the British Museum, London, United Kingdom. xxviii + 289 pp.

LECTOTYPE.— BMNH 1947.3.6.47 (formerly BM RR 1934.9.1.49 [.21.a]), from “Borneo”; designated by Mahony (2011).

LOCALITIES.— Kabul (ZFMK 8694–5) [Fig. 14; see pl. 6, fig. 5 for distribution].

REMARKS.— This species is not mentioned for Afghanistan by Sindaco and Jeremčenko (2008).

The identity and distribution of true *H. brookii* remains problematic. Gray's types were from “Australia” and “Borneo.” The Australian locality has been dismissed as an error and Bornean populations have only recently been rediscovered (Das and Jensen 2006; Das and Sukumaran 2007), but it has been argued that the current population represents a different species than the type specimen (Kathriner et al. 2014). Current Bornean populations are conspecific with a



FIGURE 14: *Hemidactylus* cf. *brookii* from Kabul. Photo by P. Wagner.

H. brookii type gecko that occurs in India and in scattered localities from Myanmar eastwards to the Lesser Sundas (Bauer et al. 2010) which has most recently been identified as *H. murrayi* (Lajmi et al. 2016). Mahony (2011) resurrected several species occurring in South Asia from the synonymy of *H. brookii*, including *Hemidactylus gleadow*. Most of the currently recognized members of the *H. brookii* complex appear to have broad distributions within India and adjacent countries and it is likely that all or most have been established in parts of their ranges by human agency. Purely on the basis of proximity, *H. kushmorensis* most closely approaches Afghanistan, with populations in Kashmir, India (Lajmi et al. 2016) and presumably in adjacent northern Pakistan, although not in the Federally Administered Tribal Areas immediately adjacent to Afghanistan (Masroor 2012). However, this is still a gap of approximately 250 km and, as the Kabul specimens are likely representative of an introduced population (it seems inconceivable that such anthropophilic geckos would have been missed by earlier workers were they present in the capitol), the source population could be at any distance away. Additional morphological data as well as DNA samples will be needed to determine if the material from Kabul can be assigned to one of the currently recognized Pakistani or Indian taxa, or if it represents a so far undescribed species of the complex.

***Hemidactylus flaviviridis* Rüppell, 1835:18, pl. 6, fig. 2**

1835 *Hemidactylus flaviviridis* Rüppell, Amphibien. Pages 1–18. In Rüppell, E. (ed.), *Neue Wirbelthiere zu der Fauna von Abyssinien gehörig, entdeckt und beschrieben*. Vol. 3, Siegmund Schmerber, Frankfurt am Main, Germany. vi + 140, pls. 1–6.

LECTOTYPE.— SMF 8772 from, “Insel [= island] Massaua, Abyssinien [= Eritrea]”.

SYNONYMS.— *Hemidactylus coctaei* Duméril and Bibron, 1836 from “Bombay and Bengal”.
Boltalia sublevis Gray, 1842 from “India”. *Hemidactylus bengaliensis* Anderson, 1871 from “Bengal, India”.

LOCALITIES.— Jalalabad (AFG 09–10, CAS 115949–55, FMNH 161143, FMNH 161145–47, FMNH 161149, FMNH 161151–52, FMNH 161154, FMNH 161156, FMNH 161159–60, MMB 28463–64, ZFMK 8580); Jalalabad (Spinlar Hotel) (1950 ft.) (MVZ 236972–74); Jalalabad,



FIGURE 15: *Hemidactylus flaviviridis* from Jalalabad. Photo by G. Nogge.

bridge across Kabul River (MMB 28461); on road to Thor Khama, 8 km ESE of Jalalabad (MMB 28462) [Fig. 15; see pl. 6, fig. 6 for distribution].

REMARKS.— Sindaco and Jeremčenko (2008) also recognized this species from the Kabul area but it needs to be confirmed.

***Mediodactylus* aff. *spinicaudus* (Strauch, 1887:58, pl. 1, figs. 15–16)**

1887 *Alsophylax spinicauda* Strauch, Bemerkungen über die Geckoniden-Sammlung im zoologischen Museum der kaiserlichen Akademie der Wissenschaften zu St. Petersburg. Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg, ser. 7, 35(2): (2), 1–72, 1 pl.

HOLOTYPE.— ZISP 4047 from, “Schahrud”, Iran.

LOCALITIES.— Dasht-e-Nawar (ZFMK 13323, see Fig. 16 for distribution).

REMARKS.— The specimen was identified as “*Cyrtopodion spinicauda*” by M. Golubev and would represent a first record of the species in Afghanistan. However the locality is far away from the known range of the species in Iran and Turkmenistan and a more detailed study of the specimen is in need to clarify its status.

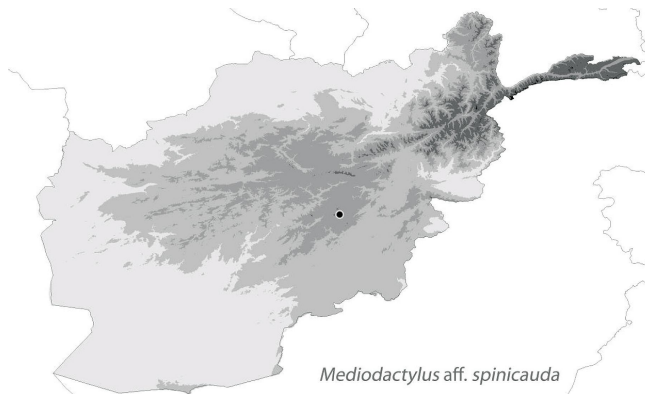


FIGURE 16: Distribution of *Mediodactylus* aff. *spinicaudus* in Afghanistan.

***Tenuidactylus caspius* (Eichwald, 1831:181)**

1831 *Gymnodactylus caspius* Eichwald, Zoologia Specialis quam Expositis Animalibus tum Vivis tum Fossilibus Potissimum Rossiae in Universum, et Poloniae in Specie, in usum Lectionum Publicarum in Universitate Caesarea Vilnensi Habendarum. Pars Posterior; Specialem Expositionem Spondylzoorum Continentis, Pars Posterior [= Vol. 3]. Josephi Zawadski, Vilnae [Vilnius], Russia [now Lithuania]. (3) + 404 pp., 2 folding pls. (Decima Classis. Amphibia [pp. 116–197]. Explicatio Tabularum [pp. 395–396]. Index Generum [pp. 397–404]).

LECTOTYPE.— ZISP 3182, from “Baku” on the Caspian Sea in Azerbaijan.

SYNONYMS.— *Gymnodactylus caspius insularis* Akhmedov and Szczerbak, 1978 from “Island of Vulf, Caspian Sea” [translation from Russian].

LOCALITIES.— Ag Chah settlement [Mazar-i-Sharif Prov.] (SNM 01–05); 25 km SW of Aqcha (CAS 120327–29, CAS 121068); Bala-Murghab [Herat Prov.] (MMB 28454–55); mountains near Cia-i-Dudi [= Kuh-e Chah Dudi] (MZUF 24144); Herat to Islam Qala (CAS 97976); Mazar-i-Sharif (FMNH 161092–96, FMNH 161099–100, FMNH 161102–03, FMNH 161106–07); Paghani (FMNH 161063); 10 km W of Tashkurgan (CAS 120326); Tchachmeh Cher, 17 km N of Pol-Khomri (NMW 15878); cave near Vaqieh, 10 km from Sar-i Pul (MZLU L957/3792); Zebak, 64 mi by rd E Faizabad (CAS 115945, FMNH 161130) [see pl. 6, fig. 7 for distribution].

REMARKS.— Recently recognized as member of the genus *Tenuidactylus* by Bauer et al. (2013). Sindaco and Jeremchenko (2008) also recognize this species from “Neizar” on the Iran side of Sistan.

***Tenuidactylus turcomenicus* (Szczerbak, 1978:41, figs. 1–2)**

1978 *Gymnodactylus turcomenicus* Szczerbak, *Gymnodactylus turcomenicus* sp. n. (Reptilia, Sauria) - Novyj vid Gekkona iz Juzhnoj Turkmenii [= *Gymnodactylus turcomenicus* sp. n. (Reptilia, Sauria) - a new species of gecko from southern Turkmenia]. Vestnik Zoologii, Kiev 1978(3): 39–44.

HOLOTYPE.— ZIK Re No. 10, from Agashly near Kushka, Badkhyz, Turkmenistan [translated from Russian].

LOCALITIES.— Bala Murghab, Herat province (Brück 1968); 24 km E Khanabad (CAS 120318–21, CAS 121069); Kouh-Akhour near Farah (NMW 15879); Kunduz, 400–500 m (ZFMK 8579, 95004–14; ZMK 2758); btw. Kunduz and Tashqurghan [Kunduz Prov., 400 m] (ZFMK 8577); Mazar-i-Sharif [36°43'N, 67°05'E] (CAS 115940–44); Seistan [Faizabad Prov.] (ZMUC R-34128); Shiberghan [Djauz-Djan Prov., 500 m] (ZFMK 8578); 60 km NE Taliqan (CAS 120317) [Fig. 17; see pl. 6, fig. 8 for distribution].

REMARKS.— Recently recognized as member of the genus *Tenuidactylus* by Bauer et al. (2013). For comments on *Tenuidactylus fedtschenkoi* see list of doubtful or absent species at the end of this checklist (p. 524).

***Tenuidactylus voraginosus* (Leviton and Anderson, 1984:270, figs. 1A–E)**

1984 *Cyrtodactylus voraginosus* Leviton and Anderson, Description of a new species of *Cyrtodactylus* from Afghanistan with remarks on the status of *Gymnodactylus longipes* and *Cyrtodactylus fedtschenkoi*. Journal of Herpetology 18(3):270–276.

HOLOTYPE.— CAS 120322, from “55 km W Girishk,” Afghanistan. *Paratypes.*— CAS 120323 from “32km north of Kandahar”, CAS 97995 from “40 mi west of Chirishk; FMNH 161255–56 from “Kandahar”, FMNH 161076 from “30 mi west of Dilaram”.

LOCALITIES.— Chamchir ghar (Pandjvai), 25 km SO of Kandahar (MZLU L958/3791); Cave Khadjah [Kouh-Siah Pochtéh, Naouzan Guerechk] (MZLU L958/3792); 40 mi W of Ghirishk

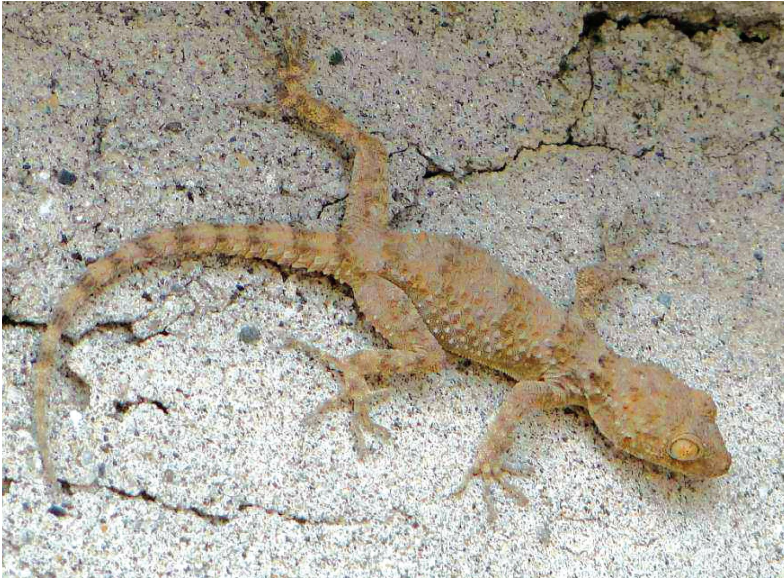


FIGURE 17: *Tenuidactylus turemenicus* from Feyzabad. Photo by F. Joisten.

[32°00'N, 64°10'E] (CAS 97995); 55 km W Girishk (CAS 120322); Kandahar (FMNH 161076, 161255–56); 32 km N Kandahar (CAS 120323) [see pl. 7, fig. 1 for distribution].

REMARKS.— This species is endemic to Afghanistan and was recently recognized as member of the genus *Tenuidactylus* by Bauer et al. (2013).

Family Sphaerodactylidae

Teratoscincus bedriagai Nikolskii, 1900:146

1900 *Teratoscincus bedriagai* Nikolskii, Deux nouvelles espèces de *Teratoscincus* de la Perse orientale. Annuaire Musée Zoologique de l'Académie Impériale des Sciences de St. Pétersbourg, 4 [1899]:145–147.

LECTOTYPE.— ZISP 9157, from “Chadschi-du-i Tschaghi,” eastern Iran.

LOCALITIES.— 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84689); Kandahar [31°36'N, 65°47'E] (CAS 115957, FMNH 161252, FMNH 161254); 16 km S Qala-i-Kang [30°58'N, 61°54'E] (CAS 115956, FMNH 161032, FMNH 161034); 5 km (by air) of Takhteh Pol (Rigestan Sand Dunes at W side of Kadeney Rud) , ca. 40 km SSE Kandahar (by road to Quetta) (3350 ft.) (MVZ 236991–98); 10 km SSE Takhteh Pol (by Quetta Rd.) (3440 ft.) (MVZ 236999–7027) [see pl. 7, fig. 2 for distribution].

Teratoscincus keyserlingii Strauch, 1863:col. 480

1863 *Teratoscincus Keyserlingii* Strauch, Charakteristik zweier neuer Eidechsen aus Persien. Bulletin de l'Académie Impériale des Sciences de St. Pétersbourg, 6:477–480.

LECTOTYPE.— ZISP 2396, from “Seri-Tschah,” eastern Iran.

LOCALITIES.— Cia-i-Lagun (MZUF 24152); 10 km NE of Darweshan (CAS 120309–10); Delaram, Farah Rod [river] (MZUF 24143); 48 km W Dilaram [32°15'N, 62°50'E] (CAS 115960, FMNH 161079–81); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84648–49); 5 mi W Lashkarghah, Dashti-margo Desert (CAS 151220–22); 10 mi W Lashkar-

gah, Daschtimargo (CAS 147416–19); 56 km S and 10 km E of Darweshan (CAS 120311–14); 16 km S Qala-i-Kang (CAS 115958–59, FMNH 161028–30) [see pl. 7, fig. 3 for distribution].

REMARKS.— The correct assignment of this species in Afghanistan is complicated. Several authors mention the Afghan taxon as *T. keyserlingii* (e.g., Szczerbak and Golubev 1986, Sindaco and Jeremčenko 2008), a taxon first recognized as a subspecies of *T. scincus* and later as distinct species by Macey et al. (2005). However, Clark (1990) specifically mentioned the (at the time) nominate subspecies *T. scincus scincus* from Andkhoy (*q.v.*). Therefore, the correct status of this complex should be investigated. Alcock and Finn (1897) mentioned that Afghans believe that this species is poisonous.

***Teratoscincus microlepis* Nikolskii, 1900:145**

1900 *Teratoscincus microlepis* Nikolskii, Deux nouvelles espèces de *Teratoscincus* de la Perse orientale. Annuaire Musée Zoologique de l'Académie Impériale des Sciences de St. Pétersbourg, 4 [1899]:145–147.

HOLOTYPE.— ZISP 9164, from “Duz-Ab in Kirmano orientali,” in eastern Iran.

LOCALITIES.— 56 km S and 10 km E of Darweshan (CAS 120302–08); 5 km (by air) of Takhteh Pol (Rigestan Sand Dunes at W side of Kadeney Rud), ca. 40 km SSE Kandahar (by road to Quetta) (3350 ft.) (MVZ 237028–33) [see pl. 7, fig. 4 for distribution].

REMARKS.— Sindaco and Jeremčenko (2008) did not mention this species for Afghanistan.

***Teratoscincus scincus* (Schlegel, 1858:16)**

1858 *Stenodactylus scincus* Schlegel, Handleiding tot de Beoefening der Dierkunde, vols. 1 and 2. Naturkundige Leercursus ten gebruike der Koninlijke Militarie Akademie. Koninlijke Militarie Akademie (Hubert-G. Nys, printer), Breda [The Netherlands]. xx + 628 + (2) pp., pls. 1–27.

LECTOTYPE.— RMNH 245 from the “zandige oevers der Ili-rivier [Ilo River], ten oosten van Turkestan.” [Ili River Valley of Xinjiang Uygur, China *vide* Zhao and Adler 1993].

LOCALITIES.— 20 km S of Andkhoy (CAS 120315–16) [see pl. 7, fig. 5 for distribution].

REMARKS.— *Teratoscincus scincus* was mentioned by Szczerbak and Golubev (1986) from Harirud River near Herat referencing the record in Boettger (1888). Clark (1990) specifically mentioned *T. scincus scincus* from Andkhoy, stating that none of his other recognized *Teratoscincus* taxa had been mentioned for Afghanistan by Szczerbak and Golubev (1986). However, in the English version of the latter publication the record from Herat (Szczerbak and Golubev 1996:36) is mentioned as “in error in original, source unknown–MG”. This could be due to a citation error, as it is not Boettger (1888) but Boulenger (1889:94) who mentioned and figured (pl. IV, fig. 1) “*Teratoscincus scincus*” from “Hari-rud river near Tirphul” that probably refers to the specimen BMNH 1886.9.21.7. Moreover, the other mentioned Afghan localities now refer to *Teratoscincus keyserlingii* (*q.v.*). We have examined the specimens from Andkhoy and they clearly are referable to *T. scincus*. Therefore, we recognize both former subspecies as distinct species in Afghanistan.

Family Lacertidae

***Acanthodactylus blanfordii* Boulenger, 1918:154**

1918 *Acanthodactylus cantoris* var. *blanfordii* Boulenger, Sur les lézards du genre *Acanthodactylus* Wieg. Bulletin de la Société zoologique France 43: 143–155.

SYNTYPES.— BMNH 1946.9.3.54–55, from “Dash;” BMNH 1946.9.8.34, from “Mand;” BMNH 1946.9.8.33, from “Bam;” and BMNH 1946.9.8.43–44, from “Jask.”

LOCALITIES.— Chah-i-Angir, Dasht-i-Margo desert (CAS 84676, CAS 84678–79, CAS 84681–83); 10 km N of Darweshan (CAS 120364–66); 35 km S of Darweshan (CAS 120367–69); 56 km S and 10 km E of Darweshan (CAS 120371); Either [31°43'N, 64°45'E] or [31°23'N, 65°53'E] (CAS 97993); 10–18 km E of Girishk (CAS 120330–35); 20 mi E of Girishk [31°43'N, 64°45'E] (CAS 97970–71); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84676–83); 45 km N Juwain (CAS 120370); 20 mi SE Kandahar [31°23'N, 65°53'E] (CAS 97994, CAS 97977); 40 km SE of Kandahar (CAS 120336–57); 45–55 km S Lashkargah (CAS 120361–63); between Nushki and Helmand (BMNH 86.9.21.77–79) [see pl. 7, fig. 6 for distribution].

REMARKS.— Clark (1990) mentioned this species as commonly found on sandy pockets and fine drifted sand pits, but not in main dune areas or on stony terrain. Specimens were also collected on river sand banks and islets.

***Acanthodactylus cantoris cantoris* Günther, 1864:73**

1864 *Acanthodactylus cantoris* Günther, The Reptiles of British India. The Ray Society, London, United Kingdom. xxvii + 452 pp, 26 pls.

SYNTYPES.— BMNH 1946.8.4.15–20, from “Ramnagor” [Ramnagar, Gujranwala District, Punjab, India], Punjab, India.

LOCALITIES.— Jalalabad (FMNH 161164); Jalalabad, confluence of Surkh-rod and Kabul River (ZFMK 20984–5); 8 km ESE Jalalabad, direction to Sarsahi (MMB 28482); Jalalabad to Nimla (CAS 120358–60); 5–10 mi ENE of Nimla, on old Kabul-Jalalabad rd, and about 10 mi SW of Balabagh [34°19'–21'N, 70°10'–15'E] (CAS 96200–01, CAS 96206–09) [see pl. 7, fig. 7 for distribution].

REMARKS.— Boulenger (1889:99) mentioned six additional specimens from “Nushki to Helmand” and one specimen from “Helmand”. MMB 28482 was retrieved from the stomach of *Psammodphis leithii*.

***Eremias acutirostris* (Boulenger, 1887:114)**

1887 *Scapteira acutirostris* Boulenger, Catalogue of the Lizards in the British Museum (Natural History) Vol. III. Lacertidae, Gerrhosauridae, Scincidae, Anelytropsidae, Dibamidae, Chamaeleontidae. Trustees of the British Museum (Natural History), London, United Kingdom. xii + 575 pp., pls. I–XL.

HOLOTYPE.— BMNH 86.9.21.88 [now BMNH 1946.8.7.46] from “between Nushki and Helmand, Afghan-Baluch border region”, described in details and figured in Boulenger (1889:100, pl. IX, fig. 4 and 4a–c).

SYNONYMS.— *Scapteira aporosceles* Alcock and Finn, 1897, (syntypes BMNH 1917.3.6.40–43) from “West of Robat I.” Das et al. (1998) mention additional syntypes: ZSI 14132, 14134, 14137, 14139–42, 14144–45, 14147–51, 14153 from the same locality. However, Lantz (1928: 127) only mentioned six male syntypes.

LOCALITIES.— 12 km SE (by air) of Daruishan (Rigestan Sand Dunes) (2350 ft.) (MVZ 237048); 10 km NE of Darweshan (CAS 120377–85); 35 km S of Darweshan (CAS 120375–76); 56 km S and 10 km E of Darweshan (CAS 120386–88); 40 km SE of Kandahar (CAS 120389–96); 5 km (by air) of Takhteh Pol (Rigestan Sand Dunes at W side of Kadeney Rud), ca. 40 km SSE Kandahar (by road to Quetta) (3350 ft.) (MVZ 237044–47) [see pl. 7, fig. 8 for distribution].

***Eremias afghanistanica* Böhme and Szczerbak, 1991:137**

1991 *Eremias afghanistanica* Böhme and Szczerbak, Ein neuer Wüstenrenner aus dem Hochland Afghanistans, *Eremias (Eremias) afghanistanica* sp. n. (Reptilia: Sauria: Lacertidae). Bonner zoologische Beiträge 42(2):137–141.

HOLOTYPE.— ZFMK 8584, from “Ost-Afghanistan [East Afghanistan], Prov. Ghazni, Dasht-e-Nawar, 3000 m N.N.”

LOCALITIES.— Dasht-e-Nawar [Ghazni Prov.], 3000 m a.s.l. (ZFMK 8585); vic. of Kabul [Kabul Prov.], 2000 m a.s.l. (ZFMK 13320) [see pl. 8, fig. 1 for distribution].

REMARKS.— This species is endemic to Afghanistan and so far only known from the two mentioned specimens.

***Eremias aria* Anderson and Leviton, 1967:1, fig. 1**

1967 *Eremias aria* Anderson and Leviton, A new species of *Eremias* (Reptilia: Lacertidae) from Afghanistan. Occasional Papers of the California Academy of Science 64:1–4.

HOLOTYPE.— CAS 96204, from “5–10 mi ENE of Nimla, on old Kabul-Jalalabad rd, and about 10 mi SW of Balabagh [34°19′–21′N, 70°10′–15′E].” *Paratype.*— CAS 96205, same data as the holotype.

LOCALITIES.— 30 km SW Jalalabad (CAS 120372–73, CAS 121065); 5–10 mi ENE of Nimla, on old Kabul-Jalalabad rd, and about 10 mi SW of Balabagh [34°19′–21′N, 70°10′–15′E] (CAS 96204–05); Waziri (ZMK 2653) [see pl. 8, fig. 2 for distribution].

REMARKS.— This species has been recently recognized as endemic to Afghanistan. According to Clark (1990), it inhabits rocks and boulders on stony grounds, hiding amongst the base of intermixed vegetation.

***Eremias fasciata* Blanford, 1874:32**

1874 *Eremias fasciata* Blanford, Descriptions of new Reptilia and Amphibia from Persia and Baluchistan. Annals and Magazine of Natural History, ser. 4, 14:31–35.

LECTOTYPE.— ZMB 9329 (designated by Szczerbak 1974), from “Karman” [= Kerman], Iran.

LOCALITIES.— 56 km S and 10 km E of Darweshan (CAS 120397); 16 km NW Delaram (CAS 120400–04); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84684–88); 64 km W Kandahar (CAS 120398–99); Pirzada (ZMUC R-4594); Urgun [Paktia Prov., 2500 m] (ZFMK 8553) [see pl. 8, fig. 3 for distribution].

REMARKS.— Clark (1990) recognized *E. fasciata* as an inhabitant of isolated sandy pockets and wind-dispersed sandy areas away from the main sand deserts. Paralectotypes are e.g.: BMNH 1946.8.7.57–59, BMNH 1946.8.7.34–35 from “Saidabad, southwest of Kerman.” Lantz (1928) mentioned one specimen from “Afghanistan”, while Boulenger (1889: 99) mentioned an additional specimen from “on the Helmand” that probably refers to BMNH 1886.9.21.87.

***Eremias grammica* (Lichtenstein, 1823:100)**

1823 *Lacerta grammica* Lichtenstein, Verzeichniss der Doubletten des zoologischen Museums der königlichen Universität zu Berlin nebst Beschreibung vieler bisher unbekannter Arten von Säugethieren, Vögeln, Amphibien und Fischen. Königlich Preussische Akademie der Wissenschaften, T. Trautwein, Berlin, Prussia [now Germany]. x + 118 pp., 1 pl.

LECTOTYPE.— ZMB 1095 (designated by Szczerbak 1974) from “Karakum, Turkmenistan”. *fide* Szczerbak (1974). Original locality “Aegypt., Nubia et Tataria.”

SYNONYMS.— *Scapteira persica* Nikolskii, 1900 from “Tscharachs, Zirkuch, Iran”.

LOCALITIES.— Ag Chah (SNM 06–14, SNM 20); 20 km S of Andkhoy (CAS 120438–39); 20–50 km S of Andkhoy (CAS 120418–37); 20 km E of Mazar-i-Sharif (CAS 120405–16); 30 km NW of Sheberghan (CAS 120417) [see pl. 8, fig. 4 for distribution].

***Eremias intermedia* (Strauch, 1876:28)**

1876 *Podarces (Eremias) intermedia* Strauch, Part III. Reptiles and amphibians. Pages 1–55, pls. I–VIII *In* Przewalski, N. Mongoliya i Strana Tangutov. Tryokhletneye puteshestviye v Vostochnoj Nagoruoij Asii [= Mongolia and the Tangut Country. Three-Years of Travel in Eastern High Asia]. Volume 2. Imperial Russian Geographic Society, St. Petersburg, Russia [in Russian; English edition, London 1876, French edition, Paris 1880, German edition, Jena 1887; abridged Russian edition with added notes, Moscow 1946].

LECTOTYPE.— ZISP [former ZIL] 3664, from “Kizil Kum, Aralo-Caspian Desert” [translated from Russian] (designated by Szczerbak 1974).

LOCALITIES.— Ag Chah (SNM 15–19); 20 km S Andkhoy, W of river (CAS 120641–42); 20–50 km S Andkhoy, E of river (CAS 120636–40); 50 km S of Andkhoy (CAS 121062); 25 km SW of Aqcha (CAS 120629–31, CAS 121061); 20 km E of Mazar-i-Sharif (CAS 120621–27, CAS 121059–60); 65–75 km W of Mazar-i-Sharif (CAS 120628); 30 km NW of Sheberghan (CAS 120632–35) [see pl. 8, fig. 5 for distribution].

REMARKS.— Clark (1990) mentioned the species as sympatric with *E. grammica* and *E. lineolata* but preferring firm sandy soils and shunning loose sands and dunes. Sindaco and Jeremčenko (2008) also provide records from northwestern Afghanistan.

***Eremias lineolata* (Nikolskii, 1897:330, pl. XVIII, fig. 4)**

1897 *Scapteira lineolata* Nikolskii, Les reptiles, amphibiens et poissons recueillis (part.) Mr. N. Zaroudny dans la Perse orientale [in Russian]. *Annuaire Musée Zoologique de l'Académie Impériale des Sciences de St.-Petersbourg* 2:306–348, pls. XVII–XIX.

LECTOTYPE.— ZISP 880, from between Feizabad and Nusi in eastern Iran [translated from Russian] (designated by Szczerbak 1974).

LOCALITIES.— 20–50 km S of Andkhoy (CAS 120441–52); 40–50 km S Andkhoy (CAS 120453–54); Aqtscha [Djauz-Djan Prov., 500 m] (ZFMK 8585); Bala Murghab (Brück 1968); 57–75 km W Mazar-i-Sharif (CAS 120440) [see pl. 8, fig. 6 for distribution].

REMARKS.— Clark (1990) reported this species as only associated with vegetation and never venturing far from cover.

***Eremias nigrocellata* Nikolskii, 1896:371**

1896 *Eremias nigrocellata* Nikolskii, Diagnoses reptilium et amphibiorum novorum in Persia orientali a N. Zarudny collectorum. *Annuaire Musée Zoologique de l'Académie Impériale des Sciences de St.-Petersbourg*, 1:369–372.

LECTOTYPE.— ZISP 8800, from “Sistan”, Iran (designated by Szczerbak 1974). However, Lantz (1928) referred to five syntypes (ZISP 8798–8799) and ZISP 8800 is only mentioned by him, but not indicated as type. Therefore, the status of the specimen ZISP 8800 should be investigated.

LOCALITIES.— Amu-Darya, N of Kunduz (ZFMK 8696); Dasht, btw. Kunduz and Khulm [Kunduz prov., 500 m] (ZFMK 8654, ZMK 2755–56); Amu-Darya swamps, nr. Darquad, N of Djangi Quala [Takhar Prov., 400 m] (ZMK 2562); Pul-e-Khumri [Baghlan Prov., 1300 m] (ZFMK 8583); 10 km W of Tashkurgan (CAS 120455, CAS 120619–20); 15 km W Tashkurgan (CAS

121058); Zebak, 102.4 km on road E Faizabad (FMNH 161127–29) [see pl. 8, fig. 7 for distribution].

REMARKS.— Clark (1990) mentioned *E. nigrocellata* as a rare species of open firm clay or loess ground with sparse vegetation. ZFMK 8696 was retrieved as a stomach content from *Eryx tataricus* (ZFMK 5385).

***Eremias persica* Blanford, 1875:31**

1874 *Eremias persica* Blanford, Descriptions of new Reptilia and Amphibia from Persia and Baluchistan. Annals and Magazine of Natural History, ser. 4, 14:31–35.

LECTOTYPE.— BMNH 1946.8.7.32, from “near Ispahan”, Iran (designated by Szczerbak 1974).

LOCALITIES.— Ab-e-Istada, vic. of Muger [Ghazni Prov., 2000 m] (ZFMK 8655); Baqrabad (ZMUC R-4587); Char-e-Kar [35°05'N, 69°10'E] (CAS 96232–33); Cia-i-Baloch [= Robot-i-Shah Baloch] and Cia-i-Lagun, camp 1 (MZUF 24037–44, 24045–46, 24048–49); 10 km N of Darweshan (CAS 120610, CAS 120974); Faizabad (ZMUC R-4589); expiration of Farah-ruds River (ZMUC R-4586); Ghaomi-Faringi, approx. 20 mi S Mukur [32°38'N, 67°30'E] (CAS 96275–76, CAS 97986); 10 km S Ghazni (CAS 120612–13); 15 km N Ghazni (CAS 120611); Btw. Ghazni and Mukur [32°53'N, 67°48'E] (CAS 97981); 15 km W Girishk (CAS 120976–77); 22 km S Girishk (CAS 120975); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84677); Herat town (ZFMK 92808); vic. of Herat (MHNG 1590.16); 72 km S Herat (CAS 120616–18, CAS 120978); 10 km E Jalalabad, direction to Somarkhel (MMB 28481); 20 mi SE Kandahar [31°23'N, 65°53'E] (CAS 97988); 36–56 km N Kandahar (CAS 120606–09); 4 mi from Kurdkabul Dam towards Buthak (CAS 151228); Meiden Khula, about 30 mi ENE of Gardez [33°40' N, 69°50'E] (CAS 96255–56); Mokuk (CAS 133825); Murichaq [Herat Prov.] (MMB 28503); Paghām (FMNH 161064); 50 km N Qalat (CAS 120614–15); Sharisafa, 60 km NE of Kandahar (CAS 90772); 5 km (by air) of Takhteh Pol (Rigestan Sand Dunes at W side of Kadeney Rud), ca. 40 km SSE Kandahar (by road to Quetta) (3350 ft.) (MVZ 237049) [see pl. 8, fig. 8 for distribution].

REMARKS.— Smith (1940: 384) mentioned additional specimens from “Ghazni 7000 ft.”, which probably refer to BMNH 1940.3.1.25–33, and “Arbarp 7000 ft.”, which probably refers to BMNH 1940.3.1.34. This is a widespread species (Fig. 18) in southern Afghanistan, occurring up to at least 2500 m a.s.l. on open ground, hiding in holes, rodent burrows or at the base of vegetation (Clark 1990).



FIGURE 18: *Eremias persica* from Tobagay, Afghanistan. Photo by R. Maroor.

***Eremias regeli* Nikolskii, 1905:479**

1905 *Eremias regeli* Nikolskii, Herpetologia rossica. Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg, Phys.-Math. Classe, St. Pétersbourg, 17(1):(1–2) + i–ii + 1–517 + (1), pls. I–II.

HOLOTYPE.— ZISP 6115, from “Shirabad”, Uzbekistan.

LOCALITIES.— 30 km SW Jalalabad (CAS 120374); 45 km W Jalalabad (CAS 121066); 5–10 mi ENE Nimla, on old Kabul-Jalalabad rd, ca. 10 mi SW Balabagh (CAS 121034, CAS 96198, CAS 96202–03, CAS 96211) [see pl. 9, fig. 1 for distribution].

REMARKS.— Sindaco and Jeremčenko (2008) also recognized this species from northern parts of the country.

***Eremias scripta scripta* (Strauch, 1867:col. 327)**

1867 *Podarces (Scapteira) scripta* Strauch, Bemerkungen über die Eidechsen-Gattung *Scapteira* (Fitz.). Bulletin de l'Académie Impériale des Sciences de St. Pétersbourg 12:313–328.

LECTOTYPE.— ZISP 3669, from “Aralo-Caspian desert” (designated by Szczerbak 1974).

LOCALITIES.— 10 km NE of Darweshan (CAS 120460–64); 35 km S of Darweshan (CAS 120456–59); 56 km S and 10 km E of Darweshan (CAS 120465–68); ca. 50 km SSW (by air) of Lashkar Gar, edge of Dasht-e Margo on W side of Helmund River (2320 ft.) (MVZ 237466); 40 km SE of Kandahar (CAS 120469–77); 81 km W (by Herat Rd.) of Kandahar (3200 ft.) (MVZ 237467).

REMARKS.— Clark (1990) mentioned this species as an inhabitant of permanent sand hills and ridges, usually occurring close to vegetation (see Fig. 19 for the distribution).

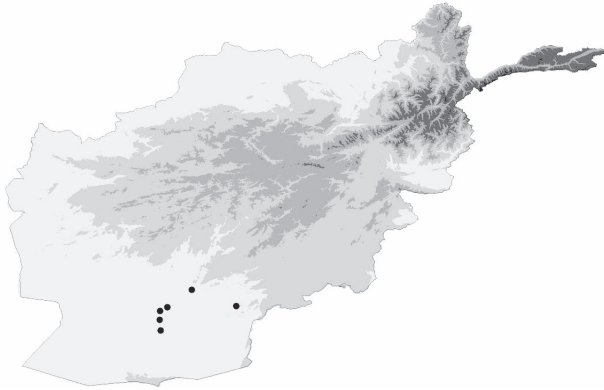


FIGURE 19: Distribution of *Eremias scripta* in Afghanistan.

***Eremias velox velox* (Pallas, 1771:407, 457)**

1771 *Lacerta velox* Pallas, Anhang. Descriptiones fugitiae animalium atque plantarum Annis 1768 et 1769 observatorum. Pages 453–504, 13 pls. *In* Reise durch verschiedene Provinzen des Rußischen Reiches, Erster Theil Kayserliche Academie der Wissenschaften, St. Petersburg, Russia. (12) + 504 pp., 26 pls.

NEOTYPE.— ZISP 16233, from the northern coast of Lake Inder, Inder district, Atyrau province, Kazakhstan (designated by Szczerbak 1974) [translated from Russian].

LOCALITIES.— 24 km SE Aqcha (CAS 120605); 25 km SW of Aqcha (CAS 120603–04); Baraki Barak [Logar Prov.] (USNM 194598–600, USNM 194978); Dasht-e-Nawar [Ghazni Prov., 3000 m] (ZFMK 8584); Doab (MNHN 1948.178); Herat (ZMUC R-4596); 24 km E Khanabad (CAS 120653); Kunduz (ZFMK 97438–39); 65–75 km W of Mazar-i-Sharif (CAS 120596–602, CAS

121063–64); 30 km E Taliqan (CAS 120654); 10 km W of Tashkurgan (CAS 120643–52, CAS 121057); Tazi, 80 mi N Kandahar [32°23'N, 67°18'E] (CAS 97984) [see pl. 9, fig. 2 for distribution].

REMARKS.— Boulenger (1889:99) mentioned additional specimens from “Helmand, Toman-agma, Gulran”, which probably refers to a locality in Iran. Clark (1990) mentioned this as a species occurring on firm, but never sandy, ground with scrub and vegetation. Sindaco and Jeremčenko (2008) noted this species only from northern parts of the country and specimens from southern parts need to be confirmed.

***Mesalina watsonana* (Stoliczka, 1872:86)**

1872 *Eremias (Mesalina) watsonana* Stoliczka, Notes on reptiles collected by surgeon F. Day in Sind. Proceedings of the Asiatic Society of Bengal 1872:85–92.

SYNTYPES.— BMNH 1946.8.7.75, ZSI 4929, ZSI 5050, ZSI 5223–25, and NMW 23474.1–3, from “Panjáb Province”.

LOCALITIES.— Armalik (MZLU L962/3177); Bagram, nr. Tsharikar [Parvan Prov., 2500 m] (ZFMK 8659); Baqrabad (ZMUC R-4588, 4590); Baraki Barak [Logar Prov.] (USNM 194963); Bozgholot, 21 km N of Ghazni (MZLU L960/3042); Cawkae dada, Ski Club Hill (CAS 147428–32); Chah-i-Angir, 35 mi downstream from Girishk, Dasht-i-Margo desert (CAS 84680); Chare-Kar [35°05'N, 69°10'E] (CAS 96218–31); Cia-i-Baloch [= Robot-i-Shah Baloch] and Cia-i-Lagun, camp 1 (MZUF 24047, 24072); Darreh-Darang (MZLU L962/3178); Djibir Ansar (MZLU L962/3179); Djaouz, Kouhqorough (MZLU L962/3175); vic. of Faizabad (ZMUC R-4591); Faizabad (ZMUC R-4592–93); Ghaomi-Faringi approx. 20 mi S Mukur [32°38'N, 67°30'E] (CAS 97985); 15 km N Ghazni (CAS 120576); 20 km W Ghazni (ZFMK 8656); 31 km N Ghazni (by Kabul Rd.) (8165 ft.) (MVZ 237478–79); 30 km E Girishk (CAS 120563); Hadda (MZLU L958/3229); 30–70 km NE of Herat (CAS 120578–86); 130 km S Herat (CAS 120559–62); Jalalabad [34°26'N, 70°25'E] (CAS 115961, FMNH 161170); 3 km SSE Jalalabad (MMB 28476–79); 8 km ESE Jalalabad, direction to Sarsahi (MMB 28475); 10 mi W of Jalabad [34°30'N, 70°22'E] (CAS 96240, 96189–94); 12 km ESE Jalalabad, direction to Sarsahi (MMB 28480); 25 km SW Jalalabad (CAS 120569–72); ca. 30 km SE (by air) Jalalabad (2950 ft.) (MVZ 237473–77); 35 km SW Jalalabad (CAS 120589); 35–45 km W Jalalabad (CAS 120565–68); Kabul (ZFMK 7923); Kabul to Lataband (CAS 120587–88); 30 km S Kabul (ZFMK 5387); 35 km S Kabul, on rd to Kandahar (CAS 91612); 80 km S Kabul (CAS 120590–92); Kandahar [31°36'N, 65°47'E] (CAS 115962–68, FMNH 161227, FMNH 161229, FMNH 161231, FMNH 161235–38, FMNH 161240–45, FMNH 161247); 20 mi SE Kandahar [31°23'N, 65°53'E] (CAS 97987); 32 km N Kandahar (CAS 120595); 40 km N Kandahar (CAS 120564, CAS 120575); 40 km NE of Kandahar, on Tarnak River (CAS 90757–60); 50 km NE of Kandahar, on Tarnak River (CAS 90758–60); 56 km N Kandahar (CAS 120573); 80 km W Kandahar (CAS 120574); Kharzar (Tang-Djangan Baz) (MZLU L957/3050); 30 mi W Khost [33°25'N, 69°22'E] (CAS 96173, CAS 96253); Kotal-e-Khair-Khana, vic. of Kabul [Kabul Prov., 2000 m] (ZFMK 8658); Kotal-Zarni (MZLU L962/3176); Mil-Karez, Pol-Mil (MZLU L958/3230); 5–10 mi ENE of Nimla, on old Kabul-Jalalabad rd, and about 10 mi SW of Balabagh [34°19'–21'N, 70°10'–15'E] (CAS 96213); 4 km S (by air) Paghman (7650 ft.) (MVZ 237471); Paghman River, 10 km SW of Kabul (CAS 92340); Paghman, 15 mi W of Kabul [34°36'N, 68°56'E] (CAS 96254); Qala-e-Bagaul, 5 km W of Ghazni [Ghazni Prov., 2300 m] (ZFMK 8657); 10 mi N Qalat [32°10'N, 67°00'E] (CAS 97982–83); 24–50 km N Qalat (CAS 120593–94); Qalat-Ghilzai (MNHN 1948.174); 32 km NE of Quandhor (MZLU L960/3043); Sharisafa, 60 km NE of Kandahar

(CAS 90764, CAS 90768, CAS 90770–71, CAS 90776); Shash Gao, few km toward Ghazni (CAS 91599–602); 10 km SSE Takhteh Pol (by Quetta Rd.) (3440 ft.) (MVZ 237472); Terra Pass, N of Gardez [Paktia Prov., 2500 m] (ZFMK 8660–61); Urgun [Paktia Prov., 2500 m] (ZFMK 8554–55); Yakhan (MZLU L962/3180) [see pl. 9, fig. 3 for distribution].

REMARKS.— Boulenger (1889: 99) mentioned two specimens as “*Eremias guttulata*” from “Helmand” and one specimen from “Tirphul” and “along the Helmand to the valley of the Hari-rud river”. The Afghan population of “*Eremias guttulata*” was later recognized as part of the subspecies *watsonana*, which today has species rank. Smith (1940:384) mentioned a specimen from “Arbarp” that may refer to BMNH 1940.3.1.35. A ubiquitous lizard inhabiting firm soils and hiding under stones, in holes or at the base of vegetation (Clark 1990).

Ophisops jerdonii Blyth, 1853:653

1854 “1853” *Ophisops jerdonii* Blyth, Notices and descriptions of various reptiles, new or little-known. Part I. Journal of the Asiatic Society of Bengal 22:639–655.

HOLOTYPE.— ZSI 2196, from “Mhow” [= Madhya Pradesh State, India].

LOCALITIES.— ca. 30 km SE (by air) Jalalabad (2950 ft.) (MVZ 237480–82); Jalalabad to Kaga (CAS 120479); Jalalabad to Nimla (CAS 120478, CAS 121056) [see pl. 9, fig. 4 for distribution].

REMARKS.— Clark (1990) mentioned the species as an inhabitant of broken terrain occurring amongst rocks and vegetation in Afghanistan.

Family Scincidae

Ablepharus grayanus (Stoliczka, 1872:74)

1872 *Blepharosteres grayanus* Stoliczka, Notes on the reptilian and amphibian fauna of Kachh. Proceedings of the Asiatic Society of Bengal 1872:71–85.

SYNTYPES.— NMW 10234, from “NE Katch” fide Tiedemann and Häupl (1980); ZSI 5403, from “Waggur district, in the North-eastern part of Kachh (in Gujarat State, western India)” fide Das et al. (1998).

LOCALITIES.— Loger Valley, 10 km S of Kabul [Kabul Prov., 2000 m] (ZFMK 8662) [see pl. 9, fig. 5 for distribution].

Ablepharus lindbergi Wettstein, 1960:61

1960 *Ablepharus bivittatus lindbergi* Wettstein, Contribution à l'étude de la faune d'Afghanistan. 3. Lacertilia aus Afghanistan. Zoologischer Anzeiger 165:58–63.

HOLOTYPE.— NMW 15877, from “Steppe einige km westl. v. Obéh [some km west of Obeh], östl. v. Hérat [east of Herat], W-Afgh[anistan].”

LOCALITIES.— Andarab [Baghlan Prov., 2500 m] (ZFMK 8586); Dasht-e-Nawur [Ghazni Prov., 3000 m] (ZMK 2655–57); 20km W of Ghazni [Ghazni Prov., 2500 m] (ZFMK 8665–67); Kotal, Zarni (MZLU L962/3170); Kotal-e-sh-tu [Maidan Prov., western Behsud, 2000 m] (ZFMK 8664); Masdjed, Tohoubi (MZLU L959/3044); Masgid-i-ciovi [= Masjed-e Chubi], Campo 2 (MZUF 23923–38, 24132–42); Obêh, E of Hérat (MZLU L957/3777, NMW 15877); Oukak, valle de Boum (MZLU L962/3171); Pandjab, Decht Ghoudjour (MZLU L962/3172); Tshomay [Maidan Prov., western Behsud, 2000 m] (ZFMK 8663); Urgun [Paktia Prov.] (ZFMK 8556); Yabowlang [= Yakawlang] to Band-i Ahair [= Band-e Amir] pass (MZUF 24154–61) [see pl. 9, fig. 6 for distribution].

REMARKS.— This taxon appears to be endemic to Afghanistan and can be differentiated from the closely related *A. bivittatus* by a higher number of scales around midbody (26 versus 22–24).

***Ablepharus pannonicus* (Lichtenstein, 1823:103)**

1823 *Scincus pannonicus* Lichtenstein, M.C.H., Verzeichniss der Doubletten des zoologischen Museums der königlichen Universität zu Berlin nebst Beschreibung vieler bisher unbekannter Arten von Säugethieren, Vögeln, Amphibien und Fischen. Königlich Preussische Akademie der Wissenschaften, T. Trautwein, Berlin, Prussia [now Germany]. x + 118 pp., 1 pl.

SYNTYPES.— ZMB 1346 [two specimens], from “Bucharia” [= Bukhoro, Uzbekistan].

SYNONYMS.— *Blepharosteres agilis* Stoliczka, 1872 (syntypes ZSI 5407, NMW 16237) from “S. W. of Kálábágh [in North-West Frontier Province, northern Pakistan]”.

LOCALITIES.— Ajdaha, near Bamiyan (MNHN 1948.171–73); Bamian (MZLU L957/3048); Espisevarz (MZLU L962/3167); 72 km S Herat (CAS 120480); 36 km S Kabul, on rd to Kandahar (CAS 91610–11); Masgid-i-ciovi [= Masjed-e Chubi], Campo 2 (MZUF 24153); Obek (MZLU L957/3049); Orozgon (MZLU L960/3041); Oubek [= Obek] (MZLU L962/3169); Pandjab, Decht Ghoudjour (MZLU L962/3168); 2 km NW Panjoa (CAS 147409–15); Qual’eh Chahrak [= Hezaradjat?] (NMW 15883); Qual èh Nou (MZLU L957/3047); Urgun [Paktita Prov., 2500 m] (ZFMK 8557–8) [see pl. 9, fig. 7 for distribution].

REMARKS.— Nearly two centuries of confusion have surrounded the application and authorship of this name. Bauer et al. (2003) summarized the issues involved in detail. Although sometimes attributed to Fitzinger (1824) or Fitzinger in Lichtenstein (1823) (e.g., Anderson 1999), it is clear that Lichtenstein, although using Fitzinger’s manuscript name (not published until the following year), based his description on material representing a different species than that intended by Fitzinger. Thus, although Fitzinger coined the specific epithet, Lichtenstein alone must be credited as the author of *Scincus pannonicus*.

Boulenger (1889: 100) mentioned one specimen as “*Ablepharus brandtii*” from “on the Helmand”.

***Asymblepharus himalayanus* (Günther, 1864:86, pl. X, fig. H)**

1864 *Eumeces himalayanus* Günther, The Reptiles of British India. The Ray Society, London, United Kingdom. xxvii + 452 pp, 26 pls.

SYNTYPES.— BMNH 1946.8.16.24, from “Kashmir” [two specimens]; BMNH 1946.6.17.62, from “Garhval” [two specimens]; BMNH 1946.8.19.71, from “Simla” [one specimen].

LOCALITIES.— Panjao, Koh-i-Baba [mountain range] (ZMUC R-47131–33); Pashki [Nuristan Prov.] (ZMUC R-47119–20); Puistagoli (ZMUC R-47134–42) [see pl. 9, fig. 8 for distribution].

***Eumeces blythianus* (Anderson, 1871:186)**

1871 *Mabouia blythiana* Anderson, On two saurian genera *Eurylepis* and *Plocederma* Blyth, with a description of a new species of *Mabouia* Fitzinger. Proceedings of the Asiatic Society of Bengal 1871:180–190.

HOLOTYPE.— ZSI 2384, from “Amritzur” [= Amritsar, Punjab State, India].

LOCALITIES.— Seberghan (ZFMK 41118) [see pl. 10, fig. 1 for distribution].

REMARKS.— Sindaco and Jeremčenko (2008) did not mention this species from Afghanistan.

***Eumeces schneiderii zarudnyi* Nikolskii, 1900:399, pl. XX, lower left fig.**

1900 *Eumeces zarudnyi* Nikolskii, Reptiles, amphibiens et poissons, recueillis pendant le voyage de Mr. N. A. Zaroudny en 1898 dans la Perse. Annuaire Musée Zoologique de l'Académie Impériale des Sciences de St.-Petersbourg, 4:375–417, pl. XX.

LECTOTYPE.— ZISP 9339, from “Urbs Bazman in Kirmano orient.” [Iran] designated by Taylor (1935).

LOCALITIES.— Feyzabad (see Fig. 20); Pirzada (ZMUC R-47130) [see pl. 10, fig. 2 for distribution].

REMARKS.— Boulenger (1889:101) mentioned specimens “from the Helmand” (one specimen) and “at Shore-kategai in the Badghis” (one specimen), and one of these should correspond to BMNH 1886.9.21.91, but Boulenger did not give specific collection numbers. Leviton and Anderson (1970:191) mentioned *Eumeces schneiderii* from Helmand Basin and northern Afghanistan (north of the Hindu Kush at low elevations) whereas Sindaco and Jeremčenko (2008) did not mention this taxon from Afghanistan.



FIGURE 20 *Eumeces schneiderii* from Feyzabad. Photo by F. Joisten.

***Eurylepis taeniolatus parthianicus* (Szczerbak, 1990:38, figs. 1b–3b)**

1990 *Eumeces taeniolatus parthianicus* Szczerbak, Systematics and geographic variability of *Eumeces taeniolatus* (Sauria, Scincidae) [in Russian]. Vestnik Zoologii, Kiev 1990(3):33–40.

HOLOTYPE.— ZIK Re 18 no. 17660, from “northern slope of central Kopet Dag, Chuli, 25 km west of Ashkhabad, Turkmenistan” [translated from Russian].

LOCALITIES.— Bala Murghab (MMB 28483); Khost [Paktia Prov., 1200 m] (ZMK 2648); Pandjvai, nr. Kandahar (NMW 15882); Somarkhel, right bank of Kabul River (MMB 28484); Tajan River (Leviton and Anderson 1970) [see pl. 10, fig. 3 for distribution].

REMARKS.— Szczerbak (1990) mentioned that he had already described the species in 1989, but the year of publication is, without doubt, 1990.

***Eutropis dissimilis* (Hallowell, 1857:78)**

1857 *Euprepis dissimilis* Hallowell, Notice of some new and rare species of Scincidae in the collection of the Academy of Natural Sciences of Philadelphia. Transactions of the American Philosophical Society, Philadelphia, new series, 11:71–82.

SYNTYPES.— ANSP 9537–38, from “Bengal”.

SYNONYMS.— *Mabuia hodgarti* Hora, 1927 (holotype ZSI 19801; paratypes in ZSP [one specimen] and ZSI 19803–05) from “Rawalpindi, Punjab [in northern Pakistan]”.

LOCALITIES.— Jalalabad (FMNH 161162); 5–10 mi ENE of Nimla, on old Kabul-Jalalabad rd, and about 10 mi SW of Balabagh [34°19–21'N, 70°10–15'E] (CAS 96195) [see pl. 10, fig. 4 for distribution].

***Heremites septemtaeniata* (Reuss, 1834:47, pl. 3, fig. 1a–c)**

1834 *Euprepis septemtaeniatus* Reuss, Zoologische Miscellen. Reptilien. Saurier. Batrachier. Abhandlungen aus dem Gebiete der beschreibenden Naturgeschichte. Museum Senckenbergianum, Frankfurt am Main, Germany 1:27–62, pl. 3.

LECTOTYPE.— SMF 14141, from “Abyssinien, die Umgebung von Massua” [= vicinity of Massawa, Eritrea].

LOCALITIES.— Dar-e-Nur, vic. Shewa [Nangahar Prov., 1200 m] (ZFMK 9064, ZMK 2572) [see pl. 10, fig. 6 for distribution].

REMARKS.— Sindaco and Jeremčenko (2008) provided an additional record from northwestern Afghanistan. The nominal genus *Heremites* was resurrected by Karin, et al. (2016) (*q.v.*).

***Ophiomorus tridactylus* (Blyth, 1854:654)**

1854 “1853” *Sphenocephalus tridactylus* Blyth, Notices and descriptions of various reptiles, new or little-known. Part I. Journal of the Asiatic Society of Bengal 22:639–655.

SYNTYPES.— ZSI 2526–29, ZSI 2531–32 from “Afghanistan”.

LOCALITIES.— Baqrabad (ZMUC R-47115–17, 47121–28); Dama rud. (ZMUC R-47118); 10 km NE of Darweshan (CAS 120482–85); 35 km S of Darweshan (CAS 120481); 20 mi E of Girishk [31°43'N, 64°45'E] (CAS 97973); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chahi-Angir (CAS 84669–75); Pirzada (ZMUC R-47129); 5 km (by air) of Takhteh Pol (Rigestan Sand Dunes at W side of Kadeney Rud), ca. 40 km SSE Kandahar (by road to Quetta) (3350) (MVZ 237068–71); 10 km SSE Takhteh Pol (by Quetta Rd.) (3440 ft.) (MVZ 237072–75) [see pl. 10, fig. 5 for distribution].

REMARKS.— Boulenger (1889:101) mentioned one additional specimen from “at an old fort called Nadir Ali, between De-kamran and De-doda on the Helmand”, which most probably refers to BMNH 1886.9.21.92. This is a fossorial lizard of small sandy tracts rather than dune areas in Afghanistan (Clark 1990).

Family Uromastycidae***Saara* Gray, 1845**

According to available studies (e.g., Wilms et al. 2009, Pyron et al. 2013), the eastern species of the genus *Uromastyx* (*U. asmussi*, *U. hardwickii*, *U. loricata*) form a clade that is sister to the remaining species of the genus. Therefore, Wilms et al. (2009) revalided the available genus name *Saara* for these three species. Pyron et al. (2013) and Sindaco et al. (2013) adopted a more conservative concept and recognized *Saara* as synonym of *Uromastyx*, but, because of the distinct morphology, we herein maintain the use of the name *Saara*.

***Saara asmussi* (Strauch, 1863:col. 479)**

1863 *Centrotrachelus Asmussi* Strauch, Charakteristik zweier neuer Eidechsen aus Persien. Bulletin de l'Académie Impériale des Sciences de St. Pétersbourg 6:477–480.

HOLOTYPE.— ZISP 3029 (adult male), from “Seri-Tschah”, in eastern Iran.

LOCALITIES.— Mellem Farak, Saliana (ZMUC R-36228); Seistan, 50km E of Seranj (ZFMK 7925) [see pl. 4, fig. 8 for distribution].

REMARKS.— Sindaco and Jeremčenko (2008) did not mention this species from Afghanistan, but it has subsequently been reported from there by Wilms et al. (2009).

***Saara hardwickii* (Gray, 1827:219)**

1827 *Uromastyx hardwicki* Gray in Hardwicke and Gray, A synopsis of the species of saurian reptiles, collected in India by Major-General Hardwicke. Zoological Journal 3:213–229.

HOLOTYPE.— BMNH 1946.8.14.44 (adult male), from “Plains of Kanouge [= Kanauj District, Uttar Pradesh], Hindustan, India”.

LOCALITIES.— 10 km ESE Jalalabad in the direction to Sarsahi (MMB 28474); 10 km ENE Jalalabad (AFG 12); nr. Jalalabad, on road to Nimla [Nangarhar Prov., 800 m] (ZFMK 8616–17) [see pl. 5, fig. 1 for distribution].

REMARKS.— There are two additional specimens (FMNH 3932–33) from Afghanistan with no further locality data.

Family Varanidae***Varanus bengalensis bengalensis* (Daudin, 1802:67)**

An X (1802) *Tupinambis bengalensis* Daudin, Histoire Naturelle, Générale et Particulière des Reptiles; Ouvrage faisant suite aux Oeuvres de Leclerc de Buffon, et Partie du Cours Complet d'Histoire Naturelle Rédigé par C.S. Sonnini, membre de plusieurs sociétés savantes. Tome troisième. F. Dufart, Paris, France. 452 pp., pls. XXIX–XLV.

LECTOTYPE.— MNHN 2179, from “Bengale” designated by Guibé (1954).

SYNONYMS.— *Varanus punctatus* Merrem, 1820 from “Bengal”. *Monitor gemmatus* Guérin-Méneville, 1829 from “Indes Orientales”. *Monitor heraldicus* Gray in Griffith, 1831 from “Bengal.” *Varanus lunatus* Gray, 1845 from “India”.

LOCALITIES.— Darunta, at the banks of Kabul River, 20 km WNW Jalalabad (MMB 28487); Jalalabad [Nangarhar Prov., 650 m] (ZFMK 8653); 18 km W (by Kabul Rd.) of Jalalabad (2020 ft.) (MVZ 237483); 19.2 km N Jalalabad (FMNH 161208); 20 km ESE Jalalabad (MMB 28485–86); 80 km E Jalalabad (MMB 28488); 30 mi E of Kabul, btwn Kabul and Sarobi [34°33'N, 69°35'E] (CAS 104378); 5–10 mi ENE of Nimla, on old Kabul-Jalalabad rd, and about 10 mi SW of Balabagh [34°19'–21'N, 70°10'–15'E] (CAS 96199) [see pl. 10, fig. 7 for distribution].

REMARKS.— Clark (1990) mentioned that the species was always found near water but also ranged into drier terrain not far from rivers or streams and up to 2600 m a.s.l.

***Varanus griseus caspius* (Eichwald, 1831:190)**

1831 *Psammosaurus caspius* Eichwald, Zoologia Specialis quam Expositis Animalibus tum Vivis tum Fossilibus Potissimum Rossiae in Universum, et Poloniae in Specie, in usum Lectionum Publicarum in Universitate Caesarea Vlnensi Habendarum. Pars Posterior; Specialem Expositionem Spondylzoorum Continentis, Pars Posterior [= vol. 3]. Josphe Zawadski, Vilnae [Vinius], Russia [now Lithuania]. (3) + 404 pp., 2 folding pls. (Decima Classis. Amphibia [pp. 116–197]. Explicatio Tabularum [pp. 395–396]. Index Generum [pp. 397–404]).

HOLOTYPE.— Not located (most probably lost), from “in littori orientali caspii maris [= coast of Caspian Sea], ad sinum balchanensem, in peninsula Dardsha [= Dardzha Peninsula, Turkmenistan]”.

LOCALITIES.— 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84641); between Herat and Islam Qala (Clark 1990, not collected); Murichaq area (J 01–03); Seistan [Faizabad Prov.] (ZMUC R-4228–29) [see pl. 10, fig. 8 for distribution].

REMARKS.— There are additional photographic records (Fig. 21) from Mazar-i-Sharif held in the ZFMK image library. Boulenger (1889: 99) provides a record from “valley of Hari-rud [river]”, this probably refers to the river valley near Herat.

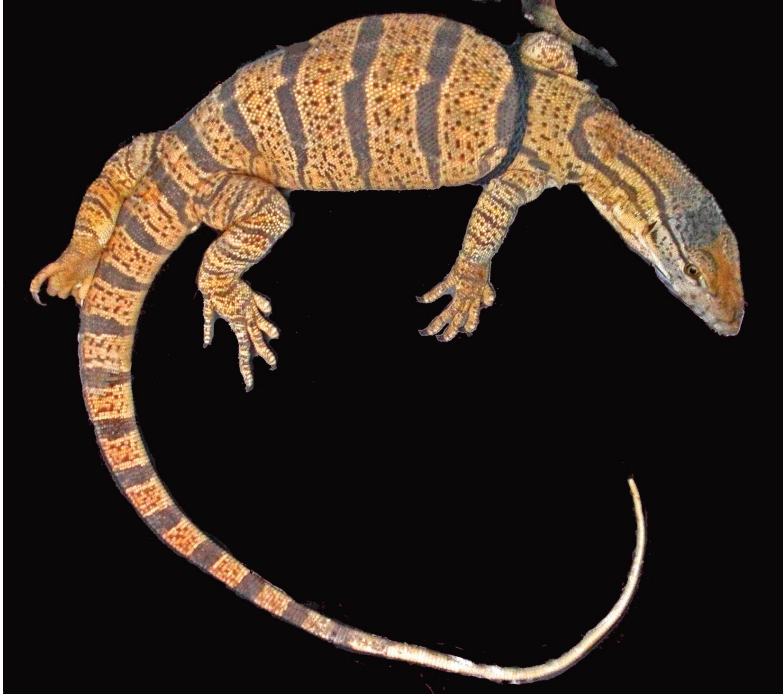


FIGURE 21: *Varanus griseus* from Mazar-i-Sharif. Photo by M. Faulde.

Reptilia: Serpentes

Family Boidae

Eryx elegans (Gray, 1849:107)

1849 *Cusoria elegans* Gray, Catalogue of the Specimens of Snakes in the Collection of the British Museum. Trustees of the British Museum, London. xv + 125 pp.

HOLOTYPE.— BMNH 43.7.21.70, from “Affghanistan [*sic*]”.

SYNONYM.— *Eryx jaculus czarewskii* Nikolskii, 1916 (syntypes ZISP 8462, 8463, 8473, 8489, 8711) from “Koppet-dag [Turkmenistan], Nachduin [Turkmenistan], Gululi-dag [Iran], Kircher [Turkmenistan] and Kopet-dag orient [Turkmenistan]”.

LOCALITIES.— Band-e-Amir [Bamyan Prov., 34°50'N, 67°11'E] (CAS 24990); Dasht-e-Nawar [Ghazni Prov., 3000 m] (ZFMK 8641); Masgidi-ciovi, Campo 2 (MZUF 24108–15); Paghham (FMNH 161178) [see pl. 11, fig. 1 for distribution].

? *Eryx johnii persicus* Nikolskii, 1907:290, fig. 8

1907 *Eryx persicus* Nikolskii, Reptiles et amphibiens recueillis (part.) M. N. A. Zarudny en Perse en 1903–1904 [in Russian and Latin]. Annuaire du Musee Zoologique de l'Academie de Sciences de St. Petersburg 10 [1905]:260–301, pl. I.

HOLOTYPE.— ZISP 10343, from “Aguljaschker” [Agulyashker, Khuzestan Province, Iran].

LOCALITIES.— Mundi, Hissar south of Kandahar (*fide* Murray 1892:79) [see pl. 11, fig. 2 for distribution].

REMARKS.— The status of this taxon is still under debate. It was recognized as a subspecies of *E. johnii* by Stull (1935) and Smith (1943) but later as a synonym of *E. jaculus familiaris* by Stimson (1969) or of *E. jaculus* by McDiarmid et al. (1999). More recently, Sindaco et al. (2013) treated it as a synonym of *E. johnii*, referring to a comment by Rastegar-Pouyani et al. (2008, citing an unpublished manuscript) that “this name [*persicus*] is not available for a western subspecies of *Eryx johnii*, because it applies to a different species of *Eryx*.” Therefore, the exact status of this taxon is not sufficiently clarified and we recognize it here as subspecies of *E. johnii* pending further taxonomic research in this complex. We have not examined any material from Afghanistan and have included it herein based on earlier publications as noted above.

In his review of our manuscript, Dr. Steve C. Anderson (*pers. com.*) offered the following commentary: “The name *Eryx persicus* is not a valid name and should not be used here. The name was associated with *E. johani* by Stull (1935), who never examined the specimen. Stimson (1969) accepted her identification, again without personal verification. At my request, Dr. Natalia Ananjeva of the Zoological Institute, St. Petersburg, examined the type and found it to be in the *E. jaculus* group (*E. j. familiaris*) and not *E. johani*. At present there are no recorded specimens of *E. johani* from Iran. Should the Afghan population prove to be significantly distinguishable from the recognized population of *E. johani*, it requires a new taxon name and description.”

We heartily agree with Dr. Anderson’s summation, which is also suggested in our first paragraph in this Remarks section.

***Eryx tataricus tataricus* (Lichtenstein in Eversmann, 1823:146)**

1823 *Boa tatarica* Lichtenstein, Vorrede (pp. iii–vi) [und] Naturhistorischer Anhang (pp. 112–147) in Eversmann, E. Reise von Orenburg nach Buchara nebst einem Wortverzeichnis aus der Afghanischen Sprache begleitet von einem naturhistorischen Anhang und einer Vorrede. E. H. G. Christiani, Berlin. viii + 150 + 1 + 35 pp.

LECTOTYPE.— ZMB 1461, from “Nähe des Aralsees” [vicinity of Aral Sea] (designated by Bauer et al. [2002]).

LOCALITIES.— Amu-Darya, N of Kunduz (ZFMK 5384–85); 20 km S of Andkhoy (CAS 120491); 2 km N Bala Murhab (J 04, in litt. Brück 1968); vic. of Chacharan (CAS 147408); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84638); Herat town (ZFMK 92801); Karam-Kol (ZFMK 8640); Kunduz (ZFMK 95015); Maimana (FMNH 161205); Nemla, near Jalalabad (MMB 28489); Paghman vic. [34°36'N, 68°56'E] (CAS 115969); 30 km NW of Sheberghan (CAS 120490); Zebak, 102.4 km E Faizabad (FMNH 161123) [see pl. 11, fig. 3 for distribution].

REMARKS.— Boulenger (1889:101) mentioned six specimens of “*Eryx jaculus*” from “Balamorghab” and an additional one from “Robat-i-turk”. Subsequently, two of the specimens (BMNH 1886.9.21.94–95) were reidentified as “*Eryx tataricus*”, whereas the additional four specimens were donated to the ZSI collection where they were mentioned by Sclater (1891:6)

as “*Eryx jaculus*” from “Bala Morghab, Herat” (ZSI 13141–13144). Clark (1990) observed the species as plentiful where it was collected. Sindaco et al. (2013) provide an additional record from Iran (Rud-e Hirmand), close to Afghanistan, so that it is likely that the species also occurs in southwestern parts of Afghanistan.

Family Colubridae

Boiga trigonata melanocephala (Annandale, 1904:209, pl. IX, fig. 4)

1904 *Dipsadomorphus trigonatus* var. *melanocephalus* Annandale, Additions to the collection of Oriental snakes in the Indian Museum. Journal of the Asiatic Society of Bengal 73(2):207–211, pl. IX.

SYNTYPES.— ZSI 14814–15, from “Perso-Baluch frontier”.

LOCALITIES.— 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84637); Ker Dahar (MNHN 0.8724); Mehtarlam (ZFMK 14321) [see pl. 11, fig. 4 for distribution].

REMARKS.— According to the original description, the syntype series consists of three specimens, but only two are present in the ZSI collection (Das et al. 1998).

Eirenis aff. *persicus* (Anderson, 1872:392, fig. 8)

1872 *Cyclophis persicus* Anderson, On some Persian, Himalayan, and other reptiles. Proceedings of the Zoological Society of London 1872(2):371–404, 9 figs.

HOLOTYPE.— ZSI 4828, from “Bushire, Persia” [Bushehr, Iran].

LOCALITIES.— Ken Dahar (MNHN 0.8723); Qual`éh Lakou (MZLU lxxx/6305) [see pl. 11, fig. 5 for distribution].

REMARKS.— An unambiguous identification of these specimens is not possible pending a thorough review of *E. persicus*. Initial data suggest that the material from Afghanistan may be more closely related to specimens from Pakistan than to the nominate subspecies (unpublished data, P. Wagner). The specimen from Paris is catalogued as “*Eirenis walteri*” and is definitely misidentified, as this taxon is only known from Turkmenistan and northeastern Iran. However, at the time of writing, the specimen is on loan and not available to us. The MZLU specimen resembles specimens from Waziristan (Pakistan) for which the names *Contia angusticeps* Boulenger, 1894 and *Contia mcmahoni* Wall, 1911 could be available. Compared with other species of the genus, it might be that the two specimens known from Afghanistan refer to two different species and, therefore, a review of the species complex is needed. Meanwhile we recognize both of the specimens as “*Eirenis* aff. *persicus*”, but we are aware that they are not referable to this species *sensu stricto*. Leviton and Anderson (1970) mention the species because of its presence to the west, south and east of Afghanistan.

Elaphe dione (Pallas, 1773:717)

1773 *Coluber dione* Pallas, Anhang zum zweyten Theil. Descriptiones Animalium. Pages 701–744 In Reise durch verschiedene Provinzen des Rußischen Reiches, Zweter Theil, Zweyres Buch vom Jahr 1771. Kayserliche Akademie der Wissenschaften, St. Petersburg, Russia. pp, 369–744 + (6) pp., pls. I–XIV, Pls. A–Z, 1 map.

TYPES(S).— Not located (most probably lost), from “mountains near Irty [= Irtysh River]” [translated from German], subsequently specified as “Gratscheffskoi outpost, near Semijarsk, upper Irtysh area, Semipalatinsk district, Kazakhstan” *vide* Helfenberger (2001).

LOCALITIES.— Kunduz, 6 ½ mi SE of, village of Bolla Quchi [Kundus Prov.] (USNM 166774–75) [see pl. 11, fig. 6 for distribution].

REMARKS.— Dotsenko (2003: 31) mentioned an additional specimen (ZIK 1796/4433) from “Wüste Registan [= Registan desert], Umgebung von Kandahar [= vicinity of Kandahar], Prov. Kandahar, Afghanistan”.

***Hemorrhois ravergieri* (Ménétriés, 1832:69)**

1832 *Coluber Ravergieri* Ménétriés, E., Catalogue Raisonné des Objets de Zoologie Recueillis dans un Voyage au Caucase et jusqu’aux Frontières Actuelles de la Perse. Imprimerie de l’Académie Impériale des Sciences, St. Pétersbourg, Russia. (4) + 271 + XXXIII + V pp.

SYNTYPE.— ZISP 1750, from “Georgien” *fide* Strauch (1873). According to the original description from “Géorgie [and], près de Bakou” [Georgia and near Baku (Azerbaijan)]; the syntype from “près de Bakou” is unlocated. In the original description, Ménétriés (1832:70) mentioned his new species from Georgia, but the only detailed description he gave is for the single specimen from “près de Bakou,” collected by Ménétriés himself. The only specimen in the ZISP from the Ménétriés collection that was collected by Ravergier is from Georgia (see Strauch 1873:274; Nikolskii 1905:239; Nikolskii 1916:103). Strauch (1873) gave the pholidosis for ZISP 1750 as “198 [ventralia] + 2 [= divided anal scale] + 81 [subcaudalia] whereas the specimen from Baku has “195 [ventralia] + 75 [subcaudalia]” *fide* Ménétriés (1832).



FIGURE 22: *Hemorrhois ravergieri* from Feyzabad. Photo by F. Joisten.

LOCALITIES.— Feyzabad (see Fig. 22); N edge of village of Kara Bagh (CAS 90798); 30 km S of Kandahar (ZFMK 5386); Kotgai, nr. Safed-Koh [Paktia Prov., 2350 m] (ZFMK 8560); Kunduz (ZFMK 95016–19); Paghman (CAS 151230, FMNH 161177); Pashki [Nuristan Prov.] (60106–08); Stieve [Nuristan Prov.] (ZMUC R-60104); Wama [Nuristan Prov.] (ZMUC R-60105) [Fig. 22; see pl. 11, fig. 7 for distribution].

REMARKS.— Boulenger (1889:102) mentioned three specimens from “Tirphul, Gulran, Chinkilok,” which most probably refer to BMNH 1886.9.21.97–99, but it is not possible to assign these specimens to their corresponding specific localities. Smith (1940:384) mentioned an additional specimen from “Bamian 8000 ft.,” that could refer to BMNH 1938.2.4.15. Schätti and Agasian (1985) mapped several localities in Afghanistan (without referencing specimens) and mentioned that ZFMK 5386 was collected from the claw of a snake eagle.

***Lytorhynchus maynardi* Alcock and Finn, 1897:562, pl. XIV**

1897 “1896” *Lytorhynchus maynardi* Alcock and Finn, An account of the Reptilia collected by Dr. F.P. Maynard, Captain A.H. McMahon, C.I.E., and the members of the Afghan-Baluch Boundary Commission of 1896. *Journal of the Asiatic Society of Bengal* 65:550–566, pls. XI–XV.

SYNTYPES.—BMNH 1946.1.14.79, from “near Robat I, 4500 ft [= south of Koh Malik-dokhand, by the River Malah Do Kand, Garmser District, Helmand Province, S Afghanistan, ca. 1350 m elevation].” ZSI 14223–25 from the same locality.

LOCALITIES.—10 km NE of Darweshan (CAS 120493); 56 km S and 10 km E of Darweshan (CAS 120494) [see pl. 11, fig. 8 for distribution].

REMARKS.—Clark (1990) collected specimens after dark on sand dunes.

***Lytorhynchus ridgewayi* Boulenger, 1887:413**

1887 *Lytorhynchus ridgewayi* Boulenger, G.A., Description of a new snake from Afghanistan. *Annals and Magazine of Natural History*, ser. 5, 20:413–414.

SYNTYPES.—BMNH 1946.1.14.77–78, from “Chin-Kilak, Afghanistan” [Chinkilok, Herat Province].

SYNONYM.—*Lytorhynchus gabrielis* Werner, 1938 from “Unter Ziarat, Belutschistan [nicht weit von der afghanischen Grenze entfert]” [= Ziarat, Baluchistan (close to the Afghan border)] (holotype NMW 23440).

LOCALITIES.—35 km S of Darweshan (CAS 120495); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84639) [see pl. 12, fig. 1 for distribution].

REMARKS.—The specimen collected by Clark (1990; CAS 120495) was found after sunset on gravel strewn alluvium. Sindaco et al. (2013) provide a record from Pakistan (Saindak) close to the Afghan border so that it is possible that the species also occurs in extreme southern parts of Afghanistan.

***Natrix tessellata* (Laurenti, 1768:87)**

1768 *Coronella tessellata* Laurenti, Specimen Medicum, Exhibens Synopsis Reptilium Emendatum cum Experimentis Circa Venena et Antidota Reptilium Austriacorum. Joan. Thomae. nob. de Trattnern, Vienna, Austria. (8) + 214 + (3) pp., 5 pls. [thesis version]; (2) + 214 + (1) pp., 5 pls. [published version].

TYPE(S).—In the Turriano collection, not located, from “in Japidia, vulgo Cars [= Kras, Slovenia/Italy]”.

LOCALITIES.—Ag Chah [Mazar-i-Sharif Prov.] (SNM 58); Feyzabad (Fig. 23); Herat town (ZFMK 92803); Kunduz (95022–25); Maimana (FMNH 161204); Masgidi-ciovi, Campo 2 (MZUF 24053, 24057–63); Mazar-i-Sharif (FMNH 161112); Paghman [34°36'N, 68°56'E] (CAS 115972, FMNH 161180); Panjao, Koh-i-Baba (ZMUC R-60101); Sar-i-Chiasma, nr. Kabul (ZMUC R-60100) [see pl. 12, fig. 2 for distribution].

REMARKS.—There are three additional specimens (BMNH 1938.2.4.12–14) from “Afghanistan”, that correspond with those specimens mentioned by Smith (1940:384) from “Dana Ghon 2400 ft.”

***Oligodon arnensis* (Shaw, 1802:526)**

1802 *Coluber arnensis* Shaw, General Zoology, or Systematic Natural History. Vol.3, part 2. G. Kearsley, Thomas Davison, London, United Kingdom. vi + (1) + 313–615 pp., pls. 87–140.

HOLOTYPE.—Specimen illustrated in Russell (1796, plate 38), from “the country of Arnee in the



FIGURE 23: *Natrix tessellata* from Feyzabad. Photo by F. Joisten.

East Indies” [= Arni, Tamil Nadu, India]. The specimen was incorrectly listed as the lectotype by Wallach et al. (2014) (see Bauer 2015).

LOCALITIES.— 3 km SE Jalalabad (MMB 28497) [see pl. 12, fig. 3 for distribution].

***Oligodon taeniolatus taeniolatus* (Jerdon, 1853:528)**

1854 [1853] *Coronella taeniolata* Jerdon, Catalogue of the reptiles inhabiting the Peninsula of India. Part 2. Journal of the Asiatic Society of Bengal xxii:522–534.

TYPES(S).— Not located (most probably lost), from “Madras” (=Chennai, Tamil Nadu State), India.

LOCALITIES.— Kars [Kandahar Prov.] (USNM 194971) [see pl. 12, fig. 4 for distribution].

REMARKS.— Brück (1968) provided a record from “dem Gebiete um Djelalabad” [= vicinity of Jalalabad] that is shown by Sindaco et al. (2013) as a second record from Afghanistan, but not confirmed here because the locality is too imprecise.

***Platyceps karelini karelini* (Brandt, 1838:col. 243)**

1838 *Coluber (Tyria) karelini* Brandt, Note sur quatre nouvelles espèces de serpents de la côte occidentale de la mer Caspienne et la Perse septentrionale, découvertes par M. Kareline. Bulletin Scientifique publié par l’Académie Impériale des Sciences de St. Pétersbourg 3:cols. 241–244.

SYNTYPES.— ZISP 1695–1700 from “sur la côte orientale de la mer Caspienne. [= coast of the Caspian Sea]”.

LOCALITIES.— Ag Chah [Mazar-i-Sharif Prov.] (SNM 54); Baqrabad (ZMUC R-6097); Bala Murghab, Herat province (Brück 1968); Chinkilok nr. Herat (ZSI 13107); btw. “Cia-i-Baloch [= Robot-i-Shah Baloch] and Cia-i-Lagun, camp 1” (MZUF 24027–29); mountains near Cia-i-Dudi [= Kuh-e Chah Dudi] (MZUF 24026); 35 mi downstream from Girishk, Dasht-i-Margo Area, Kandahar (MZLU L958/3224); Ker Dahar (MNHN 0.8722, MNHN 1999.8160); Kilki (BMNH 1886.9.21.103); 45 km W of Herat (CAS 120714); Herat to Islam Qala [34°22’N, 62°10’E to 34°47’N, 61°05’E] (CAS 103785); Mazar-i Sharif (ZFMK 86743, 36°43’N, 67°07’E); 10 km W of Tashkurgan (CAS 120540); Tirphul (BMNH 1886.9.21.102) [see pl. 12, fig. 5 for distribution].

REMARKS.— Blanford (1876:415) mentioned one specimen (BMNH 1873.1.7.10) as “*Zamenis Ladacensis*” from “Kila-i-Fath, Sístán [= Qala-i Fateh, Qal’eh-ye Fath, Afghanistan, ca. 30°34’N, 61°50’E]”. However, the specimen was later identified as hybrid between *Platyceps k. karelini* and *Platyceps r. rhodorachis* by Schätti et al. (2014). Sclater (1891:28) mentioned one specimen (ZSI 13107) as “*Zamenis karelini*” from “Chinkilok nr. Herat [ca. 34°31’N, 61°52’E]” collected by the “Afghan Boundary Commission (Aitchison 1889). Boulenger (1889:102) mentioned four specimens from “Helmand, Tirphul, Chinkilok, Kilki” which have been identified by Schätti et al (2012) as: BMNH 1886.9.21.101 from “Helmand [ca. 30°17’N, 62°03’E]” [= a hybrid between *Platyceps k. karelini* and *Platyceps* sp.]; ZSI 13107 from “Chinkilok [ca. 34°31’N, 61°52’E]” and donated to the ZSI from the BMNH [= ? *Platyceps k. karelini*]; BMNH 1886.9.21.102 from “Tirphul [ca. 34°36’N, 61°16’E]” [= *Platyceps k. karelini*]; BMNH 1886.9.21.103 from “Kilki [ca. 34°00’N, 61°25’E]” [= *Platyceps k. karelini*]. Moreover, Boulenger (1889:102) mentioned one specimen (BMNH 1886.9.21.104) as “*Zamenis rhodorachis*” from “second Gulran encampment, Badghis”, that was identified as a hybrid between *P. k. karelini* and *P. r. rhodorachis* by Schätti et al. (2014). The same authors also recognized ZFMK 86743 from Mazar-i-Sharif as hybrid of the same two species. Clark (1990) mentioned this species as very common at Darweshan and Kandahar, but sporadic elsewhere. It occurs on non-sandy to sandy soils with both firm and loose sands.

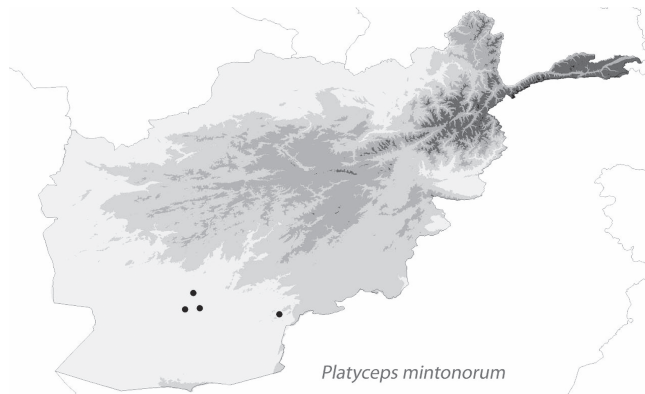


FIGURE 24: Distribution of *Platyceps mintonorum* in Afghanistan.

***Platyceps mintonorum* (Mertens, 1969:56)**

1969 *Coluber karelini mintonorum* Mertens, Die Amphibien und Reptilien West-Pakistans. Stuttgarter Beiträge zur Naturgeschichte aus dem Staatlichen Museum für Naturkunde Stuttgart 197:1–96.

HOLOTYPE.— SMF 62942 from “Zangi-Nawar, 27 km südwestlich von Nushki [= 27km SW of Nushki], Distr. Chagai, West-Pakistan”.

LOCALITIES.— Chah-i-Angir (CAS 84630–36), 10 km N of Darweshan (CAS 120541, CAS 120543), 10–20 km NE of Darweshan (CAS 120715), 40 km SE of Kandahar (CAS 120716–17).

REMARKS.— See Fig. 24 for distribution.

***Platyceps rhodorachis* (Jan in de Filippi, 1865:356)**

1865 *Zamenis rhodorachis* Jan, Prime line d’una fauna della Persia occidentale. Rettili. Pages 352–357 In De Filippi, F., Note di un Viaggio in Persia nel 1862. G. Daelli and C. Editori, Milan, Italy.

LECTOTYPE.— MSNG 30312 from “Persia, Schiraz”. For further information concerning the type material we refer to Schätti et al. (2014).

LOCALITIES.— Ag Chah (SNM 55–57); Bisut area [= Behsud] (MMB 28501–02); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84634–36); Dashti Nawar [Plain] (ZFMK 41340); Hadda (MZLU L958/3225–26); Herat town (ZFMK 92802, USNM 166773); 30 km SW of Jalalabad (CAS 120718); 40 km W of Jalalabad (CAS 120492); 10 km west of Jawand [“Kala-i-Chambar”] (SMF 67907); 15 km southwest of Kabul (CAS 92323); Kabul (ZFMK 8559, 8651, 8678; MMGU 2729a–b, NMW 34992); Kabul Carteseh (CAS 147425); Kabul Sharinau (CAS 147426); 15 km SW of Kabul on rd to Kandahar (CAS 92323); east of Kandahar (CAS 115970); Kandahar (CAS 115970, FMNH 161075, FMNH 171788, MZLU L960/3035–36, ZFMK 8645); Kunduz (ZFMK 84787, 95020; ZSM 22.1954.1–2); Lashkargah, Dashtimargo (CAS 147427); Masgid-i-ciovi [= Chobi] (MZUF 23939–42); Mazar-i-Sharif (ZFMK 86744); 5–10 mi ENE of Nimla and about 10 mi SW Balabagh, on old Kabul-Jalalabad rd [34°19′–21′N, 70°10′–15′E] (CAS 96250); Paghman vic. [34°36′N, 68°56′E] (CAS 115971 formerly FMNH 161185); Pesh Valley [Nuristan Prov.] (ZFMK 8643–44); Qualat (MZLU L958/3227); Such (BMNH 1968.1303) [see pl. 12, fig. 6 for distribution].

REMARKS.— Jan (1857) first mentioned the name *rhodorachis* but its use was as a *nomen nudum* as no characters were provided to separate it from other known species. However, just a few years later he gave a valid description (Jan in de Filippi 1865). The taxonomic status of this species is complex and still needs to be resolved. Král (1969) recognized two subspecies, *P. r. rhodorachis* [*sic*] (SNM 57) and *P. r. ladacensis* (SNM 55–56) (both from Ag Chah) in Afghanistan. But *P. r. ladacensis* (Anderson, 1871), described from Ladakh a few years after the description of the nominate form, was treated as a synonym of *P. rhodorachis* [*sic*] by Boulenger (1893). Later it was again recognized as subspecies (e.g., Terent’ev and Chernov 1949, Szczerbak 2003). According to Szczerbak (2003), the nominate subspecies occupies only southern Turkmenistan, whereas *P. r. ladacensis* occurs throughout rest of the distribution range. In as much as both taxa were recognized in southern Turkmenistan, Shammakov (1989) suggested they be accorded full species status. Recently, referring only to the count of ventral scales given in the first description, Perry (2012) also recognized *P. ladacensis* as a full species, ranging from Israel to India. Given the obvious uncertainties in recognizing species-level taxa within this species complex, we believe that a full, integrative revision is definitely needed. A first step was taken in the morphological review by Schätti et al. (2014) who recognized several potential hybrids between *P. rhodorachis* [*sic*] and *P. k. karelini* (see herein the species account of the latter species).

ZFMK 8644 has bats (*Nyctalus leisleri*) in its stomach.

***Ptyas mucosa nigriceps* Terent’ev and Chernov, 1949:246**

1949 *Ptyas mucosus nigriceps* Terent’ev and Chernov, *Opredelitel Presmykatushchikhsya i Zemnovodnykh*. [Encyclopedia of reptiles and amphibians, in Russian]. Sovetskaya Nauka, Moscow, Union of Soviet Socialist Republics [now Russia]. 340 pp.

SYNTYPE.— ZISP 15698, from “Takhta-Bazar st., left bank of Murgab” [= Turkmenistan, Mary Province; translated from Russian].

LOCALITIES.— Baraki Barak, 10 km W of [Logar Prov.] (USNM 194606); Darulman, vic. of Kabul [Kabul prov., 1800 m] (ZFMK 8639); btw. Gornails and Bokan, NE of Bala Morhab (MNHN 1948.176); Herat area (FMNH 161113); Kabul (CAS 120544); 40 km SW of Kabul on rd to Kandahar, in Kabul River (CAS 92324); Kamdesh (FMNH 161135); Kamu (13325–26);

Kandahar [31°36'N, 65°47'E] (CAS 115973, FMNH 161272–73); Maimana [35°54'N, 64°43'E] (CAS 115974); Obek (ZMUC R-60102); ca. 4 km above Paghman (7950 ft.) (MVZ 237484) [see pl. 12, fig. 7 for distribution].

REMARKS.— The status of this subspecies is questionable. Terent'ev and Chernov (1949) indicated that they were describing a new subspecies but the diagnosis, “Adult specimens from Turkmenistan are almost black, shiny, with yolk yellow abdomen, and young are light gray, with some scales being partly or entirely white, and with yellow abdomen”, seems somewhat abbreviated. Moreover, no name-bearing type is specifically mentioned, and, therefore, all specimens examined by the authors from Turkmenistan have to be treated as syntypes. However, some subsequent authors have accepted the taxon (e.g., Szczerbak 2003 as *P. m. nigricens* Chernov, 1949 [*sic*]).

***Spalerosophis diadema schirazianus* (Jan in de Filippi, 1865:356)**

1865 *P[eriops] parallellus* Geoff. var *schiraziana* Jan, Prime line d'una fauna della Persia occidentale. Rettili. Pages 352–357 in De Filippi, F. Note di un Viaggio in Persia nel 1862. G. Daelli & C. Editori, Milan, Italy.

SYNTYPES.— Originally three specimens housed in MSNM based on Jan (1863) from “Schiraz, Persia” [Shiraz, Fars Province, Iran], now lost (*fide* Schätti et al. [2010]).

LOCALITIES.— Anahoy Desert (USNM 194977); Jalalabad (MMB 28500); E Jalalabad (MMB 28499); Kabul 14457); (ZFMK Maimana (FMNH 161206); Nimla [Nangahar Prov., 1000 m] (ZFMK 8642); Paghman (FMNH 161057); Tirphul [= Tir Pul] (Boulenger 1889) [see pl. 12, fig. 8 for distribution].

REMARKS.— Other spellings of the specific epithet, e.g., *schirazana/-us*, *schirasiana/-us* are incorrect subsequent spellings. Lantz (1918) additionally referred to a record from the “Tajan River area”, an imprecise locality not mapped here. Boulenger (1889:201; 1893:412) mentioned another specimen from “Nushki to Helmand” in the BMNH collection that most probably refers to the “eastern *diadema*” according to Schätti et al. (2010, see below). The taxonomic status of this taxon is under debate. Baig and Masroor (2008) placed it as a synonym of the nominate form, whereas Schätti et al. (2009) recognized it as subspecies. According to Schätti et al. (2010), the records from eastern Afghanistan (border area with Pakistan) do not represent the taxon *Spalerosophis diadema schirazianus*, but a form named by Schätti et al. (2010) “eastern *diadema* (modus operandi)”. This includes both specimens listed above from Jalalabad. The specimen mentioned by Günther (1864:253) and Boulenger (1893:413) from “Afghanistan” collected by “Dr. Griffith” was tentatively included in this form as well. This results in the following assemblage of taxa: (1) *S. d. schirazianus* Anahony Desert; Kabul, Maimana; Paghman; and Tirphul, and (2) “eastern *diadema*” (*fide* Schätti et al. 2010), which is represented by the specimens from Jalalabad, Nimla, and Nushki to Helmand.

***Telescopus rhinopoma* (Blanford, 1874:34)**

1874 *Dipsas rhinopoma* Blanford, Descriptions of new Reptilia and Amphibia from Persia and Baluchistán. Annals and Magazine of Natural History, ser. 4, 14:31–35.

SYNTYPES.— BMNH 1946.1.5.10 and ZSI 3500, from “in Carmania” [Kerman, Iran], according to Blanford (1876) collected at Karmán at 5000 ft elevation. Blanford, in his original description (Blanford 1874), gave morphological characters, but later (Blanford 1876:421) he explicitly mentions two specimens with identical pholidosis and locality as given in the original description. Therefore, the type series includes two syntypes rather than the ZSI specimen, which has

been cited as the holotype by several authors (e.g., Sclater 1891:48; Das et al. 1998:148).

SYNONYMS.— *Dipsadomorphus Jollyi* Wall, 1914 from “Kacha Thana, Baluchistan” (holotype not located).

LOCALITIES.— Band-e-Kadjaki, Kadjaku [Kandahar Prov., 1050 m] (ZMK 2736) [see pl. 13, fig. 1 for distribution].

***Xenochrophis piscator* (Schneider, 1799:247)**

1799 *Hydrus Piscator* Schneider, *Historiae Amphibiorum naturalis et literariae. Fasciculus primus, continens Ranas, Calamitas, Bufones, Salamandras et Hydros in genera et species descriptos notisque suis distinctos*, vol. 1. Friederici Frommanni, Jena, XIII + (1) + 264 + (2) pp., pls. 1–2.

HOLOTYPE.— Specimen illustrated in Russell [1796], pl. 33 from “Indiae orientalis.” Vogel and David (2012) identified this specimen as a dried skin, BMNH 1904.7.27.31, presumably from Patrick Russell’s collection. They also restricted the type locality to “the coastal areas of northern Andhra Pradesh State, eastern India” based on Russell’s chief area of residence and activity during his stay in India. However, according to Bauer (2015), BMNH 1904.7.27.31 was obtained by the museum about 100 years after Russell’s death, so the status of the specimen as holotype is still questionable.

LOCALITIES.— Darunta, 20 km WNW Jalalabad (MMB 28506–07); Jalalabad [Nangahar Prov., 650 m] (MMB 28504–05, ZFMK 8652); 40 km SW of Jalalabad (CAS 120542) [see pl. 13, fig. 2 for distribution].

REMARKS.— The specimen collected by Clark (1990; CAS 120542) was found amongst rocks along the edge of a stream.

Family Elapidae

***Bungarus sindanus* Boulenger, 1897:73, pl. 1**

1897 *Bungarus sindanus* Boulenger, A new krait from Sind (*Bungarus sindanus*). *Journal of the Bombay Natural History Society* 11(1):73–74, 1 pl.

SYNTYPES.— BMNH 1946.1.18.54–55 from “Sukkur, Sind” and BMNH 946.1.19.16 from “Umarkot, Sind” [Sukkur and Umerkot, Sindh Prov., Pakistan].

LOCALITIES.— 20 km E Jalalabad (MMB 28492); Khost [Paktia Prov., 1200 m] (NMW 35010, ZFMK 8672) [see pl. 13, fig. 3 for distribution].

REMARKS.— Král (1969) recorded *B. caeruleus* from the Kabul River Valley of eastern Afghanistan, a record also mentioned by subsequent authors (e.g., Khan 1985), but this record is likely referable to *B. sindanus* (the questionably valid subspecies *B. sindanus razai* Khan, 1985, is now usually recognized as synonym, but it is still regarded as a distinct taxon by some authors). Kuch (2003) later published the first vouchered record of *B. sindanus* from Khost, based on a juvenile specimen (NMW 35010).

***Naja oxiana* (Eichwald, 1831:171)**

1831 *Tomyris oxiana* Eichwald, *Zoologia Specialis quam Expositis Animalibus tum Vivis tum Fossilibus Potissimumi Rossiae in Universum, et Poloniae in Specie, in usum Lectionum Publicarum in Universitate Caesarea Vilnensi Habendarum. Pars Posterior; Specialem Expositionem Spondylzoorum Continentis*, vol. Pars Posterior [= Vol. 3]. Josphi Zawadzki, Vilnae [Vilnius], Russia [now Lithuania]. (3) + 404 pp., 2 folding pls. (Decima Classis. Amphibia [pp. 116–197]. Explicatio Tabularum [pp. 395–396]. Index Generum [pp. 397–404]).

HOLOTYPE.— ZISP 8728, from “Oxus” [= Amu Darya River, Central Asia].

LOCALITIES.— Ashab Kahf (MZLU L957/3035); Jalalabad (FMNH 161138); vic. of Jalalabad (Brück 1968); Kabul, on road to Paghman [Kabul Prov., 2000 m] (ZFMK 8561); Khurd-Kabul [Kabul prov., 1900 m] (ZFMK 8646); Kunduz (ZFMK 95021); Logar Valley, 15 km S of Kabul [Kabul Prov., 2000 m] (ZMK 2742); Omegnen, nr. Kabul (ZMUC R-6523–24); Selsala-Koh-i-Bend-i-Kermak [Herat Prov.] (MMB 28498) [see pl. 13, fig. 4 for distribution].

REMARKS.— Boulenger (1889:103) mentioned two specimens from “Chinkilok” and one from “Kara-bagh [= Qarabagh]”, which probably refer to BMNH 1886.9.21.118–120.

Family Lamprophiidae

Psammophis leithii Günther, 1869:505

1869 *Psammophis leithii* Günther, Report on two collections of Indian reptiles. Proceedings of the Zoological Society of London 1869:500–507.

HOLOTYPE.— BMNH 1946.1.2.82 (formerly 1869.8.28.124), from “Sind.”

LOCALITIES.— Afghanistan [without detailed locality] (ZFMK 8650); 8 km ESE Jalalabad, direction to Sarsahi (MMB 28496) [see pl. 13, fig. 5 for distribution].

REMARKS.— Sclater (1891:50) mentioned one specimen (ZSI 11421) as “*Psammophis leithii*” from “Chaman, S. Afghanistan”, which was donated by “J.A. Murray”. While it was not possible to locate this place in Afghanistan, it seems most probable that it refers to Chaman, a locality just across the Afghan-Pakistan border in present-day Pakistan.

Psammophis lineolatus (Brandt, 1837:col. 243)

1837 *Coluber (Taphrometopon) lineolatus* Brandt, Note sur quatre nouvelles espèces de serpents de la côte occidentale de la mer Caspienne et la Perse septentrionale, découvertes par M. Kareline. Bulletin Scientifique publié par l’Académie Impériale des Sciences de St. Pétersbourg 3:cols. 241–244.

HOLOTYPE.— ZISP 2042, from “sur la côte orientale de la mer Caspienne [= coast of the Caspian sea], dans la Turcomanie et dans le nord de la Perse [= northern Iran], notamment dans les environs d’Astrabad [= Gorgan, Golestan province, Iran].”

LOCALITIES.— Ag Chah [Mazar-i-Sharif Prov.] (SNM 59–60); 45 km S Andkhoy (CAS 120496); Murichaq, N Bala Murghab [Herat Prov.] (MMB 28493); 8 km ESE Jalalabad, direction to Sarsahi (MM 28494); near Kunduz (MMB 28495); 65–75 km W of Mazar-i-Sharif (CAS 120539); vic. Paghman (FMNH 161184); 30 km SE Shindand (CAS 120497) [see pl. 13, fig. 6 for distribution].

REMARKS.— Sclater (1891:49 f.) mentioned one specimen (ZSI 13135) as “*Taphrometopon lineolatum*” from “Zindijan near Tirphul” and two others (ZSI 13136) from “near Tirphul”, collected by the “Afghan Boundary Commission (Aitchison 1889). These are, most probably, the specimens that are later mentioned by Boulenger (1889:103) and donated to the ZSI collection. Moreover, Boulenger (1889) refers to four specimens from “Tirphul” that are probably represented by BMNH 1886.9.21.115–117 and BMNH 1886.9.21.14 [*sic*; the correct number is 114]. Moreover, Boulenger (1896:152) also mentioned one specimen from “Helmand”. Clark (1990) collected specimens from amongst vegetation on firm clay or baked earth terrain.

Psammophis schokari (Forskål, 1775:14)

1775 *Coluber schokari* Forskål, Descriptiones Animalium, Avium, Amphibiorum, Piscium, Insectorum, Vermium; quae in Itinere Orientali Observavit Petrus Forskål. Mölleri, Hauniae [Copenhagen, Denmark]. xxxiv + 164 pp.

TYPE(S).— Not located, from “Yemen”.

LOCALITIES.— Baqrabad (ZMUC R-6349–51); 20 km N of Farah (MZUF 24174); 18 km E of Girishk (CAS 120498–99, CAS 120709); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84629); 45 km W Jalalabad (CAS 120500, CAS 120538); 40 km SE of Kandahar (CAS 120713); 71 km SSW Kabul (by Kandahar Rd.) (6230 ft.) (MVZ 237082); Ker Dahar (MNHN 0.8721); 32 km NW Lashkargah (CAS 120710–12, CAS 120987); Seistan [Faizabad Prov.] (ZMUC R-6352); Shawalikot, Wayan Village [Kandahar Prov.] (USNM 194980); SE of Zehak (along the Iran-Afghanistan border, Agricultural College) (1450 ft.) (MVZ 243503) [see pl. 13, fig. 7 for distribution].

REMARKS.— Boulenger (1889:103) mentioned specimens as “*Psammophis leithii*” from “Helmand (2 spec.)” and “Hamun to Khusan [= Kohsan] (3 spec.)”. Most probably the two specimens from Helmand (?BMNH 1886.9.21.111–112) were subsequently re-identified as *Psammophis schokari*. However, BMNH 1882.3.20.1 is also catalogued as *P. schokari* and could represent one of the Helmand specimens (see Boulenger 1896:158). Moreover, Boulenger (1896:152) mentioned one specimen of *P. lineolatus* from “Helmand” collected by the “Afghan Boundary Comm.”, which could also refer to one of these specimens. Clark (1990) documented this species as very common and usually found near bushes and on man-made earth banks close to rodent holes. A record plotted by Sindaco et al. (2013) from northern Afghanistan is based on incorrect coordinates and should be considered invalid (Sindaco, pers. comm. Nov. 2013).

Family Leptotyphlopidae

Myriopholis blanfordii (Boulenger, 1890:243, fig. 72)

1890 *Glauconia blanfordii* Boulenger, The Fauna of British India, Including Ceylon and Burma. Reptilia and Batrachia. Taylor and Francis, London, United Kingdom, xviii + 541 pp.

SYNTYPES.— BMNH 1946.1.16.85–89 (formerly BMNH 1869.8.28.58–61), from “Sind” [Sindh, Pakistan].

LOCALITIES.— Jalalabad to Nimla (CAS 120486–87); Laghman [Laghman Prov., 1000 m] (ZFMK 8673–77); Nimla (CAS 120488–89, CAS 121054–55) [see pl. 13, fig. 8 for distribution].

REMARKS.— The specimens collected at Nimla were found under stones and rocks in dampish conditions (Clark 1990).

Family Typhlopidae

Indotyphlops braminus (Daudin, 1803:279)

1803 *Eryx braminus* Daudin, Histoire Naturelle, Générale et Particulière des Reptiles; Ouvrage faisant suite aux Oeuvres de Leclerc de Buffon, et Partie du Cours Complet d’Histoire Naturelle Rédigé par C.S. Sonnini, membre de plusieurs sociétés savantes. Tome septième. F. Dufart, Paris. 436 pp., pls. LXXXI–XCII.

HOLOTYPE.— Type specimen lost but imaged in Russell (1796, pl. 43) from “Vizagapatam [Visakhapatnam, Andhra Pradesh, India].”

LOCALITIES.— No specific locality known.

REMARKS.— Sclater (1891:1) mentioned one specimen (ZSI 12896) as “*Typhlops braminus*” from “Afghanistan,” collected by the “Boundary Commission.”

***Xerotyphlops vermicularis* (Merrem, 1820:158)**

1820 *Typhlops vermicularis* Merrem, Versuch eines Systems der Amphibien — Tentamen Systematis Amphibiorum. Johann Christian Krieger, Marburg, Germany. XV+191 [German], XV +191 [Latin] pp., 1 pl.

TYPE(S).— Not located, from “Griechische Inseln, Asien/ in Archipelagi, Asia” [Greek islands and Asia], incorrectly restricted to “Griechische Inseln [= Greek islands]” by Mertens and Müller (1928).

SYNONYMS.— *Typhlops persicus* Blanford, 1874 from “in Persia meridionali”, is based on two syntypes (ZSI 6899 and BMNH 1946.1.11.87 [formerly BMNH 1874.11.25.17]). Blanford (1876) specified the type locality as “Hills, north-east of Darján, between Karmán and Shiráz” [Iran]. Sclater (1891) and Das et al. (1998) recognized ZSI 6899 as the holotype, but Blanford (1876) explicitly referred to two type specimens. Therefore, the taxon is based on two syntypes rather than on one holotype (see e.g., McDiarmid et al. 1999:124).

LOCALITIES.— Chinkilok, N of Herat (Boulenger 1889:101); Kishm (Keshem), near Dara-i-kur [Badakhshan Prov.] (USNM 163539); Kunduz (ZFMK 94241); Tala (MZLU L947/3197) [see pl. 14, fig. 1 for distribution].

REMARKS.— Boulenger (1889:101) mentioned one specimen as “*Typhlops persicus*” from “camp at Chinkilok, north of Herat [...] if not there, certainly between that and the Sang-khotal pass.”, that probably refers to BMNH 1886.9.21.93. Sindaco et al. (2013) provided additional records from northern Afghanistan.

Family Viperidae***Echis carinatus sochureki* (Stemmler, 1969:118, figs. 1–4)**

1969 *Echis carinatus sochureki* Stemmler, Die Sandrasselotter aus Pakistan: *Echis carinatus sochureki* subsp. nov. Aquaterra 6:118–124.

HOLOTYPE.— NHMB 17468 from “West-Pakistan, Ban Kushdil Khan bei Pishin, Rand eines Staueses [bank of a barrier lake at Ban Kushdil near Pishin in western Pakistan].”

LOCALITIES.— Balk (ZMUC R-6840); Baqrabad (ZMUC R-6837); 35 mi downstream from Girishk, Dasht-i-Margo Area, Chah-i-Angir (CAS 84627–28); 20 km SE Islam Qala (CAS 120501); outskirts of Jalalabad (MMB 28490–91); Kandahar [Kandahar Prov.] (FMNH 161072–73, ZFMK 8647); Kaykay [Helmand Prov.] (ZMUC R-6839); 32 km NW of Lashkargah (CAS 120719); Seistan [Faizabad Prov.] (ZMUC R-6838); 10 km W of Tashkurgan (CAS 120502–03, CAS 120545–46); Tirphul (ZSI 13105); SE of Zehak (along the Iran-Afghanistan border, Agricultural College) (1450 ft.) (MVZ 243502) [see pl. 14, fig. 2 for distribution].

REMARKS.— There is an additional specimen from Afghanistan without a detailed locality in the AMNH collection (AMNH R-70593). Boulenger (1889:104) additionally mentioned specimens as “*Echis arenicola*” from “Nushki to Helmand” and “Chil-gaz”. The former BMNH specimen from “Tirphul” was subsequently donated to the ZSI collection (ZSI 13105) and mentioned by Sclater (1891:69) as “*Echis carinata*” from “Tiphul near Herat”, collected by the Afghan Boundary Commission (Aitchison 1889). The other two specimens may be identical with BMNH 1886.9.21.123–124, but it is not possible to refer them to the specific locality.

***Eristicophis macmahoni* Alcock and Finn, 1897:564, pl. XV**

1897 “1896” *Eristicophis macmahonii* Alcock and Finn, An account of the Reptilia collected by Dr. F.P. Maynard, Captain A.H. McMahon, C.I.E., and the members of the Afghan-Baluch Boundary Commission of 1896. Journal of the Asiatic Society of Bengal 65:550–566, pls. XI–XV.

SYNTYPES.— ZSI 14179–84, from “Amirchah, 3300 feet elevation;” “Zeh, 2500 feet elevation;” “Drana Koh;” and “Robot I., 4300 feet elevation.”

LOCALITIES.— 10 km NE of Darweshan (CAS 120504); 40 km W of Kandahar (MZUF 24165) [see pl. 14, fig. 3 for distribution].

REMARKS.— Clark (1990) mentioned two specimens from Darweshan, but only one is catalogued in the CAS collection. The whereabouts of the other specimen is unknown. One of the two specimens was found in the morning on sand surface, the other one dead on firmer dune margins, thus suggesting that the latter one may not have been collected.

***Gloydus halys boehmei* (Nilson, 1983:479, fig. 1)**

1983 *Agkistrodon halys boehmei* Nilson, A new subspecies of the Asiatic pit viper *Agkistrodon halys* Pallas, 1776 (Serpentes, Viperidae) from Afghanistan. *Bonner zoologische Beiträge* 34(4):469–476.

HOLOTYPE.— ZFMK 8648 from “Andarab valley, province of Baghlan, at 2500 m altitude, east Afghanistan”. The paratype is ZFMK 8649 (= ZMK 2637), with the same locality as the holotype.

LOCALITIES.— Andarab Valley [Baghlan Prov., 2500 m] (ZFMK 8648–49) [see pl. 14, fig. 4 for distribution].

REMARKS.— Leviton and Anderson (1970) mentioned this species (as *Agkistrodon halys*) from a single record of the Universitetets Zoologiske Museum, Copenhagen from the Sauzak Pass near Herat. This specimen was later identified by Nilson (1983) as “*Gloydus intermedius caucasicus*” (see below). However, the same author also described a subspecies of *Gloydus halys* from Afghanistan and, therefore, this species is indeed part of the Afghan herpetofauna. The paratype specimen ZFMK 8649 was later (1972) donated to the Zoological Museum in Kabul (ZMK) and is now lost.

***Gloydus halys caucasicus* (Nikolskii, 1916:274)**

1916 *Ancistrodon halys caucasicus* Nikolskii, Fauna Rossij i sopredelnykh stran. *Presmykajuszczijasja*. Tom II. Ophidia [Faune de la Russie et des pays limitrophes. Reptiles (Reptilia). Vol. II. Ophidia]. Tipografija Imperatorskoj Akademii Nauk, Petrograd [St. Petersburg], Russia. III + 349 + (1) pp., pls. I–VIII.

LECTOTYPE.— MNKNU 14942, from “Dzhi vill., Arussk. Obshch., Lenkoran uezd [Dzhi village, Lenkoran district, Azerbaijan]” (designated by Vedmederya et al. [2009])

LOCALITIES.— Sauzak Pass, nr. Herat (ZMUC R-6912) [see pl. 14, fig. 5 for distribution].

REMARKS.— Leviton and Anderson (1970) mentioned this species as *Agkistrodon halys* from a single record of the Universitetets Zoologiske Museum, Copenhagen. Later, Nilson (1983) recognized it as the taxon *caucasicus* and placed it as subspecies into *Gloydus intermedius*. However, some authors (e.g., David and Ineich 1999, Orlov and Barabanov “1999” 2000, Gumprecht et al. 2004, Sindaco et al. 2013) accepted it as the same subspecies, but placed it again into *G. halys*. In any case, according to Gloyd and Conant (1982), this represents the easternmost record for the taxon *caucasicus*.

In 2000, Orlov and Barabanov (“1999” 2000) designated ZISP 19017.1 from “Azerbaijan, Lenkoran District, vicinity of the Kirovsk town” as neotype, stating that all original types were lost. However, Vedmederya et al. (2009) were able to show that one of the syntypes still existed and designated it as the lectotype.

***Macrovipera lebetina* (Linnaeus, 1758:218) - complex**

1758 *Coluber Lebetinus* Linnaeus, *Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Gen-*

era, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio decima, reformata. Laurentii Salvii, Holmiæ (Stockholm), Sweden. (4) + 823 + (I) pp.

TYPE.— Not located, from “Habitat in Oriente.”

SYNONYMS.— *Vipera peilei* Murray, 1892 from “Zandra. S. Afghanistan, Quetta [in Baluchistan, Pakistan]”; types not located.

LOCALITIES.— Jalalabad (FMNH 161139); Wama [Nuristan Prov.] (ZMUC R-6911) [see pl. 14, fig. 6 for distribution].

REMARKS.— Boulenger (1889:104) mentioned four specimens, one each from “Shore-kaltegai”, “Sang-hadji”, “Sang-kotal” and “Mt. Do-Shakh, at Kilki”. Specimens from the first two localities are probably identical with specimens BMNH 1886.9.21.121–122 of *Macrovipera lebetina turanica*. The specimen from “Sang-kotal” was donated to the ZSI collection, whereas the whereabouts of the specimen from “Mt. Do-Shakh at Kilki” is unknown. Sclater (1891:68) mentioned a specimen (ZSI 13137) of “*Vipera lebetina*” from “Sang Kotal [NW Herat]”, collected by the “Boundary Commission (Aitchison 1889)”. This specimen may be identical with the specimen mentioned by Leviton and Anderson (1970, see below) and could represent the subspecies *M. l. turanica*. Leviton and Anderson (1970) mentioned a single record from the Kabul River Valley near Jalalabad. However, they also mentioned a specimen of *Gloydus himalayanus* (Günther, 1864) from the Universitetets Zoologiske Museum, Copenhagen collected at Wama in Nuristan Province. This specimen was later identified by Nilson (1983) as *Macrovipera lebetina*. Leviton and Anderson (1970) also mentioned an occurrence of *M. lebetina* in northwestern Afghanistan (without mentioning specific specimens, but see also above), and this record should be attributed to *M. l. turanica*.

The taxon *Macrovipera lebetina* needs to be clarified. Oraie et al. (*in litt.* David and Ineich 1999:322f.) studied the Iranian populations of the species and recognized the western and northwestern Populations in Iran as the subspecies *obtusata*, and the eastern and northeastern (in the border area to Afghanistan and Turkmenistan) as the subspecies *M. l. chernovi*. According to David and Ineich (1999), Turkmenistan is inhabited only by *M. l. chernovi*, Uzbekistan by *M. l. chernovi* and *M. l. turanica*, Tajikistan by *M. l. turanica*, and Afghanistan solely by *M. l. chernovi*. Moreover, some of the populations in Afghanistan, Pakistan and India that are recognized today as *M. l. chernovi* may be referable to the synonymy of *Vipera peilei*. If the taxa are identical, *chernovi* would be a junior synonym of *peilei* and some of the Afghan populations would represent this taxon. From the aforementioned comments, it is obvious that most likely more than one taxon of the complex is present in Afghanistan. Eastern and western populations could refer to “*Vipera peilei*” or *Macrovipera lebetina chernovi*, whereas specimens from northern Afghanistan could refer to *Macrovipera lebetina turanica*. An occurrence of the latter taxon in Afghanistan is very likely because this taxon was found in Tajikistan directly at the border with Afghanistan (P. Wagner, pers. obs.).

Reptilia: Testudinoidea

Family Testudinidae

Testudo horsfieldii horsfieldii Gray, 1844:7

1844 *Testudo horsfieldii* Gray, Catalogue of Tortoises, Crocodilians, and Amphisbaenians in the Collection of the British Museum. Trustees of the British Museum, London, United Kingdom. viii + 80 pp.

HOLOTYPE.— BMNH 1947.3.4.3 from “Kabul,” Afghanistan.

SYNONYMS.— *Homopus burnesii* Blyth, 1854 from “Afghanistan” (holotype ZSI 793 *vide* Das et al. 1998). *Testudo baluchiorum* Annandale, 1906 from “Baluchistan” (holotype ZSI 11420 *vide* Das et al. 1998).

LOCALITIES.— 24 km SW of Aqcha (CAS 120708); 25 km SW of Aqcha (CAS 120707); Ghazni (MZLU L957/3075); 10 mi. SE Chakansur (CU 11324); Kabul (NMW 10563, inventoried as *T. horsfieldii* sspec. *baluchiorum*); N edge of village of Kara Bagh (CAS 90799–800); Kunduz [Kataghan Prov.] (AFG 13–14); Mazar-i-Sharif (PWC 46); 65–75 km W of Mazar-i-Sharif (CAS 120706); Paghman (FMNH 161207); Seistan [Faizabad Prov.] (ZMUC R-2563) [see pl. 14, fig. 7 for distribution].

REMARKS.— Boulenger (1889: 94) mentioned 12 specimens as “*Testudo horsfieldii*” from “Gulran, Badghis”. Jakeš (1964, *in litt.*; Král 1968) observed this species frequently in the valleys of Wadi-i-Ali Gul (Maimana Prov.) and Wadi-i-Namak Shor (Herat Prov.). Sayer and Zon (1981: 88) also mention one specimen from “Loami”. There is also a series of specimens from Afghanistan without further locality in the FLMNH collections (FLMNH 15522, FLMNH 25780–90, FLMNH 48758).

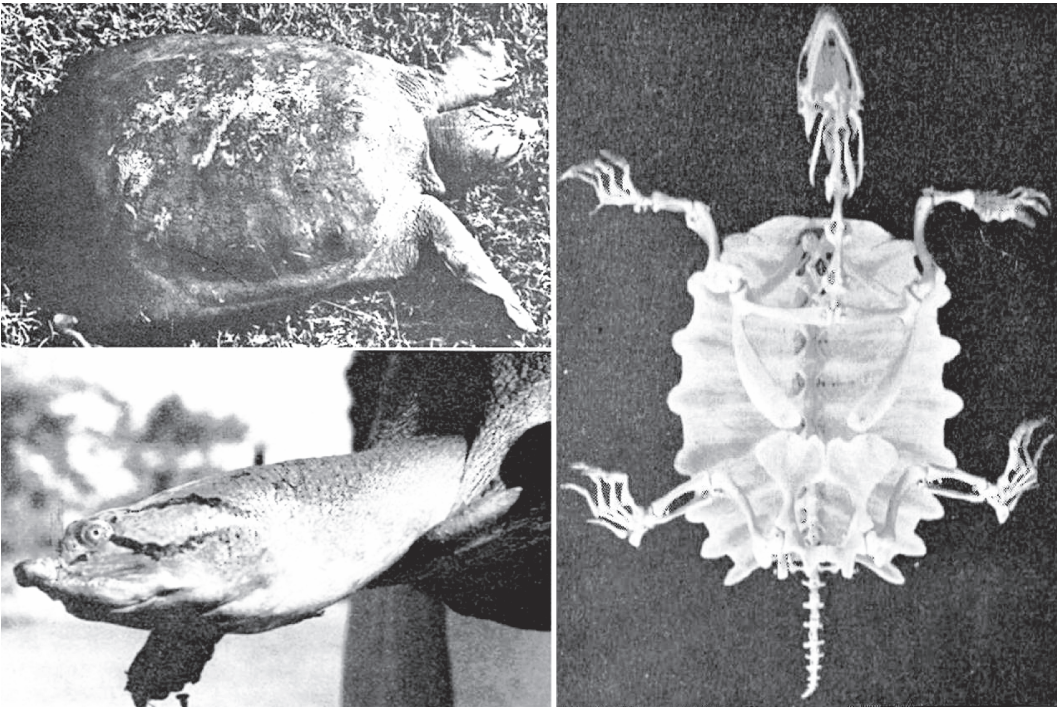


FIGURE 25: The specimen” of *Nilssonina gangetica* from the lost Kabul collection.

Family Trionychidae

Nilssonina gangetica (Cuvier, 1825:203)

1825 *Trionyx gangeticus* Cuvier, Recherches sur les Ossemens Fossiles de Quadrupèdes, où l’on Rétablit les Caractères du plusieurs Espèces d’Animaux que les Révolutions du Globe paroissent avoir Détruites. Dufour & d’Ocagne, Paris. ed. 3, Tome cinquième, II^e Partie. (2) + 548 pp., 33 pls.

SYNTYPES.— MNHN 4148, 9387, 1887–838, A5226 (= 1866–751), from “du Gange” [= Ganges River], India.

LOCALITIES.— Khost [Pakthia Prov.] (specimen uncataloged and presumed lost) [Fig. 22; see pl. 14, fig. 8 for distribution].

REMARKS.— Even though the first record of this species from Afghanistan was published in 1970,

it has rarely been recognized in subsequent literature (except for Dayer and Zon 1981:88). The authors (Schneider and Djalal 1970) found two specimens. One was seen in a garden pond of a German medical practitioner in Khost. The other one was collected near Khost and donated to the Zoological Museum in Kabul where it was catalogued as a skeleton (see Fig. 25). The authors did not give a museum catalog number but presented images (Fig. 25) and a determination of the species supported by Heinz Wermuth. Therefore, without any doubt *N. gangetica* is part of the Afghan herpetofauna.

**Amphibians and reptiles probably present in Afghanistan,
but not yet vouchered by specimens**

Bufonidae: *Bufo pewzowi* Bedriaga, 1898:56

1898 *Bufo viridis* var. *pewzowi* Bedriaga, *Amphibien und Reptilien*. Wissenschaftliche Resultate der von N. M. Przewalski nach Central-Asien unternommenen Reisen/Nauchnuie Rezul'tatui puteshestvii N. M. Przheval'skagho po tzentral'noi Azii. Band III, Zoologischer Theil, Abth.1, Lieferung 1. Akademie der Wissenschaften, St. Petersburg, Russia.1–69, pl. 1.

LECTOTYPE.— ZISP 1818 (designated by Stöck et al. 2001), from “Kokyar (= Pishan, 37°25'N, 77°10'E), Xinjiang, China”.

DISTRIBUTION.— The species is found in isolated oasis populations ranging through Kyrgyzstan and adjacent Russia to eastern Uzbekistan, Tajikistan and the eastern Pamirs in China to western Mongolia.

REMARKS.— This species is mentioned by Das (2014) as *Bufotes pewzowi* for Afghanistan but without mentioning any voucher record or a respective publication.

Bufonidae: *Duttaphrynus olivaceus* (Blanford, 1874:35)

1874 *Bufo olivaceus* Blanford, *Descriptions of new reptiles and amphibia from Persia and Baluchistan*. Annals and Magazine of Natural History, ser. 4, 14:31–35.

LECTOTYPE.— BMNH 74.11.23.122, from “Dasht, Baluchistan” Iran, designated by Balleto et al. (1985).

DISTRIBUTION.— Found in southeastern Iran and from extreme western Balochistan (Pakistan) to the Gurgaon District (Haryana state) in India.

REMARKS.— Because of the disjunct distribution range in Iran and Pakistan/India, it is very likely that this species occurs in southern Afghanistan. The species is mentioned by Das (2014) for the country but without mentioning any voucher specimens or a respective publication.

Agamidae: *Phrynocephalus ornatus vindumi* Golubev, 1998:163, fig. 1a, 2

1998 *Phrynocephalus ornatus vindumi* Golubev, A new subspecies of *Phrynocephalus ornatus* Boulenger (Reptilia: Agamidae) from eastern Iran, with a key to south-western and Middle-Asian Microphrynocephalids. Hamadryad 23(2):162–168.

HOLOTYPE.— CAS 141204, from “Iran, Khorasan Prov., 35 km N of Gonabad on road to Torbat-E. Heydariyeh (ca. 34°49'N, 58°47'E), 850 m. elevation”.

DISTRIBUTION.— In Iran it occurs in the eastern part of Kavir-i-Namak Desert, along NE slopes of Kelat (Qalat) Range, and Kayen Mountains at the Iranian-Afghanistan border.

REMARKS.— As this species is recognized from the Iranian side of the border with Afghanistan, there is a high possibility that it also occurs on the Afghan side.

Gekkonidae: *Cyrtopodion agamuroides* (Nikolskii, 1900:384)

1900 “1899” *Gymnodactylus agamuroides* Nikolskii, Reptiles, amphibiens et poissons, recueillis pendant le voyage de Mr. N. A. Zaroudny en 1898 dans la Perse. Annuaire Musée Zoologique de l’Académie Impériale des Sciences de St.-Petersbourg, 4:375–417, pl. XX.

LECTOTYPE.— ZISP 9327 from “Pendsch’ Sara in Kirmano orient.”, E Kerman Prov., Iran designated by Szczerbak and Golubev (1986).

DISTRIBUTION.— Known from Iran and Pakistan (Šmíd et al. 2014).

REMARKS.— As this species is recognized from the Iranian side of the border with Afghanistan, there is a high possibility that it also occurs on the Afghan side. Šmíd et al. (2014) already mentioned it for Afghanistan but failed to present a reference or voucher specimen.

Gekkonidae: *Cyrtopodion kirmanense* (Nikolskii, 1900:381)

1900 *Gymnodactylus kirmanense* Nikolskii, Reptiles, amphibiens et poissons, recueillis pendant le voyage de Mr. N. A. Zaroudny en 1898 dans la Perse. Annuaire Musée Zoologique de l’Académie Impériale des Sciences de St.-Petersbourg, 4 [1899]:375–417, pl. XX.

LECTOTYPE.— ZISP 9220B from “Mons Kuh-i-Tuftan in Sargado”, Iran designated by Szczerbak and Golubev (1986).

DISTRIBUTION.— Known only from Iran (Šmíd et al. 2014).

REMARKS.— As this species is recognized from the Iranian side of the border with Afghanistan, there is a high possibility that it also occurs on the Afghan side.

Gekkonidae: *Mediodactylus russowii* (Strauch, 1887:49, figs. 10, 11, 12)

1887 *Gymnodactylus Russowii* Strauch, Bemerkungen über die Geckoniden-Sammlung im zoologischen Museum der kaiserlichen Akademie der Wissenschaften zu St. Petersburg. Mémoires de l’Académie Impériale des Sciences de St. Pétersbourg, Phys.-Math. Classe, St. Pétersbourg, ser. 7, 35(2):(2), 1–72, 1 pl.

LECTOTYPE.— ZISP 3658 from “30 km east of Fort Shevchenko (formerly Fort Alexandrowsk), Kazakhstan, on the Mangyschak Peninsula” Designated by Szczerbak and Golubev (1986).

DISTRIBUTION.— S Russia, Kazakhstan, Turkmenistan, Uzbekistan, Kyrgyzstan, Tajikistan, NE Iran, China.

REMARKS.— As this species is recognized from the Iranian and Tajikistan side of the border with Afghanistan, there is a high possibility that it also occurs on the Afghan side. Šmíd et al. (2014) already mentioned it for Afghanistan but failed to provide a reference.

Gekkonidae: *Tenuidactylus longipes* (Nikolskii, 1896:369)

1896 *Gymnodactylus longipes* Nikolskii, Diagnoses reptilium et amphibiorum novorum in Persia orientali a N. Zarudny collectorum. Annuaire Musée Zoologique de l’Académie Impériale des Sciences de St.-Petersbourg, 1:369–372.

LECTOTYPE.— ZISP 8810 from “Tedzhen”, S Turkmenistan, designated by Szczerbak and Golubev (1986).

DISTRIBUTION.— Turkmenistan, E Iran.

REMARKS.— As this species is recognized from the Iranian side of the border with Afghanistan, there is a high possibility that it also occurs on the Afghan side. Šmíd et al. (2014) already mentioned it for Afghanistan but did not provide a reference. Alternatively, the record may be a hold-over from the time *Cyrtopodion voraginosus* was recognized as subspecies of *Cyrtopodion longipes*.

Lacertidae: *Acanthodactylus micropholis* **Blanford, 1874:33**

1874 *Acanthodactylus micropholis* Blanford, Descriptions of new Reptilia and Amphibia from Persia and Baluchistan. Annals and Magazine of Natural History, ser. 4, 14:31–35.

SYNTYPES.— BMNH 74.11.23.79 from “Rigan”; BMNH 1946.9.3.71–72 (formerly BMNH 1874.11.23.76–77) from “Magas”; BMNH 74.11.23.78 from “Bampur”; ZSI 5301 from “Magras” and ZMB 9333 from “Zamran”.

DISTRIBUTION.— Known from SE Iran and SW Pakistan.

REMARKS.— Although this species is sometimes listed for Afghanistan (e.g., Uetz and Hošek 2016), we could identify no confirmed records from the country. Salvador (1982) and Sindaco and Jeremčenko (2008) likewise do not recognize this lizard from Afghanistan. However, there are records from the border area between Pakistan and Afghanistan and an occurrence on the Afghan side is possible.

Scincidae: *Ophiomorus breviceps* (**Blanford, 1874:33**)

1874 *Zygnopsis brevipes* Blanford, Descriptions of new Reptilia and Amphibia from Persia and Baluchistan. Annals and Magazine of Natural History, ser. 4, 14:31–35.

HOLOTYPE.— ZSI 3464 from “Sáadatabád, S.W. of Karman [Kerman], Persia [= Iran]” (*vide* Das et al. 1998).

DISTRIBUTION.— E Iran, SW Pakistan.

REMARKS.— As this species is recognized from the Iranian side of the border with Afghanistan and in Pakistan, there is a high possibility that it also occurs on the Afghan side.

Scincidae: *Ophiomorus chernovi* **Anderson and Leviton, 1966:503, figs. 2a–b, 3a**

1966 *Ophiomorus chernovi* Anderson and Leviton, A review of the genus *Ophiomorus* (Sauria: Scincidae), with descriptions of three new forms. Proceedings of the California Academy of Sciences ser. 4, 33(16):499–534.

HOLOTYPE.— BMNH 91.10.6.25, from “Turkmen: Pul-i-Khatun, at confluence of Geshef-Rud and Hari-Rud.”

DISTRIBUTION.— Southern Turkmenistan (near the border between Iran and Afghanistan) and NE Iran.

REMARKS.— As this species occurs in Iran and Turkmenistan near the border with Afghanistan, a presence in Afghanistan is possible.

Colubridae: *Lycodon striatus bicolor* (**Nikolskii, 1903:96**)

1903 *Contia bicolor* Nikolskii, Sur trois nouvelles espèces de reptiles, recueillis par Mr. N. Zarudny dans la Perse orientale en 1901. [in Russian and Latin] Annuaire Musée Zoologique de l’Académie Impériale des Sciences de St.-Pétersbourg 8:95–98.

SYNTYPES.— ZIS 10006, 10013, from “Persia orientalis” and from “Transcaspia. Kulkulab”.

DISTRIBUTION.— E and NE Iran, S Turkmenistan, Uzbekistan and W Tajikistan.

REMARKS.— Leviton and Anderson (1970) mentioned no specimens found in Afghanistan but there is a record of the species from the Iranian part of the Sistan Basin. Therefore, an occurrence of the species in Afghanistan is possible.

Elapidae: *Bungarus caeruleus* (Schneider, 1801: 284)

1801 *Pseudoboa caerulea* Schneider, *Historiae Amphibiorum naturalis et literariae*. Fasciculus secundus continens Crocodilos, Scincos, Chamaesauras, Boas. Pseudoboas, Elapes, Angues. Amphisbaenas et Caecili-
as. Fried. Frommann, Jena, Germany. vi + 374 pp., 2 pls.

SYNTYPE.— ZMB 2787 from “India orientali” is the surviving syntype (*vide* Bauer 1998). Two other syntypes are a dry specimen in Schneider’s own collection and a specimen figured on plate I of Russell (1796), both now lost (Bauer 2015).

DISTRIBUTION.— Most of South Asia from southwestern Pakistan to Bangladesh and northeast India, south through Peninsular India and Sri Lanka and north to Kashmir and northern Pakistan, including the border region with Afghanistan.

REMARKS.— Král (1969) recorded *B. caeruleus* from eastern Afghanistan, but this record should be reexamined and is here interpreted as referable to *B. sindanus*. Masroor (2012) mapped several localities of *B. caeruleus* in Pakistan that are near the Afghan-Pakistan border, so an occurrence within the borders of Afghanistan is possible.

Viperidae: *Pseudocerastes persicus* (Duméril, Bibron, and Duméril, 1854:1443)

1854 *Cerastes persicus* Duméril, Bibron, and Duméril, *Erpétologie Générale ou Histoire Naturelle Complète des Reptiles*, vol. 7 (part 2). Librairie Encyclopédique de Roret, Paris, France. (1), (1), xii, 781–1536 pp., 2 folding tables, pls. 75–84 [see p. 1443 and pl. 78bis].

TYPE(S).— Not located, from “Persia”.

DISTRIBUTION.— From Iraq and Oman to Turkmenistan and India.

REMARKS.— Although Afghanistan is mentioned by some authors for this species, the closest record to this country is from Gomal Pass in Pakistan, which is close to the border with Afghanistan. Leviton and Anderson (1970) mentioned that “while Afghanistan has been included in the distribution of this species by previous authors, we find no documented records”. This latter statement is still correct.

**Species previously mentioned to be present in Afghanistan,
but now considered to be doubtful or absent**

Bufonidae: *Bufo luristanicus* Schmidt, 1952

REMARKS.— This species is recognized in Afghanistan based on a single record from Tanatchiv, 165 km N Kandahar (MZLU L960/3073). However, according to Stöck et al. (2001), this species is only known from few localities in the Zagros Mountains and from Fars Provinces of western Iran. Thus, this record seems doubtful and a reexamination of the specimen is needed.

Ranidae: *Pelophylax ridibundus* (Pallas, 1771)

REMARKS.— Specimens previously mentioned under this name are now recognized as *Pelophylax terentievi* (q.v.).

Agamidae: *Phrynocephalus reticulatus* (Eichwald, 1831)

REMARKS.— Leviton and Anderson (1970) mentioned the taxon *boettgeri* as a subspecies *Phrynocephalus reticulatus*. However, today it is recognized as a synonym or sometimes a subspecies of *P. raddei* (q.v.). Therefore, *Phrynocephalus reticulatus* has to be deleted from the Afghan herpetofauna.

Agamidae: *Trapelus ruderatus* (Olivier, 1804)

REMARKS.— *Trapelus ruderatus* was previously mentioned from Afghanistan by several authors in respect to the taxon *baluchianus* (Smith 1935), which was recognized as subspecies of *T. ruderatus* at the time. However, today this taxon is now treated as synonym of *T. megalonyx* and, therefore, should be referred to under that nomen in the Afghan fauna.

Eublepharidae: *Eublepharis hardwickii* Gray, 1827

REMARKS.— Wettstein (1960) mentioned a specimen from Kandahar donated to K. Lindberg by “Dr. Colognato.” Today we know that this species is restricted to eastern parts of the Indian subcontinent. Therefore, this specimen bears an erroneous locality or refers to *E. afghanicus*.

Gekkonidae: *Alsophylax pipiens* (Pallas, 1827)

REMARKS.— Specimens from Afghanistan previously assigned to this species are now referred to *Altiphylax levitoni* (Golubev and Szczerbak, 1979).

Gekkonidae: *Tenuidactylus fedtschenkoi* (Strauch, 1887)

REMARKS.— To date, *T. fedtschenkoi* is still cited (as *Cyrtopodion fedtschenkoi*) as present in Afghanistan by many authors (e.g., UNEP 2003), even though Clark (1990) explicitly mentioned that this is a mistake due to the misidentification of material collected by him and the Street expedition. These records actually refer to *T. turcmenicus* (q.v.).

Lacertidae: *Eremias guttulata* (Lichtenstein, 1823)

REMARKS.— This species, mentioned e.g., by Leviton and Anderson (1970) with its subspecies *Eremias guttulata watsonana*, has to be deleted from the Afghan herpetofauna, because this subspecies is today regarded as full species and respective localities can be found under this account.

Scincidae: *Eumeces schneiderii princeps* (839)

REMARKS.— The eastern populations of this subspecies are now recognized as *Eumeces schneiderii zarudnyi* (Anderson 1999).

Boidae: *Eryx miliaris* (Pallas, 1773)

REMARKS.— Only one specimen (CAS 84638, from “Chah-i-Angir, Dasht-i-Margo desert”) of this species was mentioned from Afghanistan (Leviton 1959), but Sergius Chernov in 1959 reidentified the specimen as *E. tataricus*.

Colubridae: *Platyiceps ventromaculatus* (Gray, 1834)

REMARKS.— Different authors, e.g., Boulenger (1890) and Leviton (1959), mentioned *P. ventromaculatus* for Afghanistan without details of either localities or specimens. According to Schätti et al. (2014), these records refer to Jan’s Cliff Racer, *P. rhodorachis*.

Elapidae: *Naja naja* (Linnaeus, 1758)

REMARKS.— Previously, *Naja oxiana* was recognized as subspecies of *Naja naja* and, therefore, the latter taxon was mentioned for Afghanistan. Meanwhile, *N. oxiana* is currently treated as full species and *N. naja* has to be deleted from the Afghan herpetofauna inasmuch as no Afghan locality records for the nominotypical subspecies exist.

Viperidae: *Gloydus himalayanus* (Günther, 1864)

REMARKS.— Leviton and Anderson (1970) mention this taxon from a single specimen from Wama in Nuristan Province, present in the collection of the Universitetets Zoologiske Museum, Copenhagen. But, this specimen was subsequently identified by Nilson (1983) as *Macrovipera lebetina* and, therefore, the previous species must be deleted from the Afghan herpetofauna.

DISCUSSION

Leviton (1959) included 67 nominal species in his first checklist of the amphibians and reptiles of Afghanistan and inadvertently omitted *Calotes versicolor*, which was known at this time as well from the country. About a decade later, Leviton and Anderson (1970) increased this number to 101 nominal and subspecific species, mentioning that the knowledge of the Afghan herpetofauna was still incomplete. Herein, we increase the number of known species and subspecies to 118, due to some new descriptions after 1970 (e.g., *Bufo pseudoraddei baturae*, *Altiphylax levitoni*), new country records between 1970 and today (e.g., *Hoplobatrachus tigerinus*, *Bungarus sindanus*, *Nilssonina gangetica*) as well as our new country records (e.g., *Hemidactylus* cf. *brookii*). Other species have been reconsidered during the past few years (e.g., *Pelophylax terentievi*, *T. turkmenicus*) and are therefore new additions to the herpetofauna of Afghanistan, whereas another 18 species have to be deleted (e.g., *Trapelus ruderatus*, *Alsophylax pipiens*, *Tenuidactylus fedtschenkoi*; see checklist above) from this list. Seven taxa (including *Eublepharis afghanicus*) are currently regarded as endemic to Afghanistan. The highest species richness can be found in the Agamidae (26 taxa), the Lacertidae (16 taxa) and the Colubridae (15 taxa). The dominant genus is the lacertid genus *Eremias* with twelve taxa, followed by the agamid genus *Phrynocephalus* with nine taxa. Amphibians (ten taxa, one endemic) and turtles (two taxa) are distinctly poor in species diversity compared with lizards and snakes.

In total, we present records of more than 1000 specimens from 36 museum and private collections. However, records from many larger areas in the country are still lacking. A summary of all records (Fig. 26) shows that the central highlands are especially undercollected, as are the southern, southeastern and easternmost regions and the Wakhan Corridor. However, the latter region is at very high elevation and its species diversity is presumed to be very low. The summary also

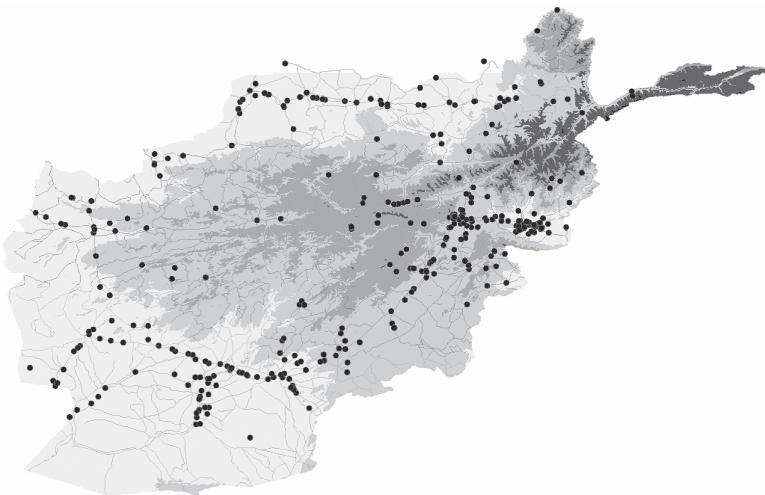


FIGURE 26: Summary of all records from Afghanistan, showing the major collection sites.

shows that most specimens were collected along major roads (Fig. 26), especially between Kabul and Herat. Based upon the number of specimens collected and collecting localities, the most abundant species are *Paralaudakia caucasia*, *Trapelus agilis*, and *Mesalina watsonana*. Other species, especially snakes are very rare and often known from a single record only (e.g., *Hoplobatrachus tigerinus*, *Laudakia tuberculata*, *Eumeces blythianus*, *Eirenis persicus*, *Elaphe dione*, *Oligodon arnensis*, *Nilssonsonia gangetica*).

Afghanistan is known to be a transition zone between the Palearctic and the Oriental zoogeographic regions. However, the diversity of amphibians and reptiles is clearly dominated by Palearctic species which occupy most areas of the country. With 26 species occurring mainly within arid areas of the country, Afghanistan is a distinct hotspot of agamid lizards, but only three species (*Calotes versicolor*, *Laudakia tuberculata*, *Saara hardwickii*) can be associated with the Oriental region. Most records of oriental species are concentrated in the Khost area, including the remarkable records of *Hoplobatrachus tigerinus* and *Nilssonsonia gangetica*. Other species are e.g., *Eublepharis afghanicus*, *Varanus bengalensis*, or *Bungarus sindanus*. Typical Palearctic elements are e.g., *Natrix tessellata*, occurring from Europe to northern Pakistan (Khan 2002), and *Pseudopus apodus*, with roughly the same distribution. Therefore, regarding the herpetodiversity, Afghanistan can be mainly recognized as part of the Palearctic region with some influence from the Oriental region.

This study is based mainly on material present in the biodiversity archives of museums and private collections, as well as some recently collected material, resulting in more than 1000 specimens known from the country. Recognizing that Afghanistan is under war conditions and has been for roughly the past 40 years, this is a surprisingly high number, especially as some larger collections (e.g., BMNH, ZISP, ZSI) have yet to be fully evaluated. This number could also lead to the impression that the Afghan herpetofauna is well explored. However, many areas in Afghanistan are still unknown, and there are as well many unresolved species or species complexes. For instance, the nomenclatural and taxonomical status of *Eublepharis afghanicus* still needs to be resolved and even the correct identities and/or relationships of some taxa from Afghanistan are yet to be established (e.g., *E. afghanicus*, *Gloydus halys boehmei*). The *Bufo viridis* complex (*B. oblongus*, *B. p. baturae*, *B. turanensis*, *B. zugmayeri*), the *Trapelus agilis* complex (*T. agilis*, *T. megalonyx*, *T. sanguinolentus*), as well as some other complexes, e.g., *Eremias persica*/*E. velox*, need to be analyzed in detail to resolve the species status of several taxa and their distributions. The value of this contribution is that it presents a summary of most of the known material from Afghanistan in the form of an up-to-date checklist, and in this regard it should prove useful inasmuch as it provides baseline distributional data for biogeographic as well as conservation studies and can serve as the springboard for additional faunistic studies as well as encourage others to examine and, hopefully, resolve some of the above mentioned taxonomic problems as they relate to the Afghan herpetofauna.

ACKNOWLEDGMENTS

PW is thankful to Günther Nogge who gave him the opportunity to visit Afghanistan as Professor of Zoology in Herat. It was one of the best times in his life. We are indebted to Roberto Sindaco and Frank Tillak who provided some important information and Glib Mazepa who gave comments to one species in the checklist. We are grateful to the following curators and collection managers for information about specimens in, or for access to, their respective collections: Natalia Ananjeva and Konstantin Milto (both ZISP); Mogens Andersen (MZUF); Patrick Campbell (BMNH); Esther Dondorp (Naturalis), Michael Franzen (ZSM), Jakob Hallermann (ZMH), Linda

Mogk (SMF), Silke Schweiger and Heinz Grillitsch (both NHMW), Carol Spencer (MVZ), Frank Tillak (ZMB), Jens Vindum (CAS), and Addison Wynn (USNM). We acknowledge with appreciation the following photographers who contributed their images and specimens of Afghan amphibians and reptiles: Andreas Dittmann, Michael Faulde, Frank Joisten, Thomas Rubner and Hermann Seufer. The research leading to this publication was supported by the German Federal Foreign Office (Auswärtiges Amt) in cooperation with the German Academic Exchange Service (DAAD, Deutscher Akademischer Austauschdienst), National Geographic Society grant no. GEFNE81–13, and by the Lemole Endowed Chair in Integrative Biology Fund at Villanova University.

Lastly, we acknowledge with grateful thanks the comments provided by an anonymous reviewer who suggested significant textual changes and posed corrections to the penultimate draft of this checklist, also George Zug, who also kindly reviewed a galley proof version of the paper and uncovered a number of embarrassing faux pas, and Steven C. Anderson for his thoughtful comments. Having said this, we accept full responsibility for errors of commission and/or omission that persist.

LITERATURE

- ADLER, K. 2012. *Contributions to the History of Herpetology*. Volume 3. Society for the Study of Amphibians and Reptiles, Vancouver, British Columbia, Canada. 564 pp.
- AITCHISON, J.E.T., ED. 1889, The zoology of the Afghan Delimitation Commission. *Transactions of the Linnean Society of London*, ser. 2, 5:53–142, pls. VI–XIV, 2 folding maps..
- ALCOCK, A., AND F. FINN. 1897 “1896”. An Account of the Reptilia collected by Dr. F. P. Maynard, Captain A. H. McMahon, C.I.E., and the Members of the Afghan-Baluch Boundary Commission of 1896. *Journal of the Asiatic Society of Bengal* 55(2):550–567, pls. XI–XV.
- ANDERSON, S.C. 1999. *The Lizards of Iran*. Society for the Study of Amphibians and Reptiles, Ithaca, New York, USA. vii + 442 pp., 25 pls.
- ANDERSON, S.C., AND A.E. LEVITON. 1967. A new species of *Phrynocephalus* (Sauria: Agamidae) from Afghanistan, with remarks on *Phrynocephalus ornatus* Boulenger. *Proceedings of the California Academy of Sciences*, ser. 4, 35(11):227–234.
- AUFFENBERG, W., AND H. REHMAN. 1993. Studies on Pakistan reptiles. Pt. 3. *Calotes versicolor*. *Asiatic Herpetological Research* 5:14–30.
- AUFFENBERG, W., AND H. REHMAN. 1995. *Calotes versicolor nigrigularis* Auffenberg and Rehman 1993 a junior primary homonym. *Asiatic Herpetological Research* 6:27.
- BAIG, K.J. 1992. *Systematic Studies of the Stellio-group of Agama (Sauria, Agamidae)*. Unpublished Ph.D. dissertation, Quaid-i-Azam University, Islamabad, Pakistan. 287 pp.
- BAIG, K.J., AND R. MASROOR. 2008 [2007]. The snakes of the genus *Spalerosophis* Jan, 1865 in Indo-Pakistan and Iran (Squamata: Serpentes: Colubridae). *Herpetozoa* 20(3/4):109–115.
- BAIG, K.J., P. WAGNER, N.B. ANANJEVA, AND W. BÖHME. 2012. A morphology-based taxonomic revision of *Laudakia* Gray, 1845 (Squamata: Agamidae). *Vertebrate Zoology* 62(2):213–260.
- BALLETTO, E., M.A. CHERCHI, AND J. GASPERETTI. 1985. Amphibians of the Arabian Peninsula. *Fauna of Saudi Arabia* 7:318–392.
- BARABANOV, A.V., AND N.B. ANANJEVA. 2007. Catalogue of the available scientific species-group names for lizards of the genus *Phrynocephalus* Kaup, 1825 (Reptilia, Sauria, Agamidae). *Zootaxa* 1399:1–56.
- BAUER, A.M. 1998. South Asian herpetological specimens of historical note in the Zoological Museum, Berlin. *Hamadryad* 23:133–149.
- BAUER, A.M. 2015. Patrick Russell’s snakes and their role as type specimens. *Hamadryad* 37:18–65.
- BAUER, A.M., AND K. ADLER. 2003. On the dates of publication and correct citation of Olivier’s Voyage dans l’Empire Othoman and its herpetological content. *Newsletter and Bulletin of the International Society for the History and Bibliography of Herpetology* 4(2):5–16.
- BAUER, A.M., T.R. JACKMAN, E. GREENBAUM, A. DE SILVA, V.B. GIRI, AND I. DAS. 2010. Molecular evidence

- for the taxonomic status of *Hemidactylus brookii* group taxa (Squamata: Gekkonidae). *The Herpetological Journal* 20:129–138.
- BAUER, A.M., R. MASROOR, J. TITUS-MCQUILLAN, M. HEINICKE, J. DAZA, AND T. JACKMAN. 2013. A preliminary phylogeny of the Palearctic naked-toed geckos (Reptilia: Squamata: Gekkonidae) with taxonomic implications. *Zootaxa* 3599:301–324.
- BAUER, A.M., G.M. SHEA, AND R. GÜNTHER. 2003. An annotated catalogue of the types of scincid lizards (Reptilia: Squamata: Scincidae) in the collection of the Museum für Naturkunde der Humboldt-Universität zu Berlin (ZMB). *Zoologische Reihe. Mitteilungen aus dem Museum für Naturkunde in Berlin* 79: 253–321.
- BAUER, A.M., G. VOGEL, AND P.D. CAMPBELL. 2015. A preliminary consideration of the dry snake skin specimens of Patrick Russell. *Hamadryad* 37:73–84.
- BAUER, A.M., V. WALLACH, AND R. GÜNTHER. 2002. An annotated type catalogue of the scolecophidian, alethinophidian, and macrostomatan snakes in the collection of the Museum für Naturkunde der Humboldt-Universität zu Berlin. *Mitteilungen des Museum für Naturkunde Berlin, Zoologische Reihe* 78(1):157–176.
- BLANFORD, W.T. 1876. *The Zoology and Geology*. In W.T. Blanford, ed., *Eastern Persia, an Account of the Journey of the Persian Boundary Commission, 1870–1872*, co. 2. Macmillan and Co., London, England. viii + 516 pp., pls. 1–28, map [foldout].
- BOETTGER, O. 1888. Materialien zur herpetologischen Fauna von China II. *Bericht über die Thätigkeit des Offenbacher Vereins für Naturkunde* 26–28:53–191.
- BÖHME, W., AND N.N. SZCZERBAK. 1991. Ein neuer Wüstenrenner aus dem Hochland Afghanistans, *Eremias* (*Eremias*) *afghanistanica* sp. n. (Reptilia: Sauria: Lacertidae). *Bonner zoologische Beiträge* 42(2):137–41.
- BÖRNER, A.R. 1974. Ein neuer Lidgecko der Gattung *Eublepharis* Gray 1827. *Miscellaneous Articles in Saurology* (4):7–14.
- BÖRNER, A.R. 1976. Second contribution to the systematics of the southwest Asian lizards of the geckonid genus *Eublepharis* Gray 1827: materials from the Indian subcontinent. *Saurologica* (2):1–15 + 22 unnumbered pages.
- BÖRNER, A.R. 1981. Third contribution to the systematics of the southwest Asian lizards of the geckonid genus *Eublepharis* Gray 1827: Further materials from the Indian subcontinent. *Saurologica* (3):1–7 + 16 unnumbered pages.
- BOULENGER, G.A. 1883. Description of new species of reptiles and batrachians in the British Museum. *Annals and Magazine of Natural History*, ser. 5, 12:161–167.
- BOULENGER, G.A. 1885. *Catalogue of the Lizards in the British Museum (Natural History)*, Vol. I. *Gekkonidae, Eublepharidae, Uroplattidae, Pygopodidae, Agamidae*. Trustees of the British Museum, London, United Kingdom. xii + 436 pp., pls. 1–32.
- BOULENGER, G.A. 1885. *Catalogue of the Lizards in the British Museum (Natural History)*, Vol. II. *Iguanidae, Xenosauridae, Zonuridae, Anguidae, Anniellidae, Helodermatidae, Varanidae, Xantusiidae*. Trustees of the British Museum, London, United Kingdom. xiii + 497 pp., pls. 1–24.
- BOULENGER, G.A. 1887. *Catalogue of the Lizards in the British Museum (Natural History)*, Vol. III. *Lacertidae, Gerrhosauridae, Scincidae, Anelytropidae, Dibamidae, Chamaeleonidae*. Trustees of the British Museum, London, United Kingdom. xii + 575 pp., pls. 1–40.
- BOULENGER, G.A. 1889. Reptiles and batrachians. Pages 94–106, pls. 8–11 in Aitchison, J.E.T., ed., *The Zoology of the Afghan Delimitation Commission. Transactions of the Linnean Society of London*, ser. 2, vol. 5
- BOULENGER, G.A. 1890. *The Fauna of British India, Including Ceylon and Burma. Reptilia and Batrachia*. Taylor & Francis, London, United Kingdom. xviii + 541 pp.
- BOULENGER, G.A. 1891. Descriptions of new Oriental reptiles and batrachians. *Annals and Magazine of Natural History*, ser. 6, 7:279–283.
- BOULENGER, G.A. 1893. *Catalogue of the Snakes in the British Museum (Natural History)*, Vol. I. *Containing the Families Typhlopidae, Glauconiidae, Boidae, Ilysiidae, Uropeltidae, Xenopeltidae, and Colubridae Aglyphae, Part*. Trustees of the British Museum (Natural History), London, United Kingdom. xiii + 448 pp.

- BOULENGER, G.A. 1896. *Catalogue of the Snakes in the British Museum (Natural History)*, Vol. III. *Containing the Families Colubridae (Opisthoglyphae and Proteroglyphae), Amblycephalidae, and Viperidae*. Trustees of the British Museum (Natural History), London, United Kingdom. xiv + 727 pp., pls. I–XXV.
- BOULENGER, G.A. 1921. *Monograph of the Lacertidae*, Vol. II. Trustees of the British Museum (Natural History), London, United Kingdom. viii + 451 pp.
- BRÜCK, G. 1969. Zur Herpetofauna Afghanistans. *Věstník Československé Společnosti Zoologické, Acta Societatis Zoologicae Bohemoslovacae* 32:201–208.
- CHANDA, S.K., I. DAS, AND A. DUBOIS. 2001 “2000”. Catalogue of amphibian types in the collection of the Zoological Survey of India. *Hamadryad* 25:100–128.
- CLARK, R. 1990. A report on herpetological observations in Afghanistan. *British Herpetological Society Bulletin* 33:20–42.
- CLARK, R.J., E.D. CLARK, S.C. ANDERSON, AND A.E. LEVITON. 1969. Report on a collection of amphibians and reptiles from Afghanistan. *Proceedings of the California Academy of Sciences*, ser. 4, 36:279–316.
- DAS, I. 1997. Resolution of the systematic status of *Eublepharis macularius fuscus* Boerner, 1981 (Eublepharidae: Sauria: Squamata). *Hamadryad* 22(1):13–20.
- DAS, I. 2014. Status and decline of amphibians of Afghanistan. Pages 102–108 in Heatwole, H., and I. Das, eds., *Amphibians of Asia. Status of Conservation and Decline of Amphibians: Eastern Hemisphere*. Natural History Publications (Borneo) Sdn. Bhd., Kota Kinabalu, Malaysia.
- DAS, I., AND K.A. JENSEN. 2006. The herpetofauna of Loagan Bunut. Pages 131–154 in Tuen, A.A., A.K. Sayok, A.N. Toh, and G.T. Noweg, eds., *Scientific Journey Through Borneo: Loagan Bunut. A Scientific Expedition on the Physical, Chemical, Biological, and Sociological Aspects. Kuala Lumpur and Kota Samarahan: Peat Swamp Forest Project, UNDP/GEF funded (MAL/99/G31)*. Sarawak Forest Department and Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak, Kuching, Malaysia.
- DAS, I., AND J. SUKUMARAN. 2007. Confirmation of *Hemidactylus brookii* Gray, 1845 from Borneo. *Gekko* 5(1):18–20.
- DAS, I., B. DATTA GUPTA, AND N.C. GAYEN. 1998. History and catalogue of reptile types in the collection of the Zoological Survey of India. *Journal of South Asian Natural History* 3:121–172.
- DAVID, P., AND I. INEICH. 1999. Les serpents venimeux du monde: systématique et répartition. *Dumerilia* 3:3–499.
- DOTSENKO, I.B. 2003. *Katalog kolektsii Zoologicheskogo Muzeia NNPM NAN Ukrainy. Zmei [Catalogue of collections of the Zoological Museum, National Museum of Natural History, Ukrainian Academy of Science. Serpentes]*. Zoomyzei NNPM NAN Ukrainy, Kiev, Ukraine. 85 + (1) pp. [in Russian].
- DUBOIS, A. 1988. Some comments on the genus concept in zoology. *Monitore Zoologico Italiano* 22:27–44.
- DUBOIS, A., AND A. OHLER. 1996 “1994”. Frogs of the subgenus *Pelophylax* (Amphibia, Anura, genus *Rana*): a catalogue of available and valid scientific names, with comments on name bearing types, complete synonymies, proposed common names, and maps showing all type localities. *Zoologica Poloniae* 39:139–204.
- EISELT, J., AND J.F. SCHMIDTLER. 1973. Froschlurche aus dem Iran unter Berücksichtigung ausseriranischer Populationsgruppen. *Annalen des Naturhistorischen Museums in Wien* 77:181–243.
- FITZINGER, L. 1824. Über den *Ablepharus pannonicus*, eine neue Eidechse aus Ungarn. *Verhandlungen der Gesellschaft naturforschender Freunde zu Berlin* 1:297–302, pl. 14.
- FREITAG H. 1971. Die natürliche Vegetation Afghanistans. Beiträge zur Flora und Vegetation Afghanistans I. Vegetatio. *Acta Geobotanica*. 22:285–349.
- FROST, D.R. 2011. Amphibian Species of the World: an online reference. Version 5.5 (31 January, 2011). Electronic Database accessible at <http://research.amnh.org/vz/herpetology/amphibial>. American Museum of Natural History, New York, USA.
- FROST, D.R., T. GRANT, J. FAIVOVICH, R.H. BAIN, A. HAAS, C.F.B. HADDAD, R.O. DE SÁ, A. CHANNING, M. WILKINSON, S.C. DONNELLAN, C.J. RAXWORTHY, J.A. CAMPBELL, B.L. BLOTTO, P.E. MOLER, R.C. DREWES, R.A. NUSSBAUM, J.D. LYNCH, D.M. GREEN, AND W.C. WHEELER. 2006. The amphibian tree of life. *Bulletin of the American Museum of Natural History* 297. 1–370 pp., 1 foldout cladogram.
- FUND, W. 2012. Ecoregions of Afghanistan. Retrieved from <http://www.eoearth.org/view/article/177116>.

- GLOYD, H.K., AND R. CONANT. 1982. The classification of the *Agkistrodon halys* complex. *Japanese Journal of Herpetology* 9:75–78.
- GOLUBEV, M. 1998. A new subspecies of *Phrynocephalus ornatus* Boulenger (Reptilia: Agamidae) from eastern Iran, with a key to south-western and Middle-Asian microphrynocephalids. *Hamadryad* 23(2):162–168.
- GRAY, J.E. 1831. A synopsis of the species of the class Reptilia, Pages 1–110 (Appendix) in Griffith, E., and E. Pidgeon, eds., *The Animal Kingdom Arranged in Conformity with its Organization, by the Baron Cuvier*. Vol. 9. *The Class Reptilia Arranged by the Baron Cuvier, with Specific Descriptions*. Whittaker, Treacher, London, United Kingdom.
- GRAY, J.E. 1845. Catalogue of the Specimens of Lizards in the Collection of the British Museum. Trustees of the British museum, London, United Kingdom. xxviii + 289 pp.
- GRILLITSCH, H., E. SCHLEIFFER, AND F. TIEDEMANN. 1996. *Kataloge der wissenschaftlichen Sammlungen des Naturhistorischen Museums in Wien*, 11 (*Vertebrata* 5). *Katalog der Trockenpräparate der Herpetologischen Sammlung des Naturhistorischen Museums in Wien. Stand 31. Dezember 1995*. Selbstverlag Naturhistorisches Museum Wien, Vienna, Austria. 137 pp.
- GRISMER, L. 1988. The phylogeny, classification, and biogeography of eublepharid geckos (Reptilia: Squamata). Pages 367–469 in Estes, R., and G.K. Pregill, eds., *Phylogenetic Relationships of the Lizard Families: Essays Commemorating Charles L. Camp*. Stanford University Press, Stanford, California, USA. xvi + 632 pp.
- GUIBÉ, J. 1954. *Catalogue des Types de Lézards du Muséum National d'Histoire Naturelle*. Colas, Bayeux. 119 pp.
- GÜNTHER, A.C.L.G. 1864. *The Reptiles of British India*. The Ray Society, London, United Kingdom. xxvii + 452 pp., 26 pls.
- GUMPRECHT, A., F. TILLACK, N.L. ORLOV, A. CAPTAIN, AND S. RYABOW. 2004. *Asian Pitvipers*. Geitje Books, Berlin, Germany. 368 pp.
- HASSINGER, J.D. 1968. Introduction to the mammal survey of the Street Expedition to Afghanistan. *Fieldiana: Zoology* 55:1–81.
- HELFFENBERGER, N. 2001. Phylogenetic relationship of Old World Ratsnakes based on visceral organ topography, osteology, and allozyme variation. *Russian Journal of Herpetology* (Supplement):1–56.
- JAN, G. 1857. *Cenni sul Museo Civico di Milano ed Indice Sistematico dei Rettili ed Anfibi Esposti nel Medesimo*. Luigi di Giacomo Pirola, Milano, Italy. 61 pp., 1 pl.
- JAN, G. 1863. *Elenco Sistematico degli Ofidi Descritti e Disegnati per l'Iconografia Generale*. A. Lombardi, Milano, Italy. 143 + iii pp.
- JAN, G. 1865. Prime line d'una fauna della Persia occidentale. Rettili. Pages 352–357 in De Filippi, F., *Note di un Viaggio in Persia nel 1862*. G. Daelli & C. Editori, Milano, Italy.
- KARIN, B.R., M. METALLINO, J.L. WEINELL, T.R. JACKMAN, AND A.M. BAUER. 2016. Resolving the higher-order phylogenetic relationships of the circumtropical *Mabuya* group (Squamata: Scincidae): An out-of-Asia diversification. *Molecular Phylogenetics and Evolution* 102:220–232.
- KATHRINER, A., M. O'SHEA, AND H. KAISER. 2014. Re-examination of *Hemidactylus tenkatei* van Lidth de Jeude, 1895: populations from Timor provide insight into the taxonomy of the *H. brookii* Gray, 1845 complex (Squamata: Gekkonidae). *Zootaxa* 3887(5):583–599.
- KHAN, M.S. 1985. Taxonomic notes on *Bungarus caeruleus* (Schneider) and *Bungarus sindanus* Boulenger. *The Snake* 17:71–78.
- KHAN, M.S. 2002. *A Guide to the Snakes of Pakistan*. Edition Chimaira, Frankfurt am Main, Germany. 265 pp.
- KRÁL, B. 1969. Notes on the herpetofauna of certain provinces of Afghanistan. *Zoologické Listy* 18:55–66.
- KREFT, H., AND W. JETZ. 2010. A framework for delineating biogeographical regions based on species distributions. *Journal of Biogeography* (Special Paper):1–25.
- KUCH, U. 2004. *Bungarus sindanus*, an addition to the venomous snake fauna of Afghanistan. *Herpetozoa* 16(3/4):171–173.
- KULLMANN, E. 1970. Die Tierwelt Ostafghanistans in ihren geographischen Beziehungen. *Freunde des Kö-*

- ner Zoo* 13:13–25.
- LAJMI, A., V.B. GIRI, AND K.P. KARANTH. 2016. Molecular data in conjunction with morphology help resolve the *Hemidactylus brookii* complex (Squamata: Gekkonidae). *Organisms, Diversity & Evolution*. Doi 10.1007/s13127-016-0271-9.
- LANTZ, L.A. 1918. Reptiles from the River Tajan (Transcaspia). *Proceedings of the Zoological Society of London* 1918(1–2):11–17.
- LANTZ, L.A. 1928. *Les Eremias de l'Asie Occidentale*. Musée de Géorgie, Tiflis [Tbilisi], Union of Soviet Socialist Republics [now Georgia].t (iv) + 136 + (1) pp., 3 pls. [reprint of two papers published in *Bulletin du Musée de Géorgie* 4(3):1–72, 3 pls., and 5(1):1–64].
- LEVITON, A.E. 1959. Report on a collection of reptiles from Afghanistan. *Proceedings of the California Academy of Sciences*, ser. 4, 29(12):445–463.
- LEVITON, A.E., AND S.C. ANDERSON. 1963. Third Contribution to the herpetology of Afghanistan. *Proceedings of the California Academy of Sciences*, ser. 4, 31(12):329–339.
- LEVITON, A.E., AND S.C. ANDERSON. 1970. The amphibians and reptiles of Afghanistan, A checklist and key to the Herpetofauna. *Proceedings of the California Academy of Sciences*, ser. 4, 38(10):163–206.
- LEVITON, A.E., AND S.C. ANDERSON. 2010. The herpetological literature for southwestern Asia. An indexed bibliography. *Occasional Papers of the California Academy of Sciences* 157. x + 622 pp.
- LEVITON, A.E., AND S.C. ANDERSON. 2012. The herpetological literature for southwestern Asia. An indexed bibliography. Supplement I. *Occasional Papers of the California Academy of Sciences* 160. x + 360 pp.
- LEVITON, A.E., AND S.C. ANDERSON. 2013. The herpetological literature for southwestern Asia. An indexed bibliography. Second edition. *Occasional Papers of the California Academy of Sciences* 161. x + 944 pp.
- MACEY, J.R., J.J. FONG, J.V. KUEHL, S. SHAFIEI, N.B. ANANJEVA, T.J. PAPENFUSS, AND J.L. BOORE. 2005. The complete mitochondrial genome of a gecko and the phylogenetic position of the Middle Eastern *Teratoscincus keyserlingii*. *Molecular Phylogenetics and Evolution* 36(1):188–193.
- MAHONY, S. 2011. Taxonomic revision of *Hemidactylus brookii* Gray: a re-examination of the type series and some Asian synonyms, and a discussion of the obscure species *Hemidactylus subtriedrus* Jerdon (Reptilia: Gekkonidae). *Zootaxa* 3042:37–67.
- MASROOR, R. 2012. *A Contribution to the Herpetology of Northern Pakistan: The Amphibians and Reptiles of Margalla Hills National Park and Surrounding Regions*. Society for the Study of Amphibians and Reptiles, Ithaca, New York, USA (in cooperation with Chimaira Buchhandelsgesellschaft mbH, Frankfurt am Main, Germany). 217 pp.
- MCDIARMID, R.W., J.A. CAMPBELL, AND T.A. TOURÉ. 1999. *Snake Species of the World. A Taxonomic and Geographic Reference*. Volume 1. The Herpetologists' League, Washington, DC, USA. xi + 511 pp.
- MERTENS, R. 1965. Bemerkungen über einige Eidechsen aus Afghanistan. *Senckenbergiana Biologica* 46(1):1–4.
- MERTENS, R. 1967. Die herpetologische Sektion des Natur-Museums und Forschungs-Institutes Senckenberg in Frankfurt a.M. nebst einem Verzeichnis ihrer Typen. *Senckenbergiana Biologica* 48(A):1–106.
- MERTENS, R., AND L. MÜLLER. 1928. Liste der Amphibien und Reptilien Europas. *Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft* 41(1):1–62.
- MEZHHERIN, S.V. 1992. A new species of green frogs *Rana terentievi* sp. nova (Amphibia, Ranidae) from South Tajikistan [in Ukrainian with English title provided]. *Dopovidi Akademii nauk Ukraïnskoï RSR. Seria B, Matematicheskije, Estestvennye, Tekhnicheskije Nauki* 5:150–153.
- MURRAY, J.A. 1884. *The Vertebrate Zoology of Sind: A Systematic Account, with Descriptions of All the Known Species of Mammals, Birds, and Reptiles Inhabiting the Province, Observations on Their Habits, &c.; Tables of Their Geographical Distribution in Persia, Beloochistan, and Afghanistan, Punjab, North-West Provinces, and the Peninsula of India Generally*. Richardson & Co., London, United Kingdom, and Education Society's Press, Bombay, India. xvi + 424 pp., 13 pls.
- MURRAY, J.A. 1892. *The Zoology of Beloochistan and Southern Afghanistan. (Reptiles and Batrachia)*. Education Society's Press, Bombay, India. 83 pp.
- NATIONAL GEOGRAPHIC SOCIETY. 2011. *National Geographic Atlas of the World*, ninth edition. Washington, D.C., USA. 137 [double pages] + 153 pp.

- NIKOLSKII, A.M. 1897. Reptiles, amphibiens et poissons, recueillis par Mr. N. Zaroudny dans la Perse orientale. *Annuaire du Musée Zoologique de l'Académie Impériale des Sciences de St.-Petersbourg* 2(3):306–348, pls. XVII–XIX [in Russian with descriptions in Latin].
- NIKOLSKII, A.M. 1905. Herpetologia rossica. *Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg, Phys.-Math. Classe*, St. Pétersbourg, 17(1):(1–2) + i–ii + 1–517 + (1), pls. I–II.
- NIKOLSKII, A.M. 1916. *Fauna Rossij i Sopredelnykh Stran. Presmykajuszcizjasja*. Tom II. *Ophidia* [Faune de la Russie et des Pays Limitrophes. Reptiles (Reptilia). Vol. II. *Ophidia*]. Tipografija Imperatorskoj Akademii Nauk, Petrograd [St. Petersburg], Russia. III + 349 + (1) pp., 8 pls. [in Russian]. [English translation 1963 by Kochva, L., and E. Kochva, *Fauna of Russia and Adjacent Countries, Reptiles*, Volume II. *Ophidia*, Israel Program for Scientific Translation, Jerusalem, Israel. vi + 257 pp.].
- NILSON, G. 1983. A new subspecies of the Asiatic pit viper *Agkistrodon halys* Pallas, 1776 (Serpentes, Viperidae) from Afghanistan. *Bonner Zoologische Beiträge* 34(4):469–476.
- OLSON, D.M., E. DINERSTEIN, E.D. WIKRAMANAYAKE, N.D. BURGESS, G.V.N. POWELL, E.C. UNDERWOOD, J.A. D'AMICO, I. ITOUA, H.E. STRAND, J.C. MORRISON, C.J. LOUCKS, T.F. ALLNUTT, T.H. RICKETTS, Y. KURA, J.F. LAMOREUX, W.W. WETTENGEL, P. HEDAO, AND K.R. KASSEM. 2001. Terrestrial eco-regions of the world: A new map of life on Earth. *BioScience* 51(11):933–937.
- ORLOV, N.L., AND A.V. BARABANOV. 2000 “1999”. Analysis of nomenclature, classification, and distribution of the *Agkistrodon halys* — *Agkistrodon intermedius* complexes: a critical review. *Russian Journal of Herpetology* 6(3):167–192.
- PALLAS, P.S. 1776. *Reise durch verschiedene Provinzen des Rußischen Reichs. Dritter Theil, vom Jahr 1772, und 1773. Reise aus Sibirien zurück bis an die Wolga im 1773sten Jahr*. Des dritten Theils zweytes Buch. - Kayserliche Academie der Wissenschaften, St. Petersburg, Russia. pp. 455–760, (1–26), Tab. I–VIII, Tab. A–Z, Tab. Aa–Nn, 1 map.
- PERRY, G. 2012. On the appropriate names for snakes usually identified as *Coluber rhodorachis* (Jan, 1865) or why ecologists should approach the forest of taxonomy with great care. *IRCF Reptiles & Amphibians* 19(2):90–100.
- PETERS, W.C.H. 1863. Bemerkungen über verschiedene Batrachier, namentlich über die Original-exemplare der von Schneider und Wiegmann beschriebenen Arten des zoologischen Museums zu Berlin. *Monatsberichte der Königlichen Preussische Akademie des Wissenschaften zu Berlin* 1863:76–82.
- PISANETS, E.M. 2001. *A Catalogue of the Type-specimens in the Zoological Museum, National Museum Natural History, Ukrainian Academy of Sciences. Volume 1. Monogenoidea, trematoda, Cestoda, Nematoda, Hirudinea, Arachnida, Crustacea, Gastropoda, Insecta, Chondrichthyes, Actinopterygii, Amphibia, Reptilia, Mammalia* [In Ukrainian]. Published by the Museum, National Academy of Sciences of Ukraine, Kiev, Ukraine. 137 pp.
- PISARSKI, B. 1967. Fourmis (Hymenoptera: Formicidae) d'Afghanistan récoltées par M. Dr. K. Lindberg. *Annales Zoologici* (Warszawa) 24:375–425.
- PYRON, A., F.T. BURBRINK, AND J.J. WIENS. 2013. A phylogeny and revised classification of Squamata, including 4161 species of lizards and snakes. *BMC Evolutionary Biology* 13:1–53.
- RASTEGAR-POUYANI, N. 2005. A multivariate analysis of geographic variation in the *Trapehus agilis* complex (Sauria: Agamidae). *Amphibia-Reptilia* 26(2):159–173
- RASTEGAR-POUYANI, N., H.G. KAMI, M. RAJABZADEH, S. SHAFIEI, AND S.C. ANDERSON. 2008. Annotated checklist of Amphibians and Reptiles of Iran. *Iranian Journal of Animal Biosystematics* 4:43–66.
- RUSSELL, P. 1796. *An Account of Indian Serpents, Collected on the Coast of Coromandel; Containing Descriptions and Drawings of Each Species; Together with Experiments and Remarks on Their Several Poisons*. George Nicol, London, United Kingdom. viii + 91 pp., 46 pls.
- SALVADOR, A. 1982. A revision of the lizards of the genus *Acanthodactylus* (Sauria: Lacertidae). *Bonner zoologische Monographien* (16):1–167.
- SAYER, J.A., AND A.P.M. VAN DER ZON. 1981. Afghanistan: *National Parks and Wildlife Management. A Contribution to a Conservation Strategy*. Volume I. Technical Report FO:DP/AFG/78/007. UNDP, FAO, Rome, Italy. ix + 107 pp.
- SCALI, S. 1995 “1994”. Sezione di zoologia dei vertebrati. Pages 248–292 in Leonardi, M., A. Quaroni,

- F. Rigato, and S. Scali, eds., Le Collezioni del Museo Civico di Storia Naturale di Milano. *Atti della Società italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano* 135:3–296.
- SCALI, S. 2010. Storia e importanza scientifica della collezione erpetologica del Museo Civico di Storia Naturale di Milano/ History and scientific importance of the herpetology collection of the Museo Civico di Storia Naturale of Milan. Pages 69–77 in Mazzotti, S., ed., *Le Collezioni Erpetologiche dei Musei Italiani, Censimento e Analisi delle Collezioni di Anfibi e Rettili per la loro Valorizzazione Scientifica/The Herpetological Collections of Italian Museums, Census and Analysis of the Amphibian and Reptile Collections for their Scientific Development. Museologia Scientifica Memorie* Numero 5.
- SCHÄTTI, B., AND A. AGASIAN. 1985. Ein neues Konzept für den *Coluber ravergeri*-*C. nummifer*-Komplex (Reptilia, Serpentes, Colubridae). *Zoologische Abhandlungen, Staatliches Museum für Tierkunde Dresden*, 40(9):109–123.
- SCHÄTTI, B., I. INEICH, AND C. KUCHARZEWSKI. 2010. Nominal taxa of *Spalerosophis diadema* (Schlegel, 1837) from Iraq to Pakistan — two centuries of confusion (Reptilia: Squamata: Colubrinae). *Revue Suisse de Zoologie* 117(4):637–664.
- SCHÄTTI, B., C. KUCHARZEWSKI, R. MASROOR, AND E. RASTEGAR-POUYANI. 2012. *Platyceps karelini* (Brandt, 1838) from Iran to Pakistan and revalidation of *Coluber chesneii* Martin, 1838 (Reptilia: Squamata: Colubrinae). *Revue Suisse de Zoologie* 119(4):441–483.
- SCHÄTTI, B., AND A. STUTZ. 2005. Morphology and systematic status of *Coluber karelini mintonorum* Mertens, 1969 (Reptilia: Squamata Colubrinae). *Revue Suisse de Zoologie* 112(2):409–420.
- SCHÄTTI, B., F. TILLACK, AND N. HELFENBERGER. 2009. A contribution to *Spalerosophis microlepis* Jan 1865, with a short review of the genus and a key to the species (Squamata: Serpentes: Colubridae). *Herpetozoa* 22(3/4):115–135.
- SCHÄTTI, B., F. TILLACK, AND C. KUCHARZEWSKI. 2014. *Platyceps rhodorachis* (Jan, 1863) — a study of the racer genus *Platyceps* Blyth, 1860 east of the Tigris (Reptilia: Squamata: Colubridae). *Vertebrate Zoology* 64(3):297–405.
- SCLATER, W.L. 1891. *List of Snakes in the Indian Museum*. Baptist Mission Press [Trustees of the Indian Museum], Calcutta, India. x + 79 pp.
- SCHMIDT, K.P. 1955. Amphibians and reptiles from Iran. *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i Kjøbenhavn* 117:193–207.
- SCHNEIDER, P., AND A.S. DJALAL. 1970. Erstnachweis einer Weichschildkröte, *Trionyx gangeticus* Cuvier, 1825, in Afghanistan. *Bonner Zoologische Beiträge* 21:269–273.
- SEMENOV, D.V., AND G.I. SHENBROT. 1990. Phrynocephalidae of the USSR fauna. Description of a new subspecies [*sic*] with remarks on the taxonomic status of *Phrynocephalus mystaceus* (Reptilia, Agamidae). *Zoologicheskyy Zhurnal* 69(5):76–81. [in Russian with English summary].
- SHAMMAKOV, S. 1989. *Reptiles of the Plains of Turkmenistan*. D.sc. thesis. Turkmen State University, Ashkabad, Union of Soviet Socialist Republics [now Turkmenistan]. 21 pp. [in Russian].
- SINDACO, R., AND V.K. JEREMČENKO. 2008. *The Reptiles of the Western Palearctic. 1. Annotated Checklist and Distributional Atlas of the Turtles, Crocodiles, Amphisbaenians and Lizards of Europe, North Africa, Middle East and Central Asia*. Edizioni Belvedere, Latina, Italy. 579 pp.
- SINDACO, R., A. VENCHI, AND C. GRIECO. 2013. *The Reptiles of the Western Palearctic. 2. Annotated Checklist and Distributional Atlas of the Snakes of Europe, North Africa, Middle East and Central Asia, with an Update to the Vol. 1*. Edizioni Belvedere, Latina, Italy. 543 pp., 342 col. photos., 184 col. distribution maps. (N.B. Update to Vol. 1, pp. 503–533.)
- ŠMÍD, J., J. MORAVEC, P. KODYM, L. KRATOCHVÍL, S.S.H. YOUSEFKHNAI, E. RASTEGAR-POUYANI, AND D. FRYNTA. 2014. Annotated checklist and distribution of the lizards of Iran. *Zootaxa* 3855:1–97.
- SMITH, M.A. 1935. *The Fauna of British India, Including Ceylon and Burma. Reptilia and Amphibia*. Vol. II. *Sauria*. Secretary of State for India in Council, London, United Kingdom. xiii + 440 pp., 1 folding map, 1 pl.
- SMITH, M.A. 1940. Contributions to the herpetology of Afghanistan. *Annals and Magazine of Natural History*, ser. 11, 5:382–384.
- SMITH, M.A. 1943. *The Fauna of British India, Ceylon and Burma, Including the Whole of the Indo-Chinese*

- Sub-region. Reptila and Amphibia*. Vol. III. *Serpentes*. Secretary of State for India in Council, London, United Kingdom. xii + 583 pp.
- STENZ, E. 1946. *The Climate of Afghanistan, Its Aridity, Dryness and Divisions*. Polish Institute of Arts and Sciences in America, New York, USA. 14 pp.
- STIMSON, A.F. 1969. Liste der rezenten Amphibien und Reptilien. Boidae (Boinae + Bolyceiinae + Loxoceminae + Pythonidae). *Das Tierreich* 89:I–XI + 1–49 pp.
- STÖCK, M., D. FRYNTA, W.-R. GROSSE, C. STEINLEIN, AND M. SCHMID. 2001. A review of the distribution of diploid, triploid and tetraploid Green Toads (*Bufo viridis* complex) in Asia including new data from Pakistan. *Asiatic Herpetological Research* 9:77–100.
- STRAUCH, A. 1873. Die Schlangen des Russischen Reichs in systematischer und zoogeographischer Beziehung. *Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg*, sér. 7, 21(4):(1–2) + 1–287 + (1), pls. I–VI.
- STRESEMANN, E. 1951. Date of publication of Pallas's 'Zoogeographia Rosso-Asiatica.' *The Ibis* 93:316–318.
- STUART, S.N., M. HOFFMANN, J. CHANSON, N. COX, R. BERRIDGE, P. RAMANI, AND B. YOUNG, EDs. 2008. *Threatened Amphibians of the World*. [Barcelona, Spain; International Union for the Conservation of Nature, Gland, Switzerland; Conservation International, Arlington, Virginia, U.S.A.]: Lynx Editions.
- STULL, O.G. 1935. A checklist of the Family Boidae. *Proceedings of the Boston Society of Natural History* 40:387–408.
- SZCZERBAK, N.N. 1974. *Yashchurki palearktiki [Palearctic Desert Lizards]*. Naukova Dumka, Kiev, Union of Soviet Socialist Republics [now Ukraine]. 296 pp., 26 pp. pls.
- SZCZERBAK, N.N. 2003. *Guide to the Reptiles of the Eastern Palearctic*. Krieger Publishing Company,, Malabar, Florida, USA. xv + 260 pp.
- SZCZERBAK, N.N., AND M.L. GOLUBEV. 1986. *The Gekkonid Fauna of the U.S.S.R. and Adjacent Countries*. Naukova Dumka, Kiev, Union of Soviet Socialist Republics [now Ukraine]. 232 pp., 8 pp. pls. [in Russian].
- SZCZERBAK, N.N., AND M.L. GOLUBEV. (1996): *Gecko Fauna of the USSR and Contiguous Regions*. Society for the Study of Amphibians and Reptiles, Ithaca, NY, 233 pp., 8 pp. pls. [translation from Russian].
- TAYLOR, E.H. 1935. A taxonomic study of the cosmopolitan scincoid lizards of the genus *Eumeces*, with an account of the distribution and relationships of its species. *The University of Kansas Science Bulletin* 23: 1–643.
- TERENT'EV, P.V., AND S.A. CHERNOV. 1949. *Opredelitel Presmykatushchikhysya i Zemnovodnykh*. [Encyclopedia of Reptiles and Amphibians. Sovetskaya Nauka, Moscow, Union of Soviet Socialist Republics [now Russia]. 340 pp. [in Russian].
- TIEDEMANN, F., AND M. HÄUPL. 1980. *Kataloge der wissenschaftlichen Sammlungen des Naturhistorischen Museums in Wien, 4 (Vertebrata 2). Typenkatalog der Herpetologischen Sammlung*. Teil II: Reptilia. Selbstverlag Naturhistorisches Museum Wien, Vienna, Austria. 80 pp.
- TIEDEMANN, F., M. HÄUPL, AND H. GRILLITSCH. 1994. *Kataloge der wissenschaftlichen Sammlungen des Naturhistorischen Museums in Wien, 10 (Vertebrata 4). Katalog der Typen der Herpetologischen Sammlung nach dem Stand vom 1. Jänner 1994*. Teil II: Reptilia. Selbstverlag Naturhistorisches Museum Wien, Vienna, Austria. 102 pp.
- UÉNO, S.-I., AND K. NAKAMURA, K. 1966. The anurans collected by the Kyoto University Pamir-Hindukush Expedition 1960. Page 327 in Kitamura, S., and R. Yosii, eds., *Results of the Kyoto University Scientific Expedition to the Karakorum and Hindukush, 1955*, Vol. VIII, *Additional Reports*. Kyoto University, Kyoto, Japan.
- UETZ P., AND J. HOŠEK. 2016. The Reptile Database. 2016. Database accessible at: <http://www.reptile-database.org>.
- UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP). 2003. *Post-conflict Environmental Assessment: Afghanistan*. UNEP, Geneva, Switzerland. 176 pp.
- UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP). 2008. *Biodiversity Profile of Afghanistan. An Output of the National Capacity Needs Self-Assessment for Global Environment Management (NCSA) for Afghanistan*. UNEP, Kabul, Afghanistan. 57 pp.

- VEDMEDERYA, V. O. ZINENKO, AND A. BARABANOV 2009. An annotated type catalogue of amphibians and reptiles in the Museum of Nature at V. N. Karazin Kharkiv National University (Kharkiv, Ukraine). *Russian Journal of Herpetology* 16(3):203–212.
- WAGNER, P. 2014a. Landcover and Natural Landscapes II: Natural Landscapes. Pages 35–37 In Dittmann, A., ed., *National Atlas of Afghanistan*. Scientia Bonnensis, Bonn, Germany.
- WAGNER, P. 2014b. Ecoregions. Pages 37–39 in Dittmann, A., ed., *National Atlas of Afghanistan*. Scientia Bonnensis, Bonn, Germany.
- WAGNER, P., AND A. DITTMANN. 2014. Medical use of *Gekko gecko* (Linnaeus, 1758) has an impact on agamid lizards. *Salamandra* 50:185–186.
- WALLACH, V., K.L. WILLIAMS, AND J. BOUNDY. 2014. *Snakes of the World: A Catalogue of Living and Extinct Species*. CRC Press, Boca Raton, Florida, USA. 1450 pp.
- WERNER, F. 1938. Reptilien aus Iran und Belutschistan. *Zoologischer Anzeiger* 121(9–10):265–271.
- WETTSTEIN, O. 1960. Lacertilia aus Afghanistan. Contribution à l'étude de la faune d'Afghanistan 3. *Zoologischer Anzeiger* 165(1/2):58–63.
- WILMS, T.M., W. BÖHME, ET AL. (2009). On the phylogeny and taxonomy of the genus *Uromastyx* Merrem, 1820 (Reptilia: Squamata: Agamidae: Uromastycinae) — resurrection of the genus *Saara* Gray, 1845. *Bonner zoologische Beiträge* 56(1/2):55–99.
- ZHAO, E., AND K. ADLER. 1993. *Herpetology of China*. Society for the Study of Amphibians and Reptiles, Oxford, Ohio, USA. 522 pp., 48 pls., 1 foldout map.

PLATES 1-14

**Distribution maps showing plots of known locality occurrences for
the amphibians and reptiles in Afghanistan**

Plate 1: (1) *Bufo oblongus*, (2) *B. pseudoraddei baturae*, (3) *B. turanensis*, (4) *B. zugmayeri*, (5) *Duttaphrynus stomaticus*, (6) *Chrysopaa sternosignata*, (7) *Euphlyctis cyanophlyctis*, (8) *Hoplobatrachus tigerinus*

Plate 2: (1) *Pelophylax terentievi*, (2) *Afghanodon mustersi*, (3) *Calotes versicolor farooqi*, (4) *Laudakia agorensis*, (5) *L. m. melanura*, (6) *L. n. nupta*, (7) *L. nuristanica*, (8) *L. tuberculata*

Plate 3: (1) *Paralaudakia badakhshana*, (2) *P. caucasia*, (3) *P. erythrogaster*, (4) *P. himalayana*, (5) *P. lehmanni*, (6) *P. microlepis*, (7) *Phrynocephalus clarkorum*, (8) *P. euptilopus*

Plate 4: (1) *Phrynocephalus interscapularis sogdianus*, (2) *P. luteoguttatus*, (3) *P. m. maculatus*, (4) *P. mystaceus galli*, (5) *P. o. ornatus*, (6) *P. raddei*, (7) *P. scutellatus*, (8) *Saara asmusi*

Plate 5: (1) *Saara hardwickii*, (2) *Trapelus a. agilis*, (3) *T. megalonyx*, (4) *T. s. sanguinolentus*, (5) *Pseudopus a. apodus*, (6) *Eublepharis afghanicus*, (7) *Agamura persica*, (8) *Altiphylax levitoni*

Plate 6: (1) *Bunopus tuberculatus*, (2) *Crossobamon e. eversmanni*, (3) *Cyrtopodion scabrum*, (4) *C. watsoni*, (5) *Hemidactylus brookii*, (6) *H. flaviviridis*, (7) *Tenuidactylus caspius*, (8) *T. turcmenicus*

Plate 7: (1) *Tenuidactylus voraginosus*, (2) *Teratoscincus bedriagai*, (3) *T. keyserlingii*, (4) *T. microlepis*, (5) *T. scincus*, (6) *Acanthodactylus blanfordi*, (7) *A. c. cantoris*, (8) *Eremias acutirostris*

Plate 8: (1) *Eremias afghanistanica*, (2) *E. aria*, (3) *E. fasciata*, (4) *E. grammica*, (5) *E. intermedia*, (6) *E. lineolata*, (7) *E. nigrocellata*, (8) *E. persica*

Plate 9: (1) *Eremias regeli*, (2) *E. velox*, (3) *Mesalina watsonana*, (4) *Ophisops jerdonii*, (5) *Ablepharus grayanus*, (6) *A. lindbergi*, (7) *A. pannonicus*, (8) *A. himalayanus*

Plate 10: (1) *Eumeces blythianus*, (2) *E. schneiderii zarudnyi*, (3) *Eurylepis t. parthianicus*, (4) *Eutropis dissimilis*, (5) *Ophiomorus tridactylus*, (6) *Trachylepis setpentaeniata*, (7) *Varanus b. bengalensis*, (8) *V. griseus caspius*

Plate 11: (1) *Eryx elegans*, (2) *E. johnii persicus*, (3) *E. t. tataricus*, (4) *Boiga trigonata melanocephala*, (5) *Eirenis aff. persicus*, (6) *Elaphe dione*, (7) *Hemorrhhois ravergieri*, (8) *Lytorhynchus maynardi*

Plate 12: (1) *Lytorhynchus ridgewayi*, (2) *Natrix tessellata*, (3) *Oligodon arnensis*, (4) *O. t. taeniolatus*, (5) *Platyceps k. karelini*, (6) *P. rhodorachis*, (7) *Ptyas mucosa nigriceps*, (8) *Spalerosophis diadema schirazianus*

Plate 13: (1) *Telescopus rhinopoma*, (2) *Xenochrophis piscator*, (3) *Bungarus sindanus*, (4) *Naja oxiana*, (5) *Psammophis leithii*, (6) *P. lineolatus*, (7) *P. schokari*, (8) *Myriopholis blanfordii*

Plate 14: (1) *Xerotyphlops vermicularis*, (2) *Echis carinatus sochureki*, (3) *Eristicophis macmahoni*, (4) *Gloydus halys boehmei*, (5) *G. halys caucasicus*, (6) *Macrovipera lebetina*, (7) *Testudo h. horsfieldii*, (8) *Nilssonsonia gangetica*

Plate 1

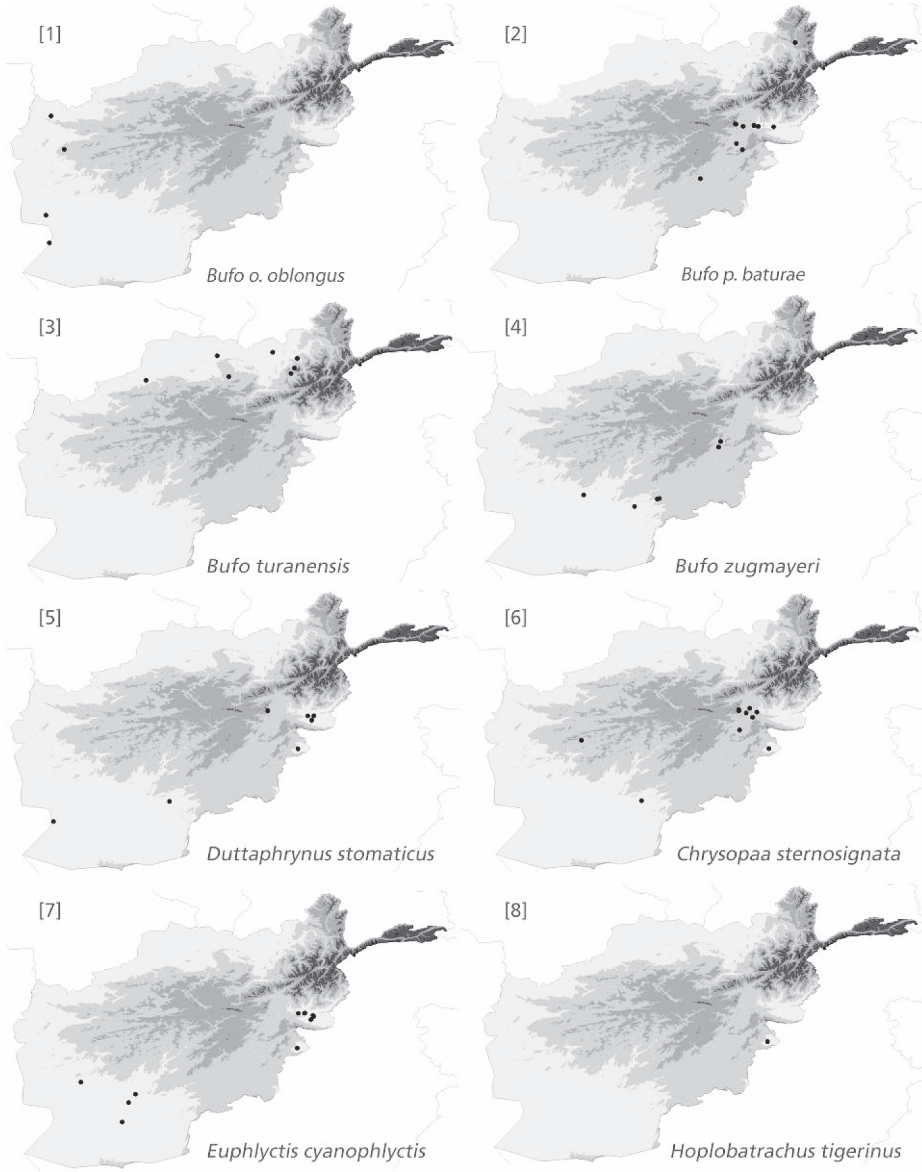


Plate 2

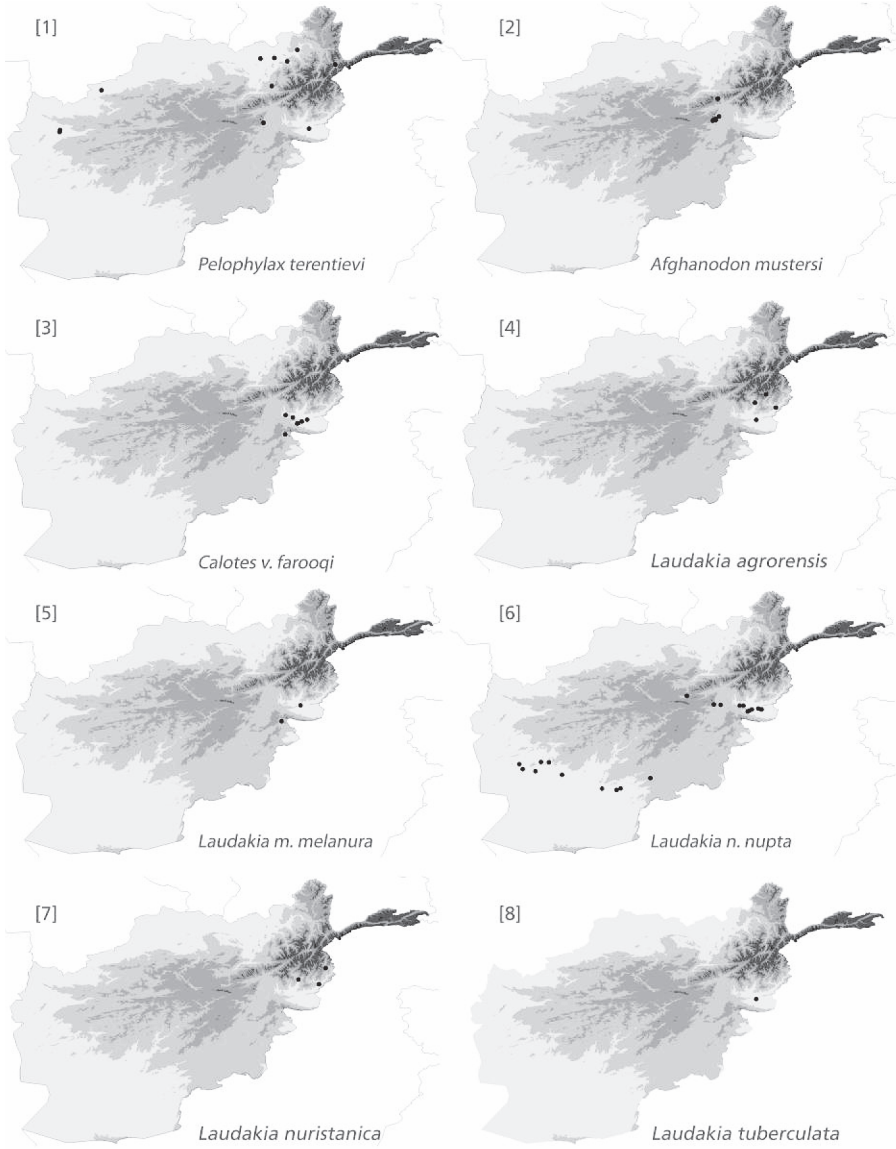


Plate 3

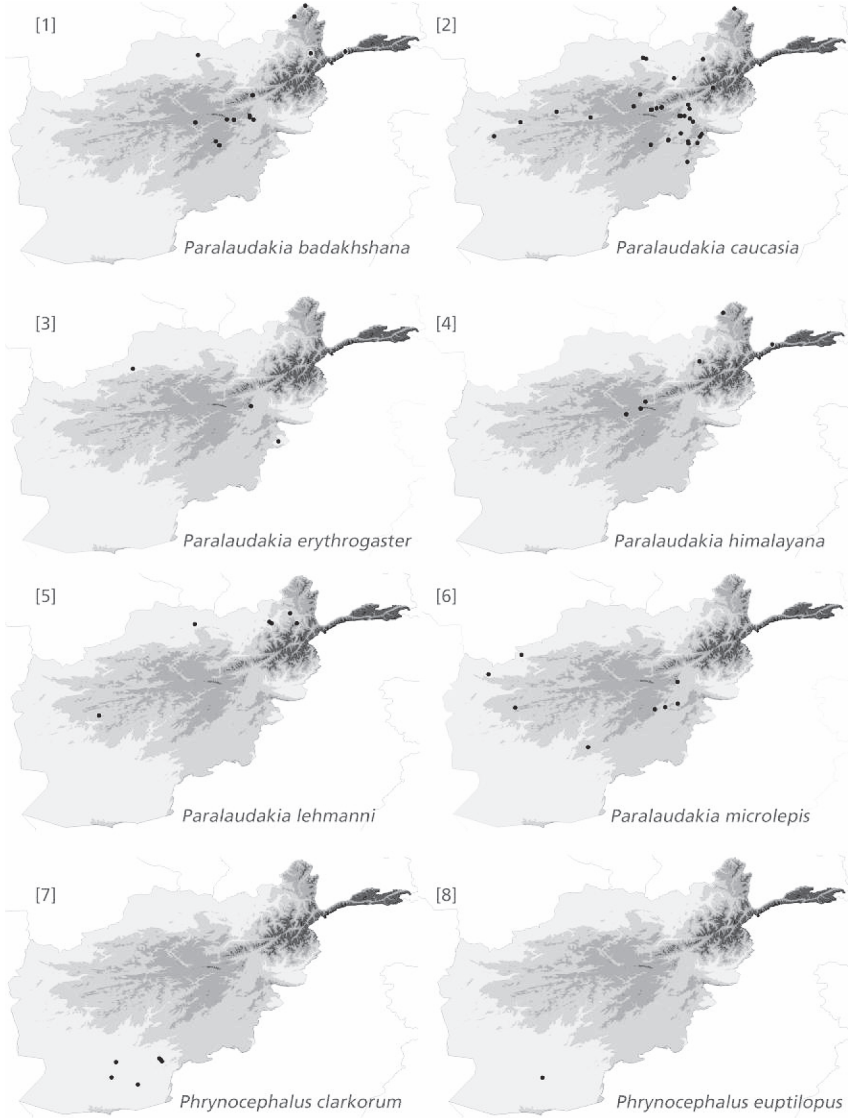


Plate 4

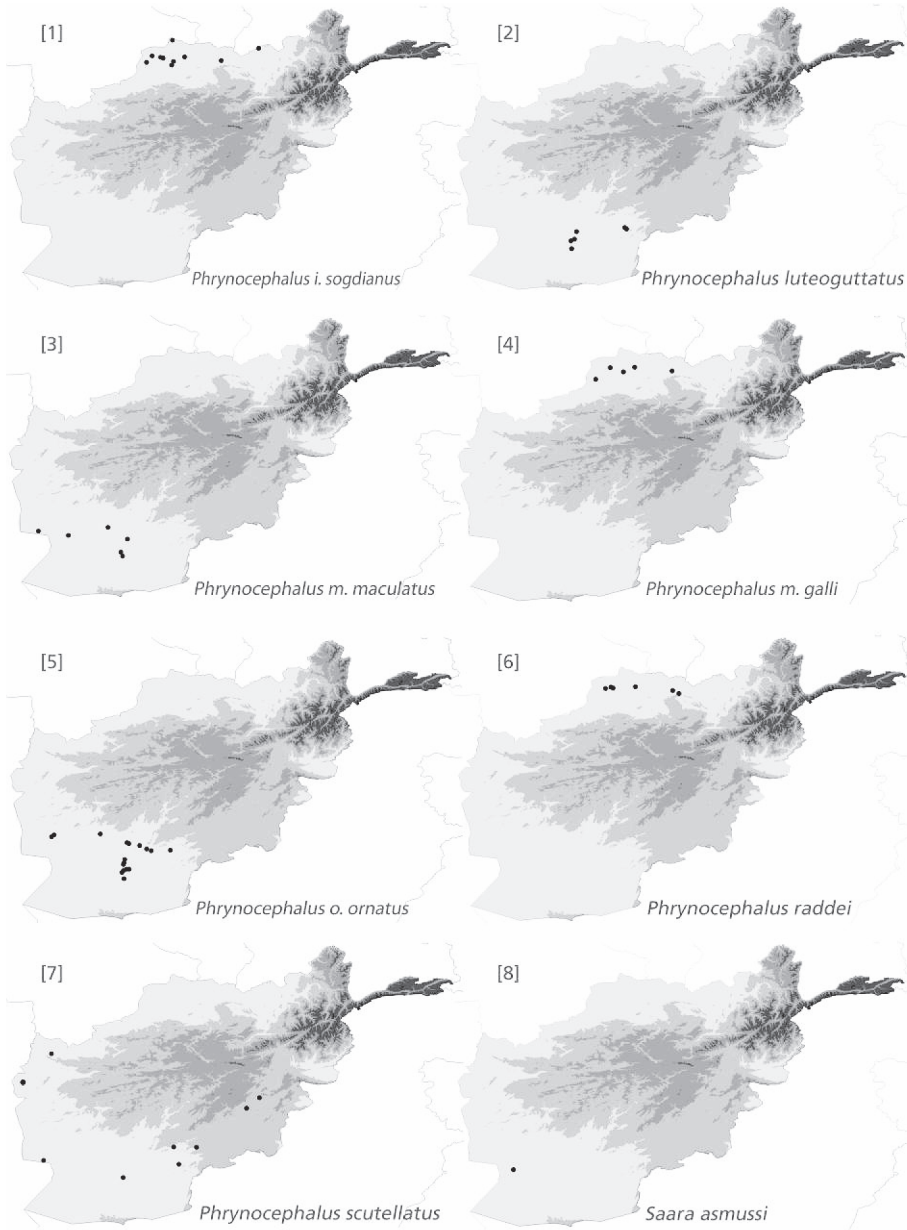


Plate 5

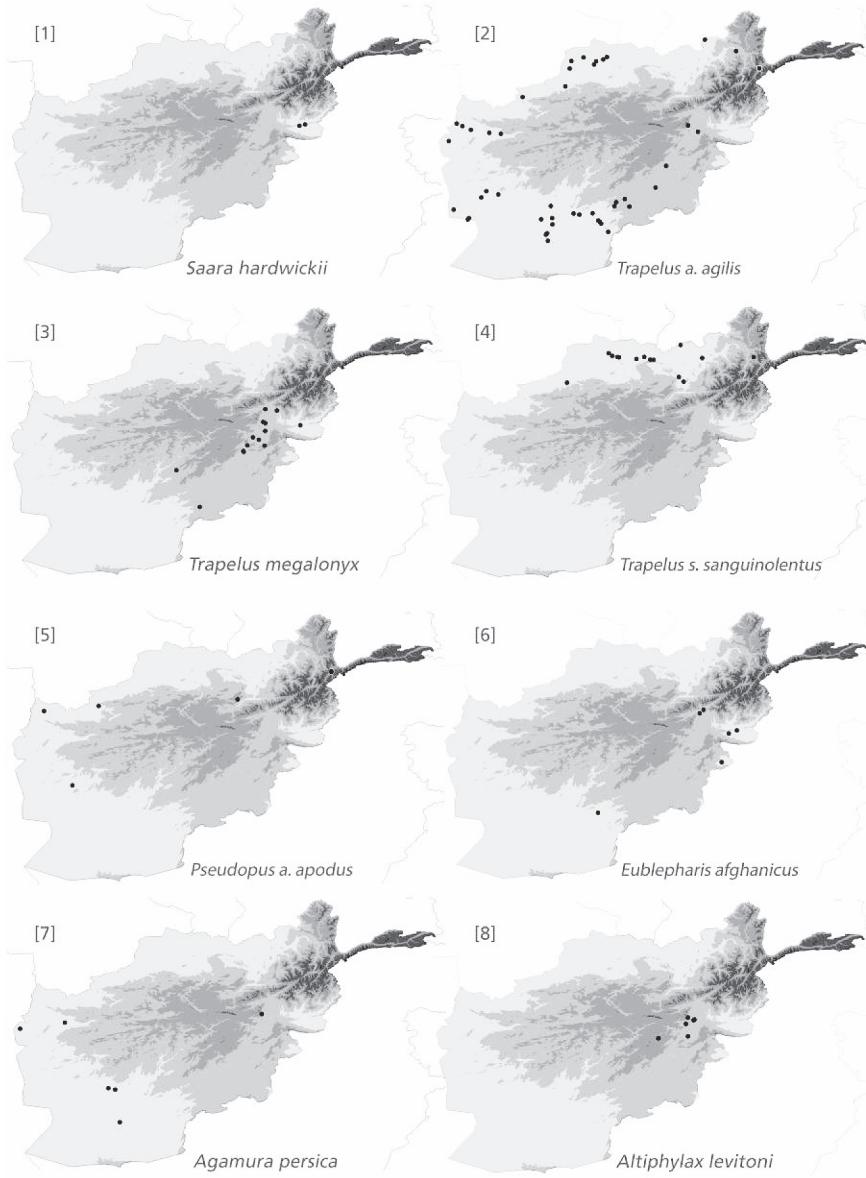


Plate 6

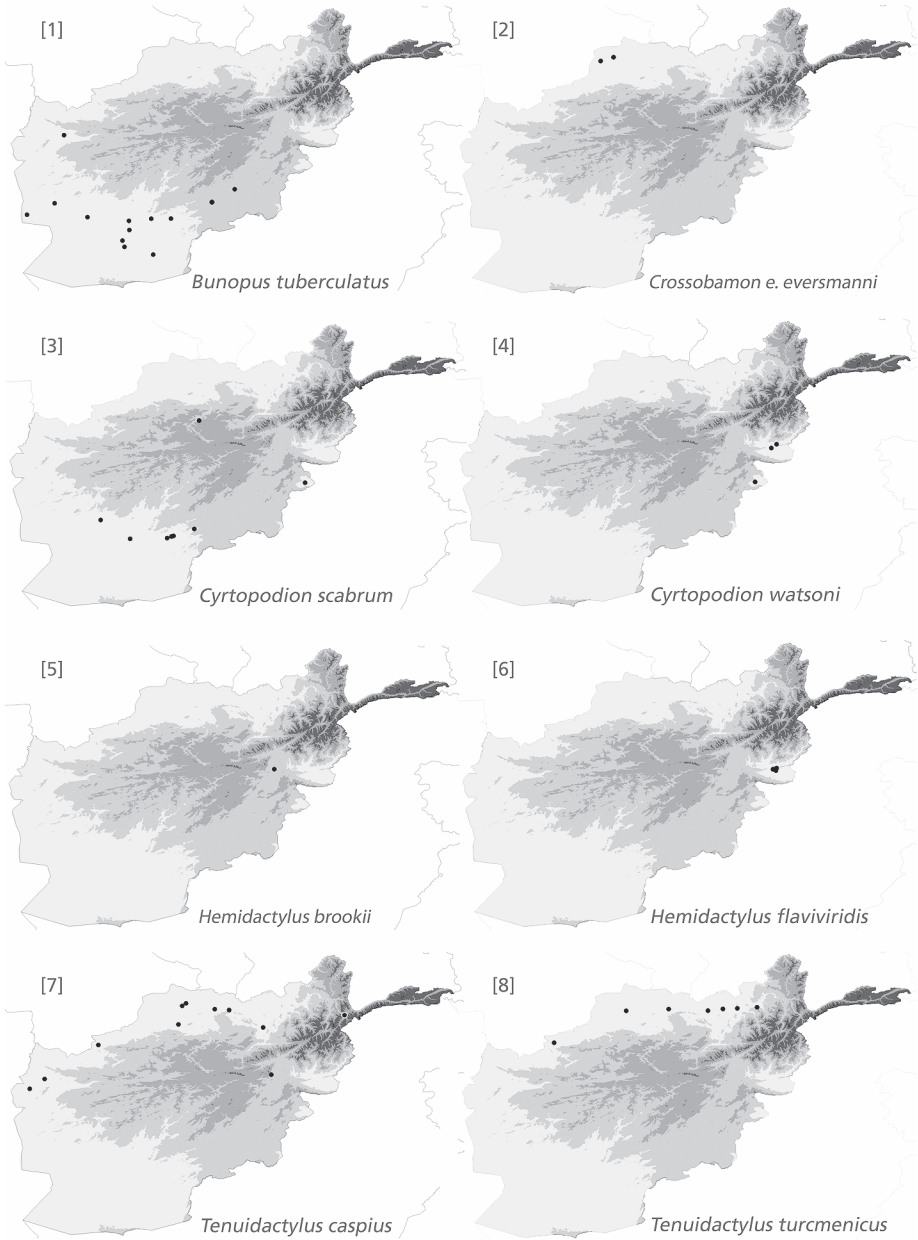


Plate 7

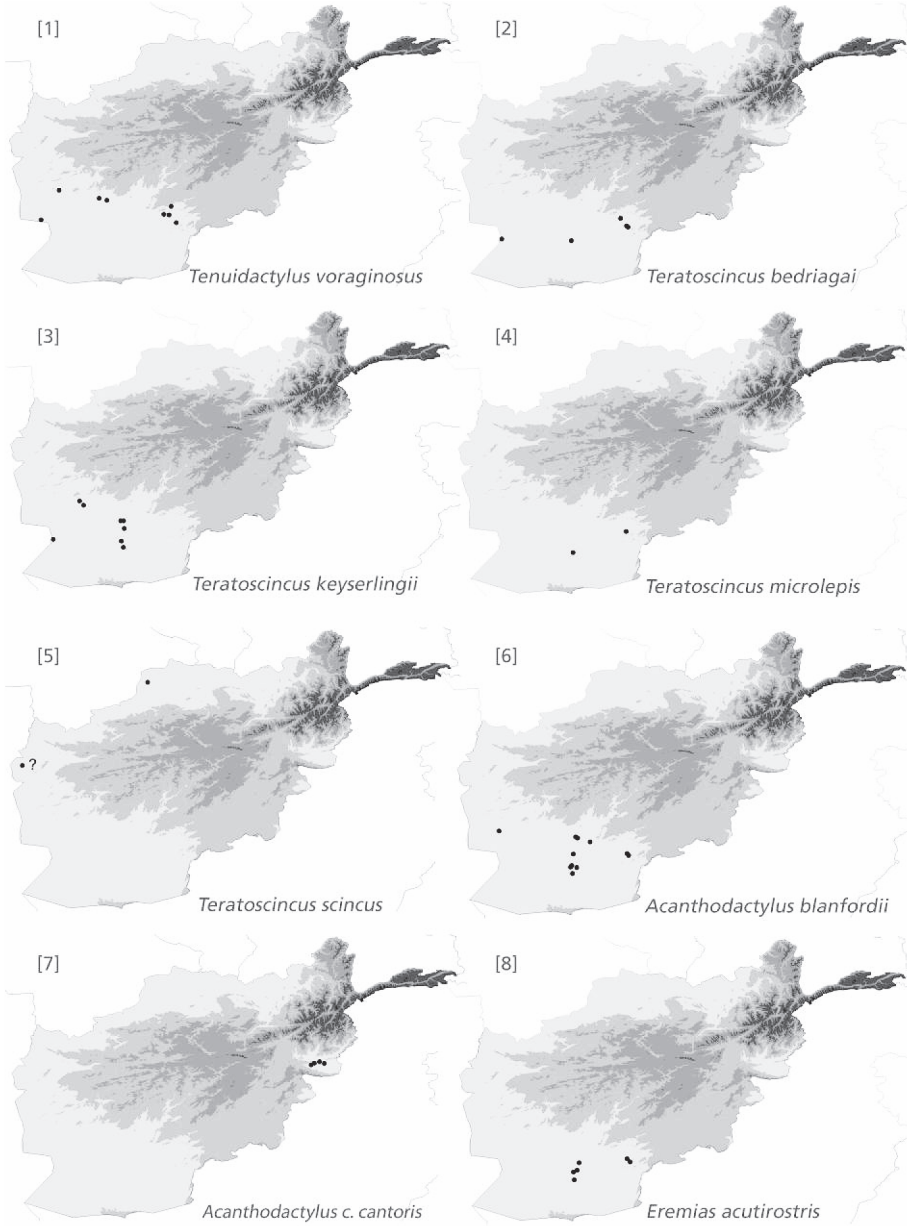


Plate 8

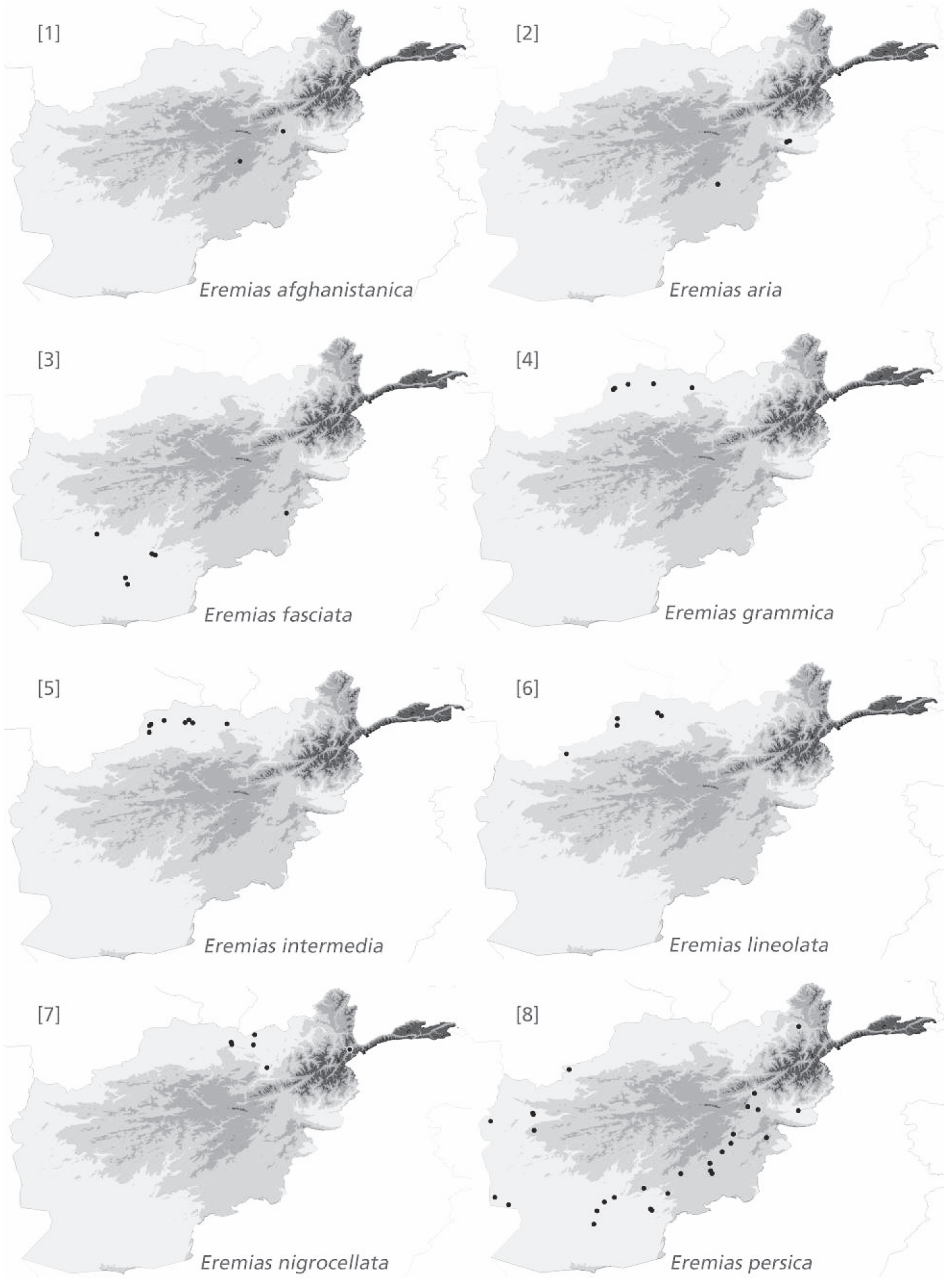


Plate 9

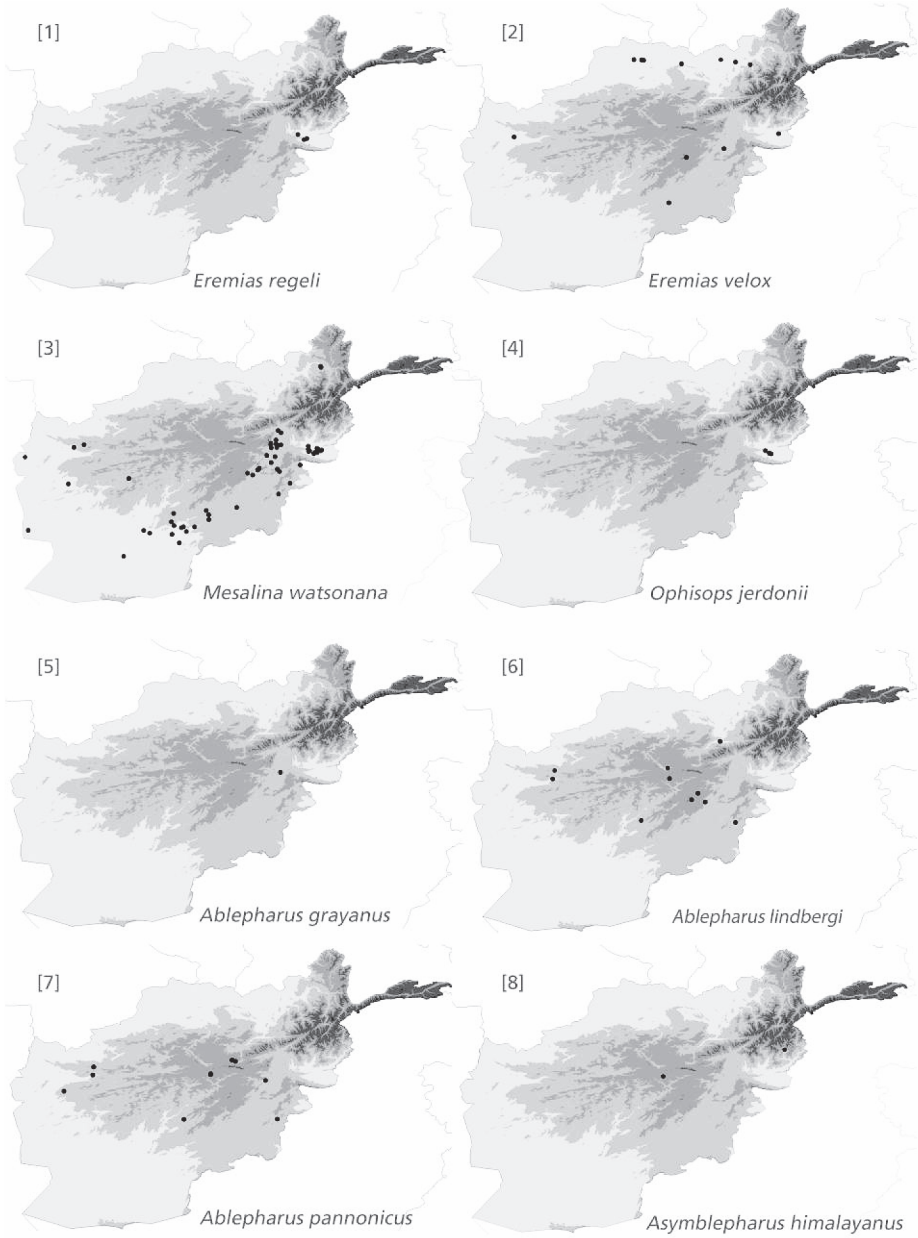


Plate 10

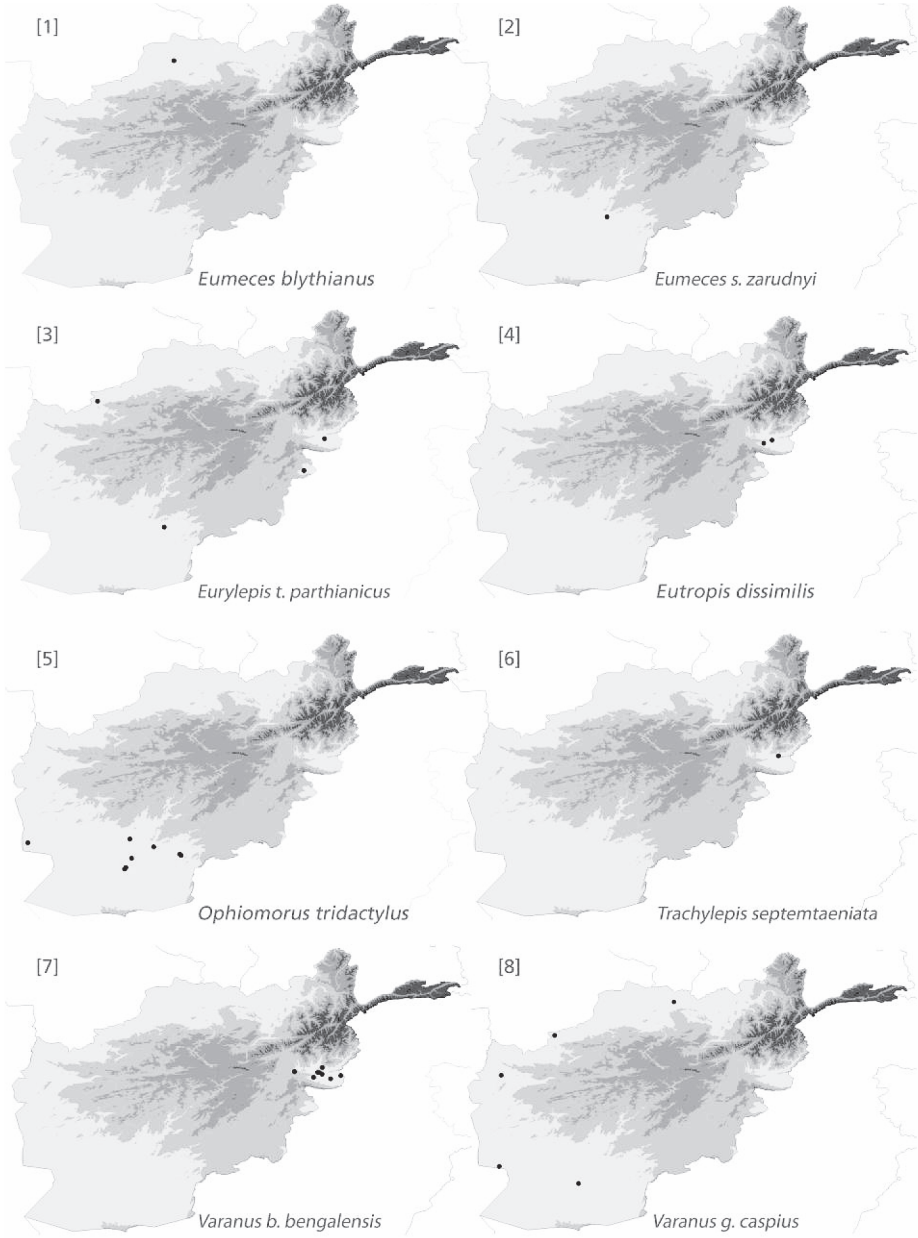


Plate 11

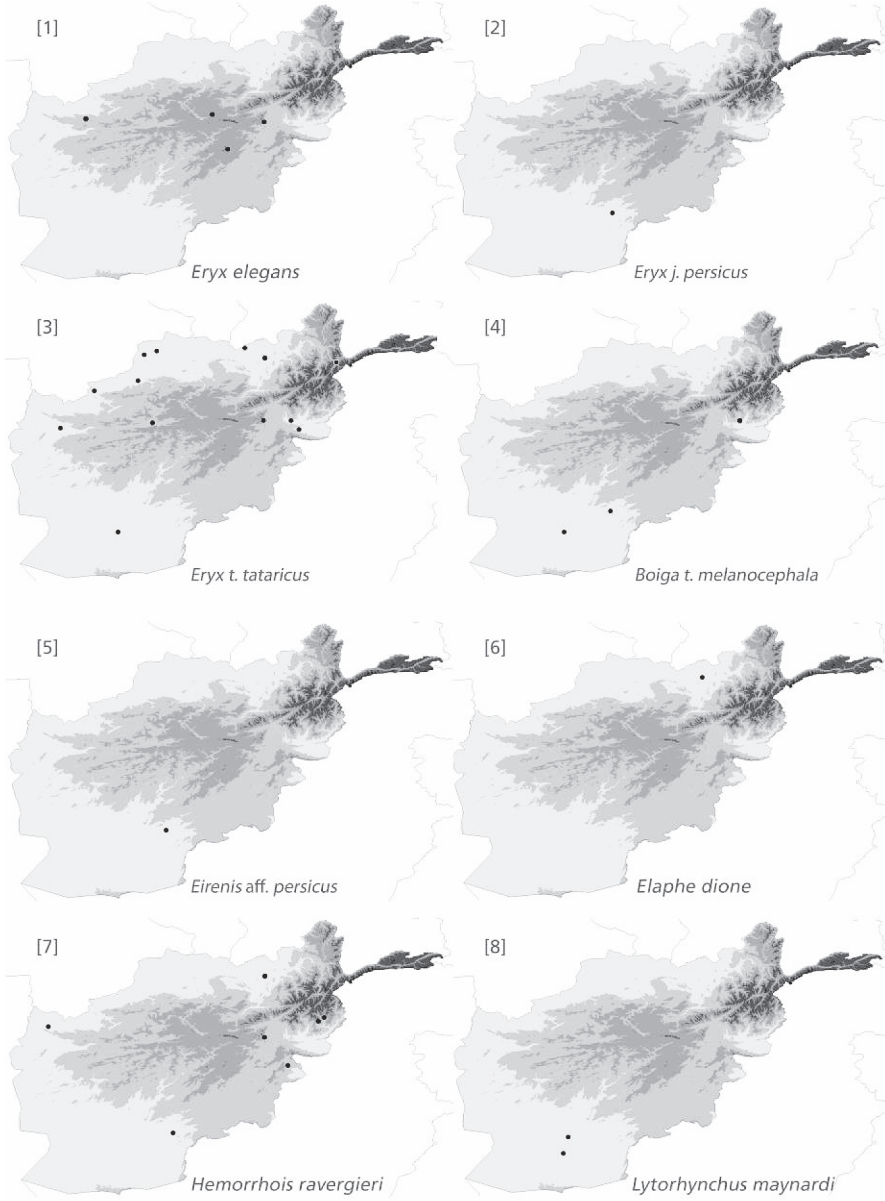


Plate 12

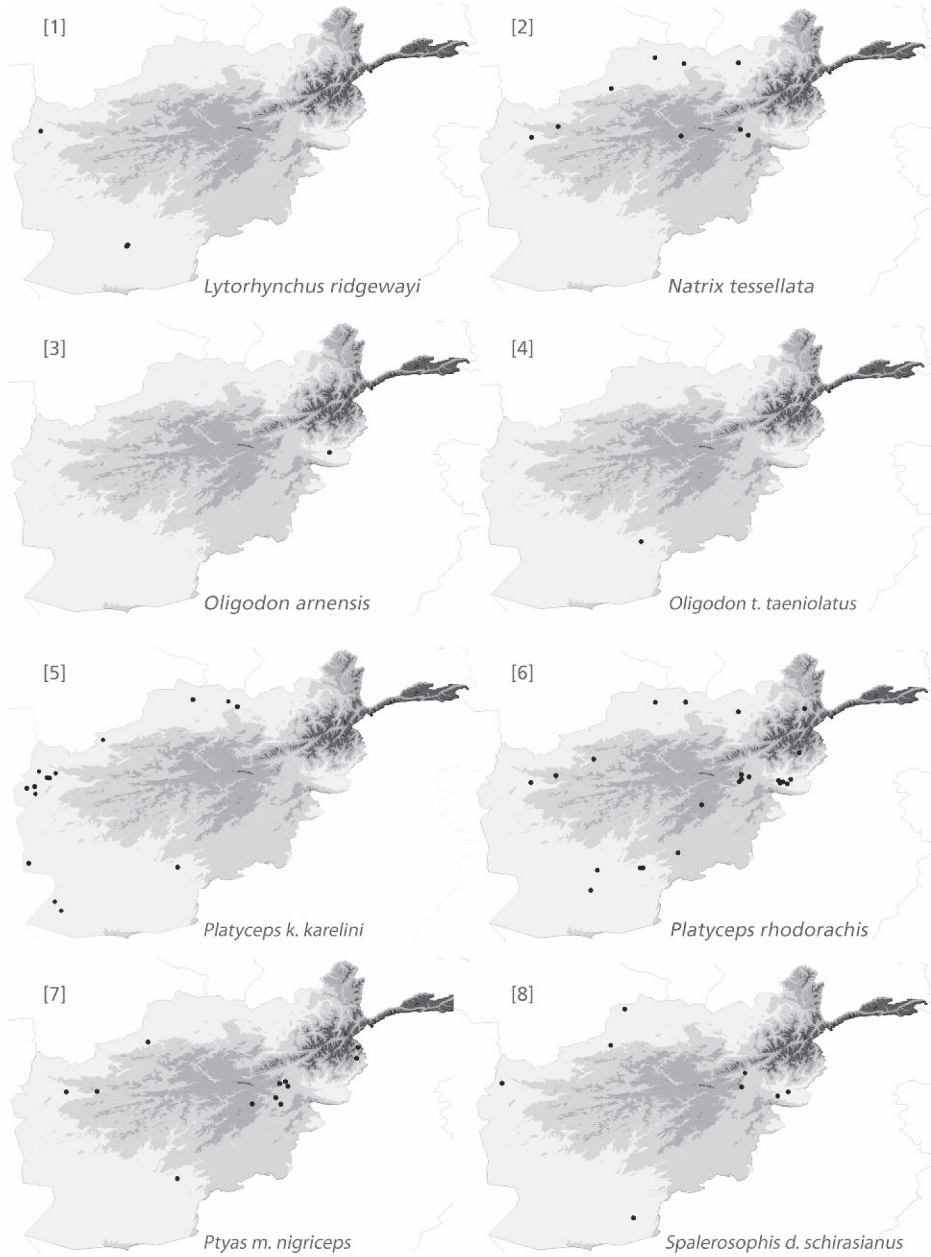


Plate 13

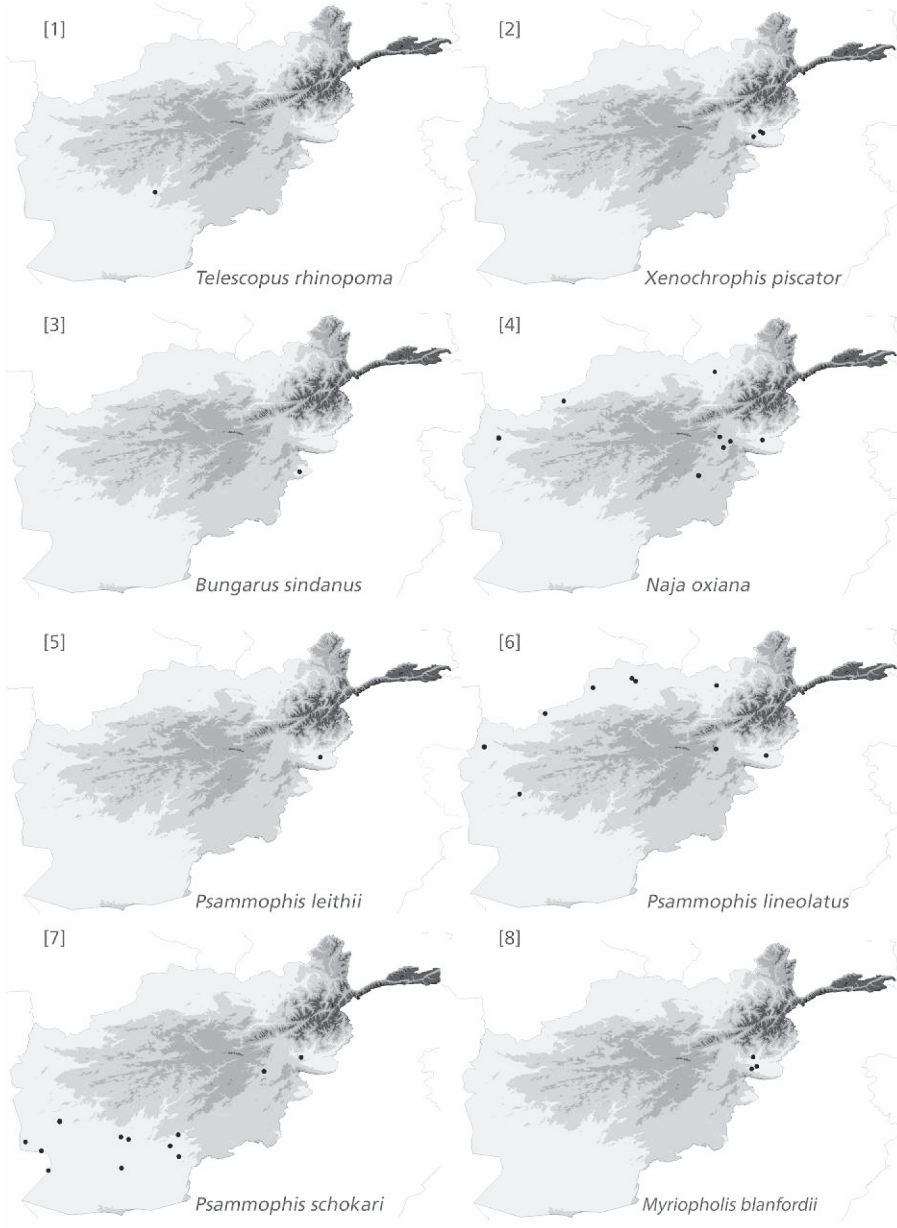
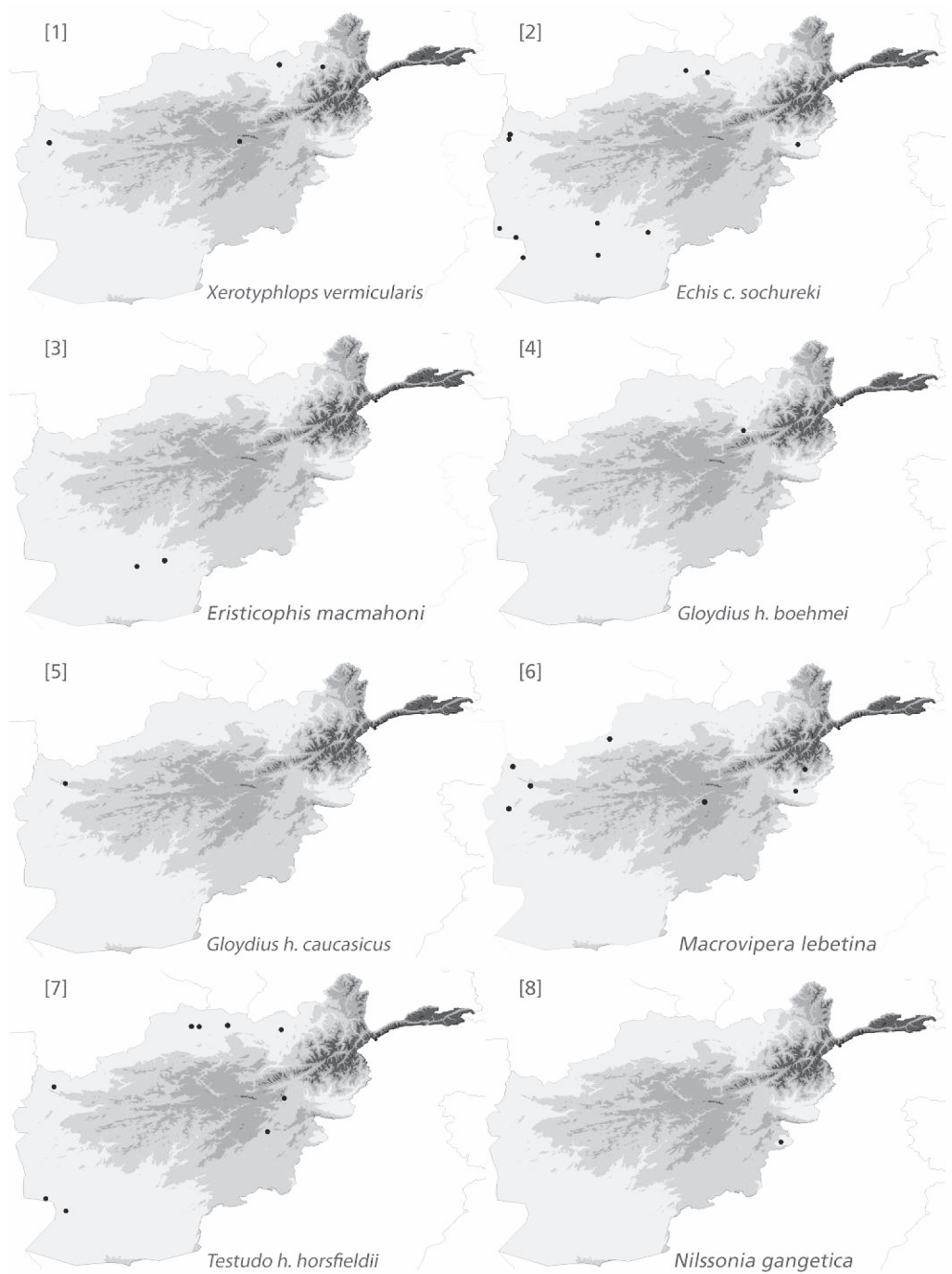


Plate 14



APPENDIX 1

Gazetteer of georeferenced localities. Coordinates presented as decimal degrees.

Assembled from several sources but principally using Google Earth, as well as internal Afghanistan reports.

Locality	Lat	Long	Locality	Lat	Long
Ab-i-Istada [Ghazni Prov., 2000 m]	32.501655	67.832966	Bamian	34.817468	67.817173
Ag Chah [=Aqcha, Mazar-i-Sharif Prov.]	36.91147	66.182785	Bamian (on rd to Saigon), along Kunduz River	34.84424	67.996902
Ag Chah settlement [=Aqcha]	36.91147	66.182785	Bamiyan Hotel, Bamiyan, 1-8km E	34.820004	67.872105
Agtsha [?=Aqcha]	36.91147	66.182785	Band-e-Amir [Bamyan Prov.]	34.83945	67.232866
Ajar Valley	35.367496	67.484837	Band-e-Kadjaki [=Band-e-Kajak]	35.368895	66.593399
Ajdaha, near Bamiyan	34.859454	67.711372	Baqrabad	31.753861	60.999985
Alikhel [=Ali Kheyli]	33.9392	69.7006	Baraki Barak	33.966712	68.949451
Amu-Darya swamps, nr. Darquad	37.000359	68.310013	Baraki Barak, 10 km W	33.966712	68.949451
Amu-Darya, N of Kunduz	37.000359	68.310013	Bataghan [=Kataghan area]	35.813359	69.229431
Anahoy Desert [=Andkhoy]	37.077093	65.224914	between Herat and Islam Qala	34.452218	61.582947
Andarab	35.600509	68.683577	Between Sheberghan and Andkhoy	36.870832	65.464325
Andkhoy	36.945502	65.120544	Bisut area [=Behsud]	34.449954	70.499754
Andkhoy, 10 km SE	36.85545	65.222855	Bokan	35.677379	63.582916
Andkhoy, 20 km S	36.778492	64.983673	Bost, vic. Lashkargah [Helmand Prov., 1000 m]	31.553963	64.365921
Andkhoy, 20 km SE	36.778492	64.983673	Bozgholot, 21 km N of Ghazni	33.749464	68.526764
Andkhoy, 20-32 km S	36.736683	64.936981	btw. Aqtchah and Andkhoy	36.760891	65.818176
Andkhoy, 20-50 km S	36.736683	64.936981	btw. Aqtscha [=Aqcha] and Anakhoi [=Andkhoy]	36.760891	65.818176
Andkhoy, 20-50 km S, E of river	36.736683	64.936981	btw. Bamian and Panjao	34.613996	67.529983
Andkhoy, 32-50 km S	36.522881	64.928284	btw. Chuagat und Dukot [?=Darqad]	37.498831	69.500828
Andkhoy, 40-50 km S	36.522881	64.928284	btw. Ghazni and Dasht-e-Nawar	33.513919	68.570251
Andkhoy, 45 km S	36.602299	64.906311	btw. Ghazni and Mukur	33.174342	68.147278
Andkhoy, 50 km S	36.522881	64.928284	btw. Gornails and Bokan, NE of Bala Morhab	33.975823	68.049889
Anhoy [=Andkhoy], 25 km E	36.870832	65.478058	btw. Kunduz and Tashqurghan	36.670622	68.378448
Aqcha, 24 km SE	36.808185	66.368179	btw. Nushki and Helmand	30.448674	65.123291
Aqcha, 24 km SW	36.826875	66.068802	btw. Kabul & Sarobi, nr rd, 30 mi E of Kabul	34.587997	69.718323
Aqcha, 25 km SW	36.826875	66.057816	Cave Khadjah	31.644029	65.5305
Aqtscha [?=Aqcha]	36.912019	66.185045	Cawkae dada, Ski Club Hill	34.455474	68.945889
Armalik [=Armālik]	34.553225	62.827792	Chacharan, 1/2 hr E on Shina River	34.545025	65.697784
Ashab Kahf [=Ālfi Khwājāh]	35.72798	63.867445	Cha-i-Angir	30.906938	64.120788
Badakshan	36.747688	70.805053	Chakansur [= Chakhansur], 10 mi. SE	31.087046	62.150803
Bagram, nr. Tsharikar	34.944488	69.271088	Chamchir ghar (Pandjvai), 25 km SO of Kandahar	31.377089	65.931244
Bala Murghab [=Balamorgab]	35.612651	63.323364	Char-e-Kar [=Charikar]	35.012986	69.169207
Bala Murhab [= Bala Murgab], 2 km N	35.582222	63.331318	Chinkilok	34.516653	61.866656
Balk[h]	36.750576	66.897955	Cia-i-Baloch [= Robat-i-Shah Baloch]	34.125448	60.900878

Locality	Lat	Long	Locality	Lat	Long
Cia-i-Dudi [= Kuh-e Chah Dudi], mountains near	34.101571	61.134567	estuary of the Farah-ruds River	31.512996	61.433716
Cia-i-Lagun	34.168636	60.834618	expiration of the Farah-ruds River	31.512996	61.433716
Dar-e-Nur, vic. Shewrak	34.55577	70.607357	Faisabad	37.112146	70.559235
Darweshan [=Darweshan], 1/2 hr S	30.826781	64.126739	Faizabad, 64 mi by rd E	36.787291	71.069641
Dargh-e-Nedjrab bei Nedjrab [?=Nejrab]	34.964748	69.567947	Farah, 20 km E	32.301063	62.308502
Darrahe Pain Stream, 3 mi N Paghman	34.62685	68.95	Farah, 20 km from	32.505129	62.121277
Darrah-e-Andarab, vic. of Bani	33.422272	63.662567	Farah, 20 mi E	32.266233	62.514496
Darreh-Darang [=Dêrê Dirang]	33.889797	69.896679	Farah, 30 km S	32.166313	61.937714
Daruishan, 12 km SE	31.0116667	64.2783333	Farah, 35 km S	32.126779	61.899261
Daruishan, 12 km SE	31.0116667	64.2783333	Farah-ruds Udlot	32.379961	62.108002
Darulman, vic. of Kabul	34.674441	69.094963	Farakhlum near Garandewal	34.467222	68.132715
Darunta near Jalalabad	34.483531	70.350001	Foothills 10 km NW of Sharisafa [?=Shahr-e Safa]	31.886887	66.510773
Darunta, 20 km WNW Jalalabad	34.483531	70.350001	Gardez	33.599322	69.224653
Darweshan, 10 km N of	31.324314	64.212112	Geresk Basic Health Center	31.823679	64.563975
Darweshan, 10-20 km NE	31.422804	64.49089	Ghaomi-Faringi, approx. 20 mi S Mukur	32.583849	67.784729
Darweshan, 32 km S	30.972899	64.173431	Ghazni	33.551696	68.430862
Darweshan, 35 km S	30.954058	64.162445	Ghazni, 10 km S	33.445193	68.42514
Darweshan, 50 km S	30.694612	64.109802	Ghazni, 15 km N	33.731193	68.499527
Darweshan, 56 km S and 10 km E	30.704058	64.186706	Ghazni, 20 km W	33.620337	68.167191
Dashit-e-Nawar	33.690067	67.743988	Ghazni, 20 mi N	33.708347	68.491058
Dasht, btw. Kunduz and Khulm	36.679433	68.274078	Ghazni, 20km W	33.611188	68.189163
Dasht-e Leila, nr. Seberghan	36.639223	65.758553	Ghazni, 21 km N	33.701666	68.495
Dasht-e-Margo, 70 km NE of Zarandj	31.377089	62.412414	Ghazni, 30 km S	33.234093	68.189163
Dasht-e-Nawur	33.690067	67.743988	Ghazni, 31 km N by Kabul Rd.	33.7816667	68.5583333
Delaram, 16 km NW	32.282489	63.216476	Ghazni, Qa-la-Baqaul [2300 m]	33.551696	68.430862
Delaram, 40 km NW	32.539867	63.214874	Ghirishk, 40 mi W	32.170963	63.41217
Delaram, 65 km NW	32.549128	62.937469	Girishk, 10-18 km E	31.840233	64.349213
Delaram, Farah Rod [river]	32.154687	63.371658	Girishk, 15 km W	31.746854	64.758453
Dibaram [?=Dilaram], 60km Seranj	32.161663	63.415375	Girishk, 18 km E	31.840233	64.349213
Dilaram [=Delaram]	32.161663	63.415375	Girishk, 20 mi E	31.875225	64.288788
Dilaram [=Delaram], 48 km W	32.224419	62.745209	Girishk, 22 km S	31.604271	64.445343
Djabir Ansar	34.705493	69.103088	Girishk, 30 km E	31.660395	64.975433
Djaouz, Kouhqorogh [=Kouhiquorogh]	34.546156	69.265251	Girishk, 35 mi downstream	30.906938	64.120788
Doab	34.447689	70.701599	Girishk, 50 km E of	31.583215	65.25238
Egnen af Kabul	34.388779	69.266968	Girishk, 50 km W	32.063956	63.725281
Either	31.716778	64.749784	Girishk, 55 km W	32.105843	63.664856
Eskhsham Wakhan [=Ishkamish], 12 mi E	36.312912	69.652862	Hadda	34.309413	70.391922

Locality	Lat	Long	Locality	Lat	Long
Harad [=Herat?]	34.347971	62.209167	Jalalabad, 3 km SE	34.411442	70.48233
Hari Rud, under Malan Bridge, nr Herat	34.28713	62.191154	Jalalabad, 3 km SSE	34.420505	70.463104
Hassan Guilan [=Hassan Gilan]	32.017392	63.96698	Jalalabad, 30 km SE (by air)	34.2916667	70.4483333
Helmand	31.428663	63.960571	Jalalabad, 30 km SW	34.368378	70.259857
Helmand River, Chah-i-Angir	30.906938	64.120788	Jalalabad, 30 km W	34.434098	70.243378
Herat	34.347971	62.209167	Jalalabad, 35 km SW	34.261757	70.339508
Herat area	34.347971	62.209167	Jalalabad, 35-45 km W	34.400111	70.158234
Herat to Islam Qala	34.452218	61.582947	Jalalabad, 40 km SW	34.311681	70.128021
Herat to Islam Qala	34.452218	61.582947	Jalalabad, 40 km W	34.415973	70.111542
Herat town	34.347971	62.209167	Jalalabad, 45 km W	34.504293	69.957733
Herat, 130 km S	33.26625	62.312622	Jalalabad, 45-15 km W	34.504293	69.957733
Herat, 30-70 km E	34.318487	62.59964	Jalalabad, 8 km ESE	34.377446	70.595169
Herat, 30-70 km NE	34.463542	62.49527	Jalalabad, 80 km E	34.388779	71.042175
Herat, 40 km S	33.856732	62.228851	Jalalabad, bridge across Kabul River	34.469203	70.556202
Herat, 45 km W	34.436363	61.657562	Jalalabad, University ground	34.435231	70.442734
Herat, 72 km S	33.847608	62.236633	Jawzan, Seberghan [Sheberghan]	36.66236	65.748253
Hirat [=Herat], 50 km N	34.876918	62.148743	Juwain	31.723495	61.630096
Imam Sahib, nr. Amu-Darya [Kundus Prov.]	37.457418	65.78247	Juwain [=Lash-e Joveyn], 45 km N of	32.063956	61.822357
Ishkamish, 19 km E	36.142311	69.540253	Kabul	34.53145	69.169464
Islam Qala, 20 km SE	34.577822	61.299362	Kabul at Puli Churkhi suburb, 67 km E	34.5033333	69.8283333
Jalabad, 10 mi W	34.504293	70.158462	Kabul Seh Carte	34.53145	69.169464
Jalalabad	34.435231	70.442734	Kabul Sharinau	34.53145	69.169464
Jalalabad (Spinlar Hotel)	34.4366667	70.4483333	Kabul to Lataband	34.53145	69.169464
Jalalabad to Kaga [=Kazhah]	34.310547	70.390549	Kabul, 10 mi E	34.53145	69.663849
Jalalabad to Nimla [=Memlah]	34.387646	70.265579	Kabul, 15 km SW on rd to Kandahar	34.377446	68.853607
Jalalabad, 10 km E direction to Somarkhel	34.470335	70.544357	Kabul, 20 km NW	34.714525	69.070587
Jalalabad, 10 km ENE	34.470335	70.544357	Kabul, 30 km S	34.161818	69.074936
Jalalabad, 10 km ESE in the direction to Sarsahi	34.470335	70.544357	Kabul, 30 mi E, btwn Kabul & Sarobi	34.513346	69.551239
Jalalabad, 12 km ESE direction to Sarsahi	34.349105	70.567703	Kabul, 35 km S on rd to Kandahar	34.200445	68.804169
Jalalabad, 18 km W by Kabul Rd.	34.4933333	70.3	Kabul, 36 km S on rd to Kandahar	34.198173	68.801422
Jalalabad, 19.2 km N	34.642247	70.444107	Kabul, 40 km SW on rd to Kandahar	34.166363	68.790436
Jalalabad, 2 km SE	34.40691	70.475693	Kabul, 70 km S	33.765449	69.147491
Jalalabad, 20 km ESE	34.283319	70.716019	Kabul, 70-80 km S	33.765449	69.147491
Jalalabad, 20 km SW	34.294665	70.374069	Kabul, 71 km SSW by Kandahar Rd.	34.0516667	68.7483333
Jalalabad, 20 mi. towards Kabul	34.511083	70.174255	Kabul, 80 km S	33.671783	69.216156
Jalalabad, 25 km SE (by air)	34.3983333	70.4666667	Kabul, Chairkana [1740 m]	34.53145	69.169464
Jalalabad, 25 km SW	34.347971	70.204925	Kabul, Koh-el-Tschel Zetun	34.53145	69.169464

Locality	Lat	Long	Locality	Lat	Long
Kabul, Logar Valley, 10km S of Kabul	34.264026	69.1642	Khurd-Kabul [=Khur Kābul] [Kabul prov., 1900 m]	34.386513	69.385128
Kabul, on road to Paghman	34.534844	69.037285	Kilki	33.999996	61.416677
Kamdesht	35.409864	71.338667	Kishm (Keshem), near Dara-i-kur	36.807086	70.106049
Kandahar	31.625321	65.70282	Kotal, Zarni	33.008663	66.091919
Kandahar, 107 km ENE	31.985	66.7316667	Kotal-e-Khair-Khana	34.57291	69.102477
Kandahar, 15 km SSW by Panjuai Rd.	31.5766667	65.5633333	Kotal-e-Unai [=Kōtal-e Ūnay]	34.452643	68.376067
Kandahar, 20 mi SE	31.341909	65.94223	Kotgai [=Kowtgay], nr. Safed-Koh	33.656352	69.73011
Kandahar, 3 km SE	31.6466667	65.765	Kouh-Akhour near Farah	32.430977	62.104797
Kandahar, 30 km S	31.419288	65.917511	Kouh-Bachio [Kouh-Bachtou near Farah]	32.472695	62.187195
Kandahar, 32 km N	31.905541	65.766449	Kundus R. NE Dashi-Doab n. of Kabul	34.852129	69.262848
Kandahar, 35 mi NW	31.896214	66.515808	Kunduz	36.725402	68.860531
Kandahar, 36-56 km N	32.031363	65.684051	Kunduz, 6 1/2 mi SE of, village of Bolla Quchi	36.726778	68.858814
Kandahar, 40 km N	32.031363	65.684051	Kurd Kabul Dam	34.386513	69.385128
Kandahar, 40 km SE	31.283245	65.986175	Kurd Kabul Dam, 1 mi N	34.386513	69.385128
Kandahar, 40 km W of	31.601931	65.126037	Kurd Kabul Dam, 4 mi tw. Buthak [=Butkhak]	34.496654	69.279385
Kandahar, 48 km SE	31.339563	65.955505	Laghman [Laghman Prov., 1000 m]	34.694203	70.147247
Kandahar, 56 km N	32.305706	65.752258	Laman, SE of Qalah [Kal Qal'ah]	32.639375	62.532348
Kandahar, 64 km W	31.662733	64.950256	Lashkar Gar, 50 km SSW	31.165	64.17
Kandahar, 65 km W by Herat Rd.	31.6066667	65.0766667	Lashkar Gar, 50 km SSW	31.165	64.17
Kandahar, 80 km W	31.751525	64.779968	Lashkaragah [Dashtimargo], 40 mi W	31.634676	63.707886
Kandahar, 81 km W by Herat Rd.	31.6716667	64.925	Lashkargah	31.550453	64.329529
Kara Bagh [=Karabagh]	34.939985	61.797638	Lashkargah (Dashtimargo), 10 mi W	31.576196	64.096756
Karam-Kol	34.59906	69.84128	Lashkargah, 12 km S	31.470839	64.332962
Kargha stream, nr Kabul	34.633208	68.926391	Lashkargah, 32 km NW	31.914868	64.099274
Kars	31.571389	65.729722	Lashkargah, 35 km NW	31.998759	64.049835
Kart-e-Tshahar [Kabul Prov., 1800 m]	34.508926	69.140217	Lashkargah, 45-55 km S	30.892797	64.318542
Kash-Rud Valley near Lashi, Dasht-i-Margo	31.674421	62.975922	Lashkargah, 50 km S	31.212801	64.186706
Ker Dahar [=Kandahar]	31.625321	65.70282	Lashkargah30-75 km S	31.010571	64.351501
Ker Dahar or Ken Dahar [=Kandahar]	31.625321	65.70282	Lashkargah, Dashti-margo Desert, 5 mi W	31.577365	64.189568
Khanabad Khenjan, 24 km E	36.744386	69.322128	Lindai-Sin Valley [Nuristan Prov., 2200 m]	34.852129	71.103058
Khanabad, 24 km E	36.744386	69.322128	Logar Valley, 15 km S of Kabul	34.184542	69.158707
Khanabad, 25 km E	36.748788	69.338608	Maimana	35.920127	64.776149
Khandout [=Khandud]	36.930443	72.27042	Maimaneh	35.920127	64.776149
Kharzar	34.284453	63.966293	Marshy area along Logar River, 7-8 mi from Kabul	34.557466	69.526749
Khoast [=Khost]	33.348885	69.92157	Masgid-i-ciovi [=Masjed-e Chubi], Campo 2	34.580083	63.252182
Khost, 30 mi W	33.289212	69.564514	Mazar-i-Sharif	36.721274	67.117767
Khulm, Mazar-i-Sharif [700 m]	36.690446	67.696152	Mazar-i-Sharif, 20 km E	36.791691	67.381439

Locality	Lat	Long	Locality	Lat	Long
Mazar-i-Sharif, 45 km W	36.774092	66.529999	Pari Kham near Darwāz	38.458831	70.877581
Mazar-i-Sharif, 50 km W	36.787291	66.48056	Pashki	35.250105	70.93277
Mazar-i-Sharif, 57-75 km W	36.81808	66.304779	Pass to Dashit-e-Nawar [=Dasht-e-Nawur]	33.555129	67.866554
Mazar-i-Sharif, 65-75 km W	36.81808	66.304779	Pesh Valley [Nuristan Prov.]	35.301677	70.773468
Meiden Khula, about 30 mi ENE of Gardez	33.619194	69.542541	Petsch-Tal [1600 m, Prov. Nuristan]	35.301677	70.773468
Mokuk [=Moqor, Mukur]	32.815844	67.766733	Petsch-Valley, Zunsail [1400 m, Prov. Nuristan]	35.301677	70.773468
Mukur (halfway btwn Kabul & Kandabar)	32.815123	67.766733	Pini Share Valley, 150 mi NE of Kabul	35.603719	70.111084
Mundi Hissar [=Mandi Hissar], south of Kandahar	31.54621	65.858009	Pirzada	31.622252	65.058281
Murghab [=Bala Morgab]	35.576917	63.335266	Pol Khomri [=Pol-e Khomri]	35.953831	68.708096
Murichaq, N Bala Murghab [=Bala Morgab]	35.759886	63.335266	Pul-e-Khumri [1300 m]	35.951052	68.708096
N edge of village of Kara Bagh	34.944488	61.775894	Pul-e-Khumri [Baghlan Prov., 1300 m]	35.951052	68.708096
Narai (NW of)	33.845683	69.637771	Pul-i-Khumri [=Pol-e-Khomri], 25 km NW	36.109034	68.548965
Nawar Pass, 6 km E	33.82023	68.944302	Qala Nau, just N of Ghazni	33.582019	68.417931
NE Dashi-Doab n. of Kabul (Kundus R.)	34.998504	69.218445	Qala-e-Bagaul, 5 km W of Ghazni	33.560851	68.339653
Nemla [=Memlah], near Jalalabad	34.3008	70.1028	Qala-i-Kang, 16 km S	30.965834	61.884384
Nimla [=Memlah], 5-10 mi ENE	34.330962	70.163956	Qalat, 10 mi N	32.261588	66.903763
Noburtscha, on road to Dascht-i-Nawar	33.619194	68.124619	Qalat, 24-50 km N	32.400835	66.821136
nr Paghman River, 10 km SW of Kabul	34.595346	68.952827	Qalat, 24-50 km S	31.854231	66.947479
Nr Tarnak River, 90 km NE of Kandahar	32.115149	66.790466	Qalat, 50 km N	32.495864	66.848602
Nuristan	35.016501	70.393982	Qalat, 50 km S	31.672083	66.939239
Oarya-e-Matun, vic. of Khost	33.348885	69.92157	Qalat-Ghilzai	32.103516	66.90628
Obëh [=Awbeh, Herat Prov.]	34.369866	63.176265	Qizil Qala [Kunduz Prov., 400 m]	37.190476	68.606608
On road to Bala-Murghab [Maimana Prov., 850 m]	35.348736	63.434143	Qualat	32.106134	66.907153
on road to Thor Khama, 8 km ESE of Jalalabad	34.391046	70.534515	Qual'eh Lakou, near the valley of Kabul		
on Tarnak River, 50 km NE of Kandahar	31.872893	66.076355	Quandhor [=Kandahar], 32 km NE	31.711813	66.16745
Orozgon	32.930318	66.139984	Rabatak	34.743869	64.478302
Oubeh	34.372274	63.182616	Rig-Revan near Golbahar, 65 km N of Kabul	35.133808	69.300871
Oukak [?=Okak], Valle de Boum	33.899487	67.954845	road N of Band-e-Amir	34.939985	67.255096
Pagham	34.591318	68.958077	Salang Pass	35.314215	69.037349
Pagham River, 10 km SW of Kabul	34.386513	68.881302	Samangan, 12 km NW	36.039105	67.499771
Paghman, 3 mi N, in Darrahe Pain Stream	34.631372	68.957891	Sang-Hadji [= Sang-e Hajeh]	34.053797	67.565689
Paghman, 4 km above	34.6116667	68.92	Sang-Kotal	34.748383	61.902237
Paghman, 4 km S (by air)	34.545	68.9316667	Sanglakh, 60-80 km W of Kabul	34.572168	68.857956
Pandjab, Decht Ghoudjour [=Panjab]	34.384529	67.013998	Sar-i-Chiasma, nr. Kabul	34.418239	69.178734
Pandjvai [=Panjiwai], nr. Kandahar	31.541675	65.457802	Sar-pol [=Sar-e-Pol], 10 km around	36.225442	65.934219
Panjao, Koh-i-Baba	34.391329	67.023067	Sauzak Pass, nr. Herat	34.696461	62.108002
Panjoa [=Panjao, Panjab], 2 km NW	34.410309	67.013111	SE of Zehak	30.830233	61.742933

Locality	Lat	Long	Locality	Lat	Long
Seberghan [=Sheberghan]	36.662911	65.748825	Terra Pass, N of Gardez [Paktia Prov., 2500 m]	33.75289	69.149895
Seistan [=Sistan area near Iran border]	31.415772	61.479263	Tirphul	34.599978	61.266645
Seistan [=Sistan, probably near Faisabad]	31.469668	61.516342	Toward Ghazni, a few km from village of Shash Gao	33.724054	68.515148
Seistan, 50km E of Seranj [= Zaranj]	31.212801	62.280579	Urgun	32.938674	69.183383
Sharisafa, 60 km NE of Kandahar	31.868228	66.438904	Uruzgan [Oruzgan], Kandahar (Naash)	32.926446	66.631712
Shawalikot, Wayan Village [Kandahar Prov.]	31.984783	65.961456	vic. of Chacharan [?=Chagcharan]	34.520914	65.253024
Sheberghan, 30 km NW	36.899391	65.395889	Village of Ghaomi-Faringi, 20 mi S Mukur [=Moqor]	32.502813	67.818146
Shibar Pass	34.902264	68.252206	Wakhan near Sarhad	36.848857	72.286835
Shibar Pass, 20km W.	34.870158	68.076324	Wakhan, Zemestani Baharak	36.848857	72.286835
Shiberghan [=Sheberghan] [Djauz-Djan Prov., 500 m]	36.66539	65.752087	Wama	35.122155	70.740509
Shindand, 30 km SE	33.112249	62.49527	Waziri	33.025217	68.025084
Shindand, 75 km E	33.683211	63.104553	Yabowlang [= Yakawlang] to Band-i Ahair pass	34.800272	67.066669
Shipun	38.068095	70.5023	Yakhan	33.449777	64.295025
Shore-Kaltegai	35.900175	64.482822	Yaktchal [=Yakhchal]	31.78356	64.698558
Sinjui [?=Band-e Sinju]	33.626055	63.712006	Zebak, 102.4 km on road E Faizabad	36.52895	71.34304
Slam Quala [=Islam Qala]	34.660252	61.108088	Zebak, 64 mi by rd E Faizabad	36.52895	71.34304
Somarkhel, about 15 km E Jalalabad	34.369511	70.582809			
Somarkhel, right bank of Kabul River	34.369511	70.582809			
southern side of Kotal-e-Sha-tu [Kotal-e-Shutur]	34.35364	67.024727			
Southern side of Safed-Koh	33.9392	69.7006			
Spin Buldak, 102 km SSE Kandahar (by Quetta Rd.)	31	66.23			
Takhteh Pol, 10 km SSE (by Quetta Rd.)	31.345	65.9416667			
Takhteh Pol, 5 km (by air)	31.3833333	65.8916667			
Tala	34.469769	67.510242			
Taliqan [=Taleqan], 24 km E	36.638672	69.746475			
Taliqan, 30 km E	36.659606	69.791794			
Taliqan, 50 km E	36.747688	69.888611			
Taliqan, 50 km NE	36.805986	69.805527			
Taliqan, 60 km NE	36.778492	69.955215			
Taliqan, 65 km NE	37.015712	70.081329			
Tanatchiv, 165 km N Kandahar	32.934929	66.046142			
Tang-e-Tashaurghan [=Tange-e-Tashqrgan, Khulm]	36.650793	67.698326			
Tarin Ko[w]t, 40 km S	32.263911	65.724792			
Tashkurgan [=Kholm], 15 km W	36.760891	67.565689			
Tashkurgan, 10 km W	36.692649	67.584915			
Tazi, 80 mi N Kandahar	32.230083	67.179995			
Tchachméh Cher, 17 km N of Pol-Khomri	36.129002	68.688812			

APPENDIX 2

Bibliography of published references relating to the Afghan herpetofauna to supplement the references listed in the Literature section above.

- ADALSTEINSSON, SOLNY A., WILLIAM R. BRANCH, SÉBASTIEN TRAPE, AND LAURIE J. VITT. 2009. Molecular phylogeny, classification, and biogeography of snakes of the Family Leptotyphlopidae (Reptilia, Squamata). *Zootaxa* (2244):1–50, figs. 1–13, tables 1–3, Appendices 1–2.
- AGAKHANYANTS, O.E., O.L. KRZYZHANOVSKII, AND M.V. MURATOV. 1963. Polevye issledovaniya v Afghanistane [Field studies in Afghanistan]. *Vestnik Akademii Nauk SSSR* 3:100–103. (In Russian.)
- AINSWORTH, DIANE. 2001. Inside the Taliban. *Berkeleyan* ([17 October]) (A popular newspaper account of Ted Papenfuss' collecting trip to Afghanistan in June 2000. *Berkeleyan* is a publication of the Office of Public Affairs, University of California, Berkeley.)
- AITCHISON, JAMES EDWARD TIERNEY. 1889. The zoology of the Afghan Delimitation Commission. *Transactions of the Linnean Society of London* 5([May]):53–142, pls. 6–14, 2 maps. (Introduction by J.E.T. Aitchison; report on reptiles by G.A. Boulenger [q.v.]
- ALCOCK, ALFRED WILLIAM. 1898. Reptiles and Amphibia. Pages 35–37 in *Report on the Natural History Results of the Pamir Boundary Commission, Calcuta, 1898*.
- ALCOCK, ALFRED WILLIAM, AND FRANK FINN. 1897. An account of the Reptilia collected by Dr. F. P. Maynard, Captain A. H. McMahon, C.I.E., and the members of the Afgan-Baluch Boundary Commission of 1896. *Journal of the Asiatic Society of Bengal* 65[1986](4[12 April]):550–566, pls. 11[map], 12–15.
- ANANJEVA, NATALIA BORISOVNA, NIKOLAI LUTSEANOVICH ORLOV, R. G. KHALIKOV, ILYA SERGEEVICH DAREVSKY, S. A. RYABOV, AND ANDREI V. BARABANOV. 2007. [Colored Atlas of the Reptiles of the North Eurasia. (Taxonomic Diversity, Distribution, Conservation Status)]. Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia. 230 pp., col. photos., distribution maps. (In Russian.)
- ANANJEVA, NATALIA BORISOVNA, AND VALENTINA FYODOROVNA ORLOVA. 1979. Distribution and geographic variability of *Agama caucasia* (Eichwald, 1831). In Natalia Borisovna Ananjeva and Leo Jakovlevich Borkin, eds., Ecology and Systematics of Amphibians and Reptiles. *Trudy Zoologicheskogo Instituta, Akademiya Nauk SSSR, Leningrad* [Proceedings of the Zoological Institute, Academy of Sciences of the SSSR, Leningrad] 89:4–17, figs. 1–3 [maps], 4. (In Russian, with English abstract.)
- ANDERSON, STEVEN CLEMENT, AND ALAN EDWARD LEVITON. 1967. A new species of *Eremias* (Reptilia: Lacertidae) from Afghanistan. *Occasional Papers of the California Academy of Sciences* (64[22 November]):1–4, fig. 1.
- ANDERSON, STEVEN CLEMENT, AND ALAN EDWARD LEVITON. 1969. Amphibians and reptiles collected by the Street Expedition to Afghanistan, 1965. *Proceedings of the California Academy of Sciences*, ser. 4, 37:25–56, 8 figs.
- ANDRÉN, CLAES, AND GÖRAN NILSON. 1979. A new species of toad (Amphibia, Anura, Bufonidae) from the Kavir Desert, Iran. *Journal of Herpetology* 13([26 February]):93–100, figs. 1[map]-3, 3 tables.
- ANDRUSHKO, A.M., AND N.E. MIKKAU. 1964. Rasprostranenie i obraz zhizni Afganskogo litorinkha (*Lytorhynchus ridgewayi* Boulenger, 1887) s ekologo-geografichskim obzorom roda *Lytorhynchus* Peters, 1862. [Distribution and life history of *Lytorhynchus ridgewayi* Boulenger, 1887 with ecological and geographical review of the genus *Lytorhynchus* Peters, 1862]. Pages 5–19 in *Vestnik Leningradskogo Universiteta*, no. 9, seriya biologii, Vypusk 2. (In Russian.)
- ANNANDALE, THOMAS NELSON. 1905. Contributions to Oriental herpetology III.—Notes on Oriental lizards in the Indian Museum, with a list of the species recorded from British India and Ceylon. *Journal and Proceedings of the Asiatic Society of Bengal*, ser. New Series, 1([May]):139–151. (A continuation of the author's previous paper of the same title, vol.1, no. 3. Note that volume title page was printed and issued in 1906.)
- ATAEV, CHARY ATAIEVICH, AND SAKHAT MURADOVICH SHAMMAKOV. 1998. Sravnitel'nyy analiz herpetofauni Turkmenistana i Afghanistana [A comparative analysis of the herpetofauna of Turkmenistan and Afghanistan]. *Izvestiya Akademii Nauk Turkmenistana*, ser. Biologicheskikh Nauk, 1996(6):3–7. (In Rus-

- sian.)
- BAIG, KHALID JAVED, AND RAFAQAT MASROOR. 2008. The snakes of the genus *Spalerosophis* Jan, 1865 in Indo-Pakistan and Iran (Squamata: Serpentes: Colubridae). *Herpetozoa* 20(3/4[30 January]):109–115, figs. 1–6, 7 [map], table 1.
- BALLAND, DANIEL. 1989. Boundaries iii. Boundaries of Afghanistan. Pages 406–415 in Ehsan Yarshater, ed., *Encyclopaedia Iranica*, vol. 4, Fascicle 4. Routledge and Kegan Paul, New York, New York, USA and London, England, UK.
- BALLAND, DANIEL. 1998. Environmental protection, ii. in Afghanistan. Pages 472–474 in Ehsan Yarshater, ed., *Encyclopaedia Iranica*, vol. 8, fascicle 5. Mazda Publications, Costa Mesa, California, USA.
- BARUS, V., E. KULLMANN, AND F. TENORA. 1972. Parasitische Nematoden aus Wirbeltieren Afghanistans. *Pr. Ust. Cesk. Akad. Ved (Nov. Ser.)* 6:3–46, 17 figs., 6 pls.
- BEDRIAGA, JACQUES VON. 1880. Verzeichniss der Amphibien und Reptilien Vorder-Asiens. [Catalogue of the amphibian and reptilian fauna of western highland Asia.]. *Bulletin de la Société Imperiale des Naturalistes de Moscou [Moskovskow Obshchestvo Ispytateliei Pirody]* 54:22–52.
- BLAISE, J., P. BORDET, R. DESPARMET, PH MARIN, AND C. MONTENAT. 1977. Géologie des les Montagnes Centrale de l'Afghanistan (Hazarajat et bordure orientale). *Mémoire de la Société géologique de France*, issue 8:117–143.
- BLANFORD, HENRY FRANCIS. 1873. *The Rudiments of Physical Geography for the Use of Indian Schools, Together with a Sketch of the Physical Structure and Climate of India, and a Glossary of the Technical Terms Employed*. Thacker, Spink and Co., Calcutta, India. viii + 169 pp., figs. 1–17. (First mention of a probable ancient land connection of India with the Seychelles Islands and Southern Africa: "Certain animals, whose remains are found fossil in the Panchét rocks, are closely related to kinds hitherto only met with in South Africa and Australia, in rocks of about the same age; and in the existing fauna of India there are many indications of relationship, and some cases of identity, with the South African and Seychelles fauna, pointing to a common origin, and therefore to a former communication between the two regions." [p. 119])
- BLYTH, EDWARD. 1853. Notices and descriptions of various reptiles, new or little known. *Journal of the Asiatic Society of Bengal* 22:639–655.
- BÖHME, WOLFGANG. 1977. Further specimens of the rare cat snake, *Telescopus rhinopoma* (Blanford, 1874) (Reptilia, Serpentes, Colubridae). *Journal of Herpetology* 11([25 April]):201–205, fig. 1[map], 2 tables.
- BÖHME, WOLFGANG. 1982. Über den Afghanischen Winkelzahnmolch, *Batrachuperus mustersi* Smith, 1940. *Elaphe* 3:33–36.
- BÖHME, WOLFGANG. 1993. *Coluber ravergieri* Ménétriés, 1832 — Ravergiers Zornnatter. Pages 145–153 in Wolfgang Böhme, ed., *Handbuch der Reptilien und Amphibien Europas*, vol. 3/I: Schlangen (Serpentes) I (Typhlopidae, Boidae, Colubridae 1: Colubrinae). (Includes figs. 34, 35 [map].) AULA-Verlag, Wiesbaden, Germany.
- BÖHME, WOLFGANG. 2010. A list of the herpetological type specimens in the Zoologisches Forschungsmuseum Alexander Koenig, Bonn. *Bonn zoological Bulletin* 59([December]):79–108.
- BORKIN, LEO JAKOVLEVICH. 1998. Amphibians of the Palearctic: a zoogeographic analysis. In Alex Y. Ryss and Nina G. Bogutskaya, eds., . *Proceedings of the Zoological Institute of the Russian Academy of Sciences* 276:43–51.
- BOULENGER, GEORGE ALBERT. 1882. *Catalogue of the Batrachia Salientia s. Ecaudata in the Collection of the British Museum*, 2nd edition. Trustees of the British Museum, London, England, UK. xvi + 503 pp., misc. text-figs., pls. 1–30. (Published 25 March 1882, *fide* Sherborn, 1934; reprint edition, Weldon and Wesley, Codicote, UK, and Verlag J. Cramer, Lehre, 1966.)
- BOULENGER, GEORGE ALBERT. 1887. Description of a new snake from Afghanistan. *Annals and Magazine of Natural History*, ser. 5, 20([December]):413–414.
- BOULENGER, GEORGE ALBERT. 1889. *Catalogue of the Chelonians, Rhynchocephalians, and Crocodiles in the British Museum (Natural History)*, New edition. Trustees of the British Museum, London, England, UK. x + 311 pp., figs. 1–73, pls. 1–6. (Reprint edition, Weldon and Wesley, Codicote, UK, and Verlag J. Cramer, Weinheim, 1966.)
- BOULENGER, GEORGE ALBERT. 1891. A contribution to the knowledge of the races of *Rana esculenta* and their

- geographical distribution. *Proceedings of the Zoological Society of London* 1891([16 June]):374–384.
- BOULENGER, GEORGE ALBERT. 1918. Sur les lézards du genre *Acanthodactylus* Wieg. *Bulletin de la Société zoologique de France* 43:143–155.
- BOULENGER, GEORGE ALBERT. 1918. A synopsis of the lizards of the genus *Eremias*. *Journal of Zoological Research* 3([June]):1–12.
- BOULIN, J., AND E. BOUYX. 1977. Introduction à la géologie de l'Indou-Kouch occidental. *Mémoire de la Société géologique de France* :87–106.
- BRECKLE, S.-W. 1971. Ökologie und Mikroklima in der alpinen Stufe des Afghanischen Hindukusch. *Bericht der Deutscher botanischer Gesellschaft* 84:721–730.
- BRECKLE, S.-W. 1971. Vegetation in alpine regions of Afghanistan. Pages 107–116, figs. 1–7 in Peter H. Davis, Peter C. Harper, and Ian C. Hedge, eds., *Plant Life of South-West Asia*. The University Press for The Botanical Society of Edinburgh, Aberdeen, Scotland.
- BRECKLE, S.-W. 1973. Mikroklimatische Messungen und ökologische Beobachtungen in der alpinen Stufe des afghanischen Hindukusch. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie, Leipzig* 93:25–55.
- BRECKLE, S.-W. 1983. Temperate deserts and semi-deserts of Afghanistan and Iran. Pages 271–319, figs. 10.1–10.57, tables 10.1–10.12 in Neil E. West, ed., *Temperate Deserts and Semi-Deserts. Ecosystems of the World*, 5. Elsevier Scientific Publishing Company, Amsterdam/Oxford/New York.
- BRECKLE, S.-W., WOLFGANG FREY, AND IAN C. HEDGE. 1969. Botanical literature of Afghanistan. *Notes from the Royal Botanical Garden, Edinburgh* 29:357–371.
- BRISTOW, G.C. 1955. *A Collection of Afghanistan Climatic Data to 1953*. U.S. Weather Bureau, Washington, DC, USA.
- BRUNET, M., J.P. CARBONNEL, E. HEINTZ, AND S. SEN. 1980. Première découverte de vertèbres, dans les formations continentales de Pul-e Charkhi, bassin de Kabul, Afghanistan. Implication stratigraphiques. *Bulletin du Muséum National d'Histoire Naturelle, Paris* 2:277–285.
- BRUNNER, MONIKA. 1995. *Morphologische Analyse der paläarktischen Schlangengruppe Elaphe dione (Reptilia, Serpentes)*. Thesis. Zoologisches Museum der Universität Zürich, Zürich, Switzerland. 88 pp.
- CARBONNEL, J.P. 1977. La limite de la plaque indienne en Afghanistan. Nouvelle données géologiques et géomorphologiques. *Mémoire de la Société géologique de France*, issue 8:145–152.
- CASIMIR, M.J. 1970. Zur Herpetofauna des Iran und Afghanistan. *Die Aquarien- und Terrarium-Zeitschrift (DATZ), Stuttgart* 23:150–154.
- CASIMIR, M.J. 1971. Zur Herpetofauna der Provinz Badghis (NW-Afghanistan). *Die Aquarien- und Terrarium-Zeitschrift (DATZ), Stuttgart* 24:244–246.
- CEI, JOSE M. 2007. Comparative studies of supraocular lepidosis in Squamata (Reptilia) and its relationships with an evolutionary taxonomy. *Multequina* (16):1–52, figs. 1–29.
- CHANDRA, H., AND CHARAN-SINGH. 1983. Some lizard predators of acridids of southwest Afghanistan. *Plant Protection Bulletin (Faridabad)* 33:153–155, 1981 (1983).
- CHERLIN, VLADIMIR A. 1981. The new saw-scaled viper, *Echis multisquamatus* sp. nov. from South-western and Middle Asia. In Natalio Borisovna Ananjeva and Leo Jakovlevich Borkin, eds., *The Fauna and Ecology of Amphibians and Reptiles of the Palearctic Asia. Trudy Zoologicheskogo Instituta, Akademiya Nauk SSSR, Leningrad [Proceedings of the Zoological Institute, Academy of Sciences of the SSSR, Leningrad]* 101:92–95, 123, fig. [map], pl. 14. (In Russian, with English summary [Russian abstract p. 123].)
- CLARK, RICHARD J. 1992. Notes on the distribution and ecology of *Phrynocephalus clarkorum* Anderson & Leviton 1967 and *Phrynocephalus ornatus* Boulenger 1887 in Afghanistan. *Herpetological Journal* 2([October]):140–142, fig. 1[map].
- DAREVSKY, ILYA SERGEEVICH. 1993. *Eryx miliaris* (Pallas, 1773) - Östliche Sandboa. Pages 55–66 in Wolfgang Böhme, ed., *Handbuch der Reptilien und Amphibien Europas*, vol. 3/I: Schlangen (Serpentes) I (Typhlopidae, Boidae, Colubridae 1: Colubrinae). (Includes figs. 10–11, 12 [map].) AULA-Verlag, Wiesbaden, Germany.
- DAVID, PATRICK, AND IVAN INEICH. 1999. Les serpents venimeux du monde: systématique et répartition. *Dumerilia* 3([February]):1–499. (In Bilingual, French and English.)

- EHSAN, M. [year unknown]. Herpetofaunal regions of Afghanistan. *Science Quarterly [Kabul]* 2:20–42.
- FET, VICTOR, AND KHABIBULLA I. ATAMURADOV, EDs. 1994. *Biogeography and Ecology of Turkmenistan*. Monographiae Biologicae, vol. 72. Kluwer Academic Publishers, Dordrecht, Netherlands. viii + 650 pp.
- FREITAG, HELMUT. 1971. Studies in the Natural Vegetation of Afghanistan. Pages 89–106, figs. 1–4 in Peter H. Davis, Peter C. Harper, and Ian C. Hedge, eds., *Plant Life of South-West Asia*. The University Press for The Botanical Society of Edinburgh, Aberdeen, Scotland, UK.
- GOLUBEV, MIKHAIL LEONIDOVICH, AND NIKOLAI NIKOLAEVICH SZCZERBAK. 1979. Novij vid roda *Tropicolotes* Peters, 1880 (Reptilia, Sauria, Gekkonidae) iz Afganistana [New species of the *Tropicolotes* Peters, 1880 genus (Reptilia, Sauria, Gekkonidae) from Afghanistan.]. *Doklady Akademii Nauk Ukrainskoi SSR (Kiev)* 1979:309–312, fig. 1. (In Russian.)
- GOODWIN, GEORGE G., AND DEAN AMADON. 1958. Animal and bird bones. Pages 288 in Louis Dupree, ed., *Shamsir Ghar: Historic cave site in Kandahar Province, Afghanistan*. *American Museum of Natural History Anthropological Papers*, 46(2).
- GRAY, JOHN EDWARD. 1844. *Catalogue of the Tortoises, Crocodiles, and Amphisbaenians, in the Collection of the British Museum*. British Museum, London, England, UK. viii + 80 pp. (Published 27 July 1844)
- GRAY, JOHN EDWARD. 1849. *Catalogue of the Specimens of Snakes in the Collection of the British Museum*. British Museum, London, England, UK. xv + 125 pp. (Published 27 October 1849)
- GRAY, JOHN EDWARD. 1873. *Hand-list of the Specimens of Shield Reptiles in the British Museum*. Trustees of the British Museum, London, England, UK. iv + 124 pp. (Published 26 April 1873)
- GRILLITSCH, BRITTA, AND HEINZ GRILLITSCH. 1993. *Typhlops vermicularis* Merrem, 1820 — Wurmsschlange oder Blödauge. Pages 15–32, figs. 1, 2–3 [maps] in Wolfgang Böhme, ed., *Handbuch der Reptilien und Amphibien Europas*, vol. 3/1: Schlangen (Serpentes) I (Typhlopidae, Boidae, Colubridae 1: Colubrinae). AULA-Verlag, Wiesbaden, Germany.
- GRÖTZBACH, E., AND C. RATHJENS. 1969. Die heutigen und die jung pleistozäne Vergleitzerung des afghanischen Hindu Kusch. *Zeitschrift für Geomorphologie Supplementband* 8:58–75.
- GÜNTHER, ALBERT CARL LUDWIG GOTTHILF. 1859 [1858]. *Catalogue of the Batrachia Salientia in the Collection of the British Museum*. Trustees of the British Museum, London, England, UK. xvi + 160 + (8) pp., 12 pls. (Title page bears the year 1858. According to C. D. Sherborn [1934, *Annales and Magazine of Natural History*, ser. 10, 13:309], it was published 12 February 1859.)
- HABIBI, KHUSHAL. 1983. Afghanistan iii. Fauna. Pages 492–495 in Ehsan Yarshater, ed., *Encyclopaedia Iranica*, vol. 1, Fascicle 5. Routledge and Kegan Paul, New York, New York, USA and London, England, UK.
- HABIBI, KHUSHAL. 2003. *Mammals of Afghanistan*. Zoo Outreach Organisation & U.S. Fish and Wildlife Service, Coimbatore, Tamil Nadu, India. iv + 167 + [1] pp., illus.
- HAHN, DONALD EDGAR. 1980. Anomalepididae, Leptotyphlopidae, Typhlopidae. In Heinz Wermuth and Edwin Möhn, eds., *Liste der rezenten Amphibien und Reptilien*. *Das Tierreich* 101:1–93. (In English.)
- HEMMER, HELMUT, JOSEF FRIEDRICH SCHMIDTLER, AND WOLFGANG BÖHME. 1978. Zur Systematik zentralasiatischer Grünkröten (*Bufo viridis*-Komplex) (Amphibia, Salientia, Bufonidae). *Zoologische Abhandlungen Staatliches Museum für Tierkunde in Dresden* 34([30 June]):349–384, figs. 1–15, map.
- HERMAN, N.M. 1965. *Le climat de l'Afghanistan*. *Monographies de la météorologie nationale*, Paris, France. 55 pp.
- HINZE, C. 1964. Die geologische Entwicklung der östlichen Hindukusch-Nordflanke. *Beihefte zum geologischen Jahrbuch* 70:19–75.
- HUMLUM, J. 1959. *La géographie de l'Afghanistan*. Gyldenal, Copenhagen, Denmark. 421 pp.
- HUTTON, THOMAS. 1846. Rough notes on the zoology of Candahar and the neighboring districts with some additional information on the birds of Afghanistan by E. Blyth. *Journal and Proceedings of the Asiatic Society of Bengal* 15:135–170.
- JEREMCHENKO, VALERY KONSTANTINOVICH, AND NIKOLAI NIKOLAEVICH SZCZERBAK. 1980. Novii vid gologlaza *Ablepharus lindbergi* sp.n. (Reptilia, Sauria, Scincidae) iz Afganistana [a new species of snake-eyed lizard *Ablepharus lindbergi* sp.n. (Reptilia, Sauria, Scincidae) from Afghanistan]. *Vestnik Zoologii [Zoological Record]*, Kiev 1980:84–86. (In Russian.) (Contrary to the title, this is not a description of a new species, but raises *Ablepharus bivittatus lindbergi* Wettstein, 1960 to species level.)
- JEREMCHENKO, VALERY KONSTANTINOVICH, AND NIKOLAI NIKOLAEVICH SZCZERBAK. 1986. *Ablefaridnie*

- Yashcheritzki Fauni SSSR i Sopredelnikh Stran* [Ablepharine Lizards in the Fauna of the USSR and Neighboring Countries]. Akademiya Nauk Kirgizkoi SSR, Ylym, Frunze. 170 + (2) pp., figs. 1–43. (In Russian.)
- KAEVER, M. 1967. Historische Entwicklung und derzeitiger Stand der geologisch-paläontologischen Erforschung Afghanistans. *Zentralblatt für Geologie und Paläontologie* 1:174–181.
- KAEVER, M. 1967. Das Tertiär Afghanistans. *Zentralblatt für Geologie und Paläontologie* 1:351–368.
- KAEVER, M. 1967. Die Kreide Afghanistans. *Zentralblatt für Geologie und Paläontologie* 1:1853–1880.
- KAEVER, M. 1972. Geologie und Lagerstätten. Pages 68–78 in W. Kraus, ed., *Afghanistan. Erdmann Ländermonographie*, 3.
- KAPOOR, HARI M. 1992. Permo-Triassic boundary of the Indian subcontinent and its intercontinental correlation. Pages 21–36, figs. 3.1–3.11 in Walter C. Sweet, Yang Zunyi, J.M. Dickins, and Yin Hongfu, eds., *Permo-Triassic Events in the Eastern Tethys. World and Regional Geography*, 2. Cambridge University Press, Cambridge, England, UK. (International Geological Correlation Programme (IGCP) Project 203, final report.)
- KASPAREK, MAX, AND BAHRAM HASSAN-ZADEH KIABI. 2004. Obituary Clas M Naumann. *Zoology in the Middle East, Heidelberg* 32:5–6, portrait.
- KASY, FRITZ. 1967. Österreichische entomologische Expedition nach Persien und Afghanistan. Bericht über die Reise von 1965. *Annalen des Naturhistorischen Museums in Wien* 70:423–429.
- KHAN, MUHAMMAD SHARIF. 2006. *Amphibians and Reptiles of Pakistan*. Krieger Publishing Company, Malabar, Florida, USA. xvi + 311 pp., 176 pls., maps.
- KHAN, MUHAMMAD SHARIF. 2008. Biology and distribution of geckos of genus *Indogekko* Khan, 2003. *Russian Journal of Herpetology* 15([May-August]):87–92, figs. 1–2, 2 tables.
- KIRBY, W. 1889. The zoology of the Afghan Delimitation Commission. *Transactions of the Linnean Society of London* ser 2, 5:137–140.
- KOUFOS, GEORGE D., AND GEORGE E. KONIDARIS. 2011. Late Miocene carnivores of the Greco-Iranian Province: Composition, guild structure and palaeoecology. *Palaeogeography, Palaeoclimatology, Palaeoecology* 305(1–4[15 May]):215–226, figs. 1–7, tables 1–2.
- KULLMANN, E. 1967. Wozu bauen wir einen Zoo in Kabul. *Freunde des Kölner Zoo* 10:43–49.
- KULLMANN, E. 1972. Die Tierwelt. Pages 68–78 in W. Kraus, ed., *Afghanistan. Erdmann Ländermonographie*, 3.
- LALANDE, PAUL. 1968. Etages a genevries en Afghanistan. *Comptes Rendus Hebdomadaires des Séances de l'Académie de Sciences* 267:503–504.
- LALANDE, PAUL, N.M. HERMANN, AND J. ZILLHARDT. 1974. *Cartes climatiques de l'Afghanistan*. Publ. Inst. Météorol., Kaboul, Afghanistan. 47 pp.
- LANG, J. 1977. Evolution géodynamique de bassins intramontagneux cénozoïques d'Afghanistan Central. *Mémoire de la Société géologique de France*, issue 8:107–116.
- LEVITON, ALAN EDWARD, AND STEVEN CLEMENT ANDERSON. 1961. Further remarks on the amphibians and reptiles of Afghanistan. *The Wassmann Journal of Biology* 19([5 December]):269–276, fig. 1 [map].
- LEVITON, ALAN EDWARD, AND STEVEN CLEMENT ANDERSON. 1984. Description of a new species of *Cyrtodactylus* from Afghanistan with remarks on the status of *Gymnodactylus longipes* and *Cyrtodactylus fedtschenkoi*. *Journal of Herpetology* 18:270–276, fig. 1a-e, 2 [map].
- LICHTENSTEIN, MARTIN HINRICH CARL. 1823. Wortverzeichniss aus der Afghanischen Sprache begleitet von einem naturhistorischen Anhang und einer Vorrede von H. Lichtenstein Dr. Naturhistorischer Anhang. Pages 113–147 in Eduard Friedrich Eversmann, ed., *Reise von Orenburg nach Buchara, nebst einem Wortverzeichniss aus der Afghanischen Sprache begleitet von einem naturhistorischen Anhang und einer Vorrede von H. Lichtenstein Dr.*, vol. 8. E.H.G. Christiani, Berlin, Germany. (Adler [pers. com.] notes that this was “probably published earlier than Lichtenstein’s “Verzeichniss” in which many of the same ssp. are described since the latter cites page nos. in this book — and not visa versa.” Part III. Amphibien, pp. 139–147.)
- LINCHEVSKY, I.A., AND A.V. PROZOROVSKYI. 1949. The basic principles of the distribution of the vegetation of Afghanistan. *Kew Bulletin* 1949:179–214, 2 maps.
- LINDBERG, K. 1961. Recherches biospélogiques en Afghanistan. *Lunds Universitets Arsskrift* N. F. Avd. 2,

57:1–39.

- MADEL, G., AND H. KLOCKENHOFF. 1972. Beobachtungen an Kaukasus-Agamen, *Agama c. caucasica* (Eichwald 1831) in Afghanistan. *Die Aquarien- und Terrarium-Zeitschrift (DATZ)*, Stuttgart 9:3–7, figs. 1–3.
- MCMAHON, A. HENRY. 1897. The southern borderlands of Afghanistan. *Geographical Journal* 9:393–415.
- MEEUWEN, H.M. VAN. 1977. Enkele herpetologische aantekeningen van een reis naar Afghanistan. *Lacerta* 35(8[May]):115–124, figs. 1–16. (In Dutch, with English summary.)
- MERTENS, ROBERT FRIEDRICH WILHELM. 1959. Liste der Warane Asiens und der Indo-australischen Inselwelt mit systematischen Bemerkungen. *Senckenbergiana Biologica* 40(5/6[29 December]):221–240, pls. 25–29.
- MERTENS, ROBERT FRIEDRICH WILHELM. 1970. Salamander aus Afghanistan: *Batrachuperus mustersi*. *Die Aquarien- und Terrarien Zeitschrift* 23([November]):346–348, figs. 1–2.
- MICHEL, ALOYS ARTHUR. 1959. *The Kabul, Kunduz, and Helmand Valleys and the National Economy of Afghanistan; a Study of Regional Resources and the Comparative Advantages of Development*. National Academy of Sciences — National Research Council, Washington, DC, USA. xix + 441 pp., maps.
- MIRWALD, P., AND H. RÖMER. 1967. Beobachtungen in Wakhan. *Erkunde [Archiv für Wissenschaftliche Geographie]* 21:48–57.
- MORAVEC, J., M. FRANZEN, AND W. BÖHME. 2006. Notes on the taxonomy, nomenclature and distribution of the *Trachylepis* (formerly *Mabuya*) *aurate* (Linnaeus, 1758) complex. in: Vences, M., J. Köhler, T. Ziegler and W. Böhme (eds): *Herpetologia Bonnensis II. Proceedings of the 13th Congress of the Societas Europaea Herpetologica*. pp. 89–93.
- NAHIF, ALI AGHA. 1986. Bibliographie der zoologischen Literatur über Afghanistan. *Bonner Zoologische Beiträge* 37([December]):311–339.
- NATAL'IN, BORIS A. 2005. Late Palaeozoic to Triassic evolution of the Turan and Scythian platforms; the pre-history of the palaeo-Tethyan closure. *Tectonophysics* 404(3–4[01 August]):175–202.
- NAUMANN, C., AND G. NOGGE. 1973. Die zoologischen Projekte Afghanistans — erfolgreiches Nebenprodukt einer Universitäts-partnerschaft. GAWI-Rundbr. 1973, 25–28.
- NAWABI, STORAI. 1965. A rare representative of the Amphibia in Afghanistan: *Batrachuperus mustersi*. *Science special issue*:21–26. (In Dari.)
- NICHOLSON, K.N., M. JKAN, AND K. MAHMOOD. 2010. Geochemistry of the Chagai-Raskoh arc, Pakistan: Complex arc dynamics spanning the Cretaceous to the Quaternary. *Lithos* 116(3–4[August]):338–348. (Abstract on line: doi:10.1016/j.lithos.2010.05.008)
- NOWROOZI, A.A. 1972. Focal mechanism of earthquakes in Persia, Turkey, West Pakistan, Afghanistan and plate tectonics of the Middle East. *Bulletin of the Seismological Society of America* 62:823–850.
- OBST, FRITZ JÜRGEN. 1978. Zur geographischen Variabilität des Scheltopusik, *Ophisaurus apodus* (Pallas) (Reptilia, Squamata, Anguidae). *Zoologische Abhandlungen Staatliches Museum für Tierkunde in Dresden* 35 [1978](8[17 October]):129–140, figs. 1–5.
- OHLE, ANNEMARIE, AND ALAIN DUBOIS. 2006. Phylogenetic relationships and generic taxonomy of the tribe Paini (Amphibia, Anura, Ranidae, Dicroglossinae) with diagnoses of two new genera. *Zoosystema* 28(3):769–784, figs. 1–2, tables 1–2, Appendix.
- PIAS, J. 1977. Differentes aspects de l'évolution périglaciale en Afghanistan. *Mémoire de la Société géologique de France*, issue 8:169–178.
- RASTEGAR-POUYANI, NASRULLAH. 1997. [Abstract] Systematics and distribution of the *Trapelus agilis* complex. Pages 168–169 in Zbynek Rocek and Scott Hart, eds., *Herpetology '97. Abstracts of the Third World Congress of Herpetology 2–10 August 1997 Prague, Czech Republic*. Third World Congress of Herpetology, Prague, Czech Republic.
- RASTEGAR-POUYANI, NASRULLAH. 1999. Analysis of geographic variation in *Trapelus agilis* complex (Sauria: Agamidae). *Zoology in the Middle East, Heidelberg* 19:75–99, figs. 1[map], 2–6, 7 tables. (Also included in Rastegar-Pouyani (1999) dissertation.)
- RASTEGAR-POUYANI, NASRULLAH. 1999. *Systematics and Zoogeography of the Agamid Lizards of Iran*. Ph.D. Dissertation. Götterborg University, Göteborg, Sweden. v + 176 pp. (This dissertation is a collection of individual papers previously published elsewhere, including papers published jointly with others, or currently in press, plus an introduction summarizing the findings and conclusions. This appears to me to

constitute a publication; it carries the ISBN no. 91–628–3419–3, and seems to be in a format that indicates distribution. In addition to the introduction, it consists of 6 papers: Rastegar-Pouyani, 1998, 1999, 1999 in press, 1999 submitted, Rastegar-Pouyani and Nilson, 1999 submitted, and Macey *et al.*, 1998. The paper by Rastegar-Pouyani (1999; *Asiatic Herpetological Research*, vol. 8) contains two new taxa, *Trapelus agilis khuzistanensis* Rastegar-Pouyani, 1999 and *Trapelus agilis pakistanensis* Rastegar-Pouyani, 1999.)

- RASTEGAR-POUYANI, NASRULLAH. 2000. Taxonomic status of *Trapelus ruderatus* (Olivier) and *T. persicus* (Blanford), and validity of *T. lessonae* (De Filippi). *Amphibia Reptilia* 21([31 March]):91–102, figs. 1, 2–3[maps], tables 1–2.
- RASTEGAR-POUYANI, NASRULLAH, AND ULRICH JOGER. 2003. The *Eremias lineolata-scripta* complex (Sauria: Lacertidae) in Iran and Central Asia. Pages 134–135 in Natalia Ananjeva, Gennady Cherepanov, Larissa Iohansen, Roman Kalikov, and Olga Tsinenko, eds., *12th Ordinary General Meeting, Societas Europaea Herpetologica (SEH), Saint-Petersburg, Russia, 12–16 August 2003. Programme and Abstracts*. Zoological Institute of the Russian Academy of Sciences for the Societas Europaea Herpetologica, St. Petersburg, Russia.
- RASTEGAR-POUYANI, NASRULLAH, AND GÖRAN NILSON. 2002. Taxonomy and biogeography of the Iranian species of *Laudakia* (Sauria: Agamidae). *Zoology in the Middle East, Heidelberg* 26:93–122, figs. 1–12 [maps 1, 3, 5, 6, 8, 11–2], tables 1–3.
- REILLY, STEPHEN M. 1983. The biology of the high altitude salamander *Batrachuperus mustersi* from Afghanistan. *Journal of Herpetology* 17([7 April]):1–9, figs. 1–2, 2 tables.
- RUSSELL, FINDLAY E., AND JAMES R. CAMPBELL. 2015. *Venomous Terrestrial Snakes of the Middle East*. Frankfurt Contributions to Natural History, vol. 53. Edition Chimaira, Frankfurt am Main, Germany. 186 pp., 304 figs.
- RUSTAMOV, ANVER KEJUSEVICH. 1981. Opit otsenki vidovogo yendimizma gerpetofauni Irana, Afganistana i Srednei Azii [Experimental estimation of specific endemism of herpetofauna of Iran, Afghanistan and Middle Asia]. Pages 118–119 in *Voprosi gerpetologii* [Problems of Herpetology]. (In Russian.)
- RYSAVY, B., AND S. JOHNSON. 1979. On some oxyurid nematodes of the genus *Tachygonetria* parasitizing tortoises in Afghanistan and Albania. *Vestnik Československé Společnosti Zoologické* [Acta Societatis Zoologicae Bohemoslovacae] 43:148–160.
- ST. JOHN, OLIVER B. 1889. On the birds of southern Afghanistan and Kelat. *Ibis*, ser. 6, 1:145–180.
- SALEM, M.Z., AND F.D. HOLE. 1969. Soil geography and factors of soil formation in Afghanistan. *Soil Science* 107:289–295.
- SCHÄTTI, BEAT. 1993. *Echis Merrem*, 1820. Pages 268–272 in Philippe et al Golay, ed., *Endoglyphs and other Major Venomous Snakes of the World*. Azemiops, Aïre-Geneva, Switzerland.
- SCHÄTTI, BEAT. 1993. *Eristicophis* Alcock & Finn, 1897. Pages 272 in Philippe et al Golay, ed., *Endoglyphs and other Major Venomous Snakes of the World*. Azemiops, Aïre-Geneva, Switzerland.
- SCHÄTTI, BEAT. 1993. *Pseudocerastes* Boulenger, 1896. Pages 277 in Philippe et al Golay, ed., *Endoglyphs and other Major Venomous Snakes of the World*. Azemiops, Aïre-Geneva, Switzerland.
- ŞENGÖR, A.M. CELÂL. 1984. *The Cimmeride Orogenic System and the Tectonics of Eurasia. Special Paper*, vol. No. 195. Geological Society of America, Boulder, Colorado, USA. 82 pp.
- SEUFER, HERMANN. 1974. Freilandbeobachtungen und Fang von *Batrachuperus mustersi*. *Das Aquarium* 60:269ff.
- SEUFER, HERMANN. 1979. Der Kaspische Geradfinger-Gecko (*Alsophylax pipiens*) Pallas. *Herpetofauna* [Weinstadt] 1(1[July]):10–15, 4 figs., 1 table.
- SEUFER, HERMANN. 1991. Pflege und Nachzucht des kleinschuppigen Wundergeckos *Teratoscincus microlepis* Nikolskii, 1899. *Herpetofauna* [Weinstadt] 13(71[April]):6–10, figs. 1–3, 1 map, table 1.
- SHARMA, RAMESH CHANDRA, AND CHARAN SINGH. 1976. Records of some little known reptiles from Afghanistan. *Newsletter of the Zoological Survey of India* 2:70–74.
- SINDACO, ROBERTO, ALBERTO VENCHI, GIUSEPPE M. CARPANETO, AND MARCO A. BOLOGNA. 2000. The reptiles of Anatolia: a checklist and zoogeographical analysis. *Biogeographia* 21([30 June]):441–554, figs. 1–116 (1–79, distribution maps; 87–116, col. photos of animals), table 1.
- SOKOLOV, V.E., ED. 1983. [*Ecology and Biogeography in Afghanistan*]. Institute of Evolutionary Morphology

- and Animal Ecology, USSR Academy of Sciences, Moscow, Russia. 208 pp. (In Russian.)
- SPARREBOOM, MAX [MARCUS]. 1977. Salamanders uit Afghanistan: *Batrachuperus mustersi*. *Lacerta* 35(8[May]):125–128, figs. 1–7, 1 table.
- SPARREBOOM, MAX [MARCUS]. 1979. Eieren van *Batrachuperus mustersi*. *Lacerta* 37(5[February]):83–88, figs. 1–9.
- STRAUCH, ALEXANDER ALEKSANDROVICH. 1862. Chelonologische Studien mit besonderer Beziehung auf die Schildkröten Sammlung der kaiserlichen Akademie der Wissenschaften zu St.-Petersburg. *Mémoires de l'Académie Impériale des Sciences de St.-Petersbourg*, ser. 7, 5([December]):1–196, pl. 1.
- STÜMPPEL, NIKOLAUS, AND ULRICH JOGER. 2009. Recent advances in phylogeny and taxonomy of Near and Middle Eastern vipers — an update. *ZooKeys* 31:179–191, figs. 1, 2–3[maps], 4–9, table 1. (Online: doi:10.3897/zookeys.31.138)
- SZCZERBAK, NIKOLAI NIKOLAEVICH. 1994. Zoogeographic analysis of the reptiles of Turkmenistan. Pages 306–328 in Victor Fet and Khabibulla I. Atamuradov, eds. 1994. *Biogeography and Ecology of Turkmenistan*. Monographiae Biologicae, vol. 72. Kluwer Academic Publishers, Dordrecht, Netherlands.
- TAPPONNIER, PAUL, M. MATTAUER, F. PROUST, AND C. CASSAIGNEAU. 1981. Mesozoic ophiolites, sutures, and large-scale tectonic movements in Afghanistan. *Earth and Planetary Science Letters* 52:355–371.
- THEOBALD, WILLIAM. 1868. Catalogue of reptiles in the museum of the Asiatic Society of Bengal, 1866. *Journal of the Asiatic Society of Bengal* Extra Number 146:vi+7–88+iii[Appendix], 4 pls. [unnumbered].
- TORKI, FARHANG. 2009. Einige ökologische und biologische Aspekte von *Echis carinatus sochureki* Stemmler, 1969, mit Anmerkungen zur wahrscheinlichen Ausbreitung der Gattung *Echis* Merrem, 1820 in Südwest-Asien. *Sauria* 31:33–37, figs. 1–6.
- TROMP, S.W. 1954. The stratigraphy and main structural features of Afghanistan. Part 1. *Proceedings of the Koninklijke Nederlandsche Akademie van Wetenschappen (Amsterdam)*, ser. B, 57:370–394.
- U.S. DEPARTMENT OF DEFENSE. 1992. *Venomous Snakes of the Middle East (Identification Guide)*. Defense Intelligence Agency, Washington, DC, USA. viii + 160 pp.
- VAN DIJK, PETER PAUL. 2000. The status of turtles in Asia. In Peter Paul van Dijk, Bryan L. Stuart, and Anders G. J. Rhodin, eds., *Asian Turtle Trade: proceedings of a workshop on conservation and trade of freshwater turtles and tortoises in Asia*, Phnom Penh, Cambodia, 1–4 December 1999. *Chelonian Research Monographs* ([August]):15–23, figs. 1–2, table 1.
- WALKER, J.T., AND J. WATERHOUSE. 1879. Notes on the survey operations in Afghanistan in connection with the campaign of 1878–79. Compiled from letters and diaries of the survey officers by Major J. Waterhouse, Assistant Surveyor General. *Journal of the Asiatic Society of Bengal* 1879:146–172, map, pl.17.
- WALL, FRANK. 1908. A Popular treatise on the common Indian snakes. Part VII. The saw-scaled viper or echis (*Echis carinata*). *Journal of the Bombay Natural History Society* 18([15 July]):525–554, 6 figs. (variously numbered and unnumbered), 3 maps, pl. 7.
- WALL, FRANK.. 1923. A hand-list of the snakes of the Indian Empire, Part 2. *Journal of the Bombay Natural History Society* 29:598–632.
- WALL, FRANK. 1924. A hand-list of the snakes of the Indian Empire. Part III. *Journal of the Bombay Natural History Society* 29([15 May]):864–878.
- WALL, FRANK. 1925. A hand-list of the snakes of the Indian Empire. Part V. *Journal of the Bombay Natural History Society* 30([25 January]):242–252.
- WALTER, HEINRICH, AND ELGENE O. BOX. 1983. The Pamir — an ecologically well-studied high-mountain desert biome. Pages 237–269 in Neil E. West, ed., *Temperate Deserts and Semi-Deserts*. (Includes figs.9.1–9.15, tables 9.1–9.24.) *Ecosystems of the World*, 5. Elsevier Scientific Publishing Company, Amsterdam, Netherlands and New York, New York, USA.
- WEISROCK, DAVID W., J. ROBERT MACEY, MASAFUMI MATSUI, DANIEL G. MULCAHY, AND THEODORE JOHNSTONE PAPANFUSS. 2013. Molecular phylogenetic reconstruction of the endemic Asian salamander family Hynobiidae (Amphibia, Caudata). *Zootaxa* (3626[9 January]):77–93, figs. 1–4, table 1.
- WELLMANN, H.W. 1966. Active wrench faults of Iran, Afghanistan, and Pakistan. *Geologische Rundschau, Leipzig* 55:716–735.
- WERNER, FRANZ JOSEF MARIA. 1925 [1924]. Übersicht der Gattungen und Arten der Schlangen der Familie Colubridae. II Teil (Dipsadomorphinae und Hydrophiinae). *Archiv für Naturgeschichte* 90:108–166,

figs. 1–18.

- WETTSTEIN, OTTO. 1960. Contribution a l'étude de la faune d'Afghanistan 2. Lacertilia aus Afghanistan. *Zoologischer Anzeiger* 165:58–63.
- WETTSTEIN-WESTERSHEIMB, OTTO. 1960. Drei seltene Echsen aus Südwest-Asien. *Zoologischer Anzeiger* 165:190–193.
- WIRTZ, D. 1964. Zur regionalgeologischen Stellung der afghanischen Gebirge. *Beihefte zum geologischen Jahrbuch* 70:5–18.
- WOLFART, REINHARDT, AND H. WITTEKINDT. 1980. Geologie von Afghanistan. *Beiträge zur regionalen Geologie der Erde* 14:500, Borntraeger, Berlin und Stuttgart, Germany.
- WÜSTER, WOLFGANG. 1998. The cobras of the genus *Naja* in India. *Hamadryad* 23([June]):15–32, fig. 1, 10 tables. (Publication date of issue shown as 31 June [clearly a typographical error])
- WÜSTER, WOLFGANG, AND ROGER S. THORPE. 1992. Asiatic cobras: Population systematics of the *Naja naja* complex (Serpentes: Elapidae) in India and Central Asia. *Herpetologica* 48(1[March]):69–85, figs. 1[map], 2–5, 6–7[maps], tables 1–3.
- ZHANG, P., Y.-Q. CHEN, H. ZHOU, Y.-F. LIU, THEODORE JOHNSTONE PAPENFUSS, DAVID B. WAKE, AND L.-H. QU. 2006. Phylogeny, evolution, and biogeography of Asiatic salamanders (Hynobiidae). *Proceedings of the National Academy of Sciences USA* 103:7360–7365.
- ZYKOV, A.E. 1991. Zoogeographic analysis of the small mammal fauna (Insectivora, Rodentia, Lagomorpha) of Kopet-Dagh Mountain Range. *Vestnik Zoologii [Zoological Record]*, Kiev 1991:3–11, figs. 1–3, table 1. (In Russian, with English abstract.)

Page intentionally left blank

***Tetramerium pauciflorum* (Acanthaceae: Justiceae): a New Species from the Basin of the Río Balsas in Michoacán, Mexico**

Thomas F. Daniel¹ and Victor W. Steinmann²

¹ Department of Botany, California Academy of Sciences, 55 Music Concourse Drive, San Francisco, CA 94118, U.S.A.; Email: tdaniel@calacademy.org. ² Rancho Santa Ana Botanic Garden, 1500 N. College Ave., Claremont, CA 91711; Email: steinmav@gmail.com

Tetramerium pauciflorum, a local endemic in the Infiernillo region of the arid basin of the Río Balsas Michoacán, Mexico, is newly described and illustrated. It is distinguished from its congeners by the combination of the following characters: shrubby and somewhat thorny habit; linear to lance-linear leaves; pubescent (eglandular and glandular trichomes), lanceolate to lance-subulate, and entire bracts that are 6–10 mm long; 5-lobed calyx; pseudopapilionaceous and whitish (with purple markings) corollas; and pubescent capsules that are 4.5–5.5 mm long. It is compared to two superficially similar congeners that also occur in the Balsas basin, *T. butterwickianum* and *T. vargasiae*. A provisional conservation assessment of Least Concern is proposed for *T. pauciflorum*.

KEYWORDS: *Tetramerium*, Michoacán, Mexico, endemic species, pollen

Se describe e ilustra *Tetramerium pauciflorum* como especie nueva de la region Infiernillo de la cuenca árida del Río Balsas en Michoacán, México. Se distingue de sus congéneres por la combinación de los siguientes caracteres: hábito arbustivo y más o menos espinoso; hojas lineares a lanceoladas-lineares; brácteas pubescentes (con ambos tricomas glandulares y eglandulares), lanceoladas a lanceoladas-subuladas, enteras, y 6–10 mm de largo; cáliz con 5 lóbulos; corolas pseudopapilionáceas y blanquecinas (con marcas de color púrpura); y cápsulas pubescentes y 4.5–5.5 mm de largo. Se compara la especie nueva con dos congéneres similar que también se ocurren en la cuenca del Balsas, *T. butterwickianum* y *T. vargasiae*. Se propone una evaluación de la conservación provisional de “Least Concern” para *T. pauciflorum*.

The Río Balsas Basin in western Mexico is a region of considerable botanical richness and endemism (e.g., Fernández et al. 1998; Rodríguez-Jiménez et al. 2005; Lott and Atkinson 2006), and Rzedowski (1978) treated its lower elevations as the Balsas Depression Floristic Province. The region is rich in Acanthaceae, and at least 13 species of the family are endemic there (see Daniel and Steinmann 2007 for a discussion of Acanthaceae in the region). *Tetramerium* Nees consists of 30 currently recognized Neotropical species, at least 10 of which have been reported as occurring in the Río Balsas Basin of Guerrero and Michoacán (Daniel 1986; Daniel and Cruz Durán 2016). To these we add another one from the Infiernillo region, which is centered around the Presa Infiernillo, a reservoir resulting from the damming of the Río Balsas just downstream from its confluence with the Río Tepalcatepec. The Infiernillo region in southern Michoacán and adjacent Guerrero is the hottest and driest portion of the Río Balsas Basin, and it is an important center of local endemism (Guevara-Fefer and Rzedowski 1980).

***Tetramerium pauciflorum* T.F. Daniel & V.W. Steinmann, sp. nov.**

Tetramerium pauciflorum is distinguished from its congeners by the combination of its shrubby and somewhat thorny habit; linear to lance-linear leaves; pubescent (eglandular and glandular trichomes), lanceolate to lance-subulate, and entire bracts that are 6–10 mm long; 5-lobed calyx; pseudopapilionaceous and whitish (with purple markings) corollas; and pubescent capsules that are 4.5–5.5 mm long.

TYPE.— MEXICO. **Michoacán:** Mpio. La Huacana, ca. 4 km SE of San Pedro Barajas, along MEX 37, hills W of El Limoncito, 18°46'59"N, 102°01'17"W, 315 m, scrublike tropical deciduous forest, 21-II-2002, V. Steinmann, E. Carranza, & E. Pérez 2310 (holotype: MEXU!; isotypes: CAS!, RSA!). Figures 1, 2.

Spindly and intricately branched shrub to 1 m tall, distal branches spreading at angles of 45° or more, sometimes sharp-pointed at apex. Young stems pubescent with retrorse eglandular trichomes 0.05–0.1 (–0.3) mm long, trichomes ± evenly to 2-fariously disposed. Leaves often absent during anthesis, subsessile to petiolate, petioles to 3 mm long, blades linear to lance-linear, 12–30 mm long, 0.6–3 mm wide, 10–25 × longer than wide, acute at apex, acute at base, surfaces (especially along midvein abaxially) pubescent with erect to antrorse eglandular trichomes 0.05–0.2 mm long, margin usually ciliate with similar trichomes. Inflorescence of densely bracteate terminal (mostly at apex of short axillary branches) 1–2-flowered spikes to 13 mm long (excluding flowers), 4–6 mm in diameter near midspike, rachis (if present) not visible. Bracts erect, lanceolate to lance-subulate, 6–10 mm long, 0.7–1.2 mm wide, 6–8.6 × longer than wide, attenuate and mucronate at apex, abaxial surface with midvein (only) evident and prominent, puberulent with erect eglandular, subglandular, and glandular trichomes to 0.05 mm long and sparsely pubescent with an overstory of flexuose eglandular trichomes 0.1–0.4 mm long, margin and adaxial surface densely shaggy pubescent with flexuose eglandular trichomes to 1.3 mm long. Bracteoles lance-subulate, 4–5 mm long, 0.4–0.6 mm wide, abaxial surface and margin pubescent like bracts. Calyx 5-lobed, 3 mm long, lobes 2–2.5 mm long, abaxially and marginally pubescent like bracts (although glandular trichomes sometimes more conspicuous). Corolla ± pseudopapilionaceous, white with maroon veins outlining light purple regions on upper lip, 12.5–16.5 mm long, externally glabrous (margins of lobes ciliate), tube 3–5 mm long, 0.8–1 mm in diameter at base, 0.8–1.4 mm in diameter at apex, upper lip spatulate to obovate, 7–11 mm long, 3–4 mm wide, lower lip 7.5–12 mm long, lateral lobes 7–11.5 mm long, 2.5–4 mm wide, lower-central lobe 6.5–10.5 mm long, 3.5–4.4 mm wide. Stamens 6–8 mm long, filaments pubescent near base, thecae 1.2–1.5 mm long; pollen 3-colporate, 6-pseudocolpate, polar diameter (P) 50–52 μm, equatorial diameter (E) 26–27 μm, P:E = 1.84–1.98. Style 10–11 mm long. Capsule 4.5–5.5 mm long, pubescent with erect to flexuose eglandular trichomes 0.05–0.1 mm long, head 3–4 mm long. Seeds plano-convex, 1.6–1.7 mm long, 1.3–1.4 mm wide, surface and margin covered with ± conic papillae.

PHENOLOGY.— Flowering: November, February, May; fruiting: February, May. Plants collected in September bear abundant leaves, but lack flowers and fruits; plants collected in November, February, and May are leafless or nearly so, but fertile. Flowering likely occurs during the entire dry season from November through May.

DISTRIBUTION AND HABITAT.— Mexico (south-central Michoacán). Plants occur on nearly vertical rocky cliffs in tropical deciduous forest (with *Hechtia* and *Agave*) at elevations of 250–400 m.

CONSERVATION ASSESSMENT.— *Tetramerium pauciflorum* is endemic to the western portion of the basin of the Río Balsas, where it has been collected from two regions ca. 30 km apart – in the valleys of the Río Marquez in the north and the Río Tepalcatepec in the south. Two collections

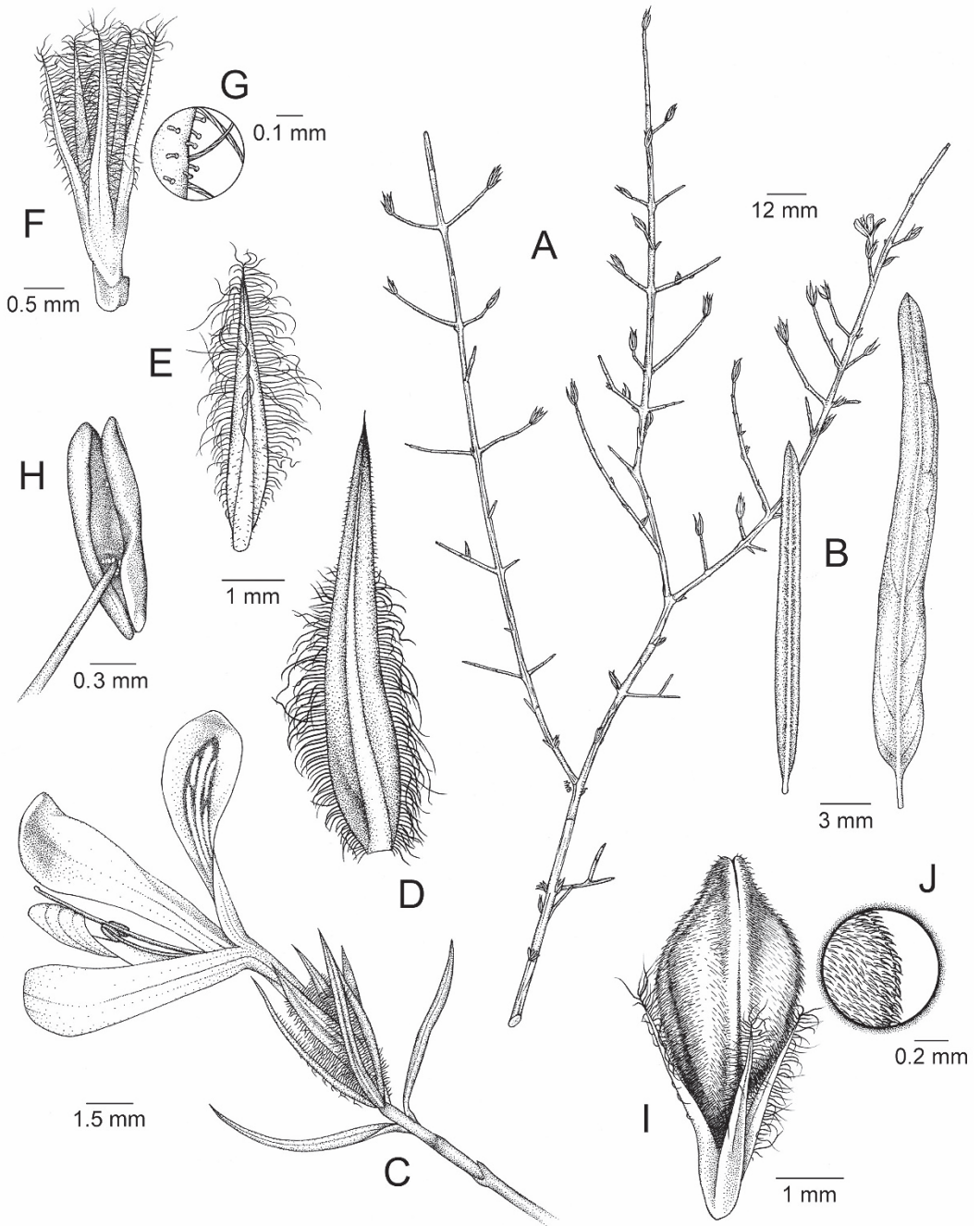


FIGURE 1. *Tetramerium pauciflorum*. A. Habit. B. Leaves, proximal leaf on right, distal leaf on left. C. Inflorescence with flower. D. Bract. E. Bracteole. F. Calyx. G. Detail of pubescence of calyx lobe. H. Anther. I. Capsule. J. Detail of pubescence of capsule. A, D–J from Steinmann 2310; B from Steinmann et al. 2688; C from Steinmann 3907. Drawn by Nicole Bollinger.

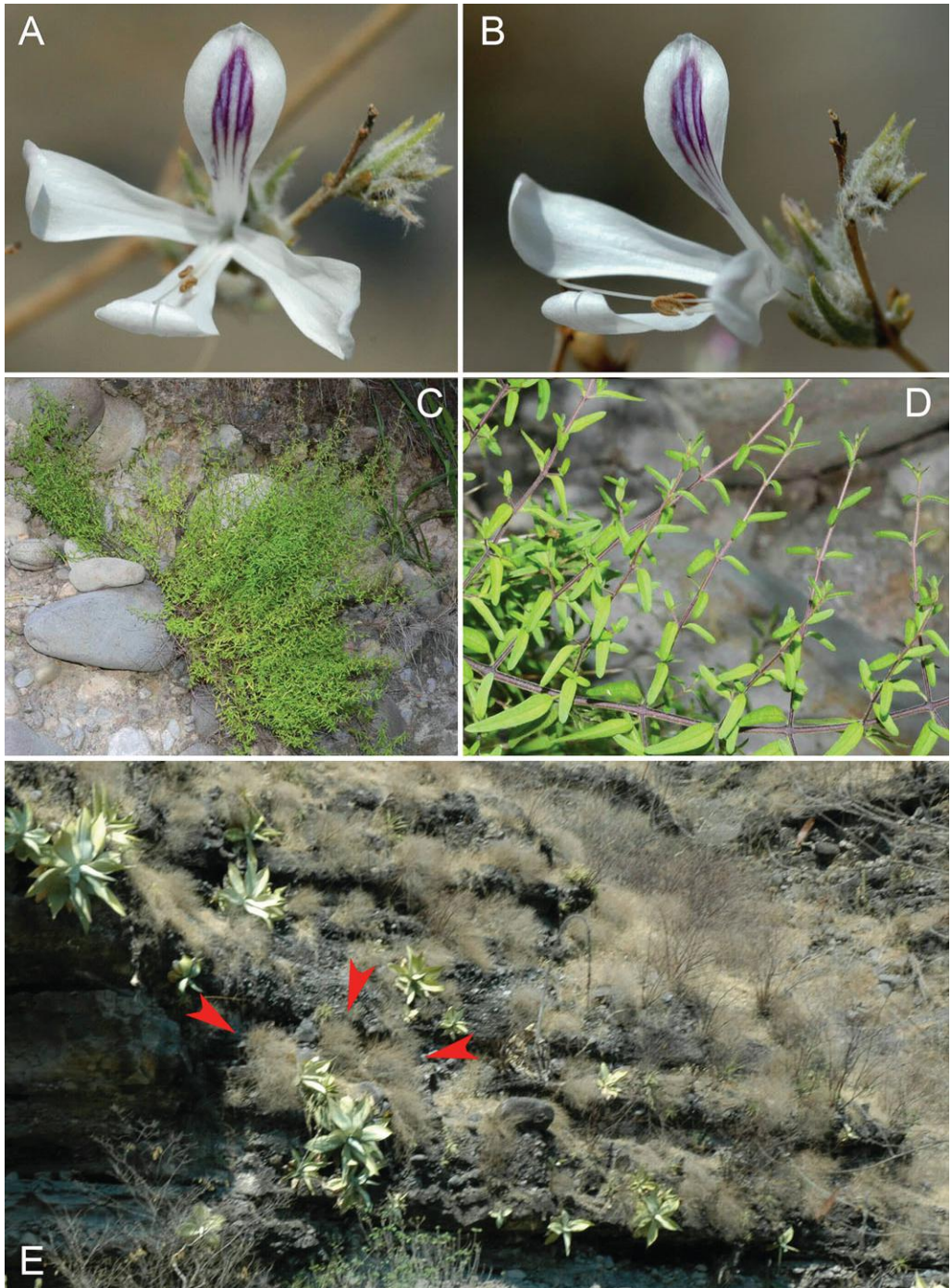


FIGURE 2. *Tetramerium pauciflorum*. A. Inflorescence with flower from front showing colored markings on upper lip and spreading lower lip of corolla. B. Inflorescence with flower from side showing separation of anthers and stigma and cottony pubescence of bracts, bracteoles, and calyx. C. Sterile plant with leaves in September. D. Close up of leafy shoots in September. E. Habitat on steep, rocky slopes and numerous leafless plants of *T. pauciflorum* in May (e.g., see red arrows). A, B, E from Steinmann & Ramirez-Amezcuca 5414; C, D from Steinman & Ramirez-Amezcuca 8089.

(Steinmann & Ramírez-Amezcuca 5414 and 8089) were made from nearby sites at the northern locality, and the type and remaining paratypes were made at the southern locality. The extent of occurrence (EOO) is ca. three km² and the area of occupancy (AOO; with grid cell area of four km²) is eight km². Field observations reveal that the species is rare within the EOO, but it can be locally abundant where it occurs (Fig. 2E). Although there is considerable agricultural development in the vicinity of the northern collections, plants occur on (or are possibly restricted to) steep (nearly vertical) and rocky slopes where habitat destruction is less than in surrounding areas. Furthermore, the southern locality is in the Zicuirán–Infiernillo Biosphere Reserve, where active efforts to conserve the vegetation are underway. Because no known threats, declines in population size/habitat quality, or extreme fluctuations can be identified at present, in spite of its limited distribution based on the calculated EOO and AOO, this species is provisionally assessed as Least Concern (LC) based on the IUCN criteria and guidelines (IUCN 2016).

PARATYPES.— MEXICO. **Michoacán:** Mpio. La Huacana, ca. 4 km SE of San Pedro Barajas, along MEX 37, hills W of El Limoncito, 18°46'59"N, 102°01'17"W, *V. Steinmann* 3907 (CAS, MEXU), *V. Steinmann et al.* 2688 (CAS, MEXU); Mpio. Múgica, 5.5 km NE de la salida a Nueva Italia por la autopista Lázaro Cárdenas–Morelia, cañada que baja al Río El Marqués debajo del puente de la autopista, 19°02'00"N, 102°03'20"W, *V. Steinmann & Y. Ramírez-Amezcuca* 5414 (CAS, MEXU); Mpio. Múgica, 5.5 km NE de la salida a Nueva Italia sobre la autopista Morelia–Lázaro Cárdenas, 19°01'57"N, 102°03'12"W, *V. Steinmann & Y. Ramírez-Amezcuca* 8089 (CAS, MEXU, RSA).

Flowers of *Tetramerium pauciflorum* are typical for species in sect. *Tetramerium*, in which the somewhat keel-like lower lip of the pseudopapilionaceous corolla acts both as a landing platform for floral visitors (including pollinators) and as a structural device to aid or ensure self-pollination as the corolla falls from the plant. This pattern was described and illustrated in some detail by Daniel (1986), especially for *T. nervosum* Nees. Herkogamy in *T. pauciflorum* can be somewhat more extreme than commonly seen in other species of sect. *Tetramerium* with the stigma extended

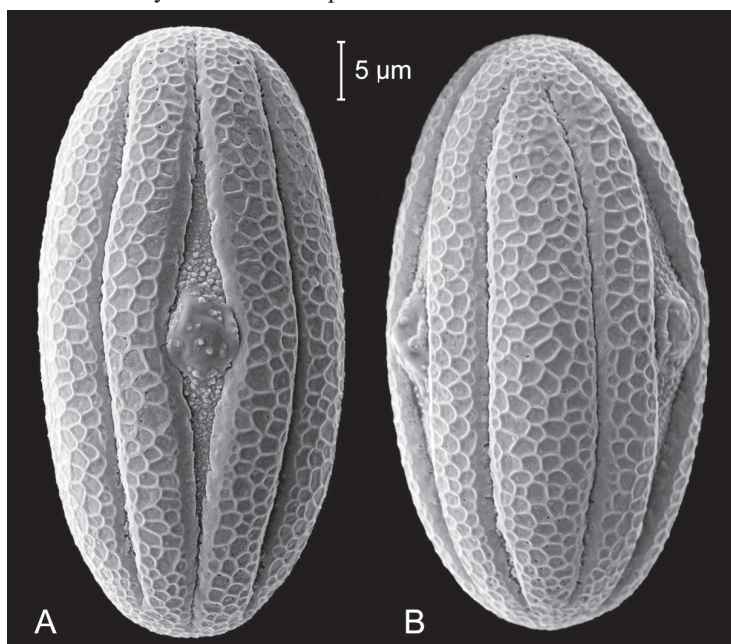


FIGURE 3. Pollen of *Tetramerium pauciflorum* (Steinmann 3907). A. Apertural view. B. Interapertural view.

beyond the anthers by up to 4 mm during anthesis (Fig. 2b). Pollen of *T. pauciflorum* (Fig. 3) resembles that of other species of the genus (Daniel 1986, 1998) in both size and sculpturing.

A characteristic of this species that appears to be unique in the genus is the terminal inflorescences that bear only one or two flowers in what appear to be mature spikes. Other species have from 4 (rare) up to 40 or more flowers per spike. Morphologically, *T. pauciflorum* appears similar to two other congeners that occur in the Balsas basin, *T. vargasiae* T.F. Daniel & Cruz Durán and *T. butterwickianum* T.F. Daniel. Whereas the former species is known only from Guerrero (ca. 300

Table 1. Morphological characteristics of three species of *Tetramerium*.

	Young stem pubescence	Length: width of leaf blades	Flowers per spike	Spike length (excluding corollas)	Bract length × width	Bract length: width	Length of apical mucro of bract	Venation of abaxial surface of bracts	Calyx lobes	Corolla length	Capsule pubescence
<i>T. butterwickianum</i>	erect to retrorsely appressed	4–8	4 or more	to 120 mm	5–6.5 × 1.5–3 mm	2.3–3.3	0.2–0.5	3 veins prominent	4	14–21 mm	pubescent
<i>T. pauciflorum</i>	retorse	10–25	1–2	to 12 mm	6–10 × 0.7–1.2 mm	6–8.6	0.8–1.2	only mid-vein evident	5	12.5–16.5 mm	pubescent
<i>T. vargasiae</i>	antrorse to antrorsely appressed	16.7–18.9	4 or more	to 46 mm	16–19 × 1.8–3.2 mm	7.4–10	0.5–0.6	3 veins ± obscure to prominent	5	20 mm	glabrous

km southeast of the nearest locality of *T. pauciflorum*), the distribution of *T. butterwickianum* overlaps that of *T. pauciflorum* in the Municipio of La Huacana. Although these two species occur within about 3.5 km of each other near Nueva Italia, they have not been found growing together. These three species, which pertain to section *Tetramerium* (Daniel 1986), all are somewhat thorny shrubs with ± divaricate branches, linear to lanceolate leaves, and white corollas. Table 1 summarizes distinctions among them, and the following key also serves to identify them:

- 1a. Calyx 4-lobed; leaf blades 4–8 × longer than wide; bracts 5–6.5 mm long, 2.3–3.3 × longer than wide, with an apical mucro 0.2–0.5 mm long, prominently 3-veined *T. butterwickianum*
- 1b. Calyx 5-lobed; leaf blades 10–25 × times longer than wide; bracts 6–19 mm long, 6–10 × longer than wide, with an apical mucro 0.5–1.2 mm long, only midvein evident or obscurely to prominently 3-veined 2
- 2a. Young stems pubescent with retrorse trichomes; capsule pubescent; inflorescence spikes 1–2-flowered, to 12 mm long; corolla 12.5–16.5 mm long; bracts 6–10 mm long, 0.7–1.2 mm wide, with an apical mucro 0.8–1.2 mm long, and with only 1 vein (midvein) evident and prominent on abaxial surface *T. pauciflorum*
- 2b. Young stems pubescent with antrorse to antrorsely appressed trichomes; capsule glabrous; inflorescence spikes 4- or more-flowered, to 45 mm long; corolla 20 mm long; bracts 16–19 mm long, 1.8–3.2 mm wide, with an apical mucro 0.5–0.6 mm long, and obscurely to prominently palmately 3-veined on abaxial surface *T. vargasiae*

ACKNOWLEDGMENTS

We thank Nicole Bollinger, 2008 intern in biological illustration at the California Academy of Sciences, for the illustration of *Tetramerium pauciflorum* and Scott Serata for assistance with scanning electron microscopy of pollen. Yocupitzia Ramírez Amezcua and Eleazar Carranza González assisted with field work.

LITERATURE CITED

- DANIEL, T.F. 1986. Systematics of *Tetramerium* (Acanthaceae). *Systematic Botany Monographs* 12:1–134.
- DANIEL, T.F. 1998. Pollen morphology of Mexican Acanthaceae: Diversity and systematic significance. *Proceedings of the California Academy of Sciences*, ser. 4, 50:217–256.
- DANIEL, T.F., AND V.W. STEINMANN. 2007. Two new species of *Justicia* (Acanthaceae) from the Río Balsas Basin of Michoacán, Mexico. *Contributions from the University of Michigan Herbarium* 25:199–205.
- DANIEL, T.F., AND R. CRUZ DURAN. 2016. *Tetramerium vargasiae* (Acanthaceae), a new species from the Basin of the Río Balsas in Guerrero, Mexico. *Proceedings of the California Academy of Sciences*, ser. 4, 63: 159–162.
- FERNÁNDEZ N., R., C. RODRÍGUEZ J., M. ARREGUÍN S., AND A. RODRÍGUEZ J. 1998. Listado florístico de la Cuenca del Río Balsas, México. *Polibotánica* 9:1–151.
- GUEVARA-FEFER, F., AND J. RZEDOWSKI. 1980. Notas sobre el género *Bursera* en Michoacán (México). I. Tres especies nuevas de los alrededores de la Presa de Infiernillo con algunos datos relativos a la región. *Boletín de la Sociedad Botánica de México* 39:63–81.
- IUCN. 2016. Guidelines for Using the IUCN Red List Categories and Criteria, Version 12. Standards and Petitions Subcommittee of the IUCN Species Survival Commission. <<http://www.iucnredlist.org/documents/RedListGuidelines.pdf>> [accessed 5 October 2016]
- LOTT, E.J., AND T.H. ATKINSON. 2006. Mexican and Central American seasonally dry tropical forests: Chamela-Cuixmala, Jalisco, as a focal point for comparison. Pages 315–342 in R.T. Pennington, G.P. Lewis, and J.A. Ratter, eds., *Neotropical Savannas and Seasonally Dry Forests: Plant Diversity, Biogeography, and Conservation*. The Systematics Association Special Volume Series 69. CRC Press, Boca Raton, Florida, USA.
- RODRÍGUEZ-JIMÉNEZ, C., R. FERNÁNDEZ-NAVA, M. ARREGUÍN-SÁNCHEZ, AND A. RODRÍGUEZ-JIMÉNEZ. 2005. Plantas vasculares endémicas de la cuenca del Río Balsas, México. *Polibotánica* 20:73–99.
- RZEDOWSKI, J. 1978. *Vegetación de México*. Editorial Limusa, Cd. México, Mexico.

Page intentionally left blank

On *Eremiasphecium arabicum* Pulawski and *Eremiasphecium sahelense* Simon Thomas (Hymenoptera: Crabronidae)

Wojciech J. Pulawski

*Department of Entomology, California Academy of Sciences, 55 Music Concourse Drive,
Golden Gate Park, California 94118, USA; e-mail: wpulawski@calacademy.org*

***Eremiasphecium arabicum* Pulawski, 1992 is first recorded from Mauritania, and
Eremiasphecium harteni Simon Thomas, 1994 is recognized as a junior synonym of
Eremiasphecium sahelense Simon Thomas, 1994.**

The two species discussed here show a similar distribution range: they are known from West Africa and the Arabian Peninsula. The gap almost certainly results from inadequate sampling in the southern Sahara area.

***Eremiasphecium arabicum* Pulawski**

Eremiasphecium arabicum Pulawski, 1992:401, ♀. Holotype: ♀, Saudi Arabia: El Riyadh (CAS). – Pulawski, 1992:404 (in checklist of *Eremiasphecium*); Schmid-Egger, 2011:526 (in key to *Eremiasphecium* of Arabian Peninsula), 528 (United Arab Emirates; recognition characters, color variation), 529 (color photographs of male), 530 and 531 (color photographs of female); Gadallah, Al Dhafer, Aldryhim, Fadl, and Elgharbawy, 2013:357 (in new catalog of Sphecidae of Saudi Arabia); Schmid-Egger, 2014:564 (United Arab Emirates).

This species was described from a single female collected in El Riyadh, Saudi Arabia (Pulawski, 1992), and subsequently recorded from the United Arab Emirates by Schmidt Egger (2011), who described the male and a significant color variation in the female. It is here reported from Mauritania.

Eremiasphecium arabicum (Fig. 1) can be recognized by the following character combination: three submarginal cells, second cell petiolate, third cell as wide anteriorly as posteriorly, head round in front view (neither transverse nor elongate), basal flagellomeres shorter than wide, and the apical process of the female forebasitarsus short (its length about 1.7 x midocellar diameter).

The Mauritanian females, although not identical to any of the four color forms recognized by Schmid-Egger, fall well within the range of the species chromatic variation described by him. They differ from the holotype by an all black clypeus and pronotal lobe and the femora all pale yellow.

RECORDS (Fig. 2).— **MAURITANIA**: 16 km SE Nouakchott, [no day] Nov 1993, Franco Borgato (4 ♀, 10 ♂, California Academy of Sciences). **SAUDI ARABIA**: El Riyadh (1 ♀, California Academy of Sciences, holotype of *Eremiasphecium arabicum*). **UNITED ARAB EMIRATES** (Schmid-Egger, 2011, 2014): 40 km NW Al-Ain Sweihan, Al-Ajban, N Ajman, Jebel Hafit S Al-Ain, Al-Wasit Protected Area, Al-Rafah, Dubai: Nakhalai, Um Al-Quwain, Wadi Shawkah.



FIGURE 1. Female of *Eremiasphecium arabicum* Pulawski in lateral view.

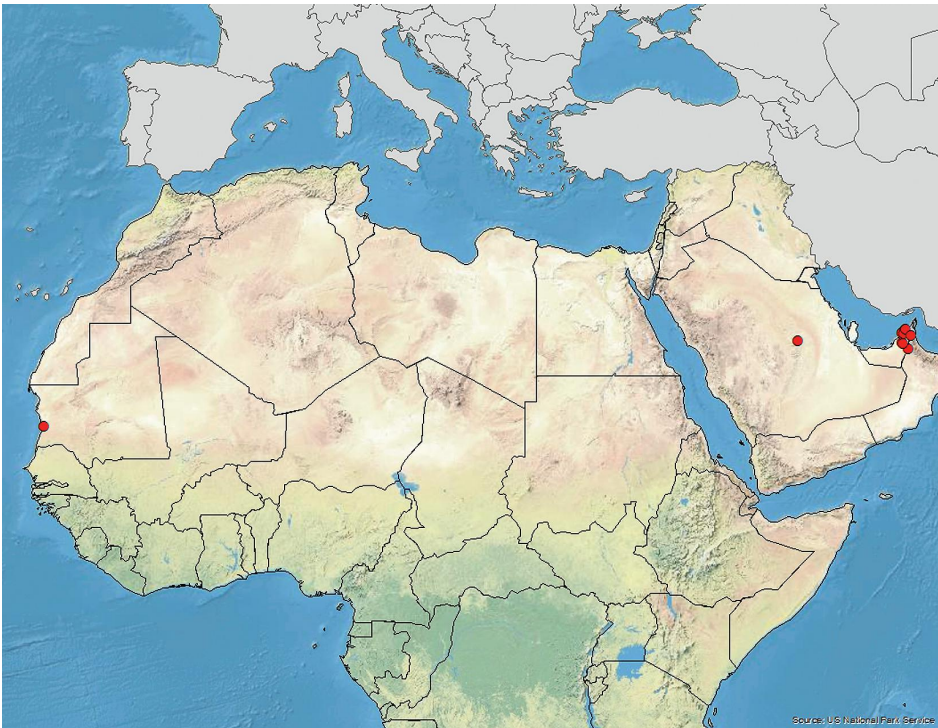


FIGURE 2. Collecting localities of *Eremiasphecium arabicum*.

Eremiasphecium sahelense (Simon Thomas)

Xanthosphecium sahelense Simon Thomas, 1994:156, ♀ (as *sahelensis*, incorrect original termination). Holotype: ♀, Senegal: 25–35 km S Richard Toll (Laboratory of Entomology, University of Wageningen).—

As *Eremiasphecium sahelense*: Simon Thomas, 1996:196 (new combination).

Xanthosphecium harteni Simon Thomas, 1994:155, ♀. Holotype: ♀, Yemen: Al Kowd (Zool. Mus. Amsterdam). **New synonym.**— **As *Eremiasphecium harteni*:** Simon Thomas, 1996:196 (new combination); Schmid-Egger, 2011b:526 (in key to *Eremiasphecium* of Arabian Peninsula), 532 (United Arab Emirates), 533 and 534 (color photographs of male and female); Schmid-Egger, 2014:564 (United Arab Emirates).

Simon Thomas (1994) described *Eremiasphecium sahelense* (Fig. 3) from Senegal and *Eremiasphecium harteni* from Yemen, placing them in his new genus *Xanthosphecium* because of the presence of only two submarginal cells. The first species was based on two females, and the second on a single female. In 1996, he correctly synonymized *Xanthosphecium* with *Eremiasphecium*. Simon Thomas distinguished the two species by the details of their coloration, and by the presence of “some pubescence” on the gena in *E. sahelense* and its absence in *harteni*. In 2011 Schmid-Egger documented a significant color variation in *E. harteni*.

I was able to collect 26 females and six males of *E. sahelense* in Mauritania in October and November 1993, and 32 females and 44 males in Niger in August and September 2005. A study of these specimens demonstrates that the supposed differences between the two species represent just individual variation. For example, the black area on the propodeal posterior surface varies from wide to linear (linear in *E. harteni*), and the entire surface is yellow in one specimen; most Mauritanian females have a black, basal spot on the gastral terga, but one has the terga all yellow (as in *E. harteni*); and the gena is glabrous (as in *E. harteni*). I conclude that the two species are conspecific, and therefore synonymize them. The two names were published in the same paper, and acting as First Reviser (Article 24.2.2 of the Code on Zoological Nomenclature) I hereby select *E. sahelense* as the valid name, and *E. harteni* as its junior synonym.

Eremiasphecium sahelense is unique among its congeners in having only two submarginal cells (rather than three).

RECORDS (Fig. 4) (West African specimens were collected by the author and are preserved in the California Academy of Sciences).— **MAURITANIA:** 16 km NE Nouakchott, 27 Oct 1993 (1 ♀); 32 km S Nouakchott, 6 Nov 1993 (24 ♀, 5 ♂); Tayart (7 km W Atar), 21 Oct 1993 (1 ♂); 25 km SW Tijikja, 30 Oct 1993 (1 ♀). **NIGER: Agadez Region:** 0.5 km SE Aderbissinat at 15°36.9'N 7°54.0'E, 10 Aug 2005 (10 ♀, 10 ♂). **Diffa Region:** 54 km NE Diffa at 13°42.3'N 12°55.8'E, 25 Aug 2005 (1 ♀, 2 ♂); 36 km SW Diffa at 13°11.3'N 12°17.4'E, 23 Aug 2005 (1 ♀, 2 ♂); 15 km W Goudoumaria at 13°42.8'N 11°03.9'E, 30 Aug 2005 (1 ♂); 3 km NNE Nguigmi at 14°16.5'N 13°06.9'E 26 Aug 2005 (2 ♀, 2 ♂); 8 km ENE Nguigmi at 14°17.2'N 13°10.1'E, 27 Aug 2005 (2 ♀, 1 ♂); 13 km SW Nguigmi at 14°10.3'N 13°01.3'E, 29 Aug 2005 (5 ♀, 6 ♂); 34 km SW Nguigmi at 13°58.8'N 12°58.2'E, 29 Aug 2005 (1 ♀). **Tahoua Region:** 60 km E Madaoua at 13°49.2'N 6°23.7'E, 2 Sept 2005 (1 ♂) **Tillabéri Region:** 13 km N Niamey at 13°32.6'N 2°16.4'E, 14 Sept 2005 (2 ♀, 1 ♂); 82 km ESE Téra at 13°51.1'N 1°31.3'E, 10 Sept 2005 (3 ♂). **Zinder Region:** 15 km N Gouré at 14°07.0'N 10°12.4'E, 21 Aug 2005 (2 ♀); 63 km E Gouré at 13°42.9'N 10°45.1'E, 22 Aug 2005 (2 ♀, 1 ♂); 4 km E Guidiguir at 13°41.7'N 9°51.9'E, 19 Aug 2005 (1 ♀, 1 ♂); 27 km W Guidiguir at 13°40.9'N 9°39.1'E, 19 Aug 2005 (1 ♀, 7 ♂); 23 km NW Magaria at 13°06.4'N 8°42.9'E, 18 Aug 2005 (5 ♂); 49 km NW Tanout at 15°11.7'N 8°27.1'E, 8 Aug 2005 (2 ♀, 1 ♂). **SENEGAL:** 25–35 km S Richard Toll (Simon Thomas, 1994). **UNITED ARAB EMIRATES** (Schmid-Egger, 2011, 2014, as *E. harteni*): Al-Ajban, N Ajman, Al-Rafah, Ra's al-Khaimah–Dibba, Um al-Quwain, Wadi Madaq.



FIGURE 3. Female of *Eremiaspecium sahelense* Simon Thomas in lateral view.

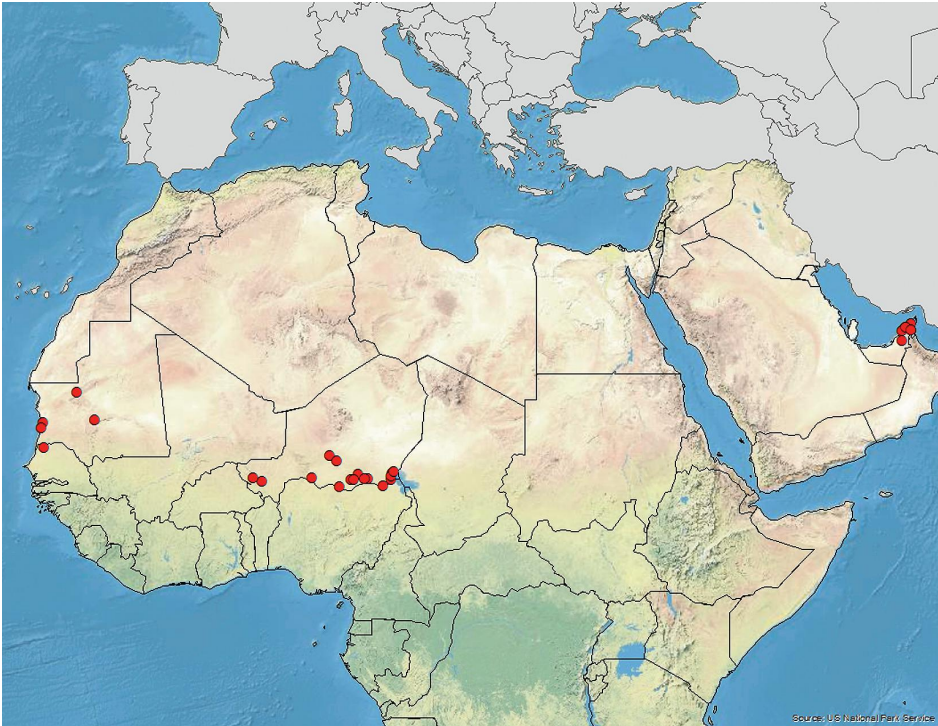


FIGURE 4. Collecting localities of *Eremiaspecium sahelense*.

ACKNOWLEDGMENTS

I am indebted to Robert L. Zuparko for having reviewed and improved the manuscript, to Jere Schweikert for having created a database of localities with their coordinates, and to Erika Garcia for generating the distribution maps.

REFERENCES

- GADALLAH, N.S., H.M. AL DHAFER, Y.N. ALDRYHIM, H.H. FADL, AND A.A. ELGHARBAWY. 2013. The digger wasps of Saudi Arabia. New records and distribution, with a checklist of species (Hym.: Ampulicidae, Crabronidae and Sphecidae). *North-Western Journal of Zoology* 9:345–364.
- PULAWSKI, W.J. 1992. A review of *Eremiasphecium* Kohl, 1897 (Hymenoptera: Sphecidae). *Entomofauna* 13:397–408.
- SCHMID-EGGER, CH. 2011. Order Hymenoptera, families Crabronidae and Sphecidae. *Arthropod Fauna of the UAE* 4:488–608.
- SCHMID-EGGER, CH. 2014. Order Hymenoptera, families Crabronidae and Sphecidae. Further records and descriptions of new species. *Arthropod Fauna of the UAE* 5:521–631.
- SIMON THOMAS, R.T. 1994. Two new species of a new genus of Sphecidae from Senegal and Yemen (Hymenoptera). *Entomologische Berichten* 54:154–157.
- SIMON THOMAS, R.T. 1996. The status of the genus *Xanthosphecium* Simon Thomas (Hymenoptera: Sphecidae). *Entomologische Berichten* 56:196.

Page intentionally left blank

**A New Species of the Genus *Palarus*
(Hymenoptera: Crabronidae)**

Wojciech J. Pulawski¹ and Sarah K. Gess²

¹ Department of Entomology, California Academy of Sciences, 55 Music Concourse Drive, Golden Gate Park, California 94118, USA; e-mail: wpulawski@calacademy.org. ² Department of Entomology and Arachnology, Albany Museum and Department of Zoology and Entomology, Rhodes University, Grahamstown, 6139 South Africa; e-mail: s.gess@ru.ac.za.

A new species, *Palarus inexpectatus*, is described from Dubai. It is closely similar to *Palarus jaxartes* Pulawski and Prentice, from which it differs by details of the elevation of sternum II and color, the male also by the venter of flagellomeres II–IX distinctly angulate near the midlength, the presence of a midtibial spur, and the shape of tergum VII. Three females and two males were collected on flowers of *Heliotropium kotschyi* Gürke (Boraginaceae), and one male on those of *Calligonum comosum* L'Herit (Polygonaceae). One prey, a male of *Bembix hauseri* Schmid-Egger, was taken from a nesting female. The nest, a sloping burrow, had been excavated.

When Pulawski and Prentice published their revision of Palarini in 2008, it was hoped that all the world species were included. In 2016, however, Sarah Gess collected seven specimens of an undescribed *Palarus* in Dubai that she submitted to Wojciech Pulawski for examination and description. Data on habitat, flower associations, prey and nest are those of Sarah Gess.

***Palarus inexpectatus* Pulawski, species nova**

Figures 1–6

NAME DERIVATION.—*Inexpectatus*, Latin for *unexpected*; with reference to the surprising discovery of this species.

POSITION WITHIN GENUS.—*Palarus inexpectatus* is a member of the *variegatus* species group. As such, it is characterized by the presence on sternum II of an elevated, transverse crest, the female pygidial plate with minute but well-defined longitudinal ridges, and the male pygidial plate bidentate apically and raised above the apex of tergum VII. The outer apical spines of female hindtarsomeres II and III, however, are slightly longer and thicker than in the other members of the group. The species obviously lacks the defining characters of the *interruptus*, *histrion*, and the *maculatus* groups (see Pulawski and Prentice, 2008).

Within the group, the new species resembles most closely *Palarus jaxartensis* Pulawski and Prentice. Both species share the following unique character combination: genal setae sinuous, some setae close to hypostomal carina slightly longer than midocellar width, least interocular distance about equal to midocellar width, female sternum II with non-dentate crest and a short, transverse platform just behind it (posterior margin of platform almost rectilinear), distance between crest and platform's posterior margin shorter than midocellar width, length of apical depression markedly greater than midocellar width, and male forebasitarsal venter with black, elongate spot.

TABLE 1. Comparison with *Palarus jaxartes*. — The two species differ as follows:

Character	<i>Palarus jaxartensis</i>	<i>Palarus inexpectatus</i>
Color of body maculae	pale yellow	brownish yellow
Color of frons	yellow up to about midheight	yellow only lateroventrally and between antennal sockets
Color of female gena	largely yellow	black
Color of flagellum	yellow or brown dorsally	all black
Color of mesopleuron	all or largely yellow	all black except yellow anterior to episternal sulcus
Color of propodeum	at least side of dorsum yellow	all black
Female sternum II: dentate carina immediately behind crest	absent	present
Color of female foretarsal venter	all yellow	with round, black, preapical spot
Venter of male flagellomeres	evenly convex	flagellomeres II-IX angulate
Apicomedian setae of male forecoxa	short, not forming a brush	long, forming a brush
Male midcoxal venter	flattened	not flattened
Male midtibial spur	absent	present
Lateral pygidial process of male	not extending beyond tergal apex	extending beyond tergal apex
Elevation of male sternum II	posterior margin even	posterior margin undulate laterally

DESCRIPTION.— Least interocular distance about $1.0-1.2 \times$ midocellar width in female, $1.1-1.3 \times$ in male. Occipital carina separated from eye margin at vertex by about hindocellar length in both sexes. Anterior margin of precoxal mesopleural declivity without angular prominence. Propodeal side finely ridged throughout or ridged only posterodorsally and posteroventrally, punctate except impunctate anteriorly.

Frons yellow laterally up to about midheight (yellow area narrowing dorsally) and between antennal sockets; mandible all yellow basally; scape yellow ventrally, black dorsally; pedicel and flagellum black. Pronotum yellow except black between streptaulus and collar; scutum yellow anterolaterally; scutellum, scutellar flange, metanotum, and metanotal flange brownish yellow; mesopleuron (except yellow preepisternal area), metapleuron, and propodeum black; mesothoracic venter black or yellow posteriorly in female, all yellow in male. Wing membrane nearly hyaline. Foreleg yellow, mid- and hindlegs brownish yellow; foretarsal venter with round, black, preapical spot. Terga brownish yellow except apical tergum black in both sexes.

♀ (Fig. 1).— Genal setae sinuous, those of genal ventral part about as long as midocellar diameter. Dorsal length of flagellomere I $2.0-2.2 \times$ apical width. Adlateral carina of tergum I gradually effaced posterad. Lateral margin of pygidial plate straight or minimally concave at about midlength. Ridges of pygidial plate nearly regular, markedly diverging posterad from midline. Sternum II (Fig. 2): transverse crest simple; transverse, obtusely dentate carina present immediately behind crest (visible only obliquely from behind; located between crest and row of long, erect

setae); with short, transverse platform just behind row of setae, posterior margin of platform sharp both mesally and laterally; distance between crest and posterior margin of platform one midocellar width; apical depression longer than midocellar width; swelling that borders apical depression extending to lateromedian angle of crest, without sharp tubercle. Length 13.8–14.5 mm.

♂.— Free margin of medioclypeus slightly arcuate. Genal setae sinuous, slightly shorter than midocellar width. Longest setae between mandibular condyle and notch slightly longer than midocellar width. Dorsal length of flagellomere I 1.9–2.0 × apical width; venter of male flagellomeres angulate (Fig. 3). Mesothoracic setae posterior of episternal sulcus slightly curved, about 0.5 × as long as midocellar width. Mesothoracic venter, before precoxal sulcus, with most punctures two to three diameters apart, and setae shorter than those on ventral portion of preepisternum. Metasternum setose throughout. Forecoxa without apicomedian platform, with apicomedian brush of dense setae. Midcoxal venter not flattened, with insignificant preapical tubercle, with a few, sparse setae, without posteroventral carina. Midtibial spur present, about as long as 0.3 × midbasitarsus length. Midbasitarsus slightly flattened laterally, not curved, its ventral margin with one preapical and one apical, short spine. Midtarsomeres II and III with apicoventral, round, circular, translucent pad. Tergum V with obtuse adlateral carina posteriorly. Tergum VI with adlateral carina. Tergum VII (Figs. 4, 5): pygidial plate concave, emarginate apically, raised above and projecting beyond tergal apex (lateral pygidial process separated from tergal apex by about 0.7 × midocellar width); lateral pygidial process widest anteriorly, processes not connected ventrally by V-shaped carina; side of tergam not markedly concave; adlateral carina evenly curved, not expanded; ventral margin of tergam close to adlateral carina, but largely visible in lateral view; carina broadening apically into rounded flange; setae longest on sides and venter of lateral pygidial process, not upcurved at tergal apex. Sternum II (Fig. 6) with transverse ridge before elevation, anterior margin of elevation even and posterior margin undulating. Sternum V with a few, sparse punctures or densely punctate next to apical depression; associated setae inconspicuous. Sternum VI, on disk, with many well-defined punctures, at least some of which are less than one diameter apart; associated setae inconspicuous, straight; adlateral carina obtuse, inconspicuous, present only basally, not acutely pointed posteriorly. Gonocoxite with narrow sclerotized area adjacent basoventrally to membranous area, with short but well-defined setae in distal third (Figs. 7, 8). Length 13.1–15.0 mm.

COLLECTING SITES.— A description of the collecting sites is given in Gess and Roosenschoon (2016).

HABITAT.— Sparsely vegetated sand dunes.

FLORAL ASSOCIATIONS.— Three females and two males were collected on flowers of *Heliotropium kotschy* Gürke (Boraginaceae), and one male on those of *Calligonum comosum* L'Herit (Polygonaceae).

PREY.— One prey, a male of *Bembix hauseri* Schmid-Egger, was taken from a nesting female.

NESTING.— A female was observed carrying prey, a male of *Bembix hauseri*, to her nest entrance where she put it down before entering the nest. The nest had been excavated in sand near the base of a large *Heliotropium kotschy* plant. The burrow of diameter 7 mm sloped down at an angle of 60° to the sand surface for 110 mm. No prey were found in the burrow.

RECORDS.— HOLOTYPE: ♂, UNITED ARAB EMIRATES: **Dubai:** Dubai Desert Conservation Reserve: Lucerne Farm at 24.77569°N 55.64268°E, 6 Apr 2016, S.K. Gess (Albany Museum, Grahamstown, South Africa).

PARATYPES: same locality and collector as holotype, 6 Apr 2016 (1 ♀, Albany Museum; 2 ♀, California Academy of Sciences) and 11 Apr 2016 (1 ♀, 1 ♂, Albany Museum); same data except not Lucerne Farm, dune area, grazing and browsing exclusion plot at 24.82096°N 55.61533°E, 3 Apr 2016 (1 ♂, California Academy of Sciences).



FIGURE 1. *Palarus inexpectatus* – female body in lateral view.



FIGURE 2. *Palarus inexpectatus* – sternum II of female in lateral oblique view.



FIGURE 3. *Palarus inexpectatus* – male flagellum.



FIGURE 4. *Palarus inexpectatus* – male tergum VII in dorsal view.



FIGURE 5. *Palarus inexpectatus* – male tergum VII in lateral view.



FIGURE 6. *Palarus inexpectatus* – male sternum II in lateral oblique view.



FIGURE 7. *Palarus inexpectatus* – male genitalia in dorsal view.



FIGURE 8. *Palarus inexpectatus* – male genitalia in lateral view.

ACKNOWLEDGMENTS

Sincere thanks are expressed by Wojciech Pulawski to Erin Prado who generated the color illustrations using Auto-Montage software package by Syncroscopy, and to Robert L. Zuparko for having improved the manuscript.

Grateful thanks are expressed by Sarah Gess to the following people and organizations: Greg Simkins, Manager of the Dubai Desert Conservation Reserve (DDCR), for his invitation to work in the DDCR, and for having provided transport, accommodation, meals and laundry; Rhodes University for her airfare and travel insurance; and Tamer Khafaga, Conservation Officer, DDCR, for plant determinations.

REFERENCES

- GESS, S.K., AND P.A. ROOSENSHOON. 2016. A preliminary survey of flower visiting by aculeate wasps and bees in the Dubai Desert Conservation Reserve. *Journal of Hymenoptera Research* 52:81–141.
- PULAWSKI, W.J., AND M.A. PRENTICE. 2008. A revision of the wasp tribe Palarini Schrottky, 1909 (Hymenoptera: Apoidea: Crabronidae). *Proceedings of the California Academy of Sciences*, ser. 4, 59:307–479.

Cumulative Index to
Proceedings of the California Academy of Sciences
Series 4, Volume 63, 2016

Index
Cumulative Index to Series 4, Volume 63 of the
Proceedings of the California Academy of Sciences (2016)

A

- Abies* 389, 394, 397, 406, 424
Ablepharus 499, 500, 536
 bivittatus 499, 500
 lindbergi 499
 brandtii 500
 grayanus 499, 536
 himalayanus 536
 lindbergi 499, 536
 pannonicus 500, 536
Abutilon 308
 incanum 308
 parvulum 308
Acacia 17
Acamptopappus sphaerocephalus 286, 296
Acanthaceae 159, 162, 163, 567
Acantheae 163
Acanthodactylus 492, 493, 522, 536
 blanfordi 536
 blanfordii 492
 cantoris 493, 536
 cantoris var. *blanfordii* 492
 micropholis 522
Acanthoideae 163
Acanthosicyos horridus 16
Acanthus 163
 ebracteatus 163
 ilicifolius 163
Acari 67, 69, 70, 71, 72, 75, 76
Acer negundo 274
Achnatherum 281, 310
 Achnatherum × *bloomeri* 310
 coronatum 310
 hymenoides 281, 310
Achyronychia cooperi 277, 303
Acmispon 277, 280, 304
 brachycarpus 277, 304
 maritimus 280, 304
 var. *brevivexillus* 304
 rigidus 280, 304
 strigosus 280, 304
Acnatherum 280, 281
 coronatum 280
 hymenoides 280, 281
Acourtia wrightii 296
Adenophyllum porophylloides 296
Adephaga 201
Adiantum 287, 294
 capillis-veneris 287
 capillus-veneris 294
Adoxaceae 294
Afghanistan 386, 433, 457-567
 Amu Darya 458, 513
 Chah-i-Angir 460, 466, 477, 479, 486, 491, 493, 494, 496, 498, 502, 504, 505, 506, 508, 510, 511, 515, 516, 524, 553
 Dasht-i-Margo 460, 477, 479, 486, 491, 493, 494, 496, 498, 502, 504, 505, 506, 508, 509, 511, 515, 516, 524, 554
 Farah 458
 Hari Rud 458, 467, 553
 Helmand 458
 Helmand Basin 501
 Hindu Kush 458, 460, 483, 501
 Kabul River 458
 Khash 458
 Murghab 458, 462, 475, 479, 490, 495, 501, 509, 514, 551, 555
 Wakhan [Corridor] 458, 459, 462, 464, 471, 474, 525, 552, 556
Afghanodon mustersi 468, 536
Africa 18, 20, 25, 31, 32, 34, 37, 39, 41, 42, 43, 71, 72, 74, 75, 174, 185, 191, 196, 199, 249, 254, 255, 260, 329, 575
 Algeria 331
 Angola 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 30, 31, 34, 36, 37, 38, 40, 41, 42, 43, 52, 60, 192
 Benguela Province 16, 19, 21, 23, 24, 25, 26, 31, 33, 37, 38, 42
 Bié Province 19, 21, 39
 Cuando Cubango Province 27
 Cunene Province 16, 23, 25, 26, 28, 36, 38

- Huíla Province 16, 19, 20, 23, 26, 38
 Kwanza Norte Province 33
 Kwanza Sul Province 20
 Namibe Province 15, 16, 17, 18, 19, 20,
 21, 23, 26, 29, 30, 32, 33, 36, 37, 38,
 41, 42
 Iona National Park 15, 16, 19, 33
 Namibe Regional Natural Park 15,
 16, 19
 Cabinda 34, 40
 Cameroon 192
 Canary Islands 331
 Democratic Republic of Congo 34
 Ethiopia 331
 Ghana 196, 198, 199
 Guinea 191, 192, 196
 Gulf of Guinea 191, 196
 Príncipe 191, 192, 193, 194, 196, 197,
 199
 São Tomé 191, 192, 193, 194, 196, 197,
 199
 Mauritania 575, 577
 Morocco 331
 Mozambique 32
 Niger 577
 Sahara 575
 Senegal 192, 198
 South Africa 18, 20, 25, 32, 34, 39, 42, 329,
 331
 Tanzania 329, 331
 West Africa 191
 Zambia 32, 331
 Zimbabwe 32, 52, 331
- Afrogecko* 18, 54
 plumicaudus 18
- Afronaja* 61
 mossambica 61
 nigricincta 61
 nigricollis 61
- Afrotropical Region 347, 381
- Afrotyphlops* 17, 59
 anomalous 59
 schlegelii 17, 59
- Agama* 17, 21, 22, 23, 45, 58, 460, 470, 471,
 472, 474, 478, 479, 480, 481, 482, 527
 aculeata 21, 58
 agilis 479
 anchietae 17, 21, 22, 58
 aralensis 482
 badakhshana 460, 471
 borstschewskyi 474
 isolepis 479, 480
 kirmanensis 479
 brevicauda 479
 nuristanica 460, 470
 planiceps 21, 22, 23, 58
 planiceps 58
 shackii 23
 runderata baluchiana 481
 scutellata 478
 tuberculata 471
- Agamidae 21, 58, 469, 475, 520, 523, 524, 525
- Agamura* 484, 536
 cruralis 484
 persica 484, 536
- Agavaceae 294
- Agave* 274, 280, 294
 mckelveyana 274, 280, 294, 295
 utahensis 294, 295
- Agkistrodon* 517
 halys 517
 boehmei 517
- Agonotrechiotes* 342, 376, 377
 longiantennatus 342, 377
- Agonotrechus* 341, 344, 346, 352, 353, 354, 355,
 356, 357, 358, 359, 360, 361, 362, 363, 383,
 384, 426, 433, 434, 435, 436, 437, 438, 439,
 447
 dubius 357
 fugongensis **sp. nov.** 341, 353, 354, 355,
 356, 357, 433, 434, 435, 437
 tenuicollis 361
 wuyipeng 353, 356, 357, 358, 433, 434,
 435, 437, 439, 447
 xiaoheishan **sp. nov.** 341, 353, 359, 360,
 361, 363, 383, 384, 433, 435, 436, 437,
 447
 yunnanus 344, 353, 361, 362, 383, 426,
 433, 435, 436, 437
- Agrilus auroguttatus* 69, 77
- Agrostis semiverticillata* 312
- Ailuropoda melanoleuca* 432
- Alcyonacea 1, 3
- Aleyrodidae 69, 71

- Allenrolfea occidentalis* 174
Allionia incarnata 308
Allium 275, 307, 317
 nevadense 275, 307
Allogorgia 3
Alnus 274
Aloysia wrightii 316
Alsophylax 485, 486, 489, 524, 525
 pipiens 485, 524, 525
 spinicauda 489
 tuberculatus 486
Altiphylax 484, 485, 524, 525, 536
 levitoni 484, 485, 524, 536
Alyson ater 339
Amara 433
 birmana 433
 chalciopae 433
 dissimilis 433
 elegantula 433
 latithorax 433
 sikkimensis 433
Amaranthaceae 295
Amaranthus fimbriatus 277, 295
Amblygenius 223
Ambrosia 275, 277, 280, 281, 286, 287, 296
 confertiflora 296
 dumosa 275, 280, 286, 296
 eriocentra 296
 monogyra 281, 286, 287, 296
 salsola 277, 281, 296
Amerizus 343
Amietia angolensis 20, 54
Amietophrynus 19
Amphibia 19, 48, 462, 468
Amphipappus fremontii var. *spinosus* 296
Amphipoda 67, 72, 76
Amsinckia 277, 280, 299
 intermedia 280, 299
 tessellata 280, 299
Amsonia palmeri 286, 295
Anacardiaceae 295
Anagallis arvensis 308
Anastrepha 65, 67, 84
 ludens 65, 67, 84
 suspensa 65, 67, 84
Ancistrodon halys caucasicus 517
Andropogon glomeratus 287, 310
Androsace occidentalis 314
Anemone tuberosa 314
Anemopsis californica 315
Anguidae 482
Anguilliformes 321
Annelida 67
Anoplophora glabripennis 66, 67, 84
Anthonomus grandis 66, 67, 84
Anura 19, 53, 462
Aonidiella aurantii 78
Aparallactus capensis capensis 60
Aphalaridae 75
Aphididae 63, 69, 71, 80
Apiaceae 295
Apis mellifera 65
Aplatophis 326
Apocynaceae 295
Apocynum cannabinum 287, 295
Aquilegia chrysantha 287, 290, 291, 314, 317
Arabian Peninsula 575, 577, 583
 Dubai 575
 Saudi Arabia 575
 United Arab Emirates 575, 577, 583
 Dubai 581, 583, 588
 Yemen 577
Arabis perennans 301
Arachnida 67
Araneae 67, 69, 70, 72, 76, 81, 82
Archastes 432
Archicolluris 201, 230, 231
 ranomafanae sp. nov. 201, 230, 231
Aristida 17, 280, 281, 310, 311
 adscensionis 280, 310
 parishii 310
 purpurea 280, 281, 310
 var. *glauca* 311
 var. *nealleyi* 311
 var. *parishii* 310
Aristochroa 343
Armadillidium vulgare 69
Artemisia 280, 281, 286, 296
 dracunculus 296
 ludoviciana 280, 281, 286, 296
Arthropoda 67
Asclepias 274, 292, 295
 albicans 274, 292, 295
 erosa 274, 295

- latifolia* 274, 287, 292
nyctaginifolia 274, 295
subulata 274, 295
 Asia 71, 72, 74, 75, 185, 321, 334, 341, 457
 Afghanistan (see under Afghanistan)
 Bangladesh 523
 Central Asia 457, 513
 Azerbaijan 471, 507, 517
 Georgia 471, 507
 Kazakhstan 482, 497, 506, 521
 Kyrgyzstan 520
 Tajikistan 464, 467, 476, 518, 520, 521, 522
 Turkmenistan 458, 474, 477, 478, 489, 490, 494, 501, 504, 506, 511, 512, 518, 521, 522, 523, 533, 557, 560, 564
 Kara Kum 458
 Uzbekistan 458, 459, 474, 486, 497, 500, 518, 520, 521, 522
 China 341, 520
 Gansu Province 353, 357
 Hengduan Mountains 342, 343, 434, 455
 Hubei Province 353
 Shaanxi Province 353, 357
 Sichuan Province 365, 377, 384, 386, 433
 Xizang Province (Tibet) 344, 379
 Yunnan Province 341, 342, 344, 345, 348, 352, 354, 356, 357, 359, 361, 363, 365, 366, 368, 369, 370, 372, 373, 376, 377, 379, 382, 386, 389, 391, 392, 395, 397, 400, 402, 403, 404, 407, 408, 409, 410, 411, 413, 415, 416, 418, 419, 421, 422, 424, 425, 426, 429, 430, 432
 Gaoligong Mountains 341, 342, 343
 Gaoligong Shan 341, 345, 346, 347, 348, 351, 354, 355, 356, 357, 358, 360, 361, 362, 363, 365, 366, 367, 369, 371, 372, 373, 374, 376, 377, 378, 380, 381, 383, 385, 388, 389, 390, 391, 392, 393, 394, 396, 397, 398, 400, 401, 403, 405, 406, 407, 408, 409, 410, 411, 412, 413, 415, 417, 418, 419, 420, 421, 423, 424, 425, 426, 428, 429, 430, 431, 432, 433, 434, 435
 Assam 377
 Indonesia 334
 Japan 71, 83, 345, 353, 433
 Myanmar 342, 344, 353, 356, 357, 361, 381, 435
 Kachin 361
 Nepal 348, 353, 361, 380
 Okinawa 321, 326
 Pakistan 458, 459, 463, 464, 465, 466, 469, 470, 471, 475, 484, 485, 486, 487, 488, 500, 502, 506, 508, 510, 512, 513, 514, 515, 516, 518, 520, 521, 522, 523, 526
 Baluchistan 458, 464, 465, 470, 476, 481, 484, 485, 486, 494, 496, 508, 513, 518, 520, 522
 Qinghai-Xizang (Tibetan) Plateau 342, 386, 433, 434
 Southwest Asia 457
 Afghanistan (see primary listing) 457
 Arabian Sea 458
 Iran 458, 520, 522
 Zagros Mountains 458, 523
 Iranian Plateau 458
 Iraq 523
 Oman 458, 523
 Persia 511
 Sri Lanka 523
 Thailand 381
 Vietnam 352, 353, 381
 Asiocolotes 485
 Aspidelaps lubricus cowlesi 61
 Assadecma 201, 252, 253, 254
 basilewskyi sp. nov. 201, 252, 253, 254
 madagascariensis 252, 254
 Asteraceae 269, 293, 296
 Astragalus 292

- Astragalus* 304, 305
 lentiginosus 304
 var. *yuccanus* 304
 newberryi 292, 305
 var. *blyae* 292
 nuttallianus 305
 var. *imperfectus* 305
 tephrodes 305
 var. *chloridae* 305
Asymblepharus himalayanus 500
Athymanus pusillus 301
 Atlantic Ocean 175, 191
 Ascension 191
 Cape Verde Islands 192, 198
 St Helena 191
Atrichoseris platyphylla 280, 296
Atriplex 303
 canescens 303
 elegans 303
 polycarpa 303
Auchenorrhyncha 63, 67, 69, 70, 71, 72, 76
Aulacophilinus 333, 334, 335, 336, 337, 339
 amblygnathus sp. nov. 333, 335, 336, 337, 338
 caliginosus 335, 337
 mandibulatus 335, 337, 338
 pyrrhicus 337, 338
 pyrrhum 334
 rennellensis 334, 335, 337, 338
Aulacophilus 333, 334
 Australia 71, 72, 74, 75, 79, 170, 185
 Australia-New Guinea 334
 Australian 334
 New Guinea 333, 334, 335, 337, 338
 Australian Region 347
Avena 311
 barbata 311
 fatua 311
Avicennia 163, 164, 165, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 179, 181, 183, 184, 185, 186, 187, 189
 bicolor 163, 167, 168, 169, 170, 175, 176, 177
 floridana 172, 175
 germinans 163, 164, 165, 167, 168, 169, 170, 171, 173, 174, 175, 176, 177
 marina 163, 164, 167, 170, 181, 182, 184, 185, 186
 australasica 163, 167, 170, 184, 185, 186
 eucalyptifolia 186
 resinifera 184
 nitida 171, 175, 176
 oblongifolia 172
 officinalis 164, 171
 nitida 171
 resinifera 185, 186
 schaueriana 177
 tomentosa 172, 175, 184
 australasica 184
 campechensis 172
 tonduzii 169, 172, 176
 Avicenniaceae 163, 186
 Avicennioideae 163
- B**
- Baccharis* 275, 280, 286, 287, 290, 296
 brachyphylla 280, 296
 salicifolia 275, 287, 296
 salisifolia 286
 sergiloides 286, 287, 290, 296
Bactrocera 65, 66, 67, 77, 84
 albistrigata 66, 67, 84
 correcta 66, 67, 84
 cucurbitae 66, 67, 84
 dorsalis 65, 77, 84
 tryoni 65
 zonata 65, 67, 84
Bahiopsis parishii 296
Baikiaea plurijuga 17
Baileya 280, 286, 296
 multiradiata 296
 pleniradiata 280, 286, 296
 Bascanichthyini 326
Batis 174, 185
 maritima 174
Batrachyperus mustersi 468
Bebbia juncea 281, 296
 Bembidiini 343
Bhutanotrechus 352, 353
 Bignoniaceae 299
Bitis 59
 arietans 59
 caudalis 59

- Blattella germanica* 69
 Blepharis 34
Blepharosteres agilis 500
Blepharosteres grayanus 499
Boa tatarica 505
Boaedon fuliginosus 60
Boechera perennans 280, 301
Boerhavia 277, 308
 coccinea 308
 wrightii 277, 308
 Boidae 504, 524
Boiga trigonata melanocephala 506, 536
Boltalia sublevis 488
Bontia 164, 171, 175
 daphnoides 164
 Boraginaceae 269, 293, 299
Bothriochloa barbinodis 280, 286, 311
Boulengerina melanoleuca 61
Bouteloua 277, 280, 281, 311
 aristidoides 277, 280, 311
 barbata 280, 311
 curtipendula 280, 281, 311
 var. *caespitosa* 311
Bowlesia incana 277, 295
Brachypelus 201, 205, 206, 207
 betsileo 205
 fischeri 205
 janaki 205, 206
 obesus 205
 ranomafanae sp. nov. 201, 205, 206, 207
 rolandi 205
Brachysomophis 326
 Brachystegia 17
Brassica tournefortii 301
 Brassicaceae 269, 293, 301
Bravaisia 163, 174
 berlandieriana 163, 174
 integerrima 163
Breviceps adspersus 53
 Brevicipitidae 53
Brickella atractyloides 280
Brickellia 280, 286, 296
 atractyloides 286, 296
 desertorum 296
 incana 280, 286, 296
 microphylla 296
Bromus 272, 277, 292, 293, 311
 arizonicus 277, 311
 berteroanus 311
 carinatus 311
 diandrus 311
 rigidus 311
 rubens 272, 292, 311
 tectorum 311
 Broscini 343
Brosocosoma 343
Bufo 462, 463, 464, 520, 523, 525, 526, 536
 andersonii 464
 luristanicus 523
 oblongus 463, 526, 536
 olivaceus 520
 pezowoi 520
 pseudoraddei 463, 464, 525, 536
 baturae 463, 525, 526, 536
 rangeri 19
 stomaticus 464
 turanensis 464, 526, 536
 viridis 462, 463, 464, 520, 526
 pezowoi 520
 turanensis 464
 zugmayeri 464
 zugmayeri 464, 526, 536
 Bufonidae 19, 48, 53, 462, 464, 520, 523, 557, 560
Bufotes 462, 520
 pezowoi 520
Bungarus 460, 513, 523, 525, 526, 536
 caeruleus 513, 523
 sindanus 460, 513, 523, 525, 526, 536
 razai 513
Bunopus 485, 536
 biporus 485
 gabrielis 485
 tuberculatus 485, 486, 536
 Buprestidae 69, 74
- C**
- Cactaceae 269, 285, 293, 302
Caelostomus 201, 207, 208, 209, 210, 211, 268
 alluaudi 209
 convexiusculus 208, 209, 210
 humilis 210
 latus 201, 207, 208, 209

- minisculus* 210
minutissimus 210
***rotundiformis* sp. nov.** 201, 209, 210
 California (see under United States)
 Callelchelyini 326
Calligonum comosum 581, 583
Callistephanus 3
Calochortus kennedyi 282, 307
Calotes 469, 525, 526, 536
 emma 469
 jerdoni 469
 maria 469, 564
 versicolor 469, 525, 526, 536
 farooqi 469, 536
 nigrigularis 469
Calycoseris 277, 296
 parryi 296
 wrightii 277, 296
Camissonia 308, 309
 arenaria 308
 boothii 309
 brevipes 308
 californica 309
 chamaenerioides 309
 claviformis 308
 aurantiaca 308
 peeblesii 308
 multijuga 309
 refracta 309
 Campanulaceae 303
 Canada 375
Canotia holacantha 274
 Carabidae 201, 264, 265, 266, 267, 268, 343
 Caraboidea 341, 342, 344
Carabus 347, 379, 433
 areolatus 347
 quadristriatus 379
 rubens 379
Carex alma 287, 304
 Caribbean Sea 175
Carnegiea gigantea 278, 292, 302, 317
 Caryophyllaceae 303
Casnonia 229, 230
 coerulans 230
 fairmairei 230
Castilleja 287, 288, 291, 309
 chromosa 288, 309
 minor spiralis 287, 291, 309
Caulanthus 301
 cooperi 301
 lasiophyllus 301
Causus 59
 resimus 59
 rhombeatus 59
Ceanothus vestitus 280, 315
Celtis reticulata 274, 275, 286, 316
 Cenozoic 434
Centaurea melitensis 296
Centaureium calycosum 306
 Central America (see also as Mesoamerica) 71,
 164, 167, 168, 174, 175
 Belize 175, 177
 Costa Rica 169, 172, 175, 177, 189
 El Salvador 168, 171, 178
 Guatemala 168, 178
 Honduras 171, 178
 Mexico (see separate listing)
 Nicaragua 168, 171, 177, 183
 Panama 167, 168, 169, 171, 183
Centrotrachelus Asmussi 503
 Cerambycidae 74
Cerastes persicus 523
Ceratitis capitata 66, 67, 77, 84
Ceratophyus gopherinus 76
Cercidium 305
 floridum 305
 microphyllum 305
Chaenactis 277, 280, 296, 297
 carphoclinia 280, 296
 var. *carphoclinia* 296
 fremontii 280, 297
 macrantha 297
 stevioides 297
Chamaeleo 17, 58
 anchietae 17, 58
 dilepis 58
 namaquensis 58
 Chamaeleonidae 58
Chamaesyce 280, 304
 albomarginata 304
 arizonica 280, 304
 melanadenia 280, 304
 polycarpa 280, 304
 setiloba 280, 304

- Chauligenion* gen.nov.** 321, 322, 323, 324, 325, 326
 ***camelopardalis* sp. nov.** 321, 322, 323, 324, 325, 326, 327
Cheilanthes 286, 294
 covillei 294
 parryi 286, 294
 xparishii 294
Chelidoperca africana 192
Chenopodiaceae 303
Chenopodium 275, 287, 303
 berlandieri 275, 287, 303
 var. *zschackei* 303
 fremontii 275, 303
Chilopoda 67, 69, 70, 72, 76
Chilopsis linearis 275, 281, 299
Chlaeniini 219
Chlaeniostenus 221
Chlaenites 219, 221, 223
Chlaenitidius 223
Chlaenius 201, 219, 220, 221, 222, 223
 allacteus 223
 attenuatus 221
 cupreolus 223
 inaequalis 223
 ***kathrynae* sp. nov.** 201, 219, 220, 221
 lyperus 223
 ***robertae* sp. nov.** 201, 221, 222, 223
 sellatus 221
 subovatus 221
Chondrodactylus 18, 23, 24, 54
 bibronii 25, 44
 fitzsimonsi 23, 24, 54
 laevigatus 25, 44
 pulitzerae 18, 23, 24, 25, 54
 turneri 23, 25
Chorizanthe 277, 280, 313, 314
 brevicornu 280, 313
 rigida 280, 314
Chrysomelidae 69, 71
Chrysopaa sternosignata 465, 536
Chrysothamnus 276, 297
 paniculatus 297
 teretifolius 276
Chylismia 277, 280, 293, 308, 309
 arenaria 308
 brevipes 280, 308
 claviformis 277, 280, 308
 aurantiaca 308
 peeblesii 308
 multijuga 309
Cicadellidae 69, 71
Cirsium neomexicanum 297
Claytonia perfoliata mexicana 314
Cleomaceae 303
Clivinina 205
Cnidaria 1
Cnides 377
Coccidae 69, 71
Coccoloba uvifera 174
Coleogyne ramosissima 277, 281, 283, 284, 315, 317
Coleoptera 66, 67, 69, 70, 71, 72, 74, 75, 76, 201, 265, 266, 267, 268, 341, 342, 343
Collembola 67, 69, 70, 72, 76, 77
Colliuris 230, 267
 olsoufieffi 230
Colophospermum mopane 17
Colorado River Indian Reservation 275
Coluber 506, 508, 509, 514, 517
 arnensis 508
 dione 506
 karelini mintonorum 510
 lebetinus 517
 ravergieri 507
 schokari 514
 (*Taphrometopon*) *lineolatus* 514
 (*Tyria*) *karelini* 509
 zebrinus 61
Colubridae 61, 506, 522, 524, 525
Combretum 17
Commiphora 17
Conocarpus erectus 174
Contia 506
 angusticeps 506
 bicolor 522
 mcmahoni 506
Convolvulaceae 303
Conyza canadensis 280, 297
Cordylidae 58
Cordylosaurus subtessellatus 38, 59
Cordylus 18, 38, 42, 49, 58
 cordylus 38
 machadoi 38, 49

namakuiyus 18, 38, 42, 58
Coreopsis californica 292, 297
Cornu aspersum 69
Coronella 508, 509
 taeniolata 509
 tessellata 508
Cosnania 229
Cottisia gracilis 307
 Crabronidae 329, 333, 339, 575, 581
 Crambidae 75
 Crassulaceae 303
 Cratocerini 207
Crossobamon 486, 536
 atropunctatus 486
 eversmanni 486, 536
 eversmanni 486
 lumsdeni 486
 maynardi 486
Crossosoma bigelovii 277, 286, 303
 Crossosomataceae 303
Crotaphopeltis hotamboeia 61
Cryptantha 277, 280, 286, 293, 299, 300
 angustifolia 299
 barbigera 280, 299
 circumscissa 286, 299
 decipiens 286, 299
 gracilis 299
 maritima 280, 300
 micrantha 286, 300
 nevadensis 300
 ptero-carya 280, 300
 var. *cycloptera* 300
 var. *ptero-carya* 300
 racemosa 280, 300
 utahensis 280, 300
Cucurbita 274, 281, 304
 digitata 281
 foetidissima 274
 palmata 274, 304
 Cucurbitaceae 304
 Cupressaceae 294
 Curculionidae 69, 71, 74
Cuscuta californica 303
Cusoria elegans 504
Cyclophis persicus 506
Cydia pomonella 69
Cylindropuntia 272, 280, 284, 285, 293, 302

acanthocarpa 280, 285, 302
 bigelovii 280, 285, 302
 echinocarpa 280, 302
 leptocaulis 302
 ramosissima 302
 Cymindidina 249
Cynodon dactylon 311
 Cyperaceae 304
Cyperus 287, 304
 laevigatus 287, 304
 odoratus 304
Cyrtodactylus voraginosus 490
Cyrtopodium 486, 487, 489, 521, 524, 536
 agamuroides 521
 fedtschenkoi 524
 kachhensis 487
 kirmanense 521
 longipes 521
 scabrum 486, 487, 536
 spinicauda 489
 voraginosus 521
 watsoni 487, 536

D

Dactyleurys 201, 211, 212, 213, 214, 215, 216
 anomalus 211, 215, 216
 ***minimus* sp. nov.** 201, 211, 212, 215, 216
 ***ranomafanae* sp. nov.** 201, 211, 212, 213, 214, 215, 216
Dactylotrechus 365, 376
Dalea mollis 305
Dasyochloa pulchella 281, 311
Datura wrightii 315
Daucus pusillus 277, 295
Delphinium 314
 parishii 314
 scaposum 314
 Dermaptera 67, 69, 70, 72, 76, 77
Descurainea pinnata 274, 277, 286
Descurainia pinnata glabra 301
Deuveilla 249
Deuveotrechus 369
Diaphorina citri 69
Diaprepes abbreviatus 66, 84
 Diaspididae 69, 71
Dichelostemma 307
 capitatum pauciflorum 307

pulchellum 307
 Dictyoptera 70
 Dictyoptera 67
Dieteria 297
 asteroides 297
 var. *asteroides* 297
 canescens 297
Digitaria californica 311
Dimorphocarpa wislizenii 286, 301
Diplacus bigelovii 309
 Diploda 67
 Diplopoda 67, 70, 72, 76
Dipsadomorphus 506, 513
 jollyi 513
 trigonatus var. *melanocephalus* 506
Dipsas rhinopoma 512
 Diptera 65, 67, 69, 70, 71, 72, 74, 75, 76
 Discroglossidae 465
Distichlis 174
 litoralis 174
 spicata 174
Ditaxis 304
 lanceolata 304
 neomexicana 304
Draba 277, 301
 cuneifolia 277, 301
 var. *integrifolia* 277, 301
 Drimostomatina 207
Dudleya 277, 279, 280, 303
 arizonica 277, 279, 280, 303
 pulverulenta 303
Duttaphrynus 464, 520, 536
 olivaceus 520
 stomaticus 464, 536
Dyssodia porophylloides 296

E

Echinocereus 277, 280, 281, 285, 302
 coccineus 280, 281, 285, 302
 engelmannii 280, 281, 302
 var. *chrysocentrus* 277
Echinochloa 174, 311
 colona 311
 polystachia 174
Echinomastus johnsonii 280, 302
Echiophis 326
Echis 516, 536

arenicola 516
 carinata 516
 carinatus sochureki 516, 536
Eirenis 506, 526, 536
 aff. *persicus* 506, 536
 persicus 526
 walteri 506
Elaphe dione 506, 526, 536
 Elapidae 61, 513, 523, 524
Elapsoidea semiannulata semiannulata 61
Eleocharis 287, 293, 304
 montevideensis 304
 ovata 287, 304
 palustris 304
 parishii 287, 304
 rostellata 287, 304
Elymus 311
 elymoides 311
 brevifolius 311
 elymoides 311
 multisetus 311
 Embiidina 67, 70, 72, 76, 77
Emmenanthe penduliflora 300
Encelia 277, 280, 281, 284, 297, 303
 farinosa 277, 280, 284, 297, 303
 resinifera 280, 297
 virginensis 280, 281, 297
Entomopison 333, 338, 339
 alini 339
 aureofaciale 339
 convexifrons 339
 cooperi 339
 gnythos 339
 longicorne 339
 oaxaca 339
 pilosum 338, 339
 sphaerophallus 339
 vincenti 339
 wasbaueri 339
Eocnides 342, 346, 376, 377, 378, 432, 433,
 435, 436, 447
 assamensis 376
 fragilis 342, 377, 378, 379, 433, 435, 436,
 447
Epaphiama 429
Epaphiopsis 379, 380, 381, 407, 411, 425, 429,
 433

- Pseudepaphius* 380, 384, 407
 gonggaicus 384
***Epaphiotrechus* gen. nov.** 341, 342, 347, 362, 383, 384, 424, 425, 426, 428, 429, 433, 436, 437
 fortipes 362, 383, 425, 426, 427, 429, 437
 ***fortipesoides* sp. nov.** 341, 342, 384, 424, 425, 426, 428
Epaphius 380, 407, 411, 424
Ephedra 272, 280, 281, 286, 294
 aspera 272, 280, 281, 286, 294
 nevadensis 294
 Ephedraceae 294
 Epidalea 462
Epilachna varivestis 65, 67, 84
Epiphyas postvittana 77
Eragrostis 17
Erectocolliuris fairmairei 230
Eremias 460, 493, 494, 495, 496, 497, 524, 525, 526, 536
 acutirostris 493, 536
 afghanistanica 494, 536
 aria 460, 494, 536
 fasciata 494, 536
 grammica 494, 495, 536
 guttulata 499, 524
 watsonana 499, 524
 intermedia 495, 536
 lineolata 495, 536
 (*Mesalina*) *watsonana* 498
 nigrocellata 495, 496, 536
 persica 496, 526, 536
 regeli 497, 536
 scripta 497
 velox 497, 526, 536
Eremiasphecium 575, 576, 577, 578
 arabicum 575, 576
 harteni 577
 sahelense 575, 577, 578
Eremothera 280, 309
 boothii 309
 refracta 280, 309
Erephognathus 201, 262, 263, 264
 coerulescens 264
 margarithrix 264
 ***ranomafanae* sp. nov.** 201, 262, 263, 264
Eriastrum 280, 312
 diffusum 280, 312
 eremicum 280, 312
Ericameria 276, 277, 280, 293, 297
 cuneata var. *spathulata* 276, 297
 laricifolia 280, 297
 linearifolia 280, 297
 paniculata 297
 teretifolia 276, 277, 297
 teretifolius 297
Erigeron 286, 297
 divergens 297
 lobatus 297
 oxyphyllus 286, 297
Eriogonum 277, 280, 281, 286, 293, 314
 deflexum 280, 314
 fasciculatum 277, 280, 281, 286, 314
 var. *polifolium* 314
 heermannii 280, 314
 var. *argense* 314
 hookeri 280, 314
 inflatum 280, 314
 lanosum 280
 maculatum 314
 nidularium 314
 palmerianum 280, 314
 reniforme 314
 thomasi 280, 314
 trichopes 280, 314
 wrightii 314
Erioneuron pulchellum 311
 Eriophyidae 69, 71
Eriophyllum 277, 280, 297
 lanosum 277, 297
 wallacei 297
Eristicophis macmahoni 516, 536
Erodium 277, 292, 306
 cicutarium 306
 texanum 277, 306
Erythranthe 309, 310
 cordata 309
 guttata 309
 verbenacea 310
Eryx 504, 505, 515, 524, 536
 braminus 515
 elegans 504, 536
 jaculus 504, 505
 czarewskii 504

- familiaris* 505
johnii persicus 505, 536
miliaris 524
persicus 505
tataricus 496, 505, 524, 536
Eschschozia 277, 280, 282, 309
californica 280, 309
mexicana 309
glyptosperma 280, 282, 309
minutiflora 280, 309
Eublepharidae 483, 524, 528, 529
Eublepharis 483, 484, 524, 525, 526, 536
afghanicus 483, 484, 524, 526, 536
fuscus 484
gracilis 483, 484
hardwickii 524
macularius 483
Eucnide urens 286, 288, 307
Eucrypta 277, 300
chrysanthemifolia var. *bipinnatifida* 277, 300
micrantha 300
Eulobus 277, 309
californicus 309
chamaenerioides 277, 309
Eumeces 500, 501, 524, 526, 536
blythianus 500, 526, 536
himalayanus 500
schneiderii 501, 524, 536
princeps 524
zarudnyi 501, 524, 536
taeniolatus parthianicus 501
zarudnyi 501
Eumecia anchietae 56
Eunostus 201, 260, 261, 262
minimus **sp. nov.** 201, 260, 261, 262
Euphlyctis 466, 536
cyanophlyctis 466, 536
microspinulata 466
Euphorbia 277, 304
eriantha 304
incisa 304
Euphorbiaceae 304
Euprepis 502
dissimilis 502
septemtaeniatus 502
Eurasian Region 434
Europe 71, 72, 74, 75, 76, 81, 82, 331
Austria 331
Caucasus 331
Cyprus 331
Czech Republic 331
France 329
Germany 331
Italy 329
Mediterranean (see also as Mediterranean Basin) 329, 331
Romania 331
Russia 331
Slovakia 331
Turkey 331
Eurydera 201, 241, 242, 243, 244, 245, 246, 247, 248, 266, 267, 268
ambreana 246
armata 245, 246
crispatifrons 246
cuspidata 246
fossulata 248, 249
latipennis 246
mormolycoides 242, 243
ocellata **sp. nov.** 201, 241, 242, 243
oracle **sp. nov.** 201, 244, 245, 246, 264
ornatipennis 246
rufotincta 246
simplica **sp. nov.** 201, 247, 248, 249
sulcicollis 246
unicolor 248, 249
Eurylepis taeniolatus parthianicus 501, 536
Eutropis dissimilis 502, 536
- F**
- Fabaceae 269, 293, 304
Fagaceae 306
Fagonia laevis 317
Fallugia paradoxa 288, 315
Ferns 293, 294
Ferocactus 280, 285, 302
cylindraceus 280, 285, 302
wislizeni 302
Ficus carica 308
Filago californica 298
Flowering Plants 293, 294
Forestiera 281, 286, 308
pubescens 281, 308

var. *parvifolia* 308
Forficula auricularia 69
 Formicidae 65, 69, 71
Fouquieria splendens 275, 279, 280, 306
 Fouquieriaceae 306
Frankenia palmeri 174
Fraxinus anomala 275, 281, 286, 308
Funastrum 281, 295
 cynanchoides 281, 295
 hirtellum 281, 295

G

Galeritini 260
Galium 315
 aparine 315
 microphyllum 315
 stellatum 315
 var. *eremicum* 315
Garrya flavescens 281, 306
 Garryaceae 306
Gekko gecko 473, 535
 Gekkonidae 23, 41, 54, 484, 521, 524
 Gelechiidae 69, 71
 Gentianaceae 306
Geraea canescens 297
 Geraniaceae 306
 Gerrhosauridae 39, 43, 59
Gerrhosaurus 39, 59
 nigrolineatus 59
 skoogi 39, 59
Gilia 277, 280, 281, 293, 312, 313, 317, 318, 320
 flavocincta australis 281, 312
 inconspicua var. *sinuata* 313
 minor 313
 scopulorum 280, 313
 sinuata 313
 stellata 280, 313
 transmontana 313
Glauconia blanfordii 515
Gloydus 517, 518, 525, 526, 536
 halys 517, 526, 536
 boehmei 517, 526, 536
 caucasicus 517, 536
 himalyanus 518, 525
 intermedius 517
 caucasicus 517

Gnaphalium 298
 chilense 298
 luteoalbum 298
 wrightii 298
 Gracillariidae 69
Grayia spinosa 277, 283, 303, 317
Gutierrezia 280, 297
 microcephala 297
 sarothrae 280, 297
Gymnodactylus 484, 486, 487, 490, 521, 561
 agamuroides 521
 brevipes 487
 caspius caspius 490
 ingoldby 487
 kachensis 487
 longipes 521
 persicus 484
 russowii 521
 turcmenicus 490
 watsoni 487
 Gymnosperms 293, 294

H

Halodendrum thouarsii 164
Halyomorpha halys 69
Harpagonella palmeri 277, 300
 Hawaii (see under United States)
Hedeoma nana 306
Heliobolus lugubris 37, 56
Heliotropium 287, 300
 curassavicum 287, 300
 var. *oculatum* 300
Heliotropium kotschyi 581, 583
 Helluonini 262
Hemidactylus 487, 488, 525, 536
 bengaliensis 488
 brookii 487, 488, 525, 536
 cf. *brookii* 487
 coctaei 488
 flaviviridis 488, 536
 gleadow 488
 kushmorensis 488
 longicephalus 54
 murrayi 488
 Hemiptera 63, 67, 69, 70, 71, 72, 74, 75, 76, 80
Hemirhagerrhis viperina 60
 Hemisotidae 53

- Hemisis guineensis* 53
Hemorrhoids ravergeri 507, 536
Heremites septemtaeniata 502
Herpetoichthys 326
Heteroptera 67, 69, 70, 72, 74, 76
Hexagoniini 223, 264
Hilairanthus 164, 171, 172
 nitidus 171
 tomentosus 172
Hilaria rigida 280, 281, 286, 311, 317
Holarctic Region 381, 433
Homalodisca vitripennis 69, 71
Homopus burnesii 518
Hoplobatrachus tigerinus 466, 525, 526, 536
Hordeum 311
 glaucum 311
 murinum glaucum 311
 pusillum 311
Hualapai Indian Reservation 275
Hubeitrechus 363, 433
Hydrus piscator 513
Hymenoclea 296
 monogyra 296
 salsola 296
Hymenopappus 281, 297
 filifolius 281, 297
 var. *lugens* 297
Hymenoptera 65, 67, 69, 70, 71, 72, 74, 75, 76,
 329, 333, 575, 581
Hymenothrix loomisii 297
Hynobiidae 468
Hyperolius chelaensis 18
Hyptis emoryi 286, 306
Hystrichopus 249
- I**
- Imperata brevifolia* 287, 311
Indian Ocean 185
Indotyphlops braminus 515
Insecta 67
Iridaceae 306
Isobertlinia angolensis 17
Isopoda 67, 69, 70, 72, 76, 77
Isoptera 67, 70, 72, 76
Ivesia arizonica 286, 315
- J**
- Janusia gracilis* 279, 307
Jarava speciosa 280, 281, 286, 311
Juamea 185
Juglans major 274
Julbernardia paniculata 17
Juncaceae 306
Juncus 287, 293, 306
 acutus 287, 306
 acutus 306
 leopoldii 306
 var. *sphaerocarpus* 306
 bufonius 287, 306
 ensifolius 287, 306
 var. *brunnescens* 306
 var. *montanus* 306
 torreyi 306
Juniperus 272, 274, 281, 289, 294
 californica 274, 281, 289, 294
Junnanotrechus 407, 451
 elegantulus 407
Justicieae 567
- K**
- Kallstroemia* 277, 317
 californica 277, 317
 parviflora 277, 317
Keckiella 280, 286, 310
 antirrhinoides 280, 286, 310
 microphylla 310
Kinixys belliana 54
Kolekanos 18, 42, 55
 plumicaudus 42, 55
Kozlovites 365, 369, 376
Krameria 280, 281, 286, 306
 bicolor 281, 306
 erecta 280, 281, 286, 306
Krameriaceae 306
Krascheninnikovia lanata 277, 281, 303
Krombeiniellum 333, 339
- L**
- Lacerta* 472, 482, 494, 497
 apoda 482
 grammica 494
 muricata 472
 sanguinolenta 482

- velox* 497
 Lacertidae 36, 56, 492, 522, 524, 525
Laguncularia racemosa 174
 Lamiaceae 306
 Lamprophiidae 60, 514
Langloisia setosissima 280, 313
Larrea 274, 275, 276, 277, 278, 280, 281, 284, 286, 317
 divaricata tridentata 317
 tridentata 274, 275, 276, 277, 278, 280, 281, 284, 286, 317
Latrodectus geometricus 69
Laudakia 469, 470, 471, 526, 527, 536, 563
 agrensensis 469, 536
 melanura 469, 470, 536
 nupta 470, 536
 nuristanica 470, 536
 Placoderma melanura 469
 tuberculata 470, 471, 526, 536
Layia glandulosa 297
Lebia 201, 255, 256, 257, 258, 259
 alluaudana 255, 257, 260
 ***apicviolacea* sp. nov.** 201, 255, 257, 259, 260
 brunneipennis 255, 256
 ***laterolucida* sp. nov.** 201
 madagascariensis 255, 256, 257, 260
 Metalebia 255, 256, 257, 258, 259, 260
 laterolucida 255, 256
 ***ranomafanae* sp. nov.** 257, 258
 mirana 255, 257, 260
 ***ranomafanae* sp. nov.** 201, 255, 260
 rufa 255
 sulcipennis 255
 tanala 255, 257, 260
 Lebiina 255
 Lebiini 232, 265
Leistus 343
Lepidium 277, 301
 fremontii 301
 lasiocarpum 277, 301
 Lepidoptera 67, 69, 70, 71, 72, 75, 76
Lepisma saccharina 69
Leptochloa 312
 filiformis 312
 panicea brachiata 312
Leptogorgia 3
Leptopelis anchietae 17, 53
Leptosiphon aureus 313
Leptosyne californica 297
 Leptotyphlopidae 59, 515
Leptotyphlops scutifrons 59
Lesquerella tenella 301
 Liliaceae 307
Linanthus 277, 280, 281, 313
 aureus 313
 bigelovii 280, 313
 demissus 280, 313
 dichotomus 313
 pungens 281, 313
Linepithema humile 69
Lithocarpus variolosus 410
 Loasaceae 307
Lobesia botrana 67
Loeseliastrum 313
 mathewsii 313
 schottii 313
Logfia filaginoides 277, 298
Lomatium nevadense var. *parishii* 295
Lotus 304
 humistratus 304
 rigidus 304
 salsuginosus var. *brevivexillus* 304
 strigosus var. *tomentellus* 304
Lupinus 277, 280, 305
 brevicaulis 305
 concinus 280, 305
 sparsiflorus 305
Lycium 281, 315, 316
 andersonii 315
 cooperi 315
 exsertum 281, 316
 fremontii 316
Lycodon striatus bicolor 522
Lycophidion 18, 45, 47, 60
 hellmichi 18, 60
 multimaculatum 60
Lygodactylus 52, 55
 capensis 55
 lawrencei 52, 55
Lymantria dispar 65, 67, 84
Lysimachia arvensis 308
 Lythraceae 307
Lythrum californicum 287, 307

- Lytorhynchus* 508, 536
gabrielis 508
maynardi 508, 536
ridgewayi 508, 536
- M**
- Mabouia blythiana* 500
Mabuia hodgarti 502
Machaeranthera 297, 299
asteroides 297
 var. *asteroides* 297
pinnatifida 299
Macrovipera 517, 518, 525, 536
lebetina 517, 518, 525, 536
 chernovi 518
 turanica 518
Madagascar 201, 202, 205, 207, 209, 211, 213, 217, 219, 221, 223, 224, 226, 228, 230, 232, 233, 234, 235, 236, 238, 239, 240, 241, 242, 244, 245, 246, 247, 248, 249, 251, 252, 254, 255, 257, 259, 260, 261, 262, 263, 264
 Ranomafana National Park 201, 202, 203, 205, 207, 209, 211, 213, 217, 219, 221, 224, 226, 228, 230, 233, 234, 236, 238, 239, 240, 242, 244, 245, 246, 248, 249, 251, 252, 254, 255, 257, 259, 261, 264
Madecassina 201, 234, 235, 236, 237
 bimaculata **sp. nov.** 201, 234, 235, 236
 maculata 236, 238
 picta 236
 quadrимaculata **sp. nov.** 201, 236, 237
Malacothrix 277, 280, 298
californica 298
 var. *glabrata* 298
 coulteri 298
 glabrata 280, 298
 sonorae 298
Malpighiaceae 307, 318
Malva parviflora 308
Malvaceae 308
Mammillaria 280, 285, 302
 grahamii 280, 285, 302
 microcarpa 302
 tetrancistra 280, 302
Mantis religiosus 69
Marah gilensis 281, 304
Marina parryi 305
Marrubium vulgare 306
Matelea parvifolia 295
Matobosaurus maltzahni 59
Maurandella antirrhiniflora 281, 310
Maurandya antirrhiniflora 310
Maytenus phyllanthoides 174
Mecoptera 343
Medicago sativa 305
Mediodactylus 489, 521
 aff. *spinicaudus* 489
 russowii 521
Mediterranean Basin 329, 331
Mediterranean Sea 191
Melica 280, 286, 312
 frutescens 280, 312
 imperfecta 280, 286, 312
Melilotus indicus 305
Menodora 308
 scabra 308
 var. *glabrescens* 308
 var. *scabra* 308
Mentzelia 274, 275, 277, 279, 280, 307, 317
 albicaulis 275, 280, 307
 involutrata 277, 279, 280, 307, 317
 nitens 307
 tricuspis 307
Merolles 17, 36, 56
 anchietae 17, 36, 56
 reticulatus 17, 36, 56
Mesalina watsonana 498, 526, 536
Mesoamerica (see also as Central America) 163, 164, 165, 167, 169, 171, 173, 174, 175, 177, 179, 181, 183, 185, 187, 189
Mesozoic 434
Mexico 71, 72, 75, 80, 159, 160, 161, 164, 167, 168, 171, 172, 174, 175, 176, 178, 179, 567
 Baja California 175, 176, 178
 Baja California Sur 175, 176, 178
 Campeche 172, 179
 Chiapas 168, 171, 179
 Colima 179
 Guerrero 159, 160, 162, 179, 180
 Gulf of California 175
 Jalisco 180
 Michoacán 180, 567, 568, 571
 Río Balsas 567, 568
 Nayarit 180

- Oaxaca 180
 Quintana Roo 180
 Sinaloa 181
 Sonora 175, 181, 188
 Tabasco 181
 Veracruz 182
 Yucatán 176, 182
 Microhylidae 20, 48, 53
Microseris lindleyi 299
Microsteris gracilis 313
Mimocolliuris 231
Mimulus 287, 288, 290, 291, 309, 310, 317, 318
 bigelovii 288, 309
 cardinalis 310
 var. *verbenaceus* 310
 cordatus 309
 guttatus 287, 290, 309
 verbenaceus 287, 290, 291, 310
***Minutotrechus* gen. nov.** 341, 346, 363, 364, 365, 409, 433, 436
 minutus 363, 409
Mirabilis 280, 308
 laevis 280, 308
 var. *villosa* 308
 multiflora 280, 308
 Miridae 69, 71
Mochlus sundevallii 56
 Mohave Desertscrub Biome 277, 286
Mohavea confertiflora 277, 278, 310, 317
 Mollusca 67, 70, 72, 76
Monardella eplingii 269, 277, 283, 292, 306, 318
Monitor 503
 gemmatus 503
 heraldicus 503
Monopeltis anchietae 17
Monoptilon bellioides 277, 280, 298
 Moraceae 308
Muhlenbergia 277, 280, 281, 287, 293, 312
 appressa 312
 fragilis 280, 312
 microsperma 277
 porteri 280, 281, 312
 rigens 287, 312
Musca domestica 69
Myosurus cupulatus 277, 314
Myriopholis blanfordii 515, 536
 Myrophinae 326
 Myrsinaceae 308
- N**
- Naja* 513, 524, 536
 naja 524
 oxiana 513, 524, 536
Nama 277, 280, 300
 demissa 280, 300
 hispidata 300
 var. *spatulata* 300
Nasturtium officinale 287, 301
Natrix tessellata 508, 526, 536
 Nebriini 343, 453
Nemacladus 277, 280, 303
 glanduliferus 277, 303
 orientalis 280, 303
 Nematopeza 255
Neogaerrhinum filipes 281, 310
 Neotropical Region 347, 433
 Neuropteroidea 343
 New Zealand 71
Nicotiana 280, 316
 glauca 316
 obtusifolia 280, 316
Nilotaspis halli 67
Nilssonia gangetica 519, 525, 526, 536
 Noctuidae 69, 71
Nolina 272, 274, 277, 280, 281, 282, 286, 295
 bigelovii 274, 277, 280, 281, 282, 286, 295
 microcarpa 274
 North America 12, 63, 65, 66, 69, 71, 72, 74, 75, 163, 164, 165, 167, 169, 171, 173, 174, 175, 177, 179, 181, 183, 185, 187, 189
 Canada (see separate listing)
 United States (see separate listing)
Nucras tessellata 56
 Nyctaginaceae 308
Nyctalus leisleri 511
- O**
- Octocorallia 1, 3
 Odacanthini 229
Odyssea paucinervis 16
Oelofisa 33
Oenothera 286, 288, 309
 caespitosa marginata 288, 309

- deltoides deltoides* 286, 309
 Oleaceae 308
 Oligochaeta 67
Oligodon 508, 526, 536
 arnensis 508, 526, 536
 taeniolatus 509, 536
Oligomeris linifolia 277, 314
Omphreoides 201, 223, 224, 225, 264
 bispinus 224
 bucculentus 224
 distinctus 224
 quodi 223, 224
 ranomafanae **sp. nov.** 201, 224, 225
 Onagraceae 308
Onychocephalus petersii 17
 Ophichthidae 321, 322
 Ophichthinae 323, 326
 Ophichthini 321, 326
Ophiomorus 502, 522, 536
 breviceps 522
 chernovi 522
 tridactylus 502, 536
Ophisops jerdonii 499, 536
 Opisthopora 67
Opuntia 274, 277, 280, 281, 285, 302, 303
 basilaris 274, 280, 281, 285, 302
 bigelovii 277
 chlorotica 274, 280, 303
 curvispina 303
 curvospina 274, 280
 polyacantha 274, 277, 280, 285, 303
 var. *erinacea* 277, 285
 Oriental Region (see also Asia) 231, 347, 353, 381, 432, 433, 434, 436, 457, 526
 Orobanchaceae 309
Orobanche ludoviciana 309
 Orthoptera 67, 69, 70, 72, 76
Oryzopsis hymenoides 310
Ovis canadensis nelsoni 281
 Oxalidaceae 309
Oxalis 309
 albicans pilosa 309
 pilosa 309
- P**
- Pachydactylus* 25, 26, 55
 angolensis 25, 55
 caraculicus 55
 geitje 26
 occellatus 26
 oreophilus 26, 55
 punctatus 26, 55
 rangei 55
 scutatus 25
 angolensis 25
 serval 26
 vanzylis 55
 Pacific Ocean 175, 185, 333
 Solomon Islands 333, 334, 337
 Rennell Island 334
 Western Pacific 333, 334
 Pacific Region 71, 72, 75
Packeria 292, 298
 multilobata 298
 quercetorum 292, 298
Palafoxia arida 286, 298
 Palarini 581
Palarus 581, 582, 583, 584, 585, 586, 587
 histrion 581
 inexpectatus **sp. nov.** 581, 582, 584, 585, 586, 587
 interruptus 581
 jaxartensis 581, 582
 jaxartes 581, 582
 maculatus 581
 Palearctic Region 231, 344, 347, 353, 432, 433, 436, 457, 526
Panaspis cabindae 57
Pandanus 213, 216, 251, 252
Panicum capillare 312
 Papaveraceae 309
Papilio cresphontes 77
Paraceramius koreensis 339
Paragonotrechus 352, 353
Paralaudakia 469, 471, 472, 473, 474, 475, 526, 536
 badakhshana 471, 536
 caucasia 471, 472, 473, 526, 536
 erythrogaster 474, 536
 himalayana 474, 536
 lehmanni 474, 536
 microlepis 475, 536
Parietaria 316
 hespera 316

- pensylvanica* 316
Parkinsonia 281, 286, 292, 305, 318
 florida 281, 286, 292, 305
 microphylla 286, 292, 305
Parthenium incanum 298
Paspalum dilatatum 287, 312
Pectis papposa 280, 298
Pectocarya 277, 280, 286, 300
 heterocarpa 277, 300
 platycarpa 280, 286, 300
 recurvata 280, 286, 300
 setosa 300
Pedioplanis 18, 37, 42, 46, 56
 benguellensis 37, 56
 haackei 18, 37, 42, 56
 huntleyi 18, 42, 56
Pellaea truncata 286, 294
Pelomedusa subrufa 54
Pelomedusidae 54
Pelophylax 467, 523, 525, 536
 terentievi 467, 523, 525, 536
 ridibundus 467, 523
Penstemon 280, 281, 310
 bicolor 310
 eatonii 280, 310
 undosus 310
 palmeri 281, 310
 pseudospectabilis 310
Pentatomidae 69
Pericalina 232
Perigona 201, 224, 226, 227, 228, 229
 bembidioides 226, 228
 descarpentriensi 226, 228
 heterodera 226, 228
 prasinus 226, 228
 ranomafanae 228
 Ripogena 201, 224, 226, 227, 228, 229
 deuvei **sp. nov.** 201, 226, 227, 228, 249, 252, 265
 ranomafanae **sp. nov.** 201, 228, 229
 viridimicans 226, 228
Perigonini 224, 265
Perileptus 341, 342, 346, 347, 348, 349, 350, 351, 352, 433, 434, 435, 436, 437, 438
 davidsoni 348
 imaicus 342, 347, 348, 349, 352, 433, 434, 435, 436, 437, 438, 447
 pusilloides **sp. nov.** 341, 347, 348, 350, 351, 352, 433, 434, 435, 436, 437
 pusillus 342, 350, 352
Periops parallelus var. *schiraziana* 512
Periplaneta americana 69
Perityle emoryi 286, 298
Petalonyx 286, 307
 nitidus 286, 307
 sp. 307
Petunia parviflora 277, 287, 316
Peucephyllum schottii 280, 298
Phacelia 277, 280, 286, 292, 293, 300, 301
 crenulata 280, 300
 distans 280, 300
 fremontii 300
 perityloides 286, 300
 var. *laxiflora* 300
 rotundifolia 286, 300
 saxicola 286, 292, 301
Phasmida 67, 70, 72, 76
Philothamnus 61
 angolensis 61
 irregularis 61
 ornatus 61
 semivariatus 61
Pholistoma 277, 301
 auritum 277, 301
 var. *arizonicum* 301
Phoradendron 317
 coryae 317
 villosum coryae 317
Phoradendron californicum 317
Phragmites australis 274, 287, 312
Phrymaceae 309, 318
Phrynobatrachus natalensis 53
Phrynocephalus 460, 475, 476, 477, 478, 479, 520, 523, 525, 536
 clarkorum 460, 475, 478, 536, 559
 euptilopus 476, 536
 interscapularis sogdianus 476, 536
 luteoguttatus 476, 536
 maculatus 477, 536
 mystaceus galli 477, 536
 olivieri 478, 479
 brevipes 478
 carinipes 478
 ornatus 476, 477, 478, 520, 536

- vindumi* 520
raddei 478, 523, 536
bilkewitschi 478
boettgeri 478
zardunyi 478
reticulatus 478, 523
boettgeri 478
scutellatus 478, 536
spiniventris 477
tickelii 478
Phrynomantis annectens 53
Phthiraptera 67, 69, 70, 72, 76
Phyllocnistis citrella 69
Physalis 275, 280, 316
crassifolia 275, 280, 316
hederifolia 316
Physaria tenella 301
Picea 394
Pieris 69, 78
marginalis 78
rapae 69, 78
Pinaceae 294
Pinus monophylla 274, 281, 289, 294
Pipidae 48, 53
Pisces 191
Pison 329, 330, 331, 333, 334, 339
alini 339
allonymum 329, 330
atrum 329, 330, 331
caliginosum 333, 334
difficile 334
icarioides 334
jurinei 339
jurini 339
mandibulatum 333, 334
montanum 329, 330, 331
pistillum 334
pyrrhicum 333
weiri 333, 334, 335, 337
woji 334
Pisonoides 333, 334, 339
obliteratum 334, 339
Plagiobothrys 277, 301
arizonicus 277, 301
jonesii 301
Plantaginaceae 310
Plantago 277, 280, 310
major 310
ovata 277, 280, 310
Platycaulos 3
Platyceps 509, 510, 511, 524, 536
karelini 509, 510, 511, 536
mintonorum 510
rhodorachis 510, 511, 524, 532, 533, 536
rhodorhachis [sic] 511
ladacensis 511
ventromaculatus 524
Pleurocoronis pluriseta 280, 286, 298
Plexauridae 1, 3, 4
Pluchea 275, 276, 287, 298
odorata 276
sericea 275, 287, 298
Poa 277, 280, 312
annua 312
bigelovii 277, 312
fendleriana 280, 312
longiligula 312
Poaceae 269, 293, 310
Podarces 495, 497
(Eremias) intermedia 495
(Scapteira) scripta 497
scripta 497
Polemoniaceae 312, 318, 320
Polygonaceae 269, 293, 313
Polypogon 287, 312
interruptus 287, 312
monspeliensis 287, 312
viridis 287, 312
Popillia japonica 65, 67, 84
Populus fremontii 275, 286, 290, 315
Porophyllum gracile 280, 298
Portulacaceae 314
Poyntonophrynus 53
dombensis 53
grandisonae 53
Prenanthes exiguus 298
Primulaceae 314
Pristacrus 201, 238, 239, 240, 241
binotatus 240, 241
bonotatus 238
laticollis 238, 241
ranomafanae sp. nov. 201, 238, 239, 241
rotundatus 241
semipiceus 240, 241

- Prosopis* 274, 277, 281, 286, 305
 glandulosa 305
 var. *torreyana* 277, 281, 286, 305
 pubescens 274, 281, 286, 305
Prosymna 60
 frontalis 60
 visseri 60
Protocolliuris coeruleans 230
Prunus 281, 315, 389, 397
 fasciculata 281, 315
Psammophis 17, 41, 60, 493, 514, 515, 536
 leithii 493, 514, 515, 536
 leopardinus 60
 lineolatus 514, 515, 536
 mossambicus 60
 namibensis 60
 notostictus 41, 60
 schokari 514, 515, 536
 sibilans 17
 stenocephalus 17
 subtaeniatus 60
 trigrammus 60
Psammophylax 17
 occelatus 17
 rhombeatus 17
Psammosaurus caspius 503
Pseudepidalea 462
Pseudoboa caerulea 523
Pseudocerastes persicus 523
Pseudococcidae 69, 71
Pseudognaphalium 287, 298
 canescens 298
 luteoalbum 287, 298
 stramineum 298
Pseudomasoreus 201, 249, 250, 251, 252, 265, 267, 268
 decorsei 252
 ranomafanae **sp. nov.** 201, 249, 250, 251, 252
Pseudopus 482, 526, 536
 apodus 482, 536
Psidium cattleianum 219, 241
Psilostrophe cooperi 298
Psocoptera 67, 69, 70, 72, 76
Psorothamnus 277, 280, 281, 283, 286, 292, 303, 305, 317
 fremontii 280, 281, 305
 var. *attenuatus* 283, 305
 spinosa 277
 spinus 281, 286, 305
Psyllidae 69, 71, 75
Ptelea trifoliata 281, 315
Pteridaceae 294
Pterostegia drymarioides 277, 286, 314
Pterostichini 343
Ptyas 511, 512, 536
 mucosa nigriceps 511, 536
 nigricens 512
Puertrechus 365
Purpusia arizonica 315
Purshia 281, 315
 mexicana var. *stansburiana* 315
 stansburyana 281, 315
Pyralidae 69, 71, 75
Python 40, 42, 59
 natalensis 40, 59
 sebae 40
Pythonidae 40, 59
Pyxicephalidae 20, 54
- Q**
- Quassiremus* 326
Queinnectrechus 341, 346, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 376, 380, 394, 403, 421, 433, 434, 435, 436, 437, 440, 441, 442, 443
 balli **sp. nov.** 341, 434, 436, 437
 excentricus 365
 Gaoligongtrechus **subgen. nov.** 341, 365, 366, 369, 372, 373, 374, 376, 394, 403
 balli **sp. nov.** 369, 372, 373, 374, 376, 394, 403
 gongshanicus **sp. nov.** 341, 366, 369, 370, 371, 376, 403, 436, 437, 441, 442
 griswoldi **sp. nov.** 341, 366, 367, 368, 369, 370, 372, 376, 394, 403, 421, 436, 437, 440, 441, 442
 jiuhecola 369
Quercus turbinella 274, 276, 281, 286, 290, 306, 317
- R**
- Rafinesquia* 277, 280, 298
 californica 280, 298

- neomexicana* 277, 280, 298
Rana 465, 466, 467
 cyanophlyctis 466
 seistanica 466
 ridibunda 467
 sternosignata 465
 terentievi 467
 tigerina 466
Ranidae 467, 523
Ranunculaceae 314
Reptilia 21, 43
Resedaceae 314
Rhamnaceae 315
Rhamnus ilicifolia 281, 286, 315
Rhizophora mangle 174
Rhododendron 362, 365, 369, 372, 389, 394,
 397, 399, 403, 409, 411, 421, 424, 425, 426,
 434
Rhoptropus 18, 26, 27, 28, 29, 30, 42, 44, 55, 56
 afer 55
 barnardi 26, 27, 30, 55
 biporosus 27, 28, 30, 55
 boultoni 18, 28, 29, 30, 55, 56
 montanus 18, 29, 56
 taeniostictus 18, 27, 30, 56
Rhus aromatica 275, 281, 295
Rhynchophorus vulneratus 66, 67, 69, 82, 84
Rizophora mangle 174
Rosaceae 315
Rubiaceae 315
Rumex hymenosepalus 287, 314
Russia 520, 521
Rutaceae 315
- S**
- Saara* 502, 503, 526, 536
 asmussi 503, 536
 hardwickii 503, 526, 536
Salazaria mexicana 307
Salicaceae 315
Salicornia 174, 185
 biguelovii 174
 virginica 174
Salix 275, 287, 315
 bonplandiana 315
 columbariae 275
 exigua 275, 287, 315
 gooddingii 275, 287, 315
Salsola tragus 303
Salvia 275, 277, 280, 283, 286, 307, 317
 columbariae 277, 307
 dorrii 280, 307
 var. *pilosa* 307
 mohavensis 280, 283, 286, 307, 317
Sambucus 294
 nigra 294
 caerulea 294
Sarcobatus 274
Sarcostemma 295
 cynanchoides 295
 hartwegii 295
 hirtellum 295
Saururaceae 315
Scaevola plumieri 174
Scapteira 493, 495, 497
 acutirostris 493
 aporosceles 493
 lineolata 495
 persica 495
Scaritini 205
Sceura 164
Schismus 312
 arabicus 312
 barbatus 312
Scincidae 30, 41, 56, 499, 522, 524
Scincus pannonicus 500
Scirtothrips perseae 69
Sclerophrys 19, 48, 53
 garmani 53
 gutturalis 53
 maculata 19, 53
Scolytus schevyrewi 77
Scutellaria mexicana 281, 307
Senecio 286, 298, 299
 douglasii 298, 299
 var. *monoensis* 299
 flaccidus 286, 298, 299
 var. *monoensis* 299
 multilobatus 298
Senegalia greggii 274, 277, 281, 286, 305, 317
Senna covesii 305
Sepsina 57
 angolensis 57
 copei 57

- Serpentes 504
 Serranidae 191
Serranus 191, 192, 193, 194, 195, 196, 197, 198, 199
 accraensis 192, 196
 hepatus 191, 192, 196
 heterurus 191, 192, 196, 198, 199
 pulcher **sp. nov.** 191, 192, 193, 194, 195, 196, 197, 199
 sanctaehelenae 191
 scriba 191, 192, 196
 Serranus sp 192, 198
Silene 281, 303
 antirrhina 303
 verecunda 281, 303
 Sinotrechiana 365
 Siphonaptera 67, 69, 70, 72, 76
Sisymbrium 301
 altissimum 301
 irio 301
 orientale 301
Sisyrinchium demissum 287, 306
Sitanion 311
 hystrix 311
 var. *brevifolium* 311
 jubatum 311
 Solanaceae 315, 318
Solanum 287, 316
 americanum 287, 316
 douglasii 316
 elaeagnifolium 316
Solenopsis 65, 75
 invicta 65, 75
 wagneri 75, 77
Sonchus 299
 asper 299
 oleraceus 299
 South America 12, 65, 71, 159, 168, 174, 175, 176
 Bolivia 159
 Brazil 174, 175
 Colombia 168
 Peru 174, 175
 Southwest Asia 331
 Afghanistan (see as separate listing)
 Iran 331
Spalerosophis 464, 512, 536
 diadema 464, 512, 536
 schirasiana 512
 schirazana 512
 schirazianus 512, 536
Spartina 174, 185
 alterniflora 174
Spergularia 287, 303
 marina 287
 salina 303
Sphaeralcea 280, 308
 ambigua 280, 308
 emoryi 308
 parvifolia 308
 Sphaerodactylidae 491
 Sphagebranchini 326
Sphenocephalus tridactylus 502
Sporobolus 16, 281, 312
 cryptandrus 281, 312
 spicatus 16
 Squamata 21, 54, 469
Stanleya pinnata 301
 Staphylinidae 69, 71, 77
Stellagama 469
Stellaria nitens 303
Stellio 469, 470, 471, 472, 474, 475
 agrorensis 469
 carinatus 470
 caucasicus 471
 erythrogaster 474
 nurgeldievi 474
 pallida 474
 himalayanus 474
 indicus 471
 lehmanni 474
 liratus 470
 microlepis 475
Stenodactylus 486, 492
 lumsdeni 486
 maynardi 486
 scaber 486
Stenogorgia 3
 Stenomphreoides 223
Stenotopsis linearifolia 297
Stephanomeria 276, 280, 299
 exigua 299
 pauciflora 276, 280, 299
Sternorrhyncha 63, 67, 69, 71, 72, 76

- Stevensius* 341, 344, 353, 363, 365
 lampros 363
 minutus 341, 344, 363
Stigmochelys pardalis 54
Stillingia linearifolia 286, 304
Stipa 310, 311
 coronata var. *depauperata* 310
 speciosa 311
Streptanthella longirostris 301
Stylocline micropoides 299
Suaeda 185
Swiftia 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
 farallonesica **sp. nov.** 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
 kofoidi 4
 spauldingi 4
Symphyla 67, 70, 72, 76
Symphyotrichum 299
 subulatum 299
 var. *parviflorum* 299
Syntrichopappus fremontii 280, 299
- T**
- Tamarix chinensis* 316
Taphrometopon lineolatum 514
 Teleostei 191
Telescopus 61, 512, 536
 finkeldeyi 61
 rhinopoma 512, 536
 Tenebrionidae 69, 71
Tenuidactylus 490, 491, 521, 524, 525, 536
 caspius 490, 536
 cf. *turcmenicus* 491
 fedtschenkoi 490, 524, 525
 longipes 521
 turcmenicus 490, 524, 525, 536
 voraginosus 490, 536
 Tephritidae 65, 77
Teratoscincus 491, 492, 531, 536
 bedriagai 491, 536
 keyserlingii 491, 492, 531, 536
 microlepis 492, 536
 scincus 492, 536
Tessaria sericea 298
 Testudines 54
 Testudinidae 518
 Testudinoidea 518
Testudo 518, 536
 baluchiorum 518
 horsfieldii 518, 536
 Tetramerium 159, 160, 161, 162, 567, 568, 569, 570, 571, 572
 butterwickianum 567, 572
 pauciflorum **sp. nov.** 567, 568, 569, 570, 571, 572
 tetramerioides 159, 160, 162
 vargasiae 567, 572
 vargasiae **sp. nov.** 159, 160, 161
 Tetranychidae 69, 71
Thamnosma montana 280, 288, 315, 317
Thelotornis capensis oatesi 61
 Theridiidae 69
 Thripidae 69, 71
Thuja 394
 Thunbergioideae 163, 187
Thysanocarpus 277, 302
 curvipes 277, 302
 laciniatus 302
 Thysanoptera 67, 69, 70, 71, 72, 76
Thysanotus 201, 232, 233, 234, 266
 bimaculatoides **sp. nov.** 201, 232, 233
 bimaculatus 233
 spinosus 233, 234
 Thysanura 67, 69, 70, 76
Tidestromia lanuginosa 295
Tiquilia 286, 301
 canescens 301
 plicata 286, 301
Tiruka 343
Tomopterna 20, 41, 46, 52, 54
 cryptotis 52
 damarensis 20, 41, 46, 54
 krugerensis 54
 tandyi 52, 54
 tuberculosa 54
Tomyris 513, 514
 oxiana 513
 leithii 514
 Tortricidae 69, 71
Trachylepis 17, 31, 32, 33, 34, 35, 57, 58
 acutilabris 34, 35, 57
 bayonii bayonii 57
 binotata 57
 chimbana 57

- hoeschi* 32, 33, 57
lacertiformis 57
laevis 33, 49, 57
occidentalis 33, 57
punctulata 17, 31, 32, 57
sulcata 34, 57
 ansorgii 34, 54
 varia 31, 58
Trachylepis setpentaeniata 536
Tragia ramosa 304
Trapelus 479, 480, 481, 482, 524, 525, 526, 536
 agilis 479, 480, 500, 526, 532, 536
 megalonyx 481, 524, 526, 536
 ruderata 481
 baluchiana 481
 ruderatus 524, 525
 sanguinolentus 480, 482, 526, 536
***Trechepaphiama* gen. nov.** 341, 342, 347, 384, 411, 415, 429, 430, 431, 433, 436, 440
 ***gaoligong* sp. nov.** 341, 342, 384, 411, 415, 429, 430, 431, 440
***Trechepaphiopsis* gen. nov.** 341, 342, 347, 369, 384, 389, 394, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 429, 432, 433, 434, 435, 436, 437, 440, 441, 443, 445, 446
 asetosa 408, 409
 ***monochaeta* sp. nov.** 342, 369, 394, 408, 418, 419, 420, 424, 436, 437, 441, 445
 ***unipilosa* sp. nov.** 342, 389, 406, 408, 418, 421, 422, 423, 424, 437, 443
 ***uniporosa* sp. nov.** 341, 342, 384, 407, 408, 411, 413, 414, 415, 432, 440
 unisetigera 408, 409, 410
 unisetosa 408, 411, 412, 415, 432, 434, 435, 440, 446
 ***unisetulosa* sp. nov.** 342, 389, 406, 408, 415, 416, 417, 418, 424, 437, 443
Trechiamia 379
Trechina 377, 379, 380
Trechini 341, 342, 344, 353, 376, 380
Trechoblemus 377
Trechus 341, 344, 347, 352, 361, 362, 363, 365, 369, 372, 376, 377, 379, 380, 381, 382, 383, 384, 385, 386, 388, 389, 390, 392, 393, 394, 395, 396, 397, 398, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 411, 418, 421, 424, 425, 426, 429, 433, 434, 435, 436, 437, 440, 441, 442, 443, 444, 445, 446, 447
 asetosus 344, 365, 408
 birmanicus 352, 361
 dacatraianus 381
 ***gongshanensis* sp. nov.** 342, 369, 372, 376, 382, 384, 394, 400, 401, 402, 436, 437, 442, 443
 himalayanus 380
 indicus 361, 362, 381, 382, 383, 384, 385, 426, 433, 434, 435, 436, 437, 444, 447
 ***luzhangensis* sp. nov.** 341, 382, 397, 398, 435, 446
 macrops 362, 382, 383, 426
 ***mingguangensis* sp. nov.** 341, 382, 389, 390, 444
 myanmarensis 381
 natmataungensis 381
 perissus 379
 ***pseudoqiqiensis* sp. nov.** 341, 382, 395, 396, 406, 437, 445
 ***qiqiensis* sp. nov.** 341, 369, 376, 380, 381, 382, 392, 393, 394, 395, 403, 421, 436, 437, 440, 445
 setitemporalis 379, 381
 ***shibalicus* sp. nov.** 342, 382, 384, 389, 397, 403, 404, 405, 418, 424, 436, 437, 443
 ***shiyueliang* sp. nov.** 341, 380, 381, 386, 388, 399, 406, 418, 424, 436, 437, 443
 thai 381
 unisetiger 344, 409
 unisetosus 344, 411
 vietnamicus 381
 yasudai 380
Tribulus terrestris 317
Trichachne californica 311
Trichinillus 201, 217, 218
 abacetoides 217, 219
 dactyleuryoides 217
 Mallopelmus 201, 217, 218, 265
 ***ranomafanae* sp. nov.** 201, 217, 218, 219
 perrieri 217, 255
Trichoptilium incisum 299
Tridens muticus 281, 312
Trionychidae 519
Trionyx gangeticus 519

- Triozidae 75
Triticum aestivum 312
Trixis californica 277, 279, 299
 Tropical America 71, 72, 75
Tropicolotes 484, 560
 levitoni 484
 Trypoxylini 333
Tupinambis bengalensis 503
Typha latifolia 275, 287, 292, 316
Typhlacontias 17, 18, 30, 31, 47, 58
 bogerti 18, 30, 31, 58
 johnsonii 58
 punctatissimus 17, 30, 31, 58
 rudebecki 58
 Typhlopidae 59, 515
Typhlops 515, 516
 braminus 515
 persicus 516
 vermicularis 515
- U**
- Uenoites* 363, 365, 369, 376, 433
 United States 159, 174, 269
 Alabama 174, 188
 Arizona 269
 Basin and Range Province 273
 Black Mountains 269, 271, 274, 275,
 276, 277
 Southern Black Mountains 269,
 270, 271, 272, 274, 277, 278,
 279, 281, 282, 283, 284, 285,
 286, 287, 288, 289, 290, 291,
 292, 293, 294, 295, 299, 300,
 302, 305, 307, 310, 313, 317
 Mohave Co. 269, 270, 271, 286
 Mohave County 269, 270, 275, 297,
 302, 319
 California 1, 2, 3, 4, 6, 8, 10, 11, 12, 14, 63,
 163, 164, 166, 167, 168, 170, 172, 174,
 175, 176, 178, 180, 182, 184, 185, 186,
 188, 190, 275, 277
 Farallon Islands 1, 2
 Gulf of the Farallones 1, 2
 Sacramento Valley 269, 270, 271, 275,
 281
 Colorado River 269, 270, 274, 275, 276,
 280
 Florida 170, 172, 174, 183
 Hawaii 71, 72, 74, 75
 Louisiana 174, 184
 Mississippi 174, 184
 Texas 174, 184
 Upata 164
 Uromastix 502, 503
 asmussi 502
 hardwickii 502, 503
 loricata 502
 Uropappus lindleyi 299
- V**
- Varanidae 39, 58, 503
Varanus 18, 39, 58, 503, 526, 536
 albigularis 18, 39, 40, 58
 albigularis 58
 angolensis 18, 39, 40, 58
 bengalensis 503, 526, 536
 griseus 503, 504, 536
 caspius 503, 536
 lunatus 503
 punctatus 503
Varroa jacobsoni 66, 84
Verbena 316
 ciliata 316
 gooddingii 316
Verbesina encelioides 299
Veronica anagallis-aquatica 287, 310
Vicia 277, 306
 exigua 277
 ludoviciana 306
Viguiera 296
 deltoidea 296
 var. *parishii* 296
Vipera 518
 lebetina 518
 peilei 518
 Viperidae 59, 516, 523, 525
Vitis arizonica 275, 287, 317
Vulpia 277, 280, 312
 microstachys var. *pauciflora* 312
 octoflora 277, 280, 312
- W**
- Welwitschia mirabilis* 17
Wislizenia refracta 287, 303

X

Xanthisma spinulosum var. *gooddingii* 299
Xanthospecium harteni 577
Xenochrophis piscator 513, 536
Xenopus petersii 53
Xerotyphlops vermicularis 516, 536
Xylorhiza tortifolia 280, 299
Xyrias 326

Y

Yabea microcarpa 295
Yucca 272, 274, 276, 277, 278, 280, 281, 292, 295
 baccata 274, 277, 280, 281, 295
 brevifolia 277

schidigera 272, 274, 277, 278, 280, 281, 292, 295

Z

Zabrini 344
Zamenis 510
 karelini 510
 Ladacensis 510
 rhodorachis 510
Zeltnera arizonica 287, 291, 306
Ziziphus obtusifolia 281, 315
Zygnopsis brevipes 522

CALIFORNIA ACADEMY OF SCIENCES

PROCEEDINGS SERIES

INSTRUCTIONS TO AUTHORS

Authors planning to submit papers for consideration for publication in the Academy's *Proceedings*, *Occasional Papers*, or *Memoir* series must follow the directions given below in preparing their submissions. Under some circumstances, authors may not be able to comply with all the computer-based requirements for submission. Should this be the case, please contact the Editor or Associate Editor for guidance on how best to present the materials.

The Scientific Publications Office of the Academy prepares all materials for publication using state-of-the-art, computer-assisted, page-description-language software. Final copy is sent to the printer for printing. The printer does not modify the files sent for printing. Therefore, it falls to the authors to check carefully page proof when it is returned for approval. Ordinarily, all communication with authors is done via email and galley and page proofs of manuscripts, including figures, are transmitted as attachments to email communications. Again, exceptions to this will be made in the event that an author is unable to communicate in this way.

Authors are expected to provide digital copies of both manuscript text files and images, as well as a paper printout of their manuscript. Please note the following:

TEXT: Text can be in Microsoft Word, as a Word document file, WordPerfect, also as a WP document file, or, best of all, as an "rtf" (rich text format) file, which can be produced by most word processors. Authors who use non-standard fonts must include file copies of those fonts so that their symbols can be reproduced accurately. However, it is strongly recommended that the type style "New Times Roman" be used throughout and that the Symbols and Bookshelf Symbol 1 and 3 fonts be used for such items as σ , φ , μ , etc. Note, words must not be typed in all capital letters either in the text or bibliography; small caps are acceptable.

IMAGES: Images should be in either JPG (JPEG), or TIF (TIFF) format. Resolution for grayscale images should be at least 600 ppi (1200 ppi if possible, especially for photomicrographs), and 300 ppi (600 ppi acceptable) for color. All images should be sized so that none exceeds a maximum print size of 5.5" x 7.875" (140 mm x 200 mm).

TABLES: Our processing software allows for direct importation of tables. This reduces the chances for errors being introduced during the preparation of manuscripts for publication. However, in order to use this feature, tables must be prepared in Microsoft Excel or in Microsoft Word using Word's table feature; do not prepare tables using tabs or space bars. Complex tables not prepared as described above will be returned to the author for revision.

DIGITAL FILES: IBM or MAC formatted disks will be accepted subject to the following conditions: (a) floppy disks must not exceed 1.4 mb and (b) zip disks, preferably IBM format, must not exceed 100mb. Authors are encouraged to submit their digital files on CD-ROM (CD-R formatted disks NOT CD-RW) inasmuch as these can be read by nearly all CD-ROM drives.

FILE NAMING PROTOCOLS: To facilitate the handling of digital files submitted by authors, the following file-naming conventions are to be followed: text files should bear the author's last name (in the case of multiple authors, only the first author's name) followed by a space and a date in the format mmyy (e.g., 0603 for June 2003) to yield a file name such as **Gosliner 0603.doc** or **Williams 0603.rtf**. If an author has submitted two or more manuscripts and must distinguish between them, then the naming should include an additional numeral: **Gosliner1 0603.doc** for the first manuscript, **Gosliner2 0603.doc** (or .rtf) for the second. Figures should follow similar conventions, as follows: **Gosliner F1 0603.tif**, **Gosliner F2 0603.tif**, for figures in the first manuscript and, if more than one manuscript, then **Gosliner1 F1 0603.tif** etc. for the figures associated with the first manuscript and **Gosliner2 F1 0603.tif** etc. for those with the second. Following these conventions will insure that figures submitted by one author are always maintained distinct from those submitted by another. Tables submitted as Excel files should follow the same naming conventions except the file type designation will be ".xls": e.g., **Gosliner T1 0603.xls**. Please note that extraneous periods are omitted in file names.

BIBLIOGRAPHY FORMAT: Three bibliographic styles are accommodated in the Academy's scientific publications, one commonly used in scientific journals publishing papers in systematic and evolutionary biology, a second used mainly in the geological literature, and lastly, the format most commonly used in the humanities by historians of science. On request, the author will be sent a style sheet that includes samples of the three formats. Authors are also encouraged to examine a copy of the latest published *Proceedings*. In all instances, however, authors should not abbreviate journal names but spell them out completely. For books, the reference must include the publisher and city of publication. It is recommended that the total number of pages in the book also be given.

SUBSCRIPTIONS/EXCHANGES

The *Proceedings* series of the California Academy of Sciences is available by exchange or subscription. For information on exchanges, please contact the Academy Librarian via regular mail addressed to the Librarian, California Academy of Sciences, 55 Music Concourse Drive, Golden Gate Park, San Francisco, CA 94118 U.S.A. or via email addressed to hyaeger@calacademy.org. Subscription requests, including information on rates, should be addressed to Scientific Publications, California Academy of Sciences, 55 Music Concourse Drive, Golden Gate Park, San Francisco, CA 94118 U.S.A. or via email to the Editors at alevton@calacademy.org or gwilliams@calacademy.org

Subscription price for 2010: \$75 (US) includes mailing to U.S. and Canadian addresses and \$85 to all others.

The *Occasional Papers* and *Memoirs* are not available by subscription. Each volume is priced separately. *Occasional Papers*, *Memoirs*, and individual issues of the *Proceedings* are available for purchase through the Academy's Office of Scientific Publications. Visit us on the web at <http://research.calacademy.org/research/scipubs/>.

COMMENTS

Address editorial correspondence or requests for pricing information to the Editor, Scientific Publications Office, California Academy of Sciences, 55 Music Concourse Drive, Golden Gate Park, San Francisco, CA 94118 U.S.A. or via email to the Editor, Scientific Publications, at alevton@calacademy.org or gwilliams@calacademy.org

Table of Contents

PHILIPP WAGNER, AARON M. BAUER, ALAN E. LEVITON, THOMAS M. WILMS, AND WOLFGANG BÖHME. A Checklist of the Amphibians and Reptiles of Afghanistan: Exploring Herpetodiversity using Biodiversity Archives	457
THOMAS F. DANIEL AND VICTOR W. STEINMANN. <i>Tetramerium pauciflorum</i> (Acanthaceae: Justiceae): a New Species from the Basin of the Río Balsas in Michoacán, Mexico	567
WOJCIECH J. PULAWSKI. On <i>Eremiasphecium arabicum</i> Pulawski and <i>Eremiasphecium sahelense</i> Simon Thomas (Hymenoptera: Crabronidae)	575
WOJCIECH J. PULAWSKI AND SARAH K. GESS. A New Species of the Genus <i>Palarus</i> (Hymenoptera: Crabronidae)	581
INDEX to Volume 63	589