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Figure 15 (see p. 189) *Chamaeleo chamaeleon* from Farwah Island, Libya,
in Bauer et. al., Atlas of the Reptiles of Libya
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Two New Species of Nudibranch Mollusks from the Tropical Eastern Pacific of Mexico

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Two new species of nudibranch gastropods are described from the Bahía de los Ángeles region of the Sea of Cortez, Baja California, México. *Rostanga ghiselini* sp. nov. is known from two specimens found 25 years apart. It is immediately recognizable and distinct from all other *Rostanga* species by its bright red coloration with large densely packed black spots and conical rhinophores with transverse lamellae. Internal differences, especially the form of the bifurcate radular teeth, also distinguish this species. Differences between *R. ghiselini* and the sympatric *R. pulchra* are noted. *Tenellia ivetteae* sp. nov., known from Mexico and Costa Rica, is characterized by a uniformly translucent white body with light yellowish pigment occupying the digestive gland of the cerata. The cerata are short and rounded. The uniseriate radula teeth have 4–7 elongate denticles on either side of the wide central cusp. The penis is armed with a short cuticular stylet.

Se describen dos especies nuevas de gasterópodos nudibranquios de la Bahía de los Ángeles en la región del Mar de Cortés, Baja California, México. De *Rostanga ghiselini* sp. nov. se conocen dos especímenes que fueron encontrados durante a lo largo de 25 años. Esta se reconoce inmediatamente y se le distingue de las otras especies de *Rostanga* por su coloración rojo brillante con grandes manchas de puntos negros agrupados densamente, y rinóforos cónicos con lamelas transversales. Las diferencias internas, en especial la forma bifurcada de los dientes radulares, también es algo que distingue a esta especie. Se describen las diferencias entre *R. ghiselini* y su simpátrica *R. pulchra*. *Tenellia ivetteae* sp. nov., conocida desde México y Costa Rica, se caracteriza por su cuerpo blanco uniformamente translúcido con pigmentos amarillos claros que ocupan la glándula digestiva de la cerata. Los cerata son cortos y redondeados. Los dientes radulares uniseriados tienen de 4 a 7 dentículos largos en cada lado de la ancha cúspide central. El pene está armado con un estilete corto cutícular.

KEYWORDS: Nudibranchs, gastropods, Panamic, new species, biodiversity, Gulf of California

The heterobranch sea slug fauna of the Pacific coast of Mexico has received considerable attention in recent years and many new taxa have been described (Gosliner and Bertsch, 2004; Bertsch, Valdés and Gosliner, 2009; Angulo-Campillo and Bertsch, 2013; Carmona, Pola, Gosliner and Cervera, 2014; Pola, Sánchez-Benítez, and Ramiro, 2014; Hoover, Lindsay, Goddard and Valdés, 2015), but many new species still remain undescribed (Behrens and Hermosillo, 2005; Camacho-García, Gosliner and Valdés, 2005).

Studies on the systematics of dorid nudibranchs of the genus *Rostanga* have added many new species to the genus, primarily based on specimens from Australia and the Indo-Pacific (Rudman and Avern, 1989) and from southern Africa (Garavoy, Valdés and Gosliner, 2001). An additional three species of *Rostanga* have been described since then: *R. ankyra* from the deep Pacific (Valdés, 2001); *R. alisae* Martynov, 2003, from the Russian Pacific; and *R. crocea* from Ghana (Edmunds, 2011). Thus far, only a single species of *Rostanga*, *R. pulchra* MacFarland, 1905, has been described from the eastern Pacific, where it is known from Alaska to Chile (Camacho-García, Gosliner and Valdés, 2005; Schrödl and Grau, 2006). The Galápagos Islands *Rostanga* sp. in Camacho-Garcia et al. appears to be a *Diaulula* sp., based on dissection of the radula (present study).

Recently, the Family Fionidae has been radically revised, combining most species of Tergipedidae, Calmidae and Eubranchidae into a single family (Cella, Carmona, Ekimova, Chichvarkhin, Schepetov and Gosliner, 2016) and realigning many of the genera within the family. As a result, most species previously considered as members of *Cuthona* Alder and Hancock, 1855 were transferred to *Tenellia* Costa, 1866. Of the 39 species of Fionidae found on the Pacific Coast of North America (Behrens and Hermosillo, 2005), only 13 were sequenced in Cella et al. (2016). They include species in the genera *Eubranchus* (*E. olivaceus* (O'Donoghue, 1922)), *Cuthona* (*C. nana* (Alder and Hancock, 1842)), *Tenellia* (*T. adspersa* (Nordman, 1845), *T. albocrusta* (MacFarland, 1966), *T. columbiana* (O'Donoghue, 1922), *T. flavovulta* (MacFarland, 1966), *T. fulgens* (MacFarland, 1966), *T. lagunae* (O'Donoghue, 1926) and *T. pustulata* (Alder and Hancock, 1854)), *Cuthonella* (*C. concinna* (Alder and Hancock, 1843) and *C. cocoachroma* (Williams and Gosliner, 1979)) and *Fiona* (*F. pinnata* (Eschscholtz, 1831)). None of the species found within the Gulf of California have been investigated by molecular studies. Despite confirmation from molecular data, a series of morphological criteria for differentiating the members of the revised genera were proposed by Cella et al. (2016).

Since the work of Behrens and Hermosillo several additional species of Fionidae (as Tergipedidae) from the tropical eastern Pacific have been described. Camacho García et al. (2005) included six undescribed species of *Cuthona*, not included in Behrens and Hermosillo. Hermosillo and Valdés (2007) described three new species of *Cuthona* and one new species of *Eubranchus*. *Cuthona destinayae* Hermosillo and Valdés, 2007 was included in Behrens and Hermosillo as *Cuthona* sp. 4 and by Camacho García et al. as *Cuthona* sp. 2. *Cuthona millenae* Hermosillo and Valdés, 2007 was included in Behrens and Hermosillo as *Cuthona* sp. 5 and in Camacho García et al. as *Cuthona* sp. 8. *Cuthona behrensi* Hermosillo and Valdés, 2007 was included in Camacho García et al. as *Cuthona* sp. 9. *Eubranchus yolandae* Hermosillo and Valdés, 2007 was not included in either of the above mentioned field guides. *Cuthona riosi* Hermosillo and Valdés, 2008 was included in Behrens and Hermosillo as *Cuthona* sp. 2.

Methods

Specimens of the two species described here were collected beginning in 1992 and most recently in March, 2017 at Bahía del los Ángeles, México. Specimens from the 1990s were preserved in either 10% formalin or Bouin's fixative for proper preservation of anatomical structures. The most recently collected specimen of *Rostanga* was preserved entirely in 95% ethanol for later molecular study.

At the California Academy of Sciences, dissections were completed, and drawings of anatomical structures were accomplished using a Nikon SMZ-U binocular microscope with drawing tube. Buccal masses, containing the jaws, radula and connective tissue, were carefully extracted from specimens with the aid of a dissecting microscope and forceps. The mass was placed in 10% sodi-

um hydroxide (NaOH), allowed to soak for 4–24 hours and then rinsed in ddH_20 or deionized H_20. Once all connective tissue was removed, the radula and jaw were dried and mounted for examination by scanning electron microscope (SEM). Reproductive systems were carefully removed, examined and sketched under a dissecting microscope with a camera lucida. Caryophyllidia and penial morphology was also examined by SEM and dissected organs were mounted on stubs and air-dried. Structures were then coated with gold/palladium using a Cressington 108 Auto vacuum sputter coater. Scanning electron micrographs were produced using a Hitachi SU3500 scanning electron microscope. Specimens and dissected structures were deposited at the California Academy of Sciences in the Invertebrate Zoology Department collection (CASIZ).

Species Descriptions

Family Discodorididae Bergh, 1891

Genus *Rostanga* Bergh, 1879

Type species: *Doris coccinea* Forbes, 1848 (=*Doris rubra* Risso, 1818), by monotypy.

***Rostanga ghiselini* Gosliner and Bertsch sp. nov.**

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Figures 1A,B, 2, 3, 4A

Reddish dorid: Bertsch, 2008:337.

Rostanga sp.: Bertsch, 2014:177; Bertsch and Aguilar Rosas, 2016:275 (photo).

Material examined.— Holotype: CASIZ 220373, dissected and subsampled for molecular study, 10 m depth, Punta Gringa, Bahía de los Ángeles, Baja California, Gulf of California, México, 25 March 2017, Craig Hoover.

Comparative material examined: Rostanga pulchra: One specimen, CASIZ 097529, Punta Vicente Roca, Isla Isabela, Galápagos Islands, 14 May 1994, Paul Humann.

Additional observations: One specimen, Bahía San Luis Gonzaga, Baja California, Gulf of California, México, 11 December 1962, Wesley M. Farmer (photo M321). One specimen, 5 m depth, Punta la Gringa, Bahía de los Ángeles, Baja California, Gulf of California, México, 12 mm, 24 October 1986, H. Bertsch. One specimen with egg mass, 3 m depth, Punta la Gringa, Bahía de los Ángeles, Baja California, Gulf of California, México, 20 mm, 14 March 1992 (HB photo M3895). One animal, 6 m depth, Punta la Gringa, Bahía de los Ángeles, Baja California, Gulf of California, México, 15 mm, 21 December 1994, H. Bertsch (HB photo M4639); One animal, 3 m depth, Punta la Gringa, Bahía de los Ángeles, Baja California, Gulf of California, México, 16 mm, 24 December 1995, Hans Bertsch (HB photo M4789); One specimen, Cuevitas, Bahía de los Ángeles, Baja California, Gulf of California, México, l0 mm, 6 April 1990, H. Bertsch (HB photo M3243). One specimen, 4 m depth, Cuevitas, Bahía de los Ángeles, Baja California, Gulf of California, México 10 mm, 20 March 1994, H. Bertsch. One animal, 3 m depth, Cuevitas, Bahía de los Ángeles, Baja California, Gulf of California, México, 8 mm, 20 December 1994, H. Bertsch (HB photo M4618). One specimen, 5 m depth, s. w. Isla Ventana, Bahía de los Ángeles, Baja California, Gulf of California, México, 15 mm, 24 February 1997, H. Bertsch (HB photo M5402). One specimen, Guaymas, Sonora, México, 30 November 1975, Leroy H. Poorman (photo M 2947).

Geographical distribution.— Thus far, known only from Bahía San Luis Gonzaga and Bahía de los Ángeles, Baja California, and Guaymas, Sonora, all within the Gulf of California, México.

Etymology.— This species is named for our colleague and mentor, Michael T. Ghiselin, a

superb teacher, scientist, philosopher, historian and friend.

Description.— *External morphology.* The living (Fig. 1A–B) holotype (Fig. 1A–B) was approximately 30 mm in length and 20 mm wide. The general body color is red to reddish orange with a series of large, well-spaced black spots present on the dorsal surface. The perfoliate rhinophores are conical with a series of 10–14 horizontal lamellae. The gill is composed of 7 bipinnae branches. The rhinophores and gill are the same color as the rest of the body. The body shape is oval. The notum is covered with a series of densely packed caryophyllidia (Fig 2A). Each caryophyllidium bears 5–6 calcareous spines with a small ciliated tubercle located in its center. The anal papilla is situated within the circle of the branchial plume. The anterior border of the foot is labiate and notched. The foot is wide relative to the mantle margin. The oral tentacles are well-formed and appear conical in shape.

Buccal armature: The labial cuticle is smooth with two small rectangular areas where chitinous jaws are present. The jaws contain numerous rodlets that are elongate and have a broader apical end (Fig. 2B). The radular formula of the holotype is 73 X 67.25.1.0.1. 25.67 (Fig. 2C). The innermost lateral teeth are deeply

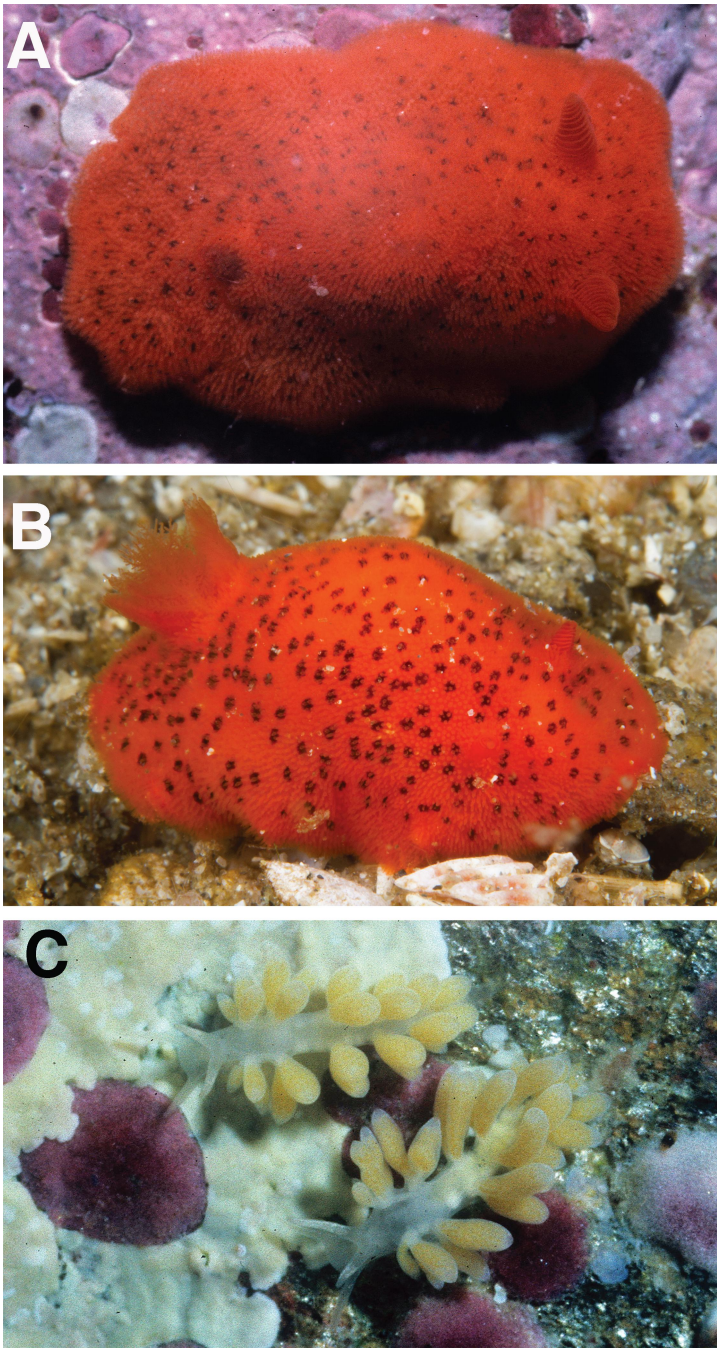

Figure 1. Living animals. A. *Rostanga ghiselini* sp. nov., specimen from Punta Gringa, Bahía de los Angeles, 14 March 1992, photo by Hans Bertsch. B. *Rostanga ghiselini* sp. nov., holotype specimen from Punta Gringa, Bahia de los Angeles, 25 March 2017, photo by Craig Hoover. C. *Tenellia ivetteae* sp. nov., holotype, CASIZ 220143 (upper animal) and paratype, CASIZ (lower animal), from Punta Gringa, Bahia de los Angeles, 30 June 1992, photo by Hans Bertsch.

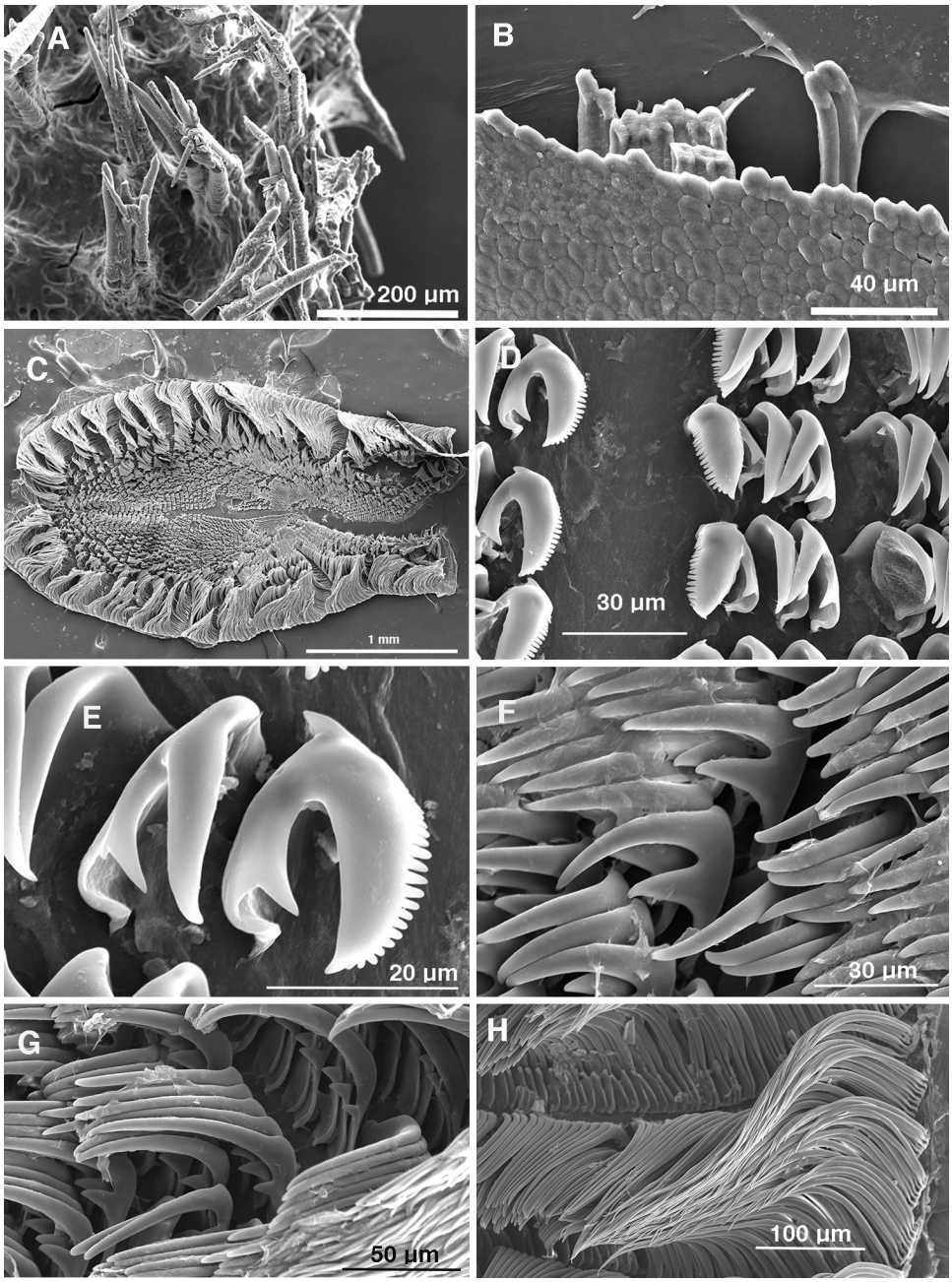

FIGURE 2. Scanning electron micrographs, *Rostanga ghiselini* sp. nov., holotype, CASIZ 220373. A. Caryophyllidia. B. Jaw rodlets. C. Entire radula. D. Inner lateral teeth and rachis. E. First and second lateral teeth. F. Middle lateral teeth. G. Elongate middle to outer lateral teeth. H. Outer lateral teeth.

arched and bifurcate with an inner denticulate lobe and an outer acutely pointed secondary cusp (Figs. 2E, 3C). The inner denticulate lobe has about 8–21 denticles along its inner margin. The next several inner lateral teeth are similar in shape to the innermost tooth (Figs. 2D, 3B), but lack denticles on the inner margin. At about tooth number 7 or 8, the bifid cusps become more elongate with the inner cusp longer than the outer one (Fig. 2F). At about tooth 25, the primary cusp is about ten times longer than the secondary cusp (Figs. 2G, 3D). The next 67 or so teeth are narrow (Fig. 2H) and elongate with a bifid cusp near the apex of the narrow apices (Fig. 3A).

Reproductive System (Fig. 4A): Reproductive organs of the holotype fully mature. Ampulla thin, tubular, and strongly curved, narrowing somewhat before bifurcating into oviduct and vas deferens. Short oviduct entering female gland mass near albumen gland. Prostatic portion of vas deferens wide, curved and thin, partially enveloping bursa copulatrix. Prostatic portion narrowing abruptly as it transitions into muscular, ejaculatory portion. Ejaculatory portion long curved, narrow, entering short, narrow, slightly wider, penial bulb. Penial bulb adjacent to straight, narrow vaginal duct at common gonopore. Female gland mass consisting of large mucous gland and small membrane and albumen glands. Small, lobate vestibular gland situated near exit of mucous gland. Moderately long vagina leading to large spherical, thin-walled bursa copulatrix. Adjacent to vagi-

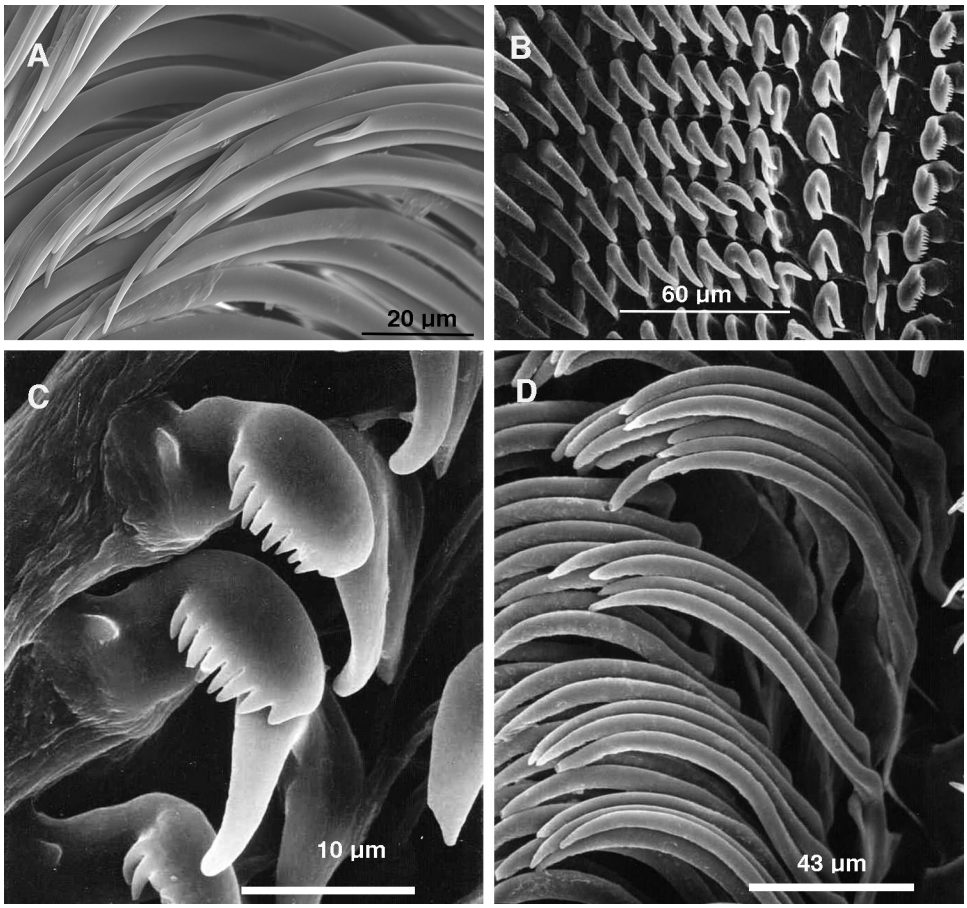

FIGURE 3. Scanning electron micrographs of *Rostanga ghiselini* sp. nov. A. Holotype, CASIZ 220373, detail of outer lateral teeth. B–D. Specimen from Punta Gringa, Bahía de los Angeles, 14 March 1992. B. Inner and middle lateral teeth. C. First and second lateral teeth. D. Elongate middle to outer lateral teeth.

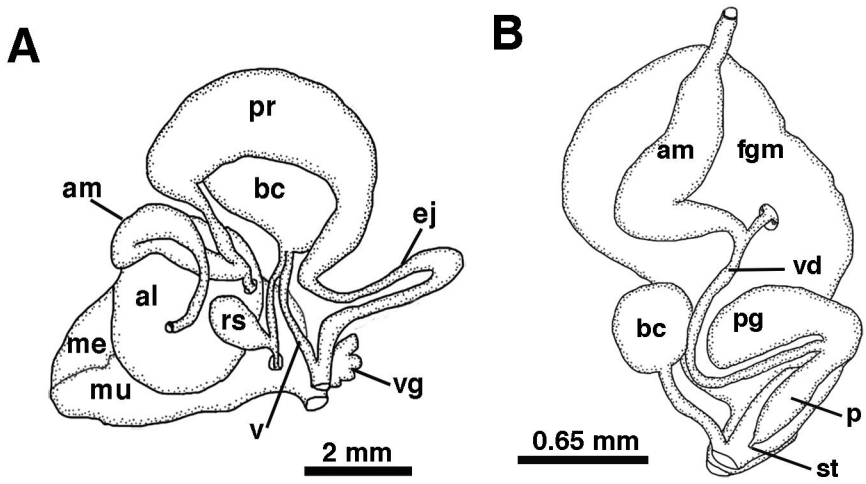

FIGURE 4. Reproductive anatomy. A. *Rostanga ghiselini* sp. nov., holotype, CASIZ 220373. B. *Tenellia ivetteae* sp. nov., paratype, CASIZ 222482. abbreviations: al-albumen gland, am ampulla, bc-bursa copulatrix, ej-ejaculatory portion of vas deferens, fg-female gland mass, me-membrane gland, mu-mucous gland, p-penis, pg-penial gland, pr-prostatic portion of vas deferens, rs-receptaculum seminis, st-penial stylet, v-vagina, vd-vas deferens, vg-vestibular gland. Scale = 1 mm.

na, long narrow uterine duct leading to smaller receptaculum seminis. Receptaculum seminis pyriform with short duct entering the female gland mass.

REMARKS.— *Rostanga ghiselini* differs from all other 23 described members of the genus. Most species of *Rostanga*, as in *R. ghiselini*, have a reddish or orange body color, except for *R. setidens* (Odhner, 1939) (whitish), *R. phepha* Garovoy, Valdés and Gosliner, 2001(white), *R. risbeci* Baba, 1991 (dark gray to black), *R. ankyra* Valdés, 2001 (white) and *R. crocea* Edmunds 2011 (yellow). Species of *Rostanga* have rhinophores of two basic forms, either conical with a series of transverse lamellae, as in most other dorid nudibranchs, including *R. ghiselini*, or broader rhinophores with nearly vertical lamellae (Table 1). Twelve species have transverse lamellae while 11 have vertical ones.

The buccal armature, both the jaws and radula, of most *Rostanga* species is distinctive. In six species, *R. ankyra*, *R. aureommala* Garovoy, Valdés and Gosliner, 2001, *R. crocea*, *R. elandsi* Garovoy, Valdés and Gosliner, 2001, *R. rosi* (Ortea, 1979) and *R. setidens* lack any trace of jaw rodlets, while the remaining species, including *R. ghiselini*, either have small areas of the labial cuticle with jaw rodlets or well developed rodlets. The inner lateral tooth of many species of *Rostanga* often contains a series of distinct denticles. This arrangement is found in 16 species of *Rostanga*, while five species have a bifid or simply hamate inner tooth. In *R. crawfordi* (as *R. australis*), Rudman and Avern (1989) noted that small specimens have a denticulate inner lateral whereas medium-sized or large specimens have an entirely smooth inner lateral. Of the species with a denticulate inner lateral tooth, only *R. ghiselini* and *R. rubra* have a secondary triangular cusp below the inner margin bearing numerous denticles. In *R. ghiselini* this cusp is far more pronounced than in *R. rubra* (Valdés and Gosliner, 2001; Edmunds, 2011). Also, in *R. rubra*, some of the middle lateral teeth near the point where the hamate teeth become more elongate, lack a secondary denticle, whereas all of them in *R. ghiselini* have a secondary denticle.

Rostanga ghiselini can be compared in detail with the only other species found in the eastern Pacific, *R. pulchra* MacFarland 1905. Both species are reddish orange in color, but *R. ghiselini* also has large black spots present on the notum. The rhinophores of *R. ghiselini* are conical with trans-

Table 1. Comparative morphology of *Rostanga* species.

Species	Rhinophoral lamellae	Jaw rodlets	Inner lateral	Middle lateral	Outer lateral	Vestibular gland
alisae	vertical	present	denticulate	smooth	multifid	absent
aliusrubens	vertical	present	denticulate	smooth, inners	multifid	absent
ankyra	transverse	absent	bifid	bifid	bifid	absent
anthelia	vertical	present	denticulate	smooth	multifid	?
arbutus	transverse	present	denticulate	denticulate	multifid	absent
aureomala	transverse	absent	bifid also rachidian present	bifid	bifid or trifid	absent
crawfordi	vertical	reduced	denticlulate or smooth	smooth	multifid	absent
bassia	vertical	present	denticulate	no denticles	multifid	absent
bifurcata	transverse	present	denticulate	denticulate	bifid	absent
byga	vertical	reduced	denticulate	smooth	multifid	absent
calumus	vertical	present	denticulate	no denticles	multifid	absent
crocea	transverse	absent	bifid	bifid	bifid	?
dentacus	transverse	reduced	denticulate	no denticles	undivided or bifid	absent
elandsia	transverse	absent	bifid	bifid	bifid	absent
ghiselini	transverse	reduced	denticulate	bifid	bifid	present
lutescens	transverse	present	denticulate	smooth	trifiid	present
muscula	vertical	reduced	denticulate	no denticles	multifid	present
orientalis	vertical	present	denticulate	no denticles	multifid	absent
phepha	transverse	reduced	bifid	smooth	bifid	absent
pulchra	vertical	reduced	denticulate	smooth	mutifid	absent
risbeci	transverse	reduced	denticulate	smooth	bifid	absent
rosi	transverse	absent	smooth	smooth	smooth	present
rubra	vertical	present	denticulate	bifid	bifid	absent
setidens	transverse	absent	smooth	smooth	bifid	absent

verse lamellae, whereas those of *R. pulchra* are broad with vertical lamellae. There are 6–7 bipinnate gill branches in *R. ghiselini* and 8–12 unipinnate branches in *R. pulchra.* Internally, the radular morphology of the two species differs. The innermost radula tooth is denticulate in both species but in *R. ghiselini* the tooth bears 8–21 denticles whereas in *R. pulchra* there are 7–9 denticles (Fig. 5E, F). In *R. ghiselini* all of the hamate teeth are strongly bifid whereas only the second tooth is bifid in *R. pulchra*. The 67 elongate outer teeth of *R. ghiselini* have bifid apices whereas the 25 elongate teeth have 3–6 fine apices in *R. pulchra* (Fig. 5H). The reproductive system is similar in both species with the exception that the vagina of *R. pulchra* is more elongate.

Valdés and Gosliner (2001) included *Boreodoris* Odhner, 1939 as a synonym of *Rostanga*, noting that the absence of jaws and a denticulate inner lateral tooth was not sufficient to warrant generic separation. Subsequently, Garavoy, Valdés and Gosliner (2001) described three new South African species of *Rostanga* that all had a bifid inner lateral tooth. Two of these species, *R. aureomala and R. elandsia*, lacked jaws, whereas *R. phepha* had distinctive jaw rodlets. Martynov (2003), stating that *Boreodoris* lacking jaws and lacking an innermost lateral tooth with denticulate flange, is sufficiently distinct from *Rostanga* and should be considered as a distinct genus. Based

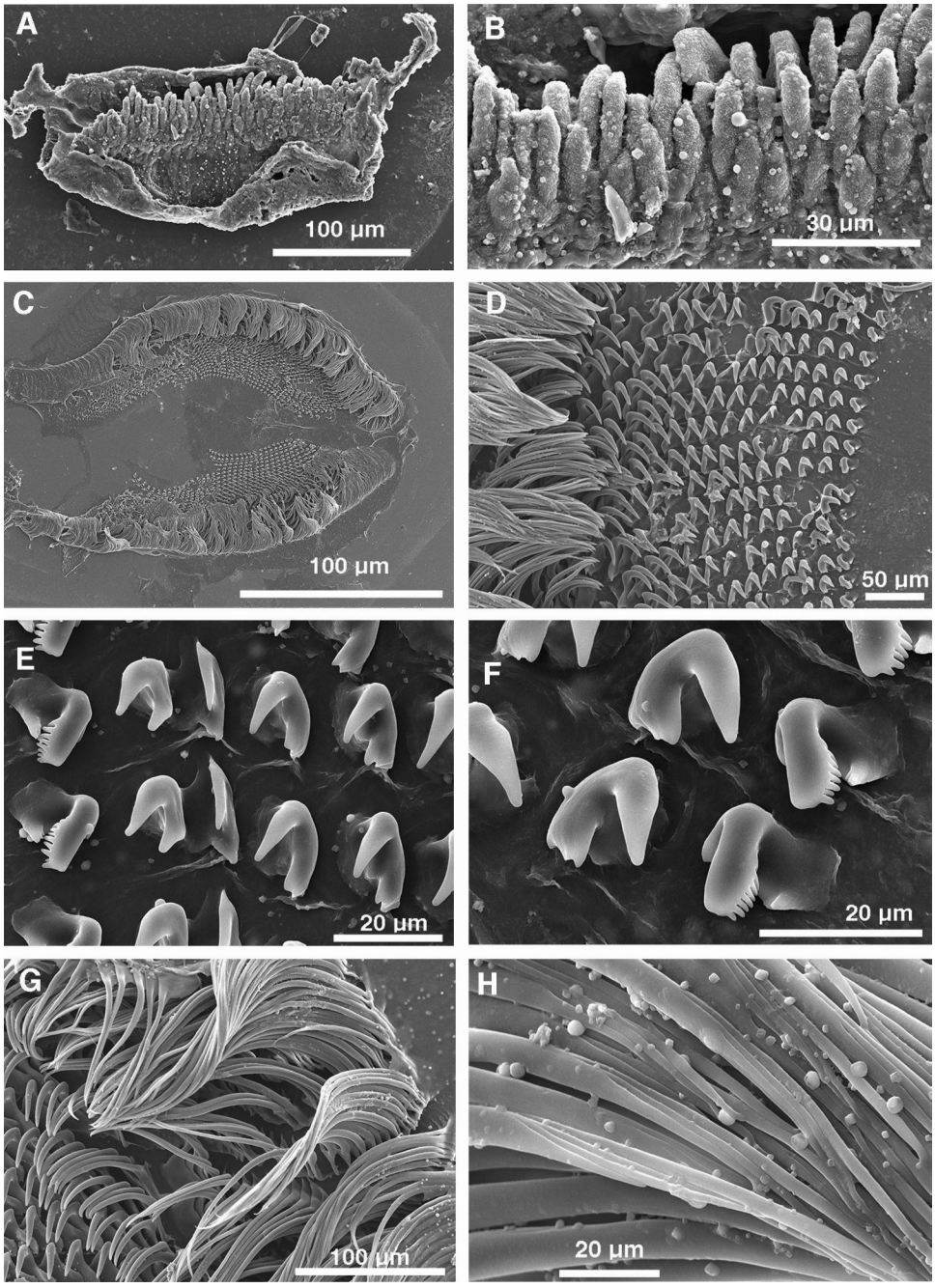

FIGURE 5. Scanning electron micrographs, *Rostanga pulchra* MacFarland, 1905, CASIZ 097525, Punta Vicente Roca, Galápagos Islands. A. Jaw. B. Jaw rodlets. C. Entire radula. D. Inner and middle lateral teeth and rachis. E. Inner lateral teeth. F. First and second lateral teeth. G. Outer lateral teeth. H. Outer lateral tooth apices.

on this distinction, he considered *R. aureomala*, *R. elandsia*, *R. phepha* and *R. ankyra* Valdés, 2001, together with *R. setidens* (Odhner, 1939), as members of *Boreodoris*. This distinction is not consistent since *Rostanga phepha* has well developed jaws with rodlets (as in *Rostanga*) but lacks an inner lateral tooth without a denticulate flange (as in *Boreodoris*). Two other species have radular morphology that is intermediate between the two forms. In *Rostanga crawfordi* (as *R. australis*) (Rudman and Avern, 1989), the inner radular in small specimens may have a denticulate flange but in larger specimens the inner lateral tooth is entirely smooth. This variability was also confirmed by Dayrat (2010). Similarly, in *Rostanga lutescens* (Bergh, 1905), the inner lateral tooth lacks a denticulate flange but the tooth has 1-5 denticles on the inner side and may have additional outer denticles (Johnson and Bertsch, 1985; Dayrat, 2010). Therefore, there are no consistent features that distinguish *Rostanga* and *Boreodori*s and they should, once again, be regarded as synonyms.

Family Fionidae Gray, 1857

Genus *Tenellia* A. Costa, 1866

Type species: *Tenellia mediterranea* A. Costa, 1866 (= *Tergipes adspersu*s Nordmann, 1845), by monotypy.

***Tenellia ivetteae* sp. nov.**

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(Figs. 1C, 4B, 6)

Cuthona sp.: Bertsch and Aguilar Rosas, 2016:301 (photo).
Cuthona sp. yellow: Bertsch, 2008:336; Bertsch, 2014:177.
Cuthona sp. 2: Hermosillo, 2006:44, 131, 134.
Cuthona sp. 3: Behrens and Hermosillo, 2005:131 (photo).
Cuthona sp. 4: Hermosillo, Behrens and Ríos-Jara, 2006:134 (photo).
Cuthona sp. 6: Camacho-García, Gosliner and Valdés, 2005:105 (photo).

Material examined.— Holotype: CASIZ 220143, 7 mm length, Punta la Gringa, Bahía de los Ángeles, Baja California, México, 30 June 1987, Sandra Millen. Paratypes: One specimen, CASIZ 222482 (dissected), Bahía de los Ángeles, Baja California, México, 30 June 1987, Sandra Millen; Three specimens, CASIZ 220142, 6 mm, 3 m depth, 20 June 1992 (HB photo M3968).

Additional records: Two specimens, 4 and 3 mm with egg masses, 4 m depth, Bahía de los Ángeles, Baja California, México, 25 July 1993; 1 animal, 3 mm, 10' deep, 31 October 2003. Twelve specimens, Majahuitas, Bahía de Banderas, Jalisco, México, between April 2002–April 2005, Alicia Hermosillo (Hermosillo, 2006: 134). One specimen, Punta Uvita, Punta Arenas, Costa Rica.

Geographical distribution.— Thus far, known only from Bahia de los Angeles, Baja California, and Bahía de Banderas, Jalisco, in México, and Punta Uvita, Pacific coast of Costa Rica.

Etymology.— This species is named in honor of Señorita Adriana Ivette Cadena, granddaughter of Señor Hans, who has helped with his research at Bahía de los Ángeles. She and her brothers and sisters—the children all around the world—remind us why we must do science and do it well: to present informed knowledge for informed decisions affecting their future and the life of our planet.

Description.— *External morphology:* The living animals (Fig. 1C) reach 7 mm in length. The body color is generally translucent white with dense opaque white spotting on the outer two-thirds of the rhinophores and oral tentalces. The digestive gland within the cerata is yellowish cream white throughout the length of the cerata with a translucent white apex. The opaque white ovotestis follicles can be seen through the translucent body. The rhinophores are smooth, thin and

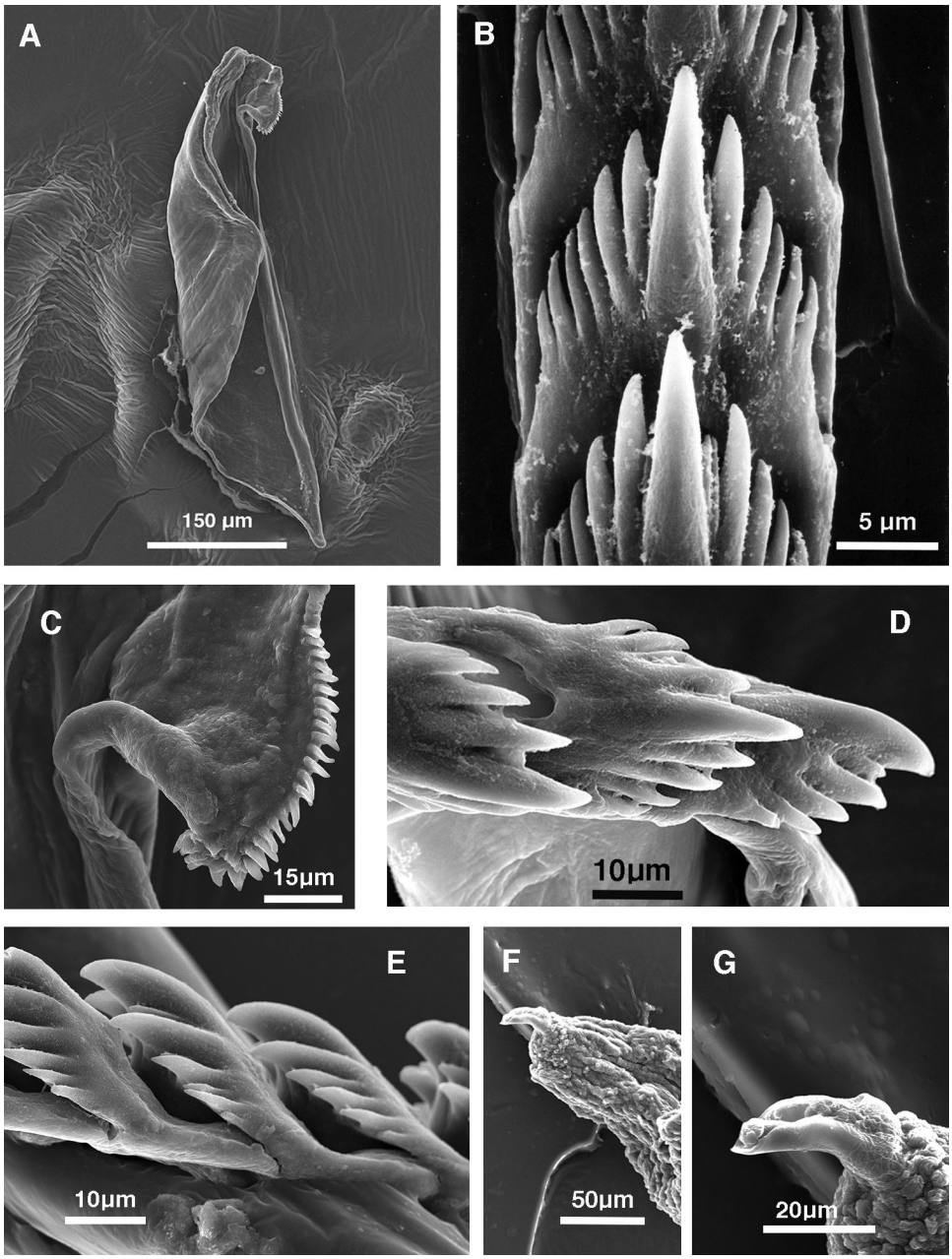

FIGURE 6. Scanning electron micrographs, *Tenellia ivetteae* sp. nov. A, C-G. paratype, CASIZ 222482. B. Specimen from Bahia de los Ángeles, 30 June, 1987. A. Entire jaw. B. Radular teeth, dorsal view. C. Masticatory border of jaw showing arrangement of denticles. D. Dorsal view of radular teeth. E. Lateral view of radular teeth. F. Apex of penis showing stylet. G. Detail of stylet.

cylindrical, slightly shorter than the narrower oral tentacles. The cerata are short and rounded with an acute apex where the cnidosac is located. They project outwards randomly, cover most of the notum, and are arranged in numerous linear rows. There are 3 rows in the precardiac ceratal rows. In four specimens, the three precardiac rows, beginning with the most anterior row, contain 1–4, 2–4, 3–4, cerata per row. After the interhepatic space, there are four postcardiac ceratal rows, each of which contains 1–4 cerata. The anus is acleioproctic, situated dorsally at the base of the upper ceras of the first postcardiac ceratal row. The genital opening is ventral to the first and second precardiac ceratal rows.

Buccal armature: The jaws are thin and elongate (Fig. 6A) with a long inner margin. The masticatory border of the jaw contains 31 simple acutely-pointed triangular denticles (Fig. 6C). The radular formula is 36 x 0.1.0 in the paratype specimen CASIZ . The central cusp is much wider and longer than the adjacent lateral denticles. There are 4–7 primary lateral cusps on either side of the wider central cusp (Figs. 6B, D, E) Secondary denticles between the primary lateral cusps are absent, although some denticles are shorter and narrower than the ones on either side of them.

Reproductive system: The reproductive system is androdiaulic (Fig. 4B). The ovotestis follicles contain a large female acinus surrounded by a series of smaller male acini. The ampulla is large and saccate and divides distally into the short oviduct and vas deferens that appears to have a glandular texture. The prostatic portion of the vas deferens is thin and narrows into a short, convoluted ejaculatory duct that joins the penis near the junction of the penial gland with the penial papilla. The penial gland is pyriform and curved, whereas the penial papilla is sausage-shaped, with a short, straight, cuticular penial stylet (Figs. 6F, G). The female glands are well-developed and small albumen and membrane glands are clearly visible, as is the larger mucous gland. A spherical bursa copulatrix is present at the distal end of the reproductive system and connects to the gonopore via a narrow elongate duct.

Remarks.— Despite the lack of suitably preserved specimens of this species for molecular study, the presence of morphological features strongly suggest that it is correctly placed in the genus *Tenellia*. In the recent revision of Fionidae, Cella et al. (2016), characterized *Tenellia* as including most members of the Fionidae having numerous well-separated ceratal rows with more than a single ceras per row. This is certainly the case in *T. ivetteae*. While it appears that not all species of *Tenellia* possess a penis armed with a straight penial stylet, the majority of species have this anatomical specialization, including *T. ivetteae*. Until fresh material is available to confirm the phylogenetic relationships and systematic status of *T. ivetteae*, we tentatively place it in *Tenellia*, based on the morphological attributes described above.

Tenellia ivetteae differs from all species of Fionidae previously documented from the temperate and tropical eastern Pacific. It is one of a handful of species that have whitish pigment as the predominant body color. Only *T. albocrusta* (MacFarland, 1966) and *T. riosi* (Hermosillo and Valdés, 2008) comb nov., have a similar external appearance. *Tenellia albocrusta* is found the eastern Pacific from Alaska to La Paz, in the Gulf of California (Berhens and Hermosillo, 2005). In this species, the body is covered by irregular patches of opaque white and encrustaceans of opaque white on the cerata. In *T. ivetteae*, the opaque white is found only on the outer portions of the rhinophores and oral tentacles. The digestive gland within the cerata in *T. albocrusta* is green to brown whereas it is pale yellow in *T. ivetteae*. *Tenellia riosi* is known from only from the Bahía Banderas region of México. As in *T. albocrusta*, *T. riosi* has opaque white patches on the notum that are absent in *T. ivetteae*. It also has a black digestive gland basally in the cerata and salmon pink gland more distally. The shape of the radular teeth differs in the three species. In *T. ivetteae*, the central cusp of the tooth is longer than the adjacent denticles, whereas it is much shorter than the adjacent denticles in *T. albocrusta* (MacFarland, 1966, pl. 67, figs. 13, 14) and slightly shorter

in *T. riosi* (Hermosillo and Valdés, 2008, fig. 3a–c). In *T. riosi* the outer denticles are markedly shorter than the inner ones, whereas they are more evenly graduated in the other two species. The reproductive systems of the three species also differ. In *T. albocrusta* (MacFarland, 1966, pl. 69, fig. 4) and *T. riosi* (Hermosillo and Valdés, 2008, fig. 2b), the prostatic portion of the vas deferens is much wider than the ejaculatory portion whereas they are about the same width in *T. ivetteae*. In *T. ivetteae* the bursa copulatrix is spherical and is found at the end of a long duct, whereas it is pyriform in both *T. albocrusta* and *T. riosi* and has a short duct in the latter species. In *T. ivetteae* the penial stylet is slightly curved where as it is sharply curved in *T. albocrusta* (MacFarland, 1966, pl. 69, fig. 4a) and appears to be absent in *T. riosi* (Hermosillo and Valdés, 2008).

Acknowledgments

We are especially grateful to Craig Hoover and Sandra Millen for collecting the type specimens, and Paul Humann for providing comparative material. We thank Ricardo Arce, Tom Smith, Mike Miller and Sam Mitani for their great diving assistance at Bahía de los Ángeles, and Wesley M. Farmer and Lindsey Groves who generously helped in obtaining additional photographic records. We also thank Esteban Félix Pico for translating the Abstract.

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New and Reconsidered Mexican Acanthaceae XII

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Six new species of Mexican Acanthaceae are described, illustrated, and mapped: *Carlowrightia yucatanensis*, *Justicia zapoteca*, *Louteridium dendropilosum*, *L. rzedowskianum*, *Poikilacanthus foliosepalus*, and *P. pochutlensis*. Information on phenology, habitats, and preliminary conservation assessments are provided for each of these species. Two new combinations are proposed in *Justicia*, *J. chrysostephana* and *J. durangensis*, based on *Cyrtanthera chrysostephana* Hook.f. and *Siphonoglossa durangensis* Henr. & Hilsenb., respectively. *Justicia lindenii* Houllet and *Justicia ardens* T.F. Daniel are treated as new synonyms of *J. chrysostephana*.

KEYWORDS: *Carlowrightia*, *Justicia*, *Louteridium*, *Poikilacanthus*, pollen

Se describen, ilustran y mapean seis especies nuevas de Acanthaceae mexicanas: *Carlowrightia yucatanensis*, *Justicia zapoteca*, *Louteridium dendropilosum*, *L. rzedowskianum*, *Poikilacanthus foliosepalus* y *P. pochutlensis*. Se proporciona información sobre fenología, hábitats y evaluaciones preliminares de conservación para cada una de estas especies. Se proponen dos combinaciones nuevas en *Justicia*, *J. chrysostephana* y *J. durangensis*, basadas en *Cyrtanthera chrysostephana* Hook.f. y *Siphonoglossa durangensis* Henr. & Hilsenb., respectivamente. *Justicia lindenii* Houllet y *Justicia ardens* T.F. Daniel son tratados como sinónimos nuevos de *J. chrysostephana*.

With about 400 species in 36 genera of Acanthaceae, Mexico appears to have the fourth-richest assemblage of that family among the world's nations (exceeded only by India, Madagascar, and Brazil). Herewith, additional undescribed species as well as taxonomic and nomenclatural renovations are noted for the family in Mexico. Four of the six new species are from the southern Mexican state of Oaxaca, the richest state in the country for species of vascular plants, as well as for Acanthaceae (Daniel 2013). Preliminary conservation assessments based on IUCN (2017) guidelines are provided for the species described here.

New Species

Carlowrightia yucatanensis T.F. Daniel, sp. nov.

Carlowrightia yucatanensis differs from its congeners by the combination of being perennial herbs or shrubs to 1.5 m tall; having corollas entirely white, pseudopapilionaceous, and 8–12 mm long; having capsules pubescent with eglandular trichomes only; and having seeds with the margin ± swollen and pectinate.

Type.— MEXICO. **Yucatán**: Mpio. Panabá, ca. 10 km N of Panabá toward San Felipe, 21°23.3′N, 088°14.9′W, 3 m elev., subdeciduous forest, 26-II-2003 (flr, frt), *T. Daniel, G. Carnevali & J. Tapia 10320* (holotype: MEXU!; isotypes: CAS!, CICY!, COLO!, F!, K!, MICH!, MO!, NY!, RSA!, US!).

Perennial herbs or shrubs to 1.5 m tall. Young stems subterete to subquadrate, pubescent with flexuose to antrorse to retrorse eglandular trichomes to 0.8 mm long and distally sometimes with erect subglandular and/or glandular trichomes to 0.3 mm long as well, trichomes ± concentrated in 2 lines. Leaves (sometimes absent or nearly so during anthesis) petiolate, petioles to 20 mm long, blades ovate to elliptic to narrowly elliptic, (10–) 22–69 mm long, (4.5–) 6.5–32 mm wide, 1.6–4.8 times longer than wide, subacuminate to acuminate at apex, acute to rounded to subcordate at base, surfaces pubescent with mostly antrorse eglandular trichomes, margin flat, ciliate with antrorse trichomes. Inflorescence of axillary and terminal dichasiate spikes, these often branched and forming panicles of spikes, rachis evenly pubescent with erect to flexuose glandular and eglandular trichomes 0.05–0.3 mm long, branches of panicles (when present) subtended by subulate to linear, sterile inflorescence bracts up to 9 mm long; dichasia (opposite, subopposite or) alternate, sessile, 1–many-flowered. Bracts subtending dichasia opposite to subopposite, subulate to lanceolate, 1–2 mm long, 0.4–0.5 mm wide, abaxial surface pubescent like rachis. Bracteoles triangular-subulate to lance-subulate, 0.9–1.5 mm long, 0.4–0.6 mm wide, abaxial surface pubescent like rachis. Flowers sessile to subsessile (i.e, borne on pedicels to 0.5 mm long). Calyx 2.2–4.5 mm long, abaxially pubescent like rachis, lobes subulate to triangular-subulate, 1.1–2.9 mm long. Corolla entirely white, 8–12 mm long, externally glabrous except lower-central lobe (and extending to tube) externally pubescent with erect to flexuose eglandular trichomes 0.2 mm long, tube 2–2.8 mm long, upper lip 8–9.5 mm long, 1.5–3 mm wide, apically 2-fid with lobes to 0.1 mm long, lower lip 6–10 mm long, lobes 5.3–8 mm long, 2.2–4 mm wide, lower-central lobe conduplicate and partially enclosing stamens. Stamens 5.5–8.5 mm long, filaments glabrous, thecae 1.3–1.8 mm long; pollen euprolate to perprolate, 3-colporate, 6-pseudocolpate, polar diameter 48–50 μm, equatorial diameter 24–26 μm, colpi flanked on each side by a pseudocolpus, colpi 6.7 μm wide at equator, colpal surface microechinate, intercolpal surface bireticulate. Style 8–10 mm long, glabrous, stigma lobes 0.1–0.15 mm long. Capsule 9.5–14 mm long, pubescent with erect to flexuose eglandular trichomes 0.05–0.2 mm long, stipe 4–7 mm long, head 6–7 mm long. Seeds up to 4, 4–4.1 mm long, 4–4.2 mm wide, surfaces papillate, margin ± swollen and pectinate with subconic tubercles (these sometimes united with one another and appearing as an irregularly pectinate wing).

Phenology.— Flowering: February–March, July; fruiting: February–March.

Distribution and habitat.— Southern Mexico (Yucatán; Fig. 1); plants occur on limestone in thornscrub, tropical deciduous forest, and tropical subdeciduous forest at elevations from near sea level to 17 m. Plants were observed in forest understory, forest edges, cut-over forest, successional fields, and disturbed areas.

Illustrations.— Figures 2, 3.

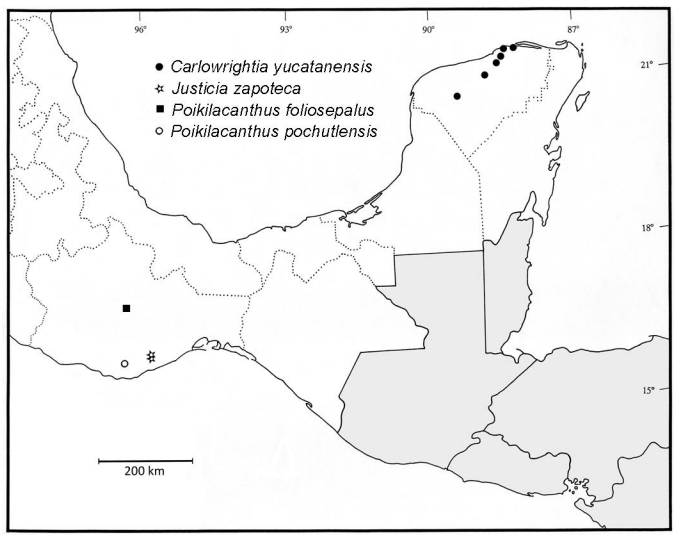

Figure 1. Map of southern Mexico (and northern Central America, shaded) with distributions of *Carlowrightia yucatanensis* (Yucatán), *Justicia zapoteca* (Oaxaca), *Poikilacanthus foliosepalus* (Oaxaca), and *P. pochutlensis* (Oaxaca).

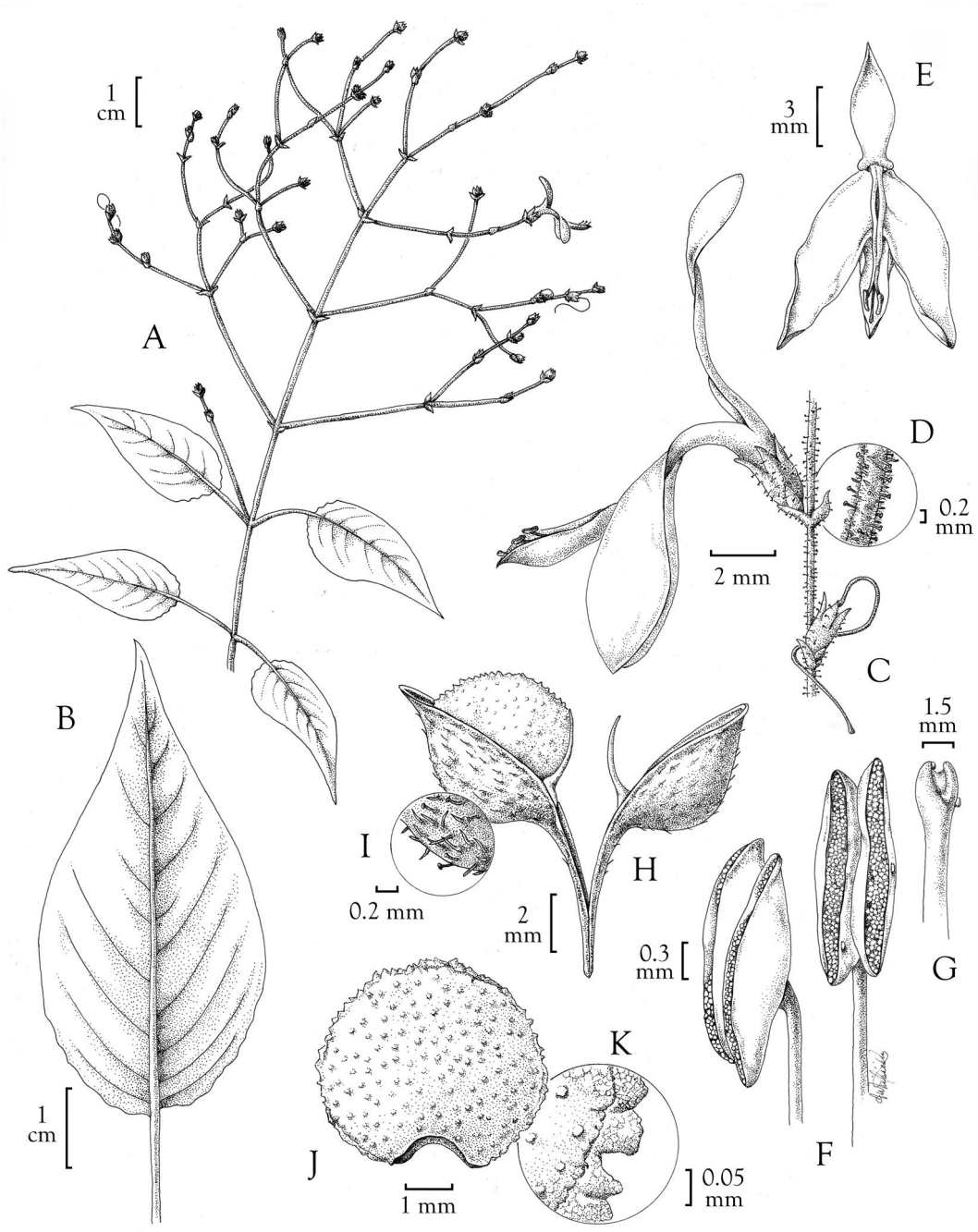

FIGURE 2. *Carlowrightia yucatanensis*. A. Shoot with inflorescence. B. Leaf. C. Inflorescence nodes with corolla dehisced (bottom) and corolla present (top) in side-view. D. Magnification of inflorescence rachis. E. Corolla in front-view. F. Distal portion of stamen with bithecous anther, side-view (left) and front-view (right). G. Distal portion of style and stigma. H. Capsule with one seed. I. Magnification showing pubescence on surface of capsule. J. Seed. K. Magnification of seed margin. (A, B from *Daniel et al. 10312*; C–K from *Daniel et al. 10320*). Drawn by Amy Whitesides

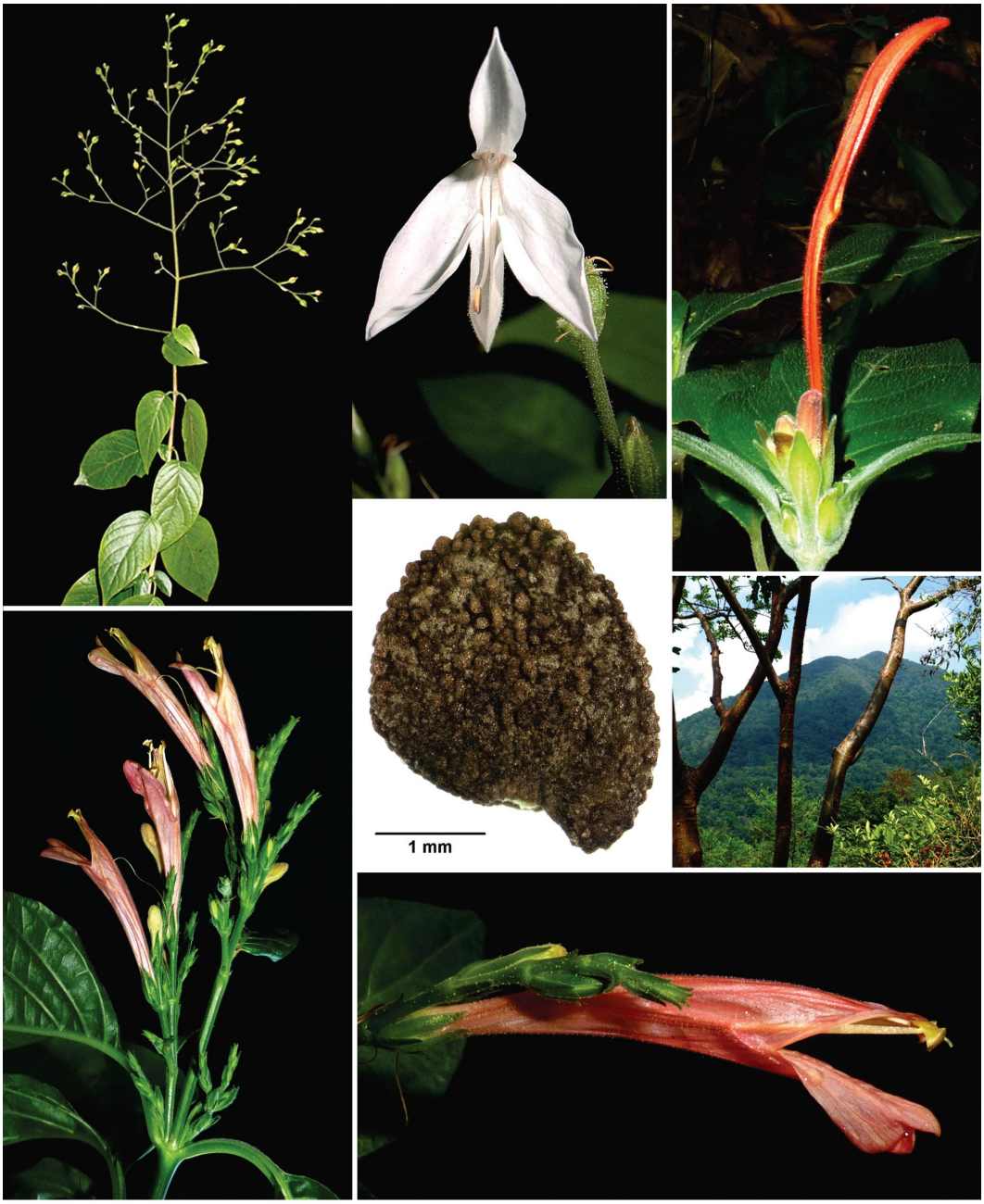

FIGURE 3. Photographs of Acanthaceae. *Carlowrightia yucatanensis* (*Carnevali et al. 4381*), habit (top left) and flower (top middle); *Poikilacanthus pochutlensis* (*Daniel & de Avila 12204*), apex of shoot with mature flower bud (top right) and Cerro Espino, locale of only known collections (middle right); *Justicia zapoteca* (*Daniel et al. 11898cv*), apex of shoot with inflorescence and flowers (bottom left), seed (middle center), and flower (bottom right). Photos by the author, except *C. yucatanensis* photos by G. Carnevali F. (used with permission).

Conservation.— The species has been recorded from at least six sites in the dry, northern portion of the Yucatan Peninsula, where it has an EOO of 1904 km^2. At two sites plants were observed to be locally frequent to common (e.g., ca. 50 individuals within 50 m^2). Like many of its congeners, *C. yucatanensis* often occurs in disturbed habitats (e.g., along roadsides). There appears to be considerable habitat for this species in this portion of the peninsula, and it occurs in at least one protected landscape (Reserva Río Lagartos). Although human population pressures and climatic changes will impact (either negatively or positively?) the distribution and numbers of individuals of this species, there are currently no immediate threats that have been identified. Thus, given its apparently restricted distribution, a preliminary assessment of Near Threatened (NT) is proposed for this species using IUCN criteria (IUCN 2017).

Paratypes.— MEXICO. **Yucatán**: alrededores de la zona arqueológica de Mayapan, 1 km S de Telchaquillo, carr. Tecoh–Oxkutzcab, [ca. 20.628200, -89.460844] *E. Cabrera & H. de Cabrera 9120* (MO); 4–6 km W de Las Coloradas, camino al crucero San Felipe–Río Lagartos, [ca. 21.609482, -88.048721], *E. Cabrera & H. de Cabrera 15739* (CICY, CIQR, MEXU, MO); Mpio. Izamal, 10–12 km W Tunkas de Izamal, carr. a Tunkas, ca. 20°54′N, 88°50.5′W, *G. Carnevali et al. 4381* (CICY); Mpio. Río Lagartos, entre el camino Río Lagartos rumbo a Las Coloradas, 21°34′N, 88°10′W, *C. Chan 4796* (CICY); Mpio. Río Lagartos, camino de Río Lagartos rumbo a Las Coloradas, 21°36.5′N, 88°03′W, *C. Chan 4809* (CICY); Mpio. Sucila, along hwy. 176 between Buctzotz and Sucila (27 km W of Sucila), 21°10.5′N, 088°28.8′W, *T. Daniel, G. Carnevali, & J. Tapia 10312* (CAS, BR, CICY, DUKE, F, K, MEXU, MO, NY, US).

Discussion.— Based on several morphological similarities (e.g., pubescent capsules, swollen and irregularly pectinate margin of the seed), Carnevali et al. (2005) treated plants of *Carlowrightia yucatanensis* from the Yucatán Peninsula as a third distinctive population of *C. hintonii* T.F. Daniel. Since then, reexamination of materials from these populations reveals that the morphological distinctions of plants from the Yucatán Peninsula are more reflective of a distinct species than a variant of *C. hintonii*. The following key summarizes distinctions between them.

1a. Corollas white with a papillate (yellow?) eye on upper lip, 15–18.5 mm long, tube 7–8.5 mm long, lobes of lower lip widely spreading (i.e., at angles ≥ 45°) from lower-central lobe; bracteoles (at fertile nodes of inflorescences) 1.5–2.5 mm long; filaments pubescent with trichomes to 0.1 mm long; pubescence of capsule all or chiefly glandular (in some plants from El Salvador, capsules all or chiefly eglandular); Pacific versant with plants occurring at elevations at or above 380 m . . . . . *C. hintonii*

1b. Corollas entirely white (lacking a papillate eye of any color on upper lip), 8–12 mm long, tube 2–2.8 mm long, lobes of lower lip spreading from lower-central lobe at angles < 45°; bracteoles (at fertile nodes of inflorescences) 0.9–1.5 mm long; filaments glabrous; pubescence of capsule entirely eglandular; Caribbean versant with plants occurring at elevations from sea level to 20 m . . . . . *C. yucatanensis*

Plants observed in late February (*Daniel et al. 10312, 10320*) showed massive flowering over several days with plants covered in flowers. These were visited by two kinds of small to medium-sized butterflies, honey bees, and smaller bees or flies. Corollas began dehiscing and falling in light winds at 13:45, which conforms to observations made on other species of the genus elsewhere in the United States and Mexico (Daniel 1983).

Based on morphological characters, *Carlowrightia yucatanensis* would pertain to section *Papilionaceae* of Daniel (1983). However, molecular phylogenetic data (Daniel et al. 2008; McDade et al. in press) reveal that neither the genus nor this section is monophyletic. Indeed, the results of McDade et al. (in press; as *C. hintonii*) reveal that the placement of *C. yucatanensis* rel-

ative to its congeners is ambiguous, depending on analytical method. Pollen of *C. yucatanensis* (Fig. 4A, B) conforms to that otherwise known for the genus (Daniel 1983, 1998). Macromorphological differences between *C. yucatanensis* and *C. myriantha* (Standl.) Standl., the only other species of the genus to occur in the Yucatán Peninsula, were summarized by Daniel (1993) and Carnevali F. et al. (2005).

Justicia zapoteca T.F. Daniel, sp. nov.

Justicia zapoteca can be distinguished by the following combination of characters: leaf blades with at least the adaxial surface pubescent; inflorescences of axillary and/or terminal, pedunculate, and dichasiate spikes or panicles of dichasiate spikes; calyces unequally five-lobed, with four lobes equal to subequal in size and the posterior lobe filiform and greatly reduced in size; corollas pale red-pink (salmon) to purplish, 25–32 mm long, and externally pubescent with glandular and eglandular trichomes; anther thecae superposed, perpendicular, dorsally pubescent, and the lower theca with a basal appendage 0.3–0.5 mm long; pollen two-aperturate with apertures flanked on each side by two rows of insulae (and sometimes peninsulae as well); capsules 12–16 mm long and pubescent with glandular an eglandular trichomes; and seeds with the testa tuberculate and with the tubercles granulate.

Type.— MEXICO. **Oaxaca**: Distr. Pochutla, Mpio. San Miguel del Puerto, ca. 13 km NW of Xadani, ca. 4 km upslope from Rancho Monte Carlo, 16°00.771′N, 096°06.305′W, 1400 m, tropical subdeciduous forest (selva mediana subperennifolia) to mesophytic montane forest, 24-II-2012 (flr, frt), *T. Daniel, E. Lott, J. Pascual, & N. Salas M. 11898* (holotype: MEXU!; isotypes; CAS!, MO!, NY!, SERO!, TEX!).

Trailing perennial herbs to erect shrubs to 3 m; young stems subquadrate and substriate to striate, internodes glabrous or sparsely 2-fariously pubescent with flexuose to antrorsely and/or retrorsely appressed eglandular trichomes to 0.7 mm long, nodes and axillary buds pubescent with eglandular trichomes. Leaves petiolate, petioles to 55 mm long, blades ovate to elliptic, 42–170 mm long, 22–101 mm wide, 1.6–2.8 × longer than wide, (rounded to) acute to acuminate at apex, truncate to rounded to acute to subattenuate at base, adaxial surface pubescent with antrorse to antrorsely appressed eglandular trichomes restricted to major veins or to midvein only, abaxial surface glabrous or very sparsely pubescent like adaxial surface, margin entire. Inflorescence of axillary and/or terminal pedunculate dichasiate spikes or panicles of dichasiate spikes to 120 mm long (including peduncle and excluding flowers), peduncles to 13 mm long, glabrous or evenly puberulent with erect eglandular and subglandular trichomes to 0.05 mm long (puberulent) and sometimes also with an overstory of erect to flexuose eglandular trichomes to 0.7 mm long , bracts subtending panicle branches ovate to linear-elliptic to subulate, 3–8 mm long, 0.3–3 mm wide; fertile portion of individual spikes to 87 mm long and 2–3 mm wide (excluding corollas), rachis clearly visible, evenly puberulent and usually also with an overstory of erect glandular trichomes 0.1 mm long (especially distally) and sometimes also with erect to flexuose eglandular trichomes (sometimes sparse) 0.1–0.5 mm long, or sometimes glabrous proximally; dichasia alternate (1 per node), ± secund, sessile, 1-flowered. Bracts not imbricate, opposite, subulate to lance-subulate, 2–3 mm long, 0.3–0.6 mm wide, abaxial surface pubescent like rachis. Bracteoles linear-subulate to lance-subulate, 1.8–2.6 mm long, 0.3–0.5 mm wide, abaxial surface pubescent like bracts. Flowers sessile to subsessile (i.e., pedicels to 0.5 mm long). Calyx 5-lobed, 3.5–6 mm long, abaxially pubescent like bracteoles, lobes heteromorphic (4+1, posterior lobe reduced), 4 lobes equal to subequal in size, lanceolate, 3–5 mm long, 0.6–1 mm wide, widest near base or midpoint, posterior lobe inconspicuous, filiform, 0.4–2 mm long, 0.05–0.2 mm wide. Corolla pale red-pink (salmon) to purplish, 25–32 mm long, externally pubescent with erect to flexuose eglandular and glandular (some-

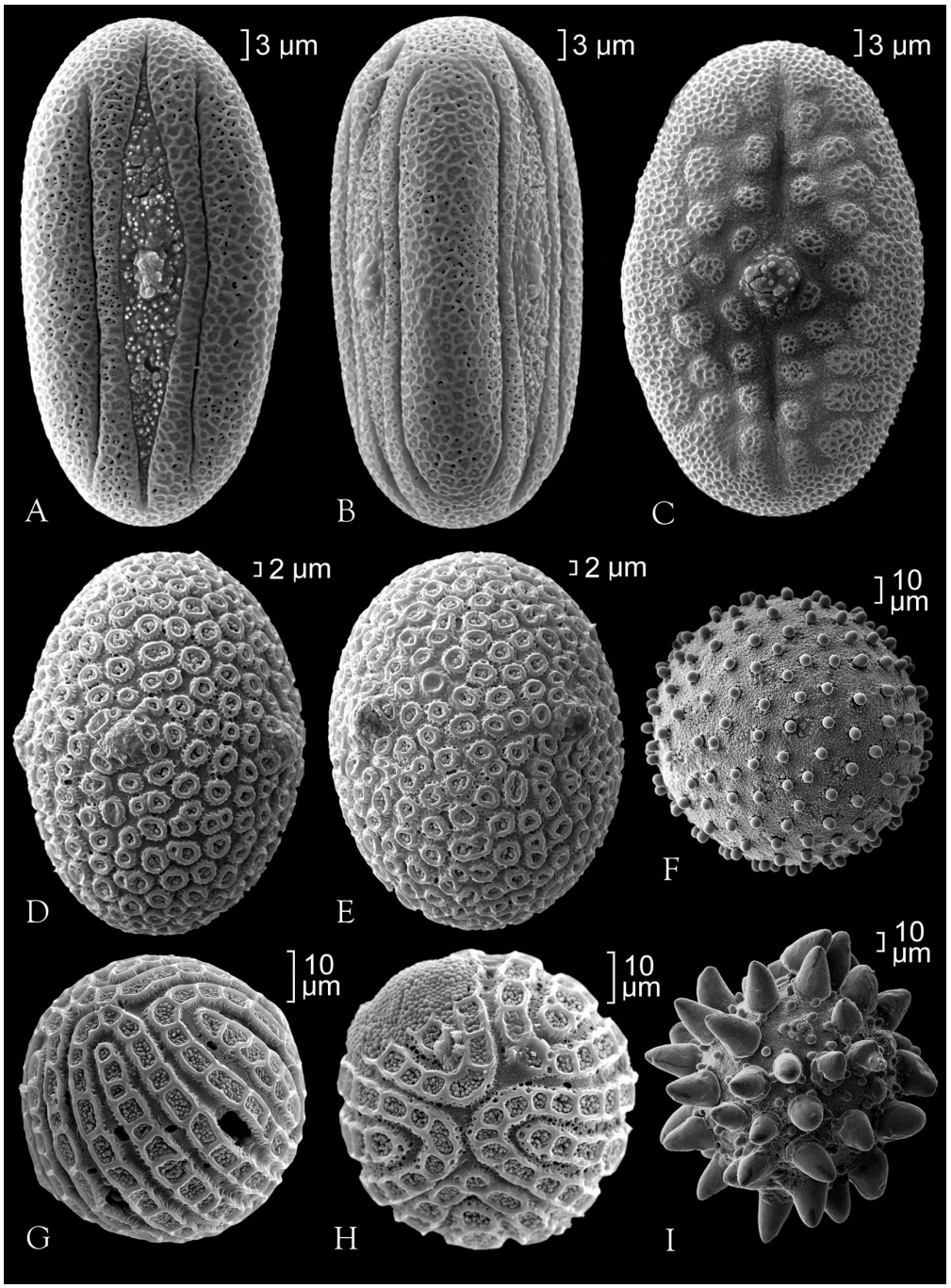

FIGURE 4. Pollen of Acanthaceae. A, B. *Carlowrightia yucatanensis* (*Daniel et al. 10320*), apertural view (A) and interapertural view (B). C. *Justicia zapoteca* (*Saynes V. & Elorsa 2741*), apertural view. D, E. *Poikilacanthus foliosepalus* (*Hernández O. 326*), apertural view (D) and interapertural view (E). F. *Louteridium dendropilosum* (*Fernández N. 4189*). G, H. *Poikilacanthus pochutlensis* (*Torres & Martínez 4907*), subpolar view (G) and polar view (H). I. *Louteridium dendropilosum* (*Daniel et al. 11784*), with internal contents extruding via pores.

times sparse) trichomes 0.05–0.2 mm long, tube 18–23 mm long, gradually expanded distally, 2.5–3.5 mm in diameter near midpoint, upper lip 6–12 mm long, 2-fid at apex, lower lip 7–12 mm long, lobes 1–2.5 mm long, 1–2.2 mm wide. Stamens 8–12.5 mm long, thecae superposed (touching or separated by a gap to 0.2 mm), perpendicular, 1.1–1.8 mm long (including basal appendage), subequal to unequal in length, both dorsally pubescent (trichomes sometimes few or inconspicuous) with erect to flexuose eglandular trichomes to 0.1 mm long, lower theca with a spurlike to pointed basal appendage 0.3–0.5 mm long; pollen 2-aperturate, polar diameter 55–56 µm, equatorial diameter (apertural view) 35 µm, apertures flanked on each side by 2 rows of insulae (and sometimes with peninsulae as well). Style 26–33 mm long, proximally pubescent with eglandular trichomes, stigma to 0.1 mm long, lobes not evident (appearing subcapitate) or unequally 2-lobed, 1 lobe 0.1 mm long, other lobe 0.05 mm long. Capsule 12–16 mm long, pubescent with erect to retrorse eglandular and glandular trichomes to 0.2 mm long, head 7.5–10 mm long, with slight medial constriction. Seeds compressed, ± cordate, 2–4 mm long, 2–2.8 mm wide, surface bubbly tuberculate, surface of tubercles granulate.

Phenology.— Flowering: November–April; fruiting: November–April. On a plant cultivated out-of-doors during a period of dry and mostly sunny weather in San Francisco, California, 10 flower buds were tagged, and the times of their opening and dehiscence/falling from the plant were recorded in six hour intervals. All flowers opened between 06:00 and 08:00. They stayed open between 72 and 258 hours, with the average life span of a flower being 152 hours (6.3 days) with the population standard variation of 49.29 hours. Corollas and styles showed no obvious signs of senescence (e.g., discoloration or withering) when the former dehisced and fell from the plant.

Distribution and habitats.— Southern Mexico (central southern Oaxaca; Fig. 1); plants occur infrequently in the understory of evergreen seasonal forests (selva mediana subperennifolia) transitioning to mesophytic montane forests, and sometimes in coffee plantations (cafetales) therein, at elevations from 690 to 1640 meters.

Illustrations.— Figures 3, 5.

Conservation.— This species is known from at least six collections in the same region of the Sierra Madre del Sur in southern Oaxaca. A considerable portion of its EOO, which consists of 4.6 sq. km, lies in a region where coffee is cultivated. Given the increasing demand for coffee, such cultivation is likely to expand in the region, thereby presenting an inferred threatening event. Although the actual geographic range of this species is likely considerably larger than currently known, based on the data available, a preliminary assessment of Critically Endangered (CR) appears warranted, and is proposed for this species (B1, a, b; IUCN 2017).

Paratypes.— MEXICO. **Oaxaca**: Distr. Pochutla, Mpio. San Miguel del Puerto, ca. 13 km NW of Xadani, ca. 4 km upslope from Rancho Monte Carlo, 16°00.771′N, 096°06.305′W, *T. Daniel, A. Sánchez, & J. Pascual 11810* (CAS, K, MEXU, MO, NY, RSA, SERO, US), specimens of plants from this locality cultivated from seed of type collection in San Francisco, California, *T. Daniel et al. 11898cv* (CAS); Distr. Pochutla, Mpio. San Miguel del Puerto, cafetal "Arroyo Arena," 15°58'36.8"N, 096°05'59.7"W, *A. Nava. Z. et al. 268* (MEXU, SERO); Distr. Pochutla, Mpio. San Miguel del Puerto, Piedra de Agua, 15°57'11.2"N, 096°06'23.6"W, *J. Pascual 224* (CAS, MEXU, SERO); Distr. Pochutla, Mpio. San Miguel del Puerto, camino a El Vijia, 16°00'42.6"N, 096°06'43.6"W, *J. Pascual 2326* (MEXU, SERO); Distr. Pochutla, Mpio. San Miguel del Puerto, 150 m N de la finca Monte Carlo, 15°59'38.1"N, 096°06'22.3"W, *A. Saynes V. & M. Elorza 2741* (CAS, MEXU).

Discussion.— Rarely, the proximal-most axillary branch of a panicle bears only a single dichasium, and thus appears like an axillary pedunculate dichasium. Although not evident on living plants, at the nodes of dried plants the region of attachment of the petioles on stems is greater

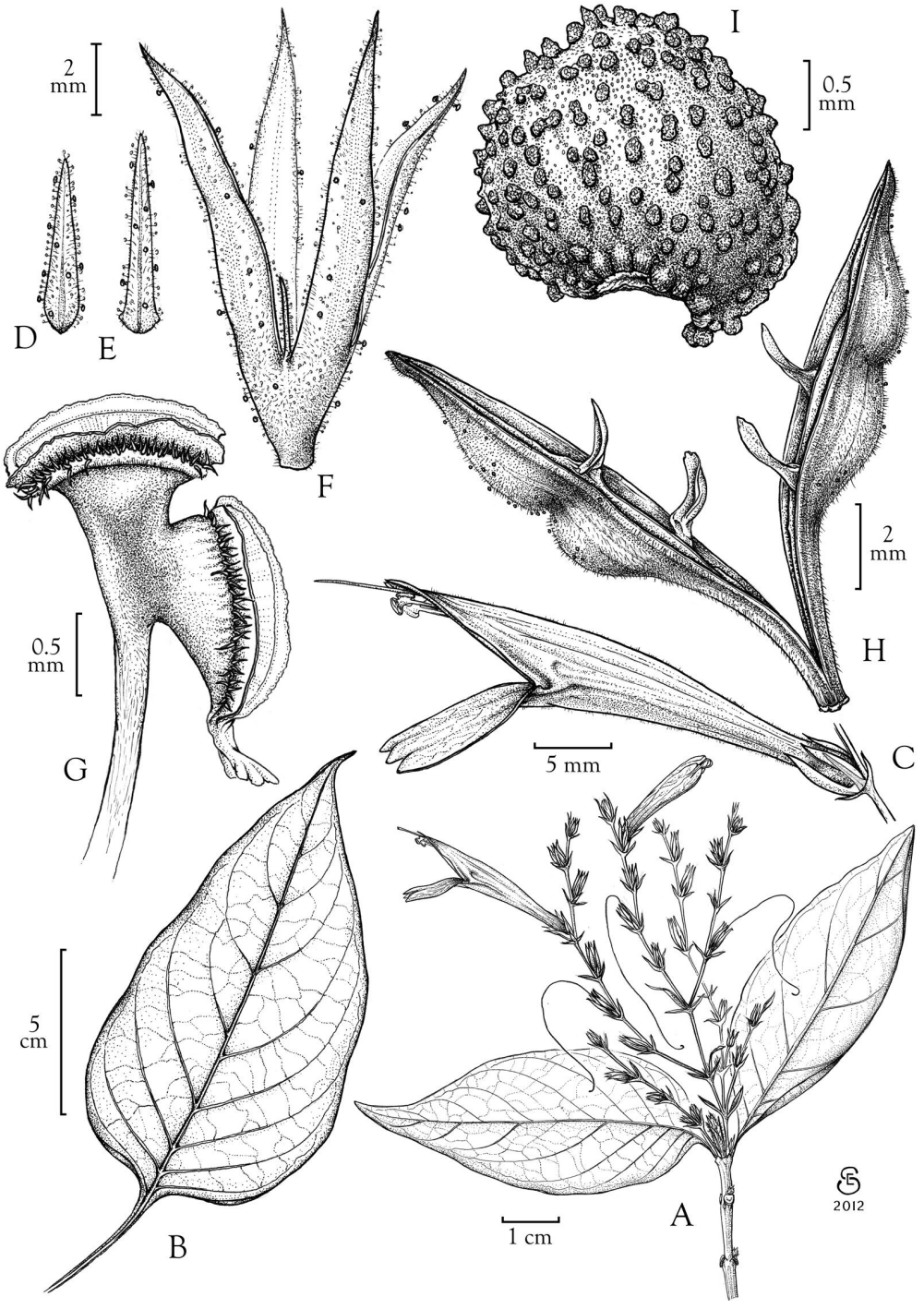

FIGURE 5. *Justicia zapoteca*. A. Shoot with inflorescence. B. Leaf. C. Inflorescence node with flower. D. Bracteole. E. Bract. F. Calyx. G. Distal portion of stamen with bithecous anther. H. Capsule. I. Seed. (A, C from *Daniel et al. 11898;* B, H, I from *Daniel et al. 11810*; D–G from *Saynes V. & Elorsa 2741*). Drawn by Sean Edgerton.

in diameter than the petiole and appears as a circular flange around the base of the petiole, and remains as a protruding flangelike or shieldlike leaf scar after the leaf has dehisced. This would appear to be due to considerable shrinkage of the petiole on drying.

Justicia zapoteca would appear to pertain to Graham's (1988) section *Sarotheca* (Nees) Benth. based on characters of the inflorescence, calyx, and seed. Indeed, it superficially looks much like the southern Central American species, *J. oerstedii* Leonard, which differs by having glabrous leaf blades, bright red corollas bearing only eglandular trichomes, unappendaged and glabrous anther thecae that are equally to subequally inserted and parallel to subsagittate but separated by a connective 0.2-0.6 mm long. Pollen of *J. zapoteca* (Fig. 4C) conforms to that occurring in several of the sections of the genus recognized by Graham (1988), and to the most commonly encountered type among Mexican species of the genus (Daniel 1998).

Louteridium dendropilosum T.F. Daniel, sp. nov.

Louteridium dendropilosum differs from its congeners by the following combination of characters: epipetric habit, four stamens, and dendritic trichomes on some vegetative and reproductive organs.

Type.— MEXICO. Oaxaca: Distr. Pochutla, Mpio. San Miguel del Puerto, Arroyo Arena, ca. 100 m downstream from jct. Río Laja, ca. 3 km SE of Rancho Dioon toward Xadani, 15°58'51.33"N, 096°05'53.91"W, 600 m, evergreen seasonal forest (selva mediana subperennifolia), 29-III-2011 (flr, frt), T. *Daniel, A. Sánchez, & J. Pascual 11784* (holotype: MEXU!; isotypes: CAS!, COLO!, K!, MO!, NY!, SERO!, US!).

Shrubs to trees to 12 m tall, frequently epipetric, larger individuals with prop trunks/roots. Older (woody) stems quadrate, lenticellate, irregularly striate-sulcate, lacking trichomes; younger (herbaceous) stems subquadrate-sulcate [terete on fresh stems], sparsely lenticellate, irregularly fissured, [lacking trichomes on fresh stems] evenly pubescent with erect to flexuose simple and dendritic (sparse) eglandular trichomes <0.1–0.5 mm long. Leaves deciduous, often ± clustered at apex of old growth or at apex of an otherwise leafless shoot of new growth, petiolate, petioles often tinged with pink or red, to 60 mm long, blades subsucculent, ovate to elliptic to broadly elliptic, 76–180 mm long, 40–107 mm wide, 1.4–2.5 × longer than wide, apiculate to acuminate at apex, rounded to acute to attenuate at base, adaxial surface pubescent with simple and dendritic eglandular trichomes, trichomes soon becoming ± restricted to proximal portion or to midvein, abaxial surface pubescent (especially along veins) with dendritic trichomes to 0.5 mm long, midvein often pinkish or reddish, margin entire (sometimes undulate and appearing subcrenate). Inflorescence a terminal subsessile to pedunculate dichasiate raceme to 220 mm long, peduncle to 50 mm long, pubescent like young stems, rachis pubescent like young stems; dichasia opposite or alternate, sessile, 1-flowered, to 47 mm long. Bracts caducous, not seen. Bracteoles caducous, not seen. Flowers pedicellate, pedicels 21–46 mm long, pubescent like rachis or with the trichomes to 1 mm long. Calyx 17–32 mm long, lobes subhomomorphic to subheteromorphic, membranaceous, subelliptic to ovate-elliptic to subrhombic-obovate, rounded to acute at apex, abaxially pubescent with mostly dendritic trichomes 0.1–0.5 mm long, posterior lobe planar, 17–32 mm long, 10–19 mm wide, usually slightly larger and sometimes more conspicuously venose than lateral lobes, major veins often maroon, lateral lobes planar, 20–31 mm long, 8–18 mm wide. Corolla light green or greenish yellow, sometimes with maroon on limb (especially at base of lobes) and distal portion of throat, externally glabrous (inconspicuously glandular punctate but lacking elongate trichomes), 50–62 mm long, tube 35–37 mm long, narrow proximal portion of tube 11–15 mm long, 6–10.5 mm diameter near midpoint, throat 20–24 mm long, 25–35 mm diameter at mouth, lobes recurved to recoiled, broadly ovate-subtriangular, 13–20 mm long, 10–21 mm wide, entire at apex. Stamens

4, 60–80 mm long, filaments glabrous distally, pubescent with eglandular trichomes near base (i.e., fused portion of pairs), pairs fused at base up to 9 mm, thecae 8–10.5 mm long; staminode consisting of a rodlike projection 0.6 mm long in dorsalmost position; pollen subspheroidal to spherical (P:E = 0.96–1.04), pantoporate, 114–131 µm in diameter, exine surface microrugulate to microverrucate and with overstory of gemmae and/or bacculae. Style 70–101 mm long, distally glabrous, pubescent with eglandular and glandular trichomes near base, stigma equally 2-lobed, lobes flattened, broadly elliptic, 1–2 mm long, 1–1.4 mm wide. Capsule 25–28 mm long, densely pubescent with erect glandular trichomes 0.05–0.5 mm long and with an overstory (sometimes sparse) of erect to flexuose (sometimes dendritic) eglandular trichomes to 1.4 mm long, stipe 2.5–3.5 mm long. Seeds to 16 per capsule, 5.2–7 mm long, 5–6.4 mm wide, surfaces smooth and lacking trichomes, margin ± thickened, densely pubescent with hygroscopic trichomes expanding to 0.5 mm long when moistened (appearing as a ± solid to irregularly eroded peripheral band when dry).

Phenology.— Flowering: February–March; fruiting: March–April. As in some other species of *Louteridium*, flowering takes place during the dry season when leaves are often absent (e.g., February). Near the end of the dry season (e.g., late March) when flowering is waning and fruits are mature, a new flush of vegetative growth appears from axils of clustered leaf scars at the base of the inflorescence (which eventually falls away). As the cluster of new leaves develops (fig. 7), internodal stem growth takes place between at least one of the pairs and the remaining cluster (e.g., the young stems of the description above).

Distribution and habitat.— Southern Mexico (central southern and southeastern Oaxaca; Fig. 6); plants occur on karstic slopes of streams in evergreen seasonal forest (selva mediana subperennifolia) and tropical deciduous forest (bosque tropical caducifolio) with *Beaucarnea*, *Brosimum*, *Bursera*, *Lonchocarpus*) at elevations from 600 to 750 m.

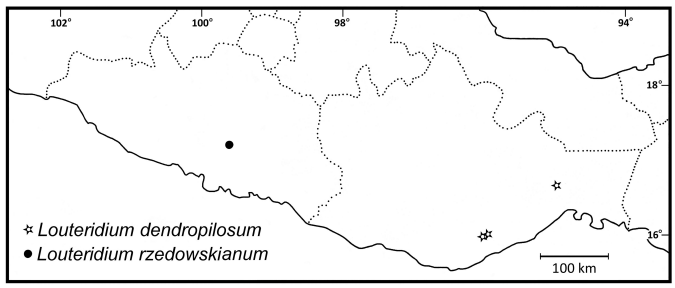

Figure 6. Map of southern Mexico with distributions of *Louteridium dendropilosum* (Oaxaca) and *L. rzedowskianum* (Guerrero).

Illustrations.— Figures 7, 8.

Conservation.— This species is known only from the Sierra Madre del Sur and the Isthmus of Tehuantepec in Oaxaca, consisting of two locations ca. 137 km apart. The EOO is 32.1 sq. km. None of known occurrences is on protected lands. At the type locality in 2014, about 50 mature plants were observed in an area of ca. 2250 square meters on rocky limestone slopes above a stream. Much or all of this locality has since been destroyed by road-building activities at that site (S. Salas, pers. comm. in March 2015). With on-going development of these and other types (e.g., agricultural) of human disturbances at one of the two locations, a decline in populations or population sizes has been observed and would seem likely to continue. Thus, a preliminary assessment of Endangered (En) is proposed for this species (B1, a, b; IUCN 2017).

Paratypes.— MEXICO. **Oaxaca**: Distr. Pochutla, Mpio. San Miguel del Puerto, Arroyo Arena, ca. 100 m downstream from jct. Río Laja, ca. 3 km SE of Rancho Dioon toward Xadani, *T. Daniel, E. Lott, J. Pascual, and N. Salas M. 11894* (CAS, MEXU); Mpio. El Barrio, 9 km N [sic] de El Barrio, Cerro Palmasola, antena microondas [ca. 16°44’32.52”N, 095°05’36.04”W], *R. Fernández N. 4189* (IEB, NY); Distr. Pochutla, Mpio. San Miguel del Puerto, Arroyo Arena,

FIGURE 7. *Louteridium dendropilosum*. From left to right and top to bottom: habit of two 4-year old plants germinated from seeds; trunks and prop roots of epipetric plant; flower with dorsal calyx lobe, yellowish green corolla, androecium (with two stamens partially broken off), and style+stigma; inflorescence with two flowers having just opened at night; nearly mature flower bud with dorsal calyx and one lateral calyx; recently opened flower showing four fertile stamens and style/stigma; greenish purple corolla with stamens in side view and front-view. Three photos on left from *Daniel et al. 11784*; all others from *Daniel et al. 11894.*

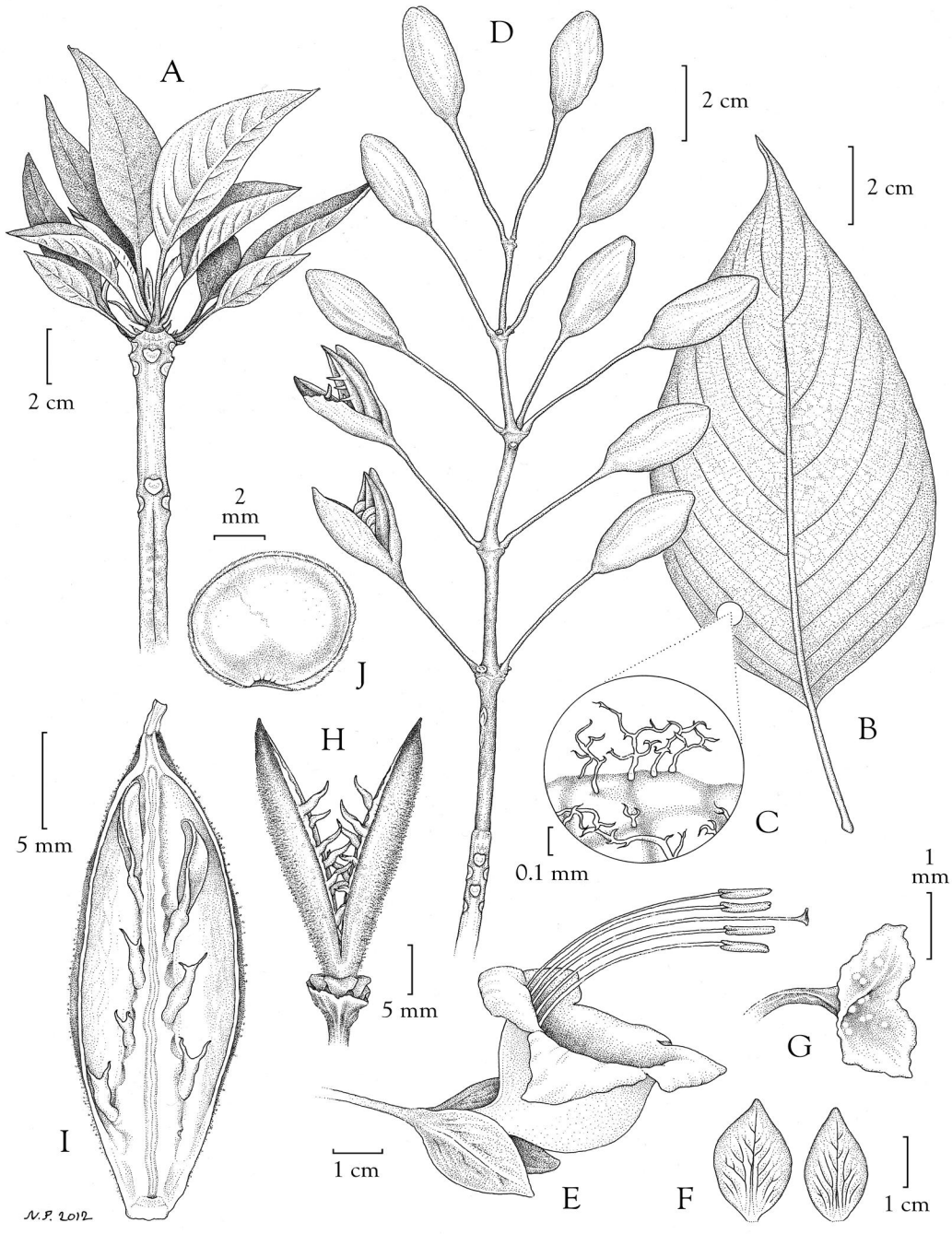

FIGURE 8. *Louteridium dendropilosum* (*Daniel et al. 11784*). A. Habit with new growth. B. Mature leaf. C. Trichomes from abaxial leaf surface. D. Inflorescence in fruit from woody shoot. E. Flower. F. Calyx lobes (dorsal on left, one of laterals on right). G. Stigma. H. Dehisced capsule. I. Capsule (internal view). J. Seed. Drawn by Noel Pugh.

15°58’39.7”N, 096°05’54.9”W, *J. Pascual 1396* (MEXU, SERO, TEX); Distr. Pochutla, Mpio. San Miguel del Puerto, 300 m de la terracería sobre la vereda rumbo Río la Laja, 15°58’49.9”N, 096°06’6.9”W, *A. Saynes V. et al. 3831* (MEXU, SERO); Distr. Juchitán, Mpio. El Barrio, parte alta del Cerro Palmasola, junto a la antena de microondas [ca. 16°44’32.52”N, 095°5’36.04”W], *S. Zamudio R. 6352* (CAS, IEB).

Discussion.— Pollen of *Louteridium dendropilosum* (Fig. 4F, I) resembles that of its congeners. The posterior calyx lobe of this species is conspicuously venose with the major veins purple, whereas the lateral lobes are green (Fig. 7). A major morphological distinction among species of *Louteridium* S. Wats. is the number of stamens (two vs. four). This distinction does not appear to correlate with either geography or molecular phylogenetic relationships (based on the limited sampling to date; Tripp et al. 2013). *Louteridium dendropilosum* is unique among congeners by its dendritic trichomes, which are present on both vegetative and reproductive organs. Trichomes of other species may consist of one or more cells and be either glandular or eglandular, but they are not branched.

Louteridium rzedowskianum T.F. Daniel, sp. nov.

Louteridium rzedowskianum differs from its congeners by the following combination of characters: stamens four, calyx 5–9 mm long with lobes broadly ovate to triangular and 3.5–6.5 mm long, and capsule pubescent with glandular trichomes only.

Louteridium brevicalyx Rzed., Ciencia (México) 28: 53. 1973, non *Louteridium brevicalyx* A. Richardson (1972), nom. inval. *Louteridium rzedowskii* T.F. Daniel, Madroño 31: 91. 1984, nom. inval.

Type.— MEXICO. **Guerrero**: Mpio. Chilpancingo, Rincón de la Vía, cerca de Agua de Obispo [ca. 17°17’45.05”N, 099°28’17.54”W], 750 m, 19-I-1964 (flr), *H. Kruse 1380* (holotype: ENCB-002790-shoots bearing flowers only; photo seen; isotypes (shoots bearing flowers only): EAP!, ENCB-002789!, FCME!, MEXU!, MICH!, MO!, US!), see discussion below.

Shrubs to trees to 4 m tall, trunk to 15 cm in diameter at base. Older (woody) stems irregularly fissured-striate, lenticellate, glabrous; younger stems not seen. Leaves deciduous, clustered at branch apices, petiolate, petioles 20-90 mm long, blades apparently subsucculent, lanceolate to ovate to elliptic, 82-260 mm long, 35-110 mm wide, 2-2.6 × longer than wide, (rounded to) acuminate at apex, cuneate to subattenuate at base, abaxial surface minutely glandular punctate (sometimes not evident) and sparsely pubescent (especially near base) with flexuose eglandular trichomes 0.2-0.7 mm long or trichomes absent on mature leaves, adaxial surface very sparsely pubescent (if at all) with similar trichomes, margin entire to subsinuate, sparsely ciliate with trichomes like those of abaxial surface. Inflorescence a terminal, pedunculate thyrse to 30.3 cm long (including peduncle and excluding corollas), peduncle glandular puberulent with glandular trichomes to 0.1 mm long, rachis pubescent with erect glandular trichomes 0.05-0.2 mm long; dichasia opposite, pedunculate, mostly 1-3-flowered, to 50 (-70 in fruit) mm long (excluding corollas), dichasial peduncles 6-14 (-29 in fruit) mm long, pubescent like rachis. Bracts caducous (not seen). Bracteoles caduceus (not seen). Flowers pedicellate, pedicels 23-30 (-48 in fruit) mm long, pubescent like rachis. Calyx 5-9 mm long, lobes subheteromorphic, apparently subsucculent, abaxially pubescent with erect to flexuose glandular trichomes 0.05-0.2 mm long, posterior lobe subconduplicate, broadly ovate to subtriangular, 3.5-4.5 mm long, 3-4.3 mm wide, sometimes smaller than lateral lobes, subacute to acute at apex, lateral lobes planar, ovate to subtriangular, 4-4.8 mm long, 3-4 mm wide, acute at apex. Corolla dark purple with green in places or green with purple in places (fide Rzedowski 73), 35-39 mm long, externally puberulent with erect glandular trichomes to 0.1 mm long, tube 17-30 mm long, narrow proximal portion of tube 4.5-9 mm long, 6-11 mm in

diameter near midpoint, throat 11-20 mm long, 20-25 mm in diameter at mouth, upper lip 11-15 mm long, lobes ovate to subtriangular, 10-11 mm long, 9-11 mm wide, lower lip 12-15 mm long, lobes ovate to subtriangular, 12-13 mm long, 11-12 mm wide. Stamens 4, exserted 35 mm beyond lips of corolla, 55-75 mm long, filaments not seen, thecae 7.5-8 mm long. Style 80-82 mm long, glabrous, stigma ± funnelform, 1.5 mm long. Capsule 38-47 mm long, pubescent throughout with erect glandular trichomes to 0.1 mm long, stipe 4 mm long. Seeds up to 24 per capsule, 4-4.5 mm long, 3-4 mm wide, surfaces minutely granulate to ± scurfy, marginal region swollen, periphery pubescent with appressed hygroscopic trichomes.

Phenology.— Flowering: January; fruiting: January–March. Label information on the type notes that flowers are "pronto caedizas," possibly referring to their being soon deciduous during the day, and thus likely largely nocturnal as in other species of the genus.

Distribution and habitat.— Western Mexico (central Guerrero; Fig. 6); plants occur on limestone slopes in tropical subdeciduous forests (selva mediana subcaducifolia) at elevations near 750 m.

Illustration.— Rzedowski (1973: fig. 4).

Conservation.— This species remains known only from the type locality, where an unknown number of individuals occurs, and from which specimens were collected over a period of seven years (1963–1970). No information is known as to the current status of this population or any possible threats to it. Therefore, according to IUCN (2017) guidelines, *Louteridium rzedowskianum* has to be assessed as Data Deficient (DD).

Paratypes.— MEXICO. **Guerrero**: Mpio. Chilpancingo, Rincón de la Vía, cerca de Agua de Obispo [ca. 17°17'45.05"N, 099°28'17.54"W], 9-VIII-1964 (vegetative) and 23-III-1963 (fruiting), *H. Kruse 1380* (EAP, ENCB, FCME, MEXU, MICH, MO, US); Mpio. Chilpancingo, Rincón de la Via [17º17'15"N, 99º28'55"W], 27-I-1970, *H. Kruse 2701* [catalog # 4755] (MEXU); same locale, 14-VII-1970, *H. Kruse 2701-b* [catalog #5033] (FCME, MEXU).

Discussion.— Although validly published at the time, but illegitimate, *Louteridium brevicalyx* Rzed. is no longer accepted as valid because more than one gathering was included within the type—a retroactive change in Article 8 of the nomenclatural rules enacted in the "Saint Louis Code" (Greuter et al. 2000). This species subsequently became known as "L. rzedowskii" when Daniel (1984) proposed a new name for Rzedowski's later homonym. Daniel's name also became invalid with the change in Article 8. To rectify this situation, and to honor Jerzy Rzedowski and his recognition of the species, *Louteridium rzedowskianum* is herewith newly described.

The sole collector of this species, Hubert Kruse, obtained specimens of these plants on multiple occasions in order to have leaves, flowers, and fruits. These were admixed to create "complete" herbarium specimens, with an indication of the date of collection of foliage (i.e., 9 Aug 1964), flowers (i.e., 19 January 1964), and fruits (i.e., 23 March 1963) on each one. Because the specimens all contain materials of these organs collected on different dates, the citation of any one of the specimens as the type is no longer acceptable for valid publication of the name. The flowering portion (only) of the Kruse specimen designated by Rzedowski as the holotype of *L. brevicalyx* at ENCB is designated above as the holotype of *L. rzedowskianum*. Fruiting and vegetative portions of this specimen, those same portions on the isotypes noted above, and the subsequent (1970) Kruse collections noted above are all paratypes.

Agua de Obispo is about 3 km (linear distance) NE of Rincón de la Vía, on the old Chilpancingo–Acapulco highway (Mexico 95). It is at an elevation of about 960 meters, whereas Rincón de la Vía is at about 750 meters. Therefore Kruse's locality information is somewhat contradictory. I have mapped the species between these two locales. Kruse made additional collections from the type locality in 1970. Plants bearing leaves only were collected from the type locality in July and

August. Leaves are not present on plants collected in January–March. According to information on *Kruse 2701-b*, leaves were taken from the same individual from which fruits and flowers were collected at other times.

This species can be distinguished from *L. brevicalyx* A. Richardson, which also occurs in dry forests of western Mexico, by characters in the following couplet:

Calyx 10–14 mm long, 3-lobed or 5-lobed with 3 large lobes and 2 reduced lobes, 3 large lobes lanceolate to ovate, 8–11 mm long; capsule pubescent with straight, eglandular trichomes 0.2–0.5 mm long; Michoacán . . . . . *L. brevicalyx*

Calyx 5–9 mm long, 3-lobed (reduced lobes absent), lobes broadly ovate to triangular, 3.5–6.5 mm long; capsule pubescent with glandular trichomes to 0.1 mm long (lacking straight, eglandular trichomes); Guerrero . . . . . *L. rzedowskianum*

Poikilacanthus foliosepalus **T.F. Daniel, sp. nov.**

Poikilacanthus foliosepalus differs from its congeners by the following combination of characters: short and few-flowered dichasiate spikes in leaf axils, elliptic calyx lobes 10–11 mm long and 2.7–5 mm wide, red corollas 39–49 mm long that are externally pubescent with eglandular trichomes only, and four-aperturate pollen covered with densely spaced but mostly discrete insulae.

Type.— MEXICO. **Oaxaca**: Distr. Tlacolula, Mpio. Mitla, Tierra de Santo Pie de Cerro, 16°55’24.3”N, 96°24’21”W, 1673 m, selva baja caducifolia, 29-VII-2009 (flr), *H. Hernández O. 326* (holotype: MEXU!; isotypes: CAS!, SERO!).

Perennial herb to shrub to 8 dm tall; young stems subquadrate and 4-sulcate, evenly pubescent with erect to flexuose eglandular trichomes 0.2–0.9 mm long. Leaves ascending to appressed, petiolate, petioles to 5 mm long, blades ovate to elliptic (to obovate), 17–38 mm long, 11.5–22 mm wide, 1.2–1.7 × longer than wide, emarginated to rounded to acute at apex, cuneate at base, surfaces and margin pubescent with cauline type trichomes (although sometimes antrorse) and with trichomes denser on abaxial surface, major veins yellowish and prominent, margin entire. Inflorescence of short dichasiate spikes in axils of leaves; spikes pedunculate, few-flowered, peduncles 2–4 mm long, pubescent like young stems, rachis evenly pubescent with erect to flexuose eglandular trichomes 0.05–0.1 mm long; dichasia alternate (1 per node), 1-flowered, sessile. Bracts sessile, subfoliose, broadly elliptic to subcircular, 7–10.5 mm long, 4–8 mm wide, rounded at apex, abaxial surface pubescent like leaves. Bracteoles narrowly elliptic to oblanceolate, 3–4.5 mm long, 0.6–0.8 mm wide, abaxial surface pubescent like bracts. Flowers subsessile (i.e., borne on pedicels to 1.5 mm long), mostly 2 per spike. Calyx 5-lobed, 12–13 mm long, lobes elliptic, 10–11 mm long, 2.7–5 mm wide, acuminate-subcaudate at apex, abaxial surface ± prominently 3–5-veined, pubescent with flexuose to appressed eglandular trichomes 0.05–0.3 mm long or nearly glabrous distally, margin conspicuously ciliate with flexuose eglandular trichomes to 1 mm long. Corolla red, 39–49 mm long, externally pubescent with flexuose eglandular trichomes 0.1–0.4 mm long, tube only very gradually and ± inconspicuously expanded distally (throat ± indistinct), 23–28 mm long, narrow proximal portion 18–20 mm long, 3–3.2 mm in diameter near midpoint, throat 4–10 mm long, upper lip 15–21 mm long, 2-fid at apex, lower lip 16–21 mm long, lobes 6–8 mm long, 3.5–4 mm wide. Stamens 17–18 mm long, filaments glabrous distally, thecae parallel, subequally inserted, 3.5–4 mm long, subequal in length, glabrous, with a rounded basal appendage 0.1–0.2 mm long (lower theca with a larger appendage than distal theca); pollen subprolate to euprolate, 4-aperturate (see discussion), polar diameter 52–55 μm, equatorial diameter 38–43 μm, insulae densely spaced but mostly discrete (rarely 2 sharing a common wall). Style 33–42 mm long, stigma 0.2 mm long, lobes not evident. Capsule and seed not seen.

Phenology.— Flowering: July; fruiting: July.

Distribution and habitat.— Southern Mexico (central Oaxaca; Fig. 1); plants occur in tropical deciduous forest at an elevation of 1673 m.

Conservation.— The sole known collection of *Poikilacanthus foliosepalus* was made in the eastern portion of the Valley of Oaxaca. This species remains known only from the type locality, where an unknown number of individuals occurs, and from which it was collected in 2009. No information is known as to the current status of this species or any possible threats. Therefore, according to IUCN (2017) guidelines, the species has to be assessed as Data Deficient (DD).

Illustration.— Figure 9.

Discussion.— *Poikilacanthus foliosepalus* has one of the two pollen types characteristic of Mexican and Central American species treated in *Poikilacanthus* Lindau (Daniel 1991, 1998), that is, with four or more apertures and the entire surface covered with discrete "insulae" consisting of gemmate regions enclosed by thick, smooth marginal walls (Fig. 4D, E). Pollen of *Hernández O. 326*, examined with both scanning and light microscopy, appears to have four apertures, but it is possible that some of the grains might have five.

Pollen appears to offer the only distinction between *Poikilacanthus* and *Justicia* (e.g., Daniel 1991, 1998). Recent molecular phylogenetic studies of Justicieae reveal that *Poikilacanthus* is polyphyletic, with species placed in several lineages among the large, diverse, and monophyletic clade of New World justicioids (Kiel et al. 2017). Until such time as a comprehensive revision of all justicioids based on both molecular and morphological data has been completed, it seems reasonable to postpone generic/nomenclatural realignments and to maintain *Poikilacanthus*.

This species is distinctive among Mexican and Central American *Poikilacanthus* (Daniel 1991, 2010) by its wide and somewhat leafy calyx lobes (vs. up to 1.5 mm wide in the other species). A species of *Ruellia* (Ruellieae) with similar subfoliose calyx lobes was recently described by Daniel (2008) from Guerrero. *Poikilacanthus foliosepalus* also appears to be unique among its Mexican and Central American congeners by the four-aperturate (vs. five- or more-aperturate) pollen (Daniel 1998, 2010).

Poikilacanthus pochutlensis T.F. Daniel, sp. nov.

Poikilacanthus pochutlensis differs from congeners by its dense and terminal dichasiate spikes with opposite dichasia, linear calyx lobes 4.5 mm long and 1.1 mm wide, red to orange-red corollas 45–60 mm long that are externally pubescent with glandular and eglandular trichomes, and five-aperturate pollen with linked insulae forming loops around rows of insulae.

Type.— MEXICO**. Oaxaca**: Distr. Pochutla, Cerro Espino, Finca Montecristo, [ca. 15°52'11.39"N, 096°24'50.89"W], 1150 m, selva mediana perennifolia, 5-IV-1984 (fl), *R. Torres & C. Martínez 4907* (holotype: FCME!).

Perennial herbs or shrubs to 1 m tall. Young stems densely and ± evenly pubescent with retrorse eglandular trichomes to 0.4 mm long. Leaves petiolate, petioles to 25 mm long, blades ovate to elliptic, 42–100 mm long, 20–50 mm wide, length:width = 1.6–2.5, acute to acuminate at apex, (rounded to) cuneate to attenuate at base. Inflorescence of dense, often very short, terminal spikes to 16 mm long (excluding corollas), rachis densely and evenly pubescent with flexuose to retrorse to retrorsely appressed eglandular trichomes to 0.4 mm long (appearing ± floccose), dichasia opposite, 1 per axil, 1-flowered, sessile. Proximal bracts subfoliose, ovate, 11–28 mm long, 5.5–8 mm wide, distal bracts oblong to broadly elliptic to obovate-elliptic, 7–11 mm long, 2.5–4 mm wide, all bracts abaxially and marginally pubescent with antrorse to antrorsely-appressed eglandular trichomes 0.05–0.6 mm long. Bracteoles lance-ovate, 5.5–6 mm long, 0.9–1.5 mm wide, abaxial surface pubescent like bracts (or with trichomes becoming flexuose to retrorse).

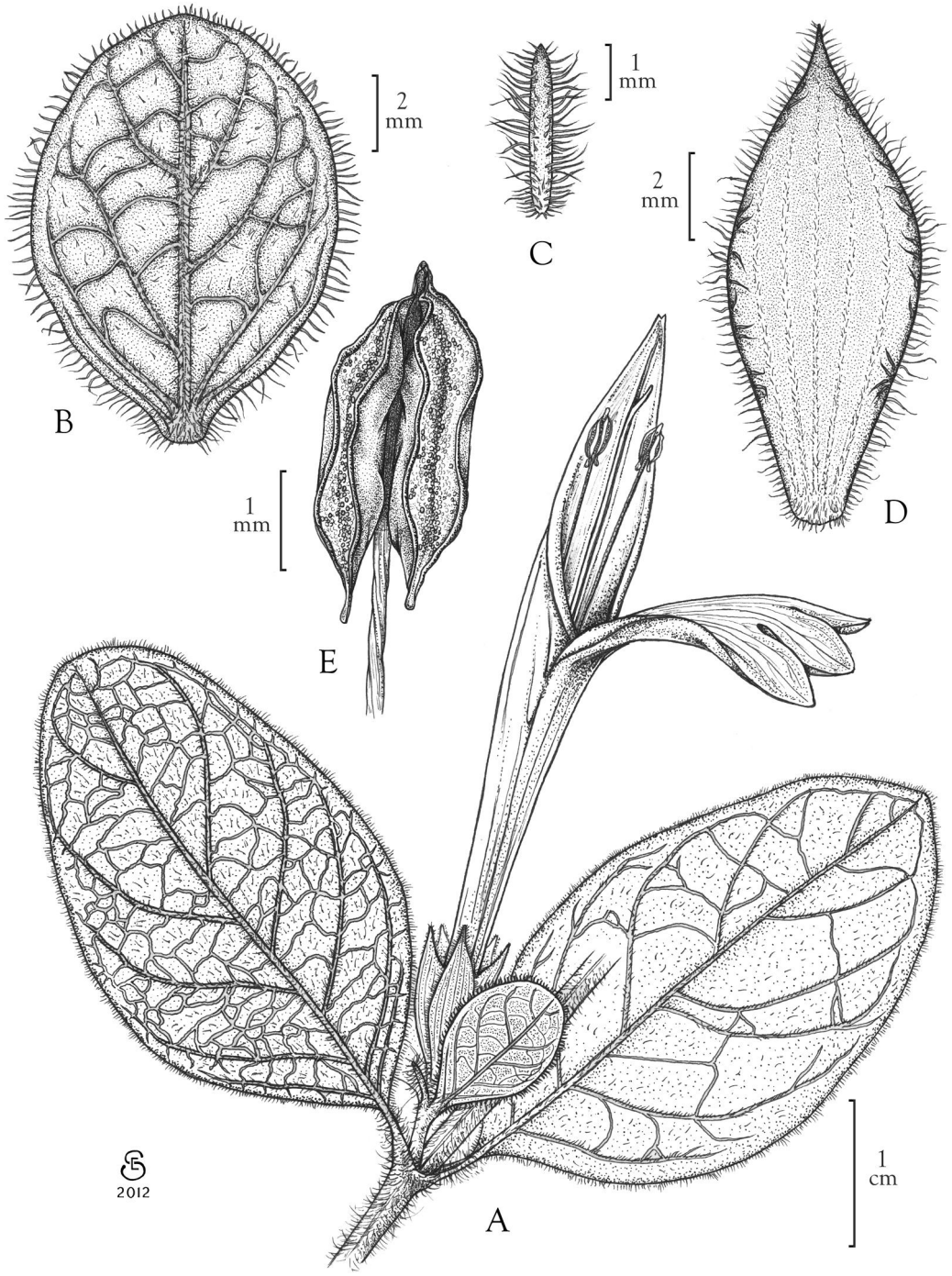

FIGURE 9. *Poikilacanthus foliosepalus* (from *Hernández O. 326*). A. Node with leaves, inflorescence, and flower. B. Bract. C. Bracteole. D. Calyx lobe. E. Distal portion of stamen with bithecous anther. Drawn by Sean Edgerton.

Calyx 5-lobed, 5 mm long, lobes linear, 4.5 mm long, 1.1 mm wide, similar in size, abaxially pubescent like bracteoles. Corolla bright and shiny red to orange-red, 45–60 mm long, externally pubescent with erect to flexuose eglandular and glandular trichomes 0.1–0.8 mm long, tube 22–35 mm long, 3.5–3.8 mm in diameter near midpoint, gradually expanded from base with no clear distinction between a narrow proximal portion and a throat, upper lip 22–25 mm long, emarginate at apex with lobes to 0.2 mm long, lower lip recoiled, up to 25 mm long. Stamens 22–24 mm long, filaments red, glabrous distally, thecae parallel, unequally inserted (overlapping by 1.6–1.8 mm), 2.5–2.7 mm long, ± equal in size, dorsally glabrous, lacking basal appendages; pollen oblate-spheroidal, 5-aperturate, polar diameter 57 μm, equatorial diameter 58–63 μm insulae linked into 5 loops, each of which surrounds a linear row or an elliptic band of insulae. Style 45–53 mm long, stigma equally 2-lobed, lobes 0.1 mm long. Capsule and seeds not seen.

Phenology.— Flowering: April–May; fruiting: unknown.

Distribution and habitat.— Southern Mexico (central southern Oaxaca; Fig. 1); plants occur very sporadically in **e**vergreen seasonal forest (selva mediana perennifolia), and cafetales therein, at elevations from 950 to 1150 m.

Conservation.— This species is known from two collections, both from Cerro Espino (Fig. 3) some 200 meters apart in elevation, from which an EOO cannot be calculated. *Daniel & de Avila 12204* was collected along a trail in an overgrown and presumably abandoned (at least not maintained) coffee plantation where fewer than 10 plants were seen. The precise location of the type collection from Cerro Espino is not known; an approximation of coordinates for it is indicated above. Although the species would appear to be both local and rare, there is insufficient data to make a preliminary assessment for it other than Data Deficient (DD).

Illustrations.— Figures 3, 10.

Paratype.— MEXICO. **Oaxaca**: western slope of Cerro Espino, 0.5–1.5 km E of Finca Monte Cristo (abandoned), which is 10 km (by road) E of Mex. Hwy. 175 at jct. of turn to Tolteпec, 15°52.282′N, 096°25.042′W, *T. Daniel & A. de Avila 12204* (CAS).

Discussion.— Like that of *Poikilacanthus foliosepalus*, pollen reveals this species to be among those that pertain to *Poikilacanthus* as traditionally recognized (see discussion above under *P. foliosepalus*). Unlike *P. foliosepalus*, pollen of *J. pochutlensis* shows the second type described for the genus (Daniel 1991, 1998), that is, with the insulae sharing common endwalls and arranged in loops that enclose a row or band of insulae (Fig. 4G, H).

The paratype was only in bud when collected (Fig. 3), but has an unopened corolla 60 mm long (vs. to 49 mm long on the holotype).

New Combinations

Justicia chrysostephana (Hook.f.) T.F. Daniel, comb. nov.

Cyrtanthera chrysostephana Hook.f., Bot. Mag. 97: t. 5887. 1871. *Jacobinia chrysostephana* (Hook.f.) Benth. & Hook.f. ex Hemsl., Biol. Centr.-Amer. 2(12): 520. 1882. **Type**.—MEXICO. The description and illustration in the protologue are based on plants cultivated in England from materials imported from Mexico by Mr. Bull of Chelsea. A specimen at K (Fig. 11) that appears to represent original material bears Hooker's name, an indication that it was cultivated from plants of Mexican origin by Bull in December 1870, and reference to the illustration (5887) in the *Botanical Magazine* — all of which appear to be in Hooker's handwriting and conform to information in the protologue. This specimen is here treated as the holotype of this name. If it can be demonstrated that it is not original material (i.e., if all of this information on the specimen at K was added to a specimen cultivated after publication of the name), then another possibility for a type would be to choose the color illustration (Fig. 11) with details from the protologue (t. 5887) as lectotype.

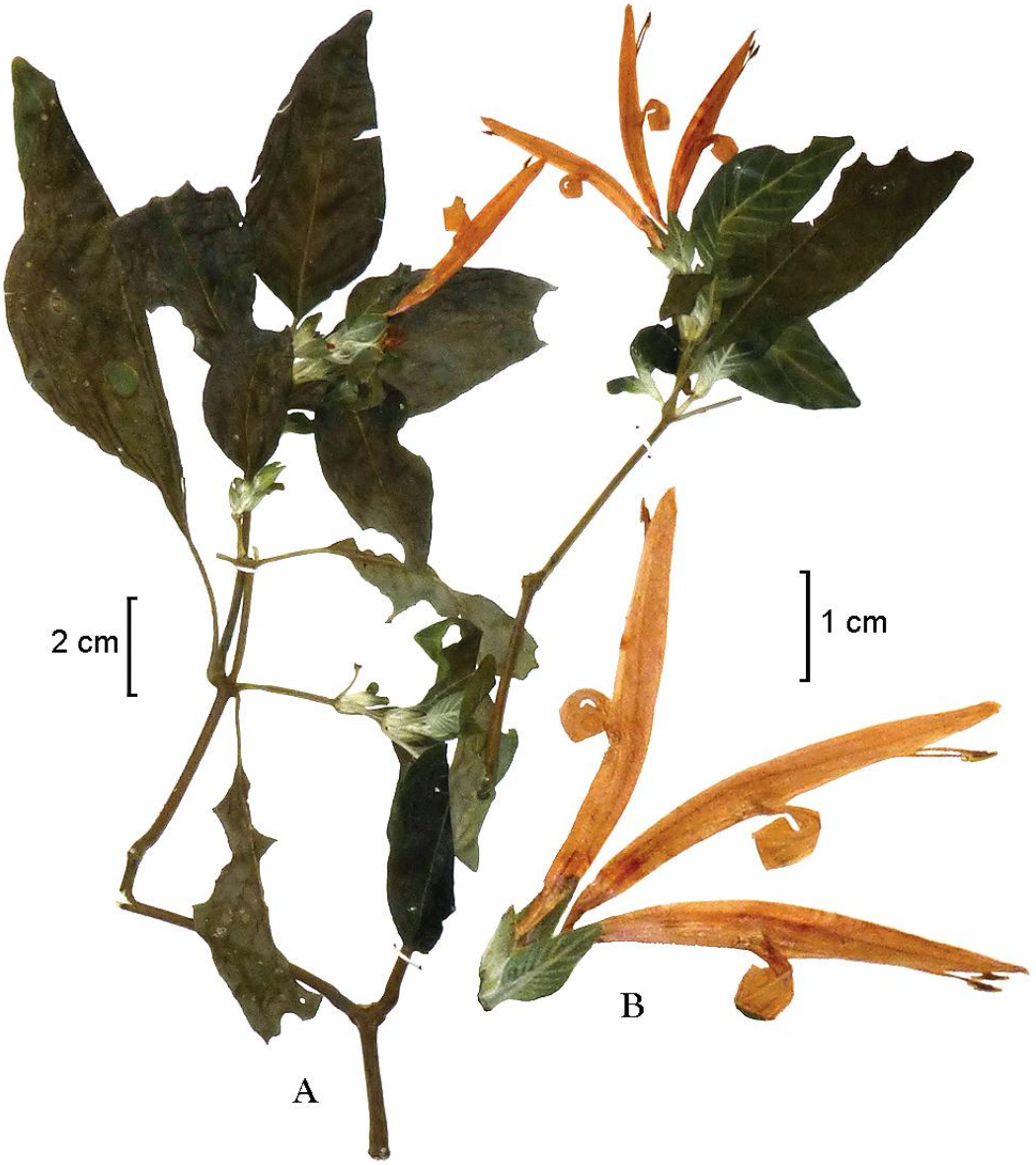

FIGURE 10. *Poikilacanthus pochutlensis*. A. Photograph of holotype specimen (*Torres C. & C. Martínez 4907* at FCME). B. Enlargement of inflorescence with flowers.

FIGURE 11. *Justicia chrysostephana*. Photograph of holotype at K (top); illustration of *Justicia lindenii* Houllet from protologue in *Revue Horticole* 42–43: 250. 1870–71 (bottom left); illustration of *Cyrtanthera chrysostephana* from protologue in *Botanical Magazine* 97: t. 5887. 1871 (bottom right).

Justicia lindenii Houllet, Rev. Hortic. 42–43: 250. 1870–71, as "*lindeni*," non *J. lindenii* T. Anderson (1868), nom. illegit. & syn. nov. **Type**.— MEXICO. The description and illustration are based on plants cultivated in Paris from material procured in Mexico by "Hahne" (presumably L. Hahn who collected in Mexico in 1865–66); original specimens, if any exist, are unknown. The colored illustration accompanying the protologue (Fig. 11) would be a logical choice as lectotype, if this illegitimate name were to become legitimate and typification was needed. One might argue that the epithet should be retained as originally spelled (i.e., "lindeni"). Although the derivation of the epithet is neither stated nor alluded to in the protologue, presumably it is derived from J. Linden, another nineteenth century Mexican collector.

Justicia ardens T.F. Daniel, Proc. Calif. Acad. Sci. 53: 41. 2002, syn. nov. **Type**.— MEXICO. **Veracruz**: Mpio. Minatitlán, Cerro Blanco, ca. 7 km NE de Uxpanapa (Pob. 12) en camino a Pob. 15, ca. 17°14′N, 094°09′W, 200 m, 19-X-1983, *T. Wendt et al. 4227* (holotype: CAS!; isotype: CHAPA).

Discussion.— Both *Justicia lindenii* and *J. ardens* are here treated as conspecific with *Cyrtanthera chrysostephana*, necessitating the new combination proposed above. The nineteenth century descriptions and illustrations of *J. lindenii* and *C. chrysostephana* are very similar and generally conform to those of *J. ardens*. Indeed, the unusual inflorescence (e.g., Daniel 2002) was noted in the protologues of all three species. Minor discrepancies in the descriptions consist of: the red coloration of veins noted and illustrated (see Fig. 11) for living plants in the protologues of *C. chrysostephana* and *J. lindenii* (neither noted by collectors on labels nor observed in dried specimens of *J. ardens*) and the glabrous corollas noted by Hooker for *C. chrysostephana* (vs. glandular pubescent for *J. ardens*). Corollas on the holotype and other cultivated specimens of *C. chrysostephana* at K, and on collections of *J. ardens* are glandular pubescent (at least distally).

The species is known from wet forests of Oaxaca and Veracruz in southern Mexico, and its characteristics and a key to morphologically similar species were provided by Daniel (2002, as *J. ardens*). Based on collections of *J. chrysostephana* at K, plants were cultivated in English gardens (including RBG Kew) throughout much of the twentieth century, and as recently as 1978.

Justicia durangensis (Henr. & Hilsenb.) T.F. Daniel, comb. nov.

Siphonoglossa durangensis Henr. & Hilsenb., *Brittonia* 31: 375. 1979. **Type**.— MEXICO. **Durango**: ca. 24 mi SW of Torreón, 7.1 mi W of Hwy. 40 on road to Presa Francisco Zarco along Río Nazas, ca. 25°16′N, 103°45′W, 1200 m, 15-VIII-1973, *J. Henrickson 12422B* (holotype: TEX).

Discussion.— American species of *Siphonoglossa* Oerst. are now usually treated in *Justicia* L. (e.g., Graham 1988; Daniel 1995; Kiel et al. 2017). *Justicia durangensis* appears to be a distinct species as described and discussed by Henrickson and Hilsenbeck (1979) and Hilsenbeck (1983). Corollas 13.5 to 16.5 mm long were noted for the species by Henrickson and Hilsenbeck (1979). Smaller flowers (e.g., open corollas 5–9 mm long) on specimens collected in late September and October (e.g., *Henrickson 22729* at CAS and TEX, and *González et al. 7012* at CAS) likely represent reduced flowers (possibly transitioning to cleistogamous flowers) occurring late in the season. If true, a similar seasonal dimorphism has been observed in corollas of *J. longii* Hilsenb. (Daniel 2016), another species formerly treated as pertaining to *Siphonoglossa*.

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PROCEEDINGS OF THE CALIFORNIA ACADEMY OF SCIENCES

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Atlas of the Reptiles of Libya

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Libya has one of the most depauperate reptile faunas in Africa, but it also remains one of the most poorly documented. Although localized collecting was carried out during the Italian colonial period (1912–1943), post-World War II field surveys have largely been limited to El Kouf National Park in northern Cyrenaica and a number of short duration field trips in other parts of the country. A combination of limited accessibility to much of the country and periods of political instability have precluded more extensive herpetological research in contrast to some other regions of North Africa, although there has been active research by Libyan scientists in recent years. In order to provide a starting point for future faunal and biogeographic studies of Libyan reptiles, we collected locality data from 3350 museum specimens and 163 literature sources, yielding 683 unique localities which we georeferenced and used to generate a gazetteer and corresponding index maps as well as species maps of each of the 66 species of reptiles confirmed to occur in Libya. Data relating to type material as well as taxonomic and distributional comments are also provided for each taxon. Libyan reptiles include three marine turtles (only one nesting), three terrestrial chelonians (one with two subspecies), 39 lizards (two with two subspecies), and 21 snakes. *Tarentola fascicularis* (Phyllodactylidae) is a species complex represented by several, as yet undescribed taxa. Three subspecies and one full species of reptile are currently regarded as endemic to Libya, although *Myriopholis lanzai*, from southwestern Fezzan, is likely to occur in neighboring Algeria. Libya's fauna is very different from that of its southern neighbors, in which Sahel taxa predominate, but similarities with Egypt, Tunisia, and especially Algeria, are great. The dominant biogeographic pattern in Libya is the contrasts between the narrow Mediterranean zone and the arid zones of the Sahara Desert and steppe-desert transition. However, many species of mesic areas occur sporadically in the arid zone, usually in association with oases, and others seem euryoecious. A secondary pattern is an east-west division of the Mediterranean zone in the Gulf of Sirte, which separates Tripolitanian taxa with faunal ties to the Maghreb from Cyrenaican taxa with affinities to Egypt and even the Middle East.

KEYWORDS: Reptilia, Chelonia, Squamata, Libya, North Africa, Tripolitania, Fezzan, Cyrenaica

The known reptile fauna of Libya is one of the poorest on the African continent (Bauer 1993), with only 63 terrestrial species recognized. This is partly an artifact of sampling effort, as most of the herpetological research in Libya was carried out before World War II, and for much of the post-war period, access to large areas of the country was limited by authoritarian restrictions or, more recently, by civil war and the resulting instability. However, the predicted herpetofaunal diversity of Libya is also low, and it is likely that relatively few additional novel taxa will be discovered, although undoubtedly continuing molecular phylogenetic studies will reveal more cryptic species.

More than any other country in Africa, Libya is dominated by the Sahara Desert, which occupies more than 90% of its land area. The harsh conditions of the desert exclude many taxa and the large sand seas, in particular, are not only depauperate, but also exhibit especially low levels of endemism, as the relatively homogeneous substrate promotes genetic connectivity across the landscape. The many rocky mountains and plateaus of the desert do provide opportunities for isolation and concomitant speciation, and this is seen in the Akakus Mountains in southwestern Libya, where the range-restricted *Uromastyx alfredschmidti* occurs (although it is a Central Saharan endemic, not a Libyan one). However, the modest elevations of Libyan landforms and the arid to hyperarid conditions surrounding them preclude the establishment of montane habitat islands that might support substantially greater or significantly different reptile faunas than the surrounding desert plains. For comparison, the highest point in the Ahaggar of neighboring Algeria is 2918 m, approximately 650 m higher than Libya's Bikku Bitti, itself part of the northern extension of the Tibesti Mountains, which rise almost 1200 m higher in Chad (Emi Koussi, 3445 m).

Because of both difficulty of access and movement and its perceived low diversity, Libya has been a much less attractive destination for herpetologists than other areas of North Africa, a fate shared by Chad (e.g., Pellegrin 1936; Wake and Kluge 1961), and to a lesser extent, Niger (Roman 1984; Trape and Mané 2015), to the south. In contrast, Libya's neighbors on the Mediterranean have been the subject of much more dedicated herpetological study, both historically and recently, e.g., Egypt (Anderson 1898; Flower 1933; Marx 1968; Saleh 1997; Baha el Din 2006a), and Tunisia (Mosauer, 1934; Domergue 1953; Joger, 2003), not to mention Morocco, which continues to be the focal point of much research, both systematic and ecological (Bons 1959; Pasteur and Bons 1960; Bons and Geniez 1996). Even Algeria, which has also been plagued by periods of war and unrest since World War II, was the subject of much more extensive study, at least during the colonial period (Guichenot 1850; Pellegrin 1911, 1913, 1931, 1934; Angel and Lhote 1938). In contrast, although Libya has been included in general works on North Africa (e.g., Le Berre 1989; Schleich et al. 1996), and the small area of El-Kouf National Park has been well surveyed (Resetar 1981; Schleich 1987), it has never been the focus of herpetofaunal studies, and no "herpetology of Libya" has been published. Indeed, most of the published work on Libyan reptiles, including the two most comprehensive, nationwide publications (Zavattari 1934, 1937), consists of little more than briefly annotated lists of material collected.

Cognizant of this lack of information, and taking advantage of an improvement in Libyan-American relationships, the senior author of this paper and David C. Blackburn, then of the California Academy of Sciences, applied for and received National Science Foundation funding for a project to explore the herpetofauna and other animal taxa of the oases of Libya and adjacent Egypt. However, just as work on this project commenced the events of the "Arab Spring" of 2011 overtook the region and precluded any field work in Libya. Although new material could not be collected, we continued with a museum-based program of study, examining critical collections of Libyan amphibians and reptiles and initiating an atlasing project on the basis of museum and literature records in order to provide a baseline for herpetologists working in the region if and when political and security conditions are again conducive to field research. This reptile atlas will be followed by a similar product focusing on the frog fauna of Libya (Blackburn, in prep.).

Physiography of Libya.— Libya has an area of 1,759,540 km^2 and lies in North Africa between approximately 19°30′ and 33° North latitude and 9°30′ and 25° East longitude. It borders the Mediterranean Sea to the north, Egypt and Sudan to the east, Niger and Chad to the south and Algeria and Tunisia to the west (Fig. 1). It is traditionally divided into three major regions: Tripolitania in the northwest, Fezzan in the desert southwest, and Cyrenaica, occupying the eastern half of the country stretching from the Mediterranean to the Sudanese and Chadian borders. The major-

ity of Libya lies within the Sahara Desert and the inland of Libya is a mosaic of sand, including sand seas with dunes (*erg*), gravel desert (*reg*), and stony plateaus (*hamadas*) and other rocky formations. The Calanshio Sand Sea is part of the Great Sand Desert which straddles the Libyan/Egyptian border. It is low lying and one of the areas of lowest rainfall in the country and extends across the largely uninhabited central region of Cyrenaica. The Sahra Rabyanah or Rebiana Sand Sea lies in the southeast corner of the country. Other major areas of sand are the Idhan Murzuq in south central Fezzan and the Idhan Awbari (Ubari Sand Sea) near the Algerian border. Libya has a mean elevation of 423 m. Its low point is Sabkhat Ghuzayyil in western Cyrenaica, at 47 m below sea level, and its highest point is Bikku Bitti (2267 m) in the Tibesti Mountains along the Chadian border (FIG. 1). Other significant highland areas are the Akakus Mountains (Tadrart Akakus) in the southwestern corner of the country (highest point 1506 m), adjacent to the Tasili n'Ajjer of Algeria, and the Jabal Al Uwaynat (1934 m) and Jabal Arkenu (1435 m) in the far southeast of the country. Al Haruj al Aswad is a black basaltic plateau near the center of the country comprising numerous volcanic shields as well a lines of conical volcanoes, reaching a maximum elevation of approximately 1200 m. Another prominent feature is the Al Hamadah al Hamra (Red Desert), an extensive plateau occupying much of western Tripolitania. The Jabal Nafusah (968 m) in northwestern Tripolitania lies at the intersection of the Jafara (Jifara) Plain and the Tripolitanian Plateau. Between the Hamadah al Hamra and the Haruj al Aswad lies the Jabal al Sawda (840 m), another distinctive volcanic region. The Jabal al Hassawinah, or Jabal Fezzan (1849 m) lies at the southeast corner of the Hamadah al Hamra. The most prominent feature in northern Cyrenaica is the limestone plateau of the Jabal al Akhdar or Green Mountain (878 m). Despite its modest height it receives high rainfall and forms a biogeographically distinctive mesic zone within the country. To the north of the Jabal Akhdar the Marj Plain extends from Benghazi to Darnah, reaching inland only about 50 km. South of the plateau is a belt of sparse grasslands which grade into the desert proper.

Natural river systems in Libya are represented by wadis that are dry most of the time, although some may flood following heavy rains. Such events are relatively common in wadis flowing from near-coastal mountain areas, but are rare in the desert where significant rainfall events seldom occur. Freshwater to support the larger cities of coastal Libya and to sustain agriculture is supplied by the Great Man-Made River, a network of aqueducts and pipes that takes water from the Nubian Sandstone Aquifer System. There are about 20 permanent natural water bodies in Libya, all of which are brackish or saline, and most of which are in Fezzan and are associated with the major oases. Oases are a critical component of Libyan geography with respect to reptile distributions. Saharan oases typically support both taxa with both Mediterranean and sub-Saharan affinities (Le Berre 1989) and many taxa are regionally restricted to these mesic pockets within the desert, although they may be more broadly distributed in areas with less harsh conditions. This includes taxa like such as blind snakes, chamaeleons, and some skinks (e.g., *Chalcides* spp.) (Angel and Lhote 1938; Dekeyser and Villiers 1956; Joger and Lambert 1996; Padial 2006), and is even more so for more water dependent taxa including frogs, fishes, and gastropods (Pellegrin 1911, 1913, 1931, 1934; Scortecci 1936; Estève 1949; Lévéque 1990; Trape 2016). Among the most significant Libyan oases are Jalu, Jufrah, Jaghbub, Murzuq, Kufrah, Gadamis and Ghat (FIG.1). Although some oases are associated with fairly large human populations (e.g., Kufrah), more than 90% of the human populations is distributed along the Mediterranean coastline, mostly between Zawiyah and Misratah in Tripolitania and from Ajdabiya to Tobruq in Cyrenaica.

CLIMATE.— Following the Köppen climate classification (Peel et al. 2007), a warm Mediterranean climate, with hot summers and mild winters, prevails in coastal Cyrenaica near the Jabal al Akhdar and on the northern slopes of the Green Mountain itself. A kernel of temperate Mediter-

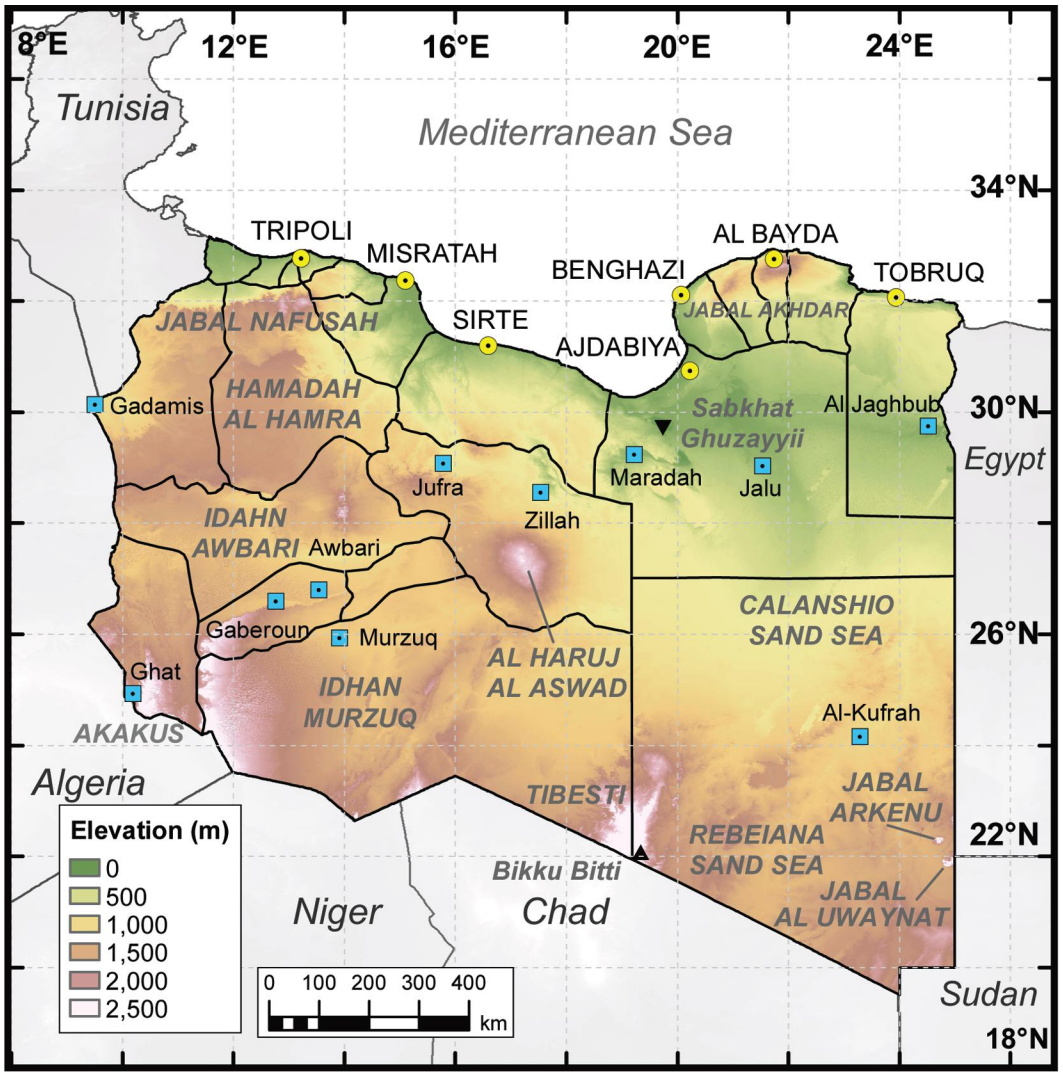


FIGURE 1. Elevational map of Libya showing the major features of the country. Yellow circles: major Mediterranean cities, blue squares: major oases; triangle: highest point in Libya, Bikku Bitti (2267 m); inverted triangle: lowest point in Libya, Sabkhat Guzayyii (-47 m). Major geographic features (mountain ranges, plateaus, sand seas) in bold, italic, capital letters.

ranean climate with a narrow rim of warm Mediterranean climate characterizes a small area around Tripoli. Steppe areas surrounding these relatively small zones of Mediterranean climate experience a warm semi-arid climate and in Tripolitania a cold desert climate prevails for up to 300 km inland. The vast majority of the country, however, including the coastal regions of the Gulf of Sirte, falls in the warm desert climate zone. The Jabal al Akhdar can receive up to 600 mm of rain per year, whereas the maximum in coastal Tripolitania is about 300 mm. These values decline steeply inland, and the average rainfall for the nation as a whole is only 26 mm per annum. The lowest rainfall occurs between about 23°N and 28°N from the Egyptian border to about 16°E, roughly coincident with the Calanshio Sand Sea. Rainfall is generally concentrated in a short period of the year, usually October to November on the coast and as late as March or April in the desert. Famously, Al-

‘Aziziyah in the northwest of Libya was long regarded as the hottest place on earth, with a record high temperature of 58°C. Although this is now regarded as an error (El Fadli et al. 2013), the town nonetheless has a mean July temperature of 39.2°C and is one of the hottest places in Africa. Nonetheless, frost can occur at higher elevations inland and, rarely, even near the coast.

Vegetation.— The coastal zone of Libya supports a moderately diverse vegetation similar to other North African countries, although it has been characterized as severely degraded in comparison to countries to the west (White 1973) and because of lower rainfall in Libya it exhibits a higher percentage of Saharan versus Mediterranean taxa. An exception is the Jabal al Akhdar in Cyrenaica which has an especially rich flora for Libya, with more typically Mediterranean taxa than the rest of the northern rim of the country (Hegazy et al. 2011). Although trees and shrubs are dominant on the northern slopes of the Jabal al Akhdar, much of the remainder of the Mediterranean climate zones of Tripolitania and Cyrenaica is typified by grasses and sclerophyllous plants and especially by taxa of anthropogenic landscapes. Wadis and oases (see below) have more diverse and mesic adapted plants than surrounding areas, but are even more heavily impacted by agriculture.

Within the Libyan Sahara, vegetation zones more-or-less correspond to rainfall regime and water availability (White 1973). Rainfall is so low in portions of the Libyan Desert, particularly in central and southern Cyrenaica, that plant life may be entirely absent over large areas, although seeds may survive in the sand and sprout if and when the rare rains come (Walter 1971). Oases support unique vegetation, including swamps and stands of *Tamarix*. Although prior to human exploitation of oases the native vegetation included doum palms (*Hyphaene*) and *Acacia* amongst other dominant plants (Walter 1971), today they are dominated by date palms (*Phoenix dactylifera*), and especially since the tapping of the Nubian Sandstone Aquifer, a diversity of other cultivated plants. The vegetation of wadis, likewise, are distinctive from that of surrounding areas. These may be dominated by *Acacia* or *Tamarix* communities (White 1973). The dunes of the sand seas may be vegetationless or may support grasses and sclerophyllous shrubs. Gravel plains (*regs*) on sand may be characterized by a diversity of therophytes, such that the vegetation may be comparatively lush following sporadic rains, but almost unnoticeable at other times. *Hamadas* and compacted *regs* often have no vegetation except where there are cracks in stone or drainage channels, in which case grasses may occur. A more mesic adapted Saharomontane vegetation characterizes areas above 1800 meters in the desert, but in Libya, this is found only on the highest parts of the northern Tibesti, and even there the Libyan portion of this mountain range receives less rain than the south and west facing slopes in Chad. The Jabal Al Uwaynat, despite being over 1900 m, lacks this formation, which is taxonomically diverse, and supports instead trees and shrubs of Mediterranean affinities (e.g., *Lavandula*, *Salvia*) as well as *Acacia* in its more protected gorges (Quézel (1965).

Holocene Conditions in Libya.— Although much of Libya is today hyperarid, during most of the Cenozoic conditions were both wetter and cooler. Although there are today no flowing rivers in the Libyan interior, Libya and adjacent regions of the Sahara have extensive paleohydrological systems that would have contained freshwater during more mesic periods (Drake and Bristow 2006; Ghoneim et al. 2007; Drake et al. 2008; Osborne et al. 2008). Roughly 120,000 years ago conditions in the Sahara were likely similar to those prevailing today in parts of the Sahel and wetlands, large lakes, and active river systems were present (Pachur and Braun 1980), although throughout the intervening period climatic conditions fluctuated between xeric and mesic extremes. Approximately 8000 years ago, conditions of the Holocene Climatic Optimum were mostly warm and wet with a pronounced monsoon season (Gasse et al. 1990; Rognon 1996; Damnati 2000) and the Libyan desert was largely grassland with permanent freshwater lakes (Pachur and Braun 1980; Petit-Marie et al. 1980) that supported human populations that subsisted

on fishing and hunting large aquatic vertebrates (Smith 1968; Sereno et al. 2008). About 4000 years ago the modern cycle of desertification began, resulting in the modern landscape and faunal patterns of the country (Kröpelin et al. 2008).

Crocodylus niloticus was once widespread in the Sahara. Historical records exist from areas of Tunisia, Algeria, northern Niger and the Tibesti of Chad, but records from the territory of Libya (Djebel Akhdar — 32.19618°N, 21.41950°E, In Habiter — 26.49082°N, 12.69354°E, Wadi Mathendous — 25.76267°N, 12.16647°E) are Holocene in age (Peters and von den Driesch 2003; de Smet 1999; Joleaud 1933; Brito et al. 2011). Kratochvíl et al. (2002) provided a photo of a crocodile carving on stone in Wadi Mathendous in the Akakus region of Fezzan, suggesting that crocodiles were present in Libya approximately 8000 ybp, when more mesic conditions prevailed in southern Libya. Libya was rich in crocodilian diversity in earlier periods, such as the lower Miocene (Llinás Agrasar 2004) and numerous fossil squamates have also been described from Libya (Arambourg and Magnier 1961; Hoffstetter 1960, 1961). Tortoise fossils are also known from Fezzan (Peters and von den Driesch 2003), where no chelonians occur today.

History of Libyan Herpetology.— Zoological research in Libya has been reviewed by Massa (2009), Chiozzi (2013) and Latella (2013) among many others, and publications specific to the herpetology of Libya were reviewed by Bshaena (2011). Early herpetological explorations in the area were prevented by the dangerous conditions in North Africa. During the late 1700s and early 1800s, the "Barbary States," including Tripoli engaged extensively in piracy in the southern Mediterranean, often capturing European and American ships and enslaving their crews. This activity ceased only after the First (1801–1805) and Second (1815–1816) Barbary Wars, and the eventual return to Ottoman control over the Tripoli in 1835. As a consequence, in the first half of the 19th century, Libyan species of reptiles were mentioned only in isolated descriptions of species or mentions of specimens from "Tripoli" (Daudin 1802; Gray 1838, 1842, 1845, 1849).

Late in the century the first focused herpetological research resulted from the study of collections made by a series of expeditions to the region. Peters (1880, 1881) described material in the Zoological Museum of Berlin (now Museum für Naturkunde) collected on the expedition of Gerhard Rohlfs and A. Stecker to the oasis of Kufra in southeastern Cyrenaica in 1879. This was followed by Emilio Cornalia's list of taxa obtained by Guiseppe Haimann in Cyrenaica (Cornalia in Haimann 1882) [also repeated in a second edition in 1886], and a summary of material collected around Benghazi by Gustav Ferdinand Ruhmer and described by von Martens (1883). Incidental to his ornithological work Alexander König (1888) reported on his own collections from North Africa, which included some reptiles from Tripoli in addition to a more comprehensive collection from Tunis and its surroundings. Boulenger (1891), likewise focused on the areas from Tunisia west to Morocco in his study of the Barbary Coast fauna, but did include some material from the Tripoli area. Some of the earliest Italian research on reptiles was published by Condorelli-Francaviglia (1896) and Rizzardi (1896), both dealing with Tripolitanian reptiles collected the year before by Antonio Balboni and Luigi Bricchetti-Robecchi, respectively. Werner (1909) critically analyzed some of the earlier papers and added a discussion of material obtained from the surroundings of Tripoli by Dr. Bruno Klaptocz in 1906, rounding out the herpetological contributions made during the Ottoman period in Libya.

The era of Italian colonialism in Libya began in 1912, following the 1911–1912 Italo-Turkish War. Arnolfo Andreucci (1913) reported on his brother Augusto's collections from Tripolitania and Boulenger (1914) discussed the 1912–1913 collections of Alfredo Andreini from Misrata and Homs to the east of Tripoli. Alessandro Ghigi (1913) summarized the Libyan fauna as a whole and subsequently focused on the vertebrates of Cyrenaica (Ghigi 1920, 1922). In the 1920s, major contributors to knowledge of the Libyan herpetofauna were Edoardo Zavattari, who reported on Cyre-

naican vertebrates collected by Francesco Testi (1922), Enrica Calabresi on the amphibians and reptiles collected in Cyrenaica by E. Festa (1923) and Giorgio Umani on the reptiles, and particularly snakes (1922, 1923) of Benghazi and other areas. Decio Vinciguerra published on the Italian Geographic Society expeditions to Giarabub (now Jaghbub) near the Egyptian border (Vinciguerra 1927; Gestro and Vinciguerra 1931) and to the Oasis of Cufra (Kufrah) in the far southeast of Cyrenaica (Vinciguerra 1931). Zavattari continued with substantial works on the fauna of Cyrenaica (1929, 1930), and Libya as a whole (1934, 1937). Giuseppe Scortecci, whose faunal works spanned all of Italian Africa was the last substantive contributor to Libyan herpetology during the colonial period, publishing chiefly on the desert herpetofauna of the province of Fezzan and the Oasis of Ghat (Scortecci 1934a,b, 1935a,b,c, 1937a,b, 1946) and the Tibesti region straddling the Libyan/Chadian frontier (Scortecci 1940, 1943), as well as on snakes of Libya more generally (Scortecci 1938, 1939) based on his own field collections as well as those of others.

Field activity up to World War II resulted in the accumulation of substantial collections in European museums, most notably Berlin (which, in addition to material from Rohlfs and Ruhmer, obtained a large collection made by Louis Egmont Borowski, who served in the Ottoman army, lived for many years in Tripoli, and was eventually shot as a spy there; his collections have never been studied), Vienna (Klaptocz), and especially Italian institutions. In particular, the collections in Genoa, Turin, Florence and especially Milan, where Scortecci was based, received the majority of specimens. Most of these collections remain largely intact, although at least some Libyan material, including apparently the type of *Philochortus zolii*, were destroyed when the Museo Civico di Storia Naturale in Milan was bombed in 1943 (Parisi 1944).

Another institution of relevance was The Libyan Museum of Natural History (Museo Libico di Storia Naturale) established in Tripoli 1936 (Masseti 2010, 2013; Latella 2013). The collection did include reptiles, but to our knowledge, no inventory of its collections exists and we could find no published references to herpetological material from this collection. The museum survived beyond the end of Italian rule and in the 21st century existed as the Assaray Al-hamra Museums, housed in the castle of Tripoli (Masseti 2010). The museum had been in decline prior to the events of 2011, with only a fraction of the ornithological specimens of the pre-World War II period surviving (Masseti 2013). Some material was exchanged or donated to collections in Italy and survives today. However, the fate of herpetological collections in Libya remains unknown. In this atlas we cite only a small number of specimens in other Libyan collections that have been reported on in the literature, none of them from the Assaray Al-hamra Museums.

Following the defeat of Italy in North Africa in World War II, Britain administered the provinces of Tripolitania and Cyrenaica and France that of Fezzan until 1951, when the United Kingdom of Libya declared its independence under King Idris, who remained in power until the 1969 coup staged by Muammar Gaddhafi, who remained in power of a totalitarian state until the "Arab Spring" and its aftermath in 2011. The political situation in the country has not since returned to stability and in 2014 a second civil war erupted. Not surprisingly, given the inhospitable political climate, relatively little herpetological work was conducted in Libya for much of the period from the outbreak of the Second World War to the present. A notable exception was the work of Hans Schnurrenberger, who studied snakes in northwestern Cyrenaica and eastern Fezzan from 1956 to 1961 and published a series of shorter papers, both alone (Schnurrenberger 1958a,b, 1959, 1962, 1963) and with collaborator Eugen Kramer (Kramer and Schnurrenberger 1958, 1959, 1960), culminating in their monograph "Systematik, Verbreitung und Ökologie der Lbyschen Schlangen" (Kramer and Schnurrenberger 1963), which remains the most comprehensive work to date on Libyian snakes. Much subsequent work was centered on Kouf (now El-Kouf) National Park in the Jabal al Akhdar area (Resetar 1981; Schleich 1987).

Other "modern" publications have largely been the result of opportunistic regional collection or short surveys (e.g., Sayers 1964; Moravec 1995; Frynta et al. 2000; Ibrahim 2008a), but have nonetheless provided important records in such a poorly collected country. The work of Ibrahim and Ineich (2005), reporting new records from Nalut added 16 species of reptiles to the fauna of the province. Other significant recent research has included that of Roberto Sindaco, whose faunal studies of the Palearctic, including Libya (Sindaco 1995, 1998; Sindaco and Jeremčenko 2008; Sindaco et al. 2013) have provided a baseline for zoogeography of the region. Most additional 21st century research dealing with the reptiles of Libya has been in the area of molecular phylogenetics and phylogeography. A large number of papers by Harris, Carranza, Rato, Kapli, Crochet and Metallinou among others have included at least some Libyan material in their studies of North African taxa, much of it based on material from the Natural History Museum of Crete, one of the only collections of Libyan material for which tissue samples are available. Only recently have Libyan researchers begun to publish on their own herpetofauna, particularly sea turtles (Hamza et al. 2009; Hamza 2010; Haddoud and El Gomati 2011), but also on the terrestrial fauna from both a faunal perspective (Essghaier et al. 2015) and a taxon specific one (Bshaena 2011; Bshaena and Joger 2013).

Material and Methods

Data were gathered from museum records and from published sources. Approximately 3350 museum records were obtained from the GBIF database, from collection queries to institutional online databases, and from specific requests to curators and collections managers. Numerous museums, including some of those with the largest collections of Libyan reptiles were visited by the authors (see Acknowledgments). A complete list of collection abbreviations used in this paper is presented in Table 1. Literature records were extracted from 163 publications explicitly mentioning Libyan material or providing specific localities within Libya. Our data includes reptile records from 683 localities (196 in Tripolitania, 129 in Fezzan, and 358 in Cyrenaica) (Fig. 2) and 2061 unique taxon-locality combinations. All localities are listed in the **Appendix** and are plotted in index maps (Figs. 3–6). Data were compiled into a spreadsheet in Microsoft Excel 2013 (available form the senior author) in which original identifications and verbatim localities were entered, as well as current identifications and locality names and coordinates. Uncertainty estimates and the georeferencing source are also included in this file.

Nomenclature for all records was updated on the basis of current taxonomy and phylogenetic information. Many of the taxa included in this atlas have recently undergone, or are still undergoing, major revisions and some identifications remain tentative. These cases are noted in the corresponding Comments sections of each species account. Phyllodactylid geckos of the genus *Tarentola* pose a particular problem and there are numerous undescribed species (see Bshaena 2011) which are here combined under a single entry, *Tarentola fascicularis* Complex. The gekkonid gecko pairs *Stenodactylus sthenodactylus/mauritanicus* and *S. petrii/stenurus* are also problematic, as recent phylogenetic and taxonomic work reveals that many older species identifications are likely incorrect and all Libyan specimens in this genus should be reexamined to confirm identity. *Acanthodactylus* species are another source of possible error as many old records refer to species now regarded as absent from Libya and the similarity of some species may have resulted in misidentification. To the extent possible we have addressed these problems in the Comments sections of the relevant species accounts.

Although some more recent data were provided in a georeferenced format, most earlier records were listed by place name only. These were georeferenced following the recommendations of Guralnick et al. (2006) and Chapman and Wieczorek (2006) using BioGeomancer, Google Earth,

TABLE 1. Symbolic codes for collections and other specimen-related abbreviations cited in this paper. Standard codes as listed by Sabaj (2016) are used except as noted and for private or smaller collections for which no standard code has been established.

AIC: Adel A. Ibrahim Collection, Ha'il University, Ha'il, Saudi Arabia
AMNH: American Museum of Natural History, New York, New York, USA
ANSP: Academy of Natural Sciences of Drexel University (formerly Academy of Natural Sciences of Philadelphia) Philadelphia, Pennsylvania, USA
BMNH: The Natural History Museum, London (formerly British Museum of Natural History), London, United Kingdom
CAS: California Academy of Sciences, San Francisco, California, USA
CM: Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA
CUP: Charles University, Prague, Czech Republic
DB: sample designations used by Rato et al. (2012), chiefly corresponding to NHMC specimens
FMNH: Field Museum of Natural History, Chicago, Illinois, USA
GNM: Göteborgs Naturhistoriska Museum, Göteborg (Gothenburg), Sweden
IZUM: Instituto di Zoologia dell'Universita di Modena, Modena, Italy
KC: Prefix for GenBank accession numbers cited by Metallinou et al. (2012)
KNP: Kouf (El-Kouf) National Park, Libya (cited exclusively by Schleich 1987)
MCSN: Museo Civico di Storia Naturale di Milano, Milan, Italy (see also MSNM)
MCCI: Museo Civico di Storia Naturale di Carmagnola, Turin, Italy
MCZ: Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA
MBRC: Marine Biology Research Centre, Tajura, Tripoli, Libya
MHNG: Muséum d'Histoire Naturelle, Ville de Genève, Geneva, Switzerland
MHNL: Musée des Confluences (formerly Musée d' Histoire Naturelle de Lyon), Lyon, France
NMP: Národní Muzeum, Prague, Czech Republic
MNHN: Muséum National d'Histoire Naturelle, Paris, France
MSNG: Museo Civico di Storia Naturale "Giacomo Doria," Genova (Genoa), Italy
MSNM: Museo Civico di Storia Naturale di Milano, Milan, Italy (see also MCSN)
MTKD: Museum für Tierkunde, Senckenberg Naturhistorische Sammlunbgen, Dresden, Germany
MWNH: Museum Wiesbaden, Naturhistorische Landessammlung, Wiesbaden, Germany
MZLU: Zoologiska Museet, Lunds Universitet, Lund, Sweden
MZUF: Museo di Storia Naturale di Firenze, Sezione di Zoologia "La Specola," Florence, Italy
MZUT: Museo di Zoologia, Università di Torino (housed but separately catalogued in Museo Regionale di Scienze Naturali di Torino), Turin, Italy
NHMB: Naturhistorisches Museum, Basel, Switzerland
NHMC: Natural History Museum of Crete, Heraklion, Greece
NHMW: Naturhistorisches Museum, Wien, Vienna, Austria
NMBE: Naturhistorisches Museum der Burgergemeinde Bern, Bern, Switzerland
NMV: Museum Victoria, Melbourne, Australia
NRM: Naturhistoriska Riksmuseet, Stockholm, Sweden
PCHP: Peter C. H. Pritchard Collection, Chelonian Research Institute, Oviedo, Florida, USA
PGe: Collection of Philippe Geniez, École Pratique des Hautes Études, Paris, France
RMNH: Naturalis Biodiversity Center (formerly Rijksmuseum van Natuurlijke Historie), Leiden, The Netherlands
RN: Centre Voltaïque de la Recherche Scientifique, Ouagadougou, Burkina Faso
SK: Sammlung Kramer (collection of Eugen Kramer), Basel, Switzerland (specimens now incorporated into NMBA; cited by Kramer and Schnurrenberger, 1963)
SMF: Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany
SMNS: Staatliches Museum für Naturkunde, Stuttgart, Germany
SNHM: Staatliches Naturhistorisches Museum, Braunschweig, Germany
Tm: abbreviation for *Tarentola mauritanica* used in Harris et al. (2004b) and Rato et al. (2010, 2012)
UMNH: Utah Museum of Natural History, Salt Lake City, Utah, USA
USNM: United States National Museum of Natural History, Washington D.C., USA
UUZM: Evolutionsmuseet, Uppsala Universitet, Uppsala, Sweden
ZCT: Zoological Collection at Taraghen, Taraghen (Traghan), Murzuq, Libya
ZFMK: Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany
ZMA: Zoölogisch Museum, Universiteit van Amsterdam, Amsterdam, The Netherlands (now incorporated into RMNH)
ZMB: Museum für Naturkunde (formerly Zoologisches Museum der Humboldt-Universität zu Berlin), Berlin, Germany
ZSM: Zoologische Staatssammlung München, Munich, Germany

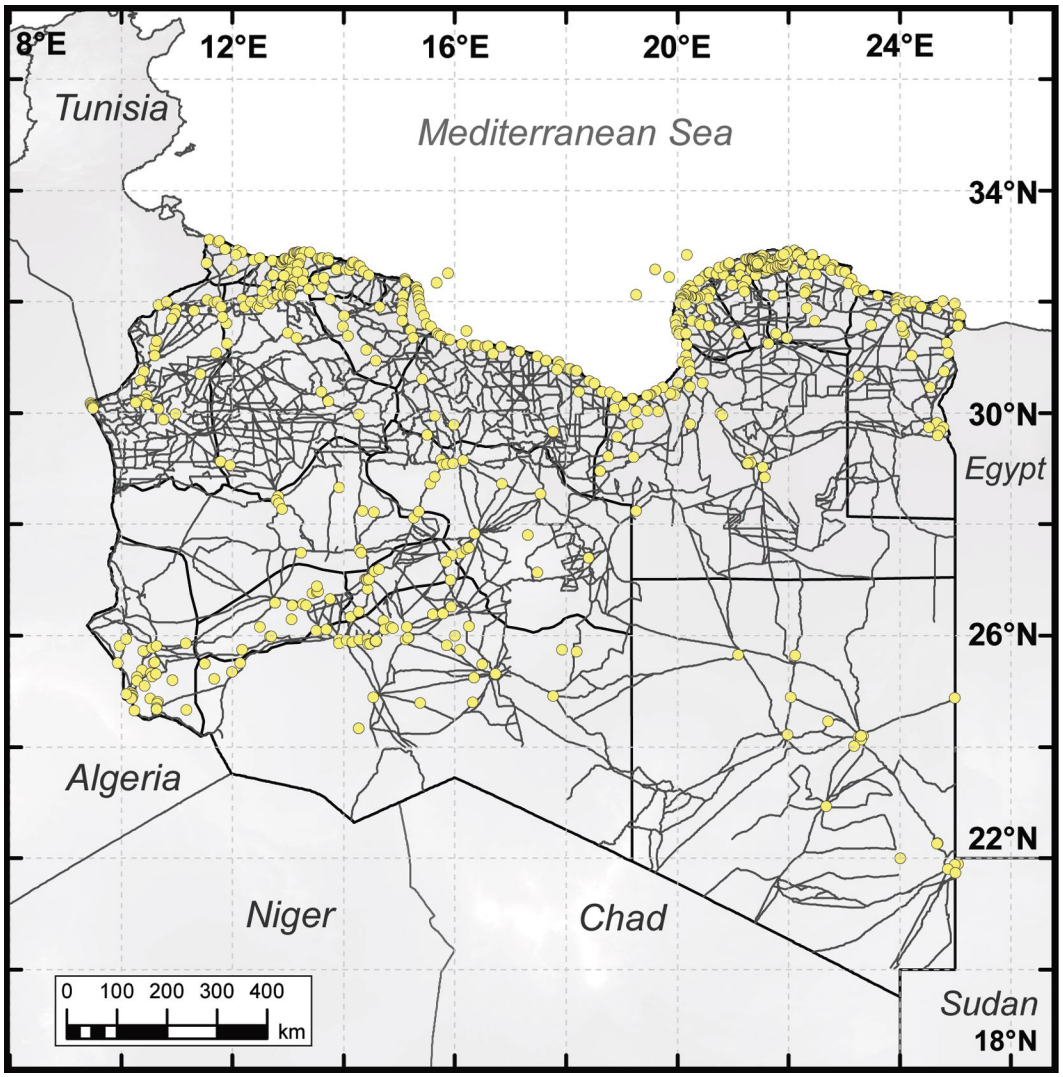


FIGURE 2. Map showing all 683 collecting localities recorded for Libyan reptiles in relation to the road system of the country. Although the roads appear to be numerous, many are small tracks through desert terrain.

and a large number of online and hard copy gazetteers and many Libyan maps, including many available online, as well as an extremely useful paper by Török (2012) which reproduced historical maps of the Kufrah region. It was our experience that many earlier attempts at georeferencing (e.g., GBIF derived records and older published records) were unreliable, or highly imprecise. Thus, unless coordinates provided with the locality data were stated to be or could reasonably be assumed to be derived from GPS or detailed map coordinate data provided by the collector, we did not necessarily use coordinate data provided by museums (although these were retained in our master file). Likewise, older published coordinates were often unreliable because they were rounded to the nearest degree or quarter degree in some cases (e.g., the gazetteer provided by Kramer and Schnurrenberger 1963).

Unfortunately many records, particularly those from the 19th century, but also many well into

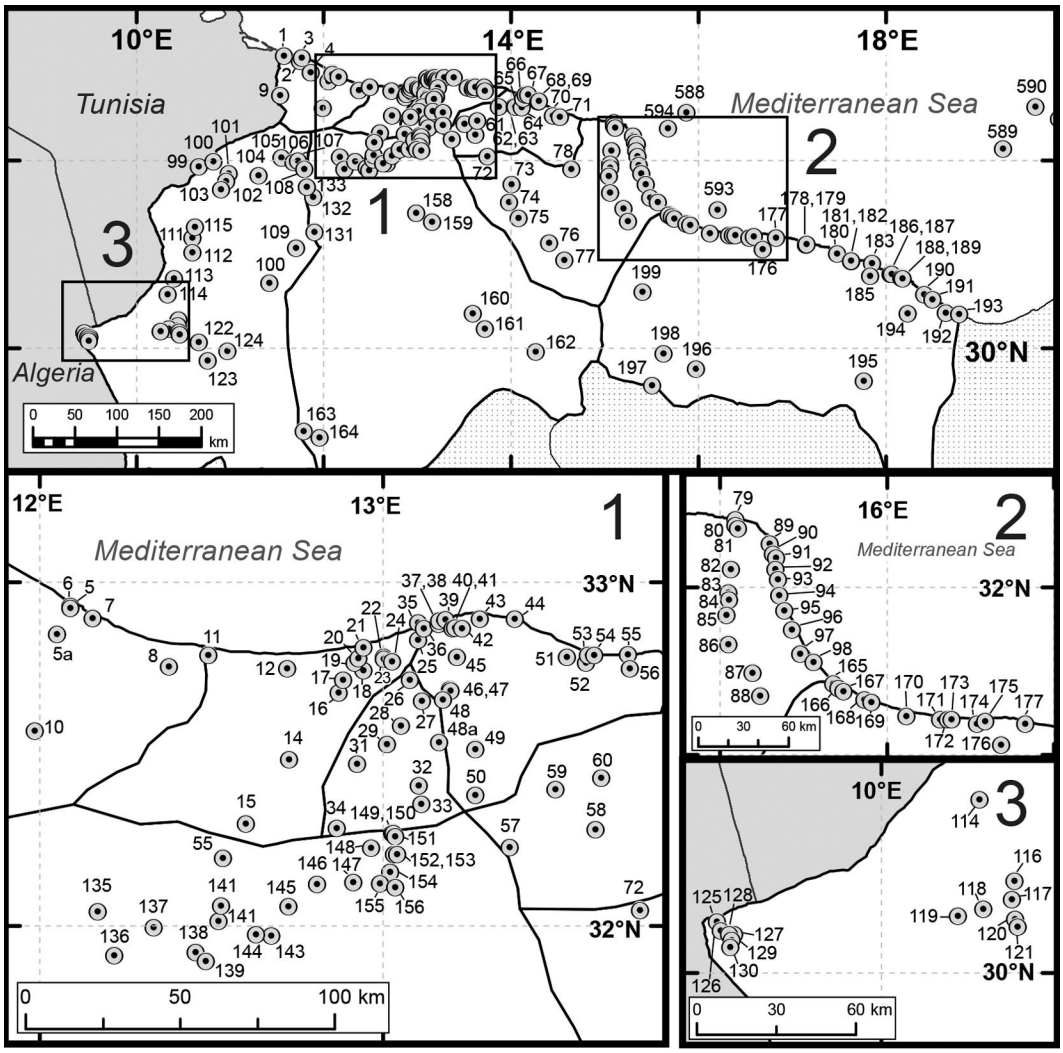


FIGURE 3. Index map of Tripolitania showing numbers used for localities in this atlas. Inset maps are 1) Tripoli and surrounding area, 2) Misratah to Sirte, and 3) west central Nalut. See APPENDIX for corresponding coordinates and locality names.

the 20th century are too imprecise to georeference, giving only the former provincial designations of Tripolitania, Cyrenaica, or Fezzan, or perhaps the name of a district or large physical feature. Other records were listed simply as being between two points. When these points were relatively close to one another, we plotted the midpoint and recorded an uncertainty equal to the distance from that point to either terminus noted in the verbatim locality name. When distances were very large we made no attempt to plot the occurrence, and the verbatim locality (or the English translation thereof) is provided in the list of Libyan localities for the relevant species after the *shabiyah* (district) or region (Tripolitania, Fezzan, Cyrenaica) within which it is located, or, if unlocatable, or potentially spanning regions, these appear in the list of localities under "Libya."

In addition, many early records mention Tripoli or Benghazi, the largest cities and points of departure for the inland of Tripolitania and Cyrenaica, respectively. Many such records are likely

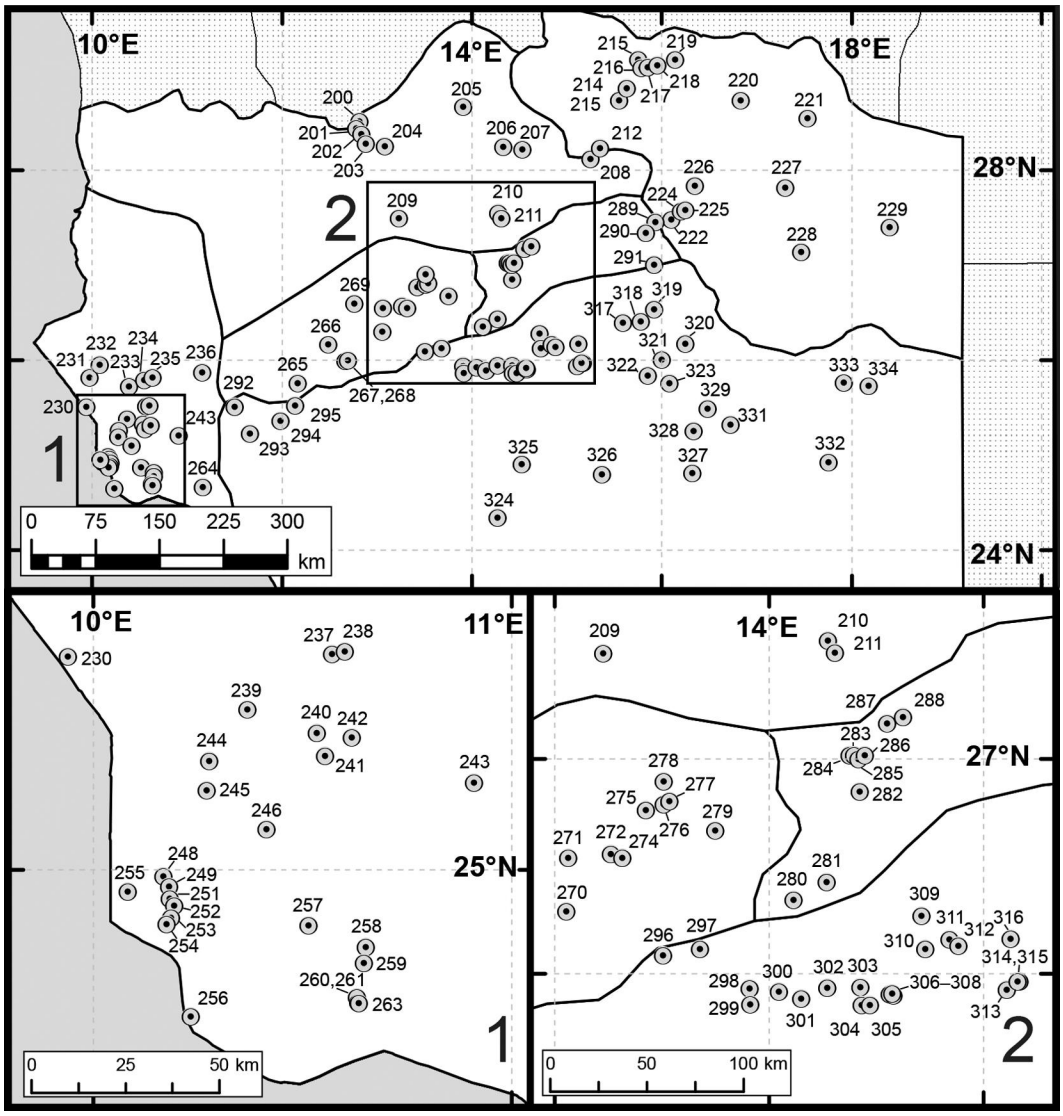


FIGURE 4. Index map of Fezzan showing numbers used for localities in this atlas. Inset maps are 1) Ghat, Tadrart Akakus and surrounding area, and 2) Muzuq-Sabha area. See APPENDIX for corresponding coordinates and locality names.

form the hinterlands of these cities or were simply shipped to Europe from these ports. In the case of Tripoli, the place name, during the Ottoman period, was sometimes used synonymously with Tripolitania. In other cases specimens were obtained from animal dealers in these cities, and the true points of collection are unknown. This was the case for some specimens noted by Werner (1909), but likewise is true for tortoises in the 21st century (see *Testudo graeca* account). Records form these localities must, therefore, be interpreted with care.

The task was complicated by the various ways in which Arabic and Berber language place names have been represented in the Roman alphabet in different European languages over time. Further, there is no single standard for the transcription or romanization of Standard Arabic and, to complicate matters, Libyan Arabic, used in much of northern Libya and with several dialects itself,

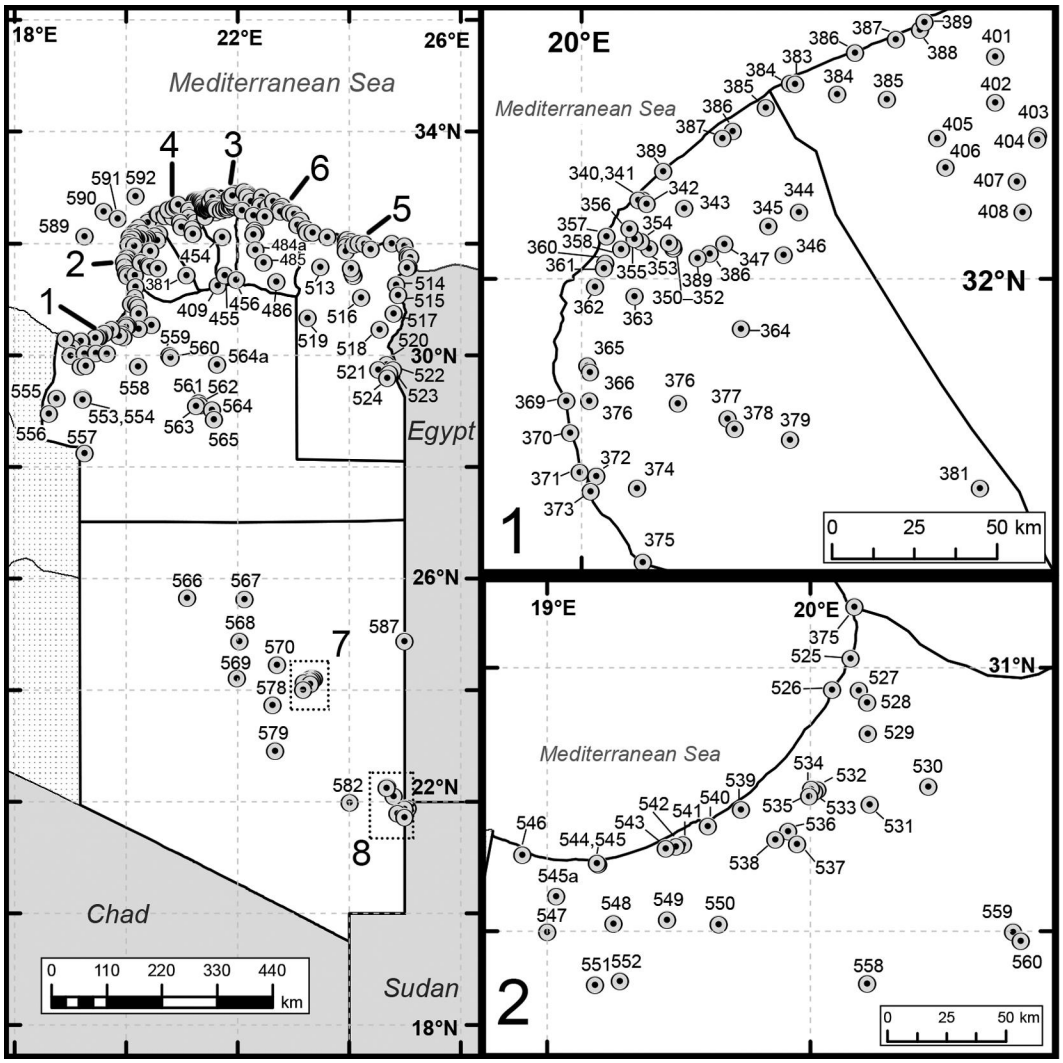


FIGURE 5. Index maps of Cyrenaica showing numbers used for localities in this atlas (see also Fig. 6). Inset maps are 1) northern Benghazi and adjacent Marj, 2) northwestern Al Wahat, See APPENDIX for corresponding coordinates and locality names.

is sufficiently different that many place names would be transliterated differently than from Standard Arabic. In many cases localities could be identified unambiguously or through the use of Fuzzy Gazetteer (Kohlschütter 2015), which allowed for variability in the spelling of locality name. We also used the context of published papers, the itineraries of collectors and other data sources in order to find localities. In so doing we identified numerous cases in which earlier authors or georeferencers clearly misplaced localities, sometimes even in the wrong country. Only in a few cases, when we could locate no evidence of the published use of a place name, was it necessary to accept a previously georeferenced locality on blind faith.

The names and coordinates of localities were compared to other literature sources for Libyan reptile distribution (e.g., Schleich et al. 1996; Sindaco and Jeremčenko 2008; Trape et al. 2012; Sindaco et al. 2013) and with relevant taxon-specific literature in order to identify potential mis-

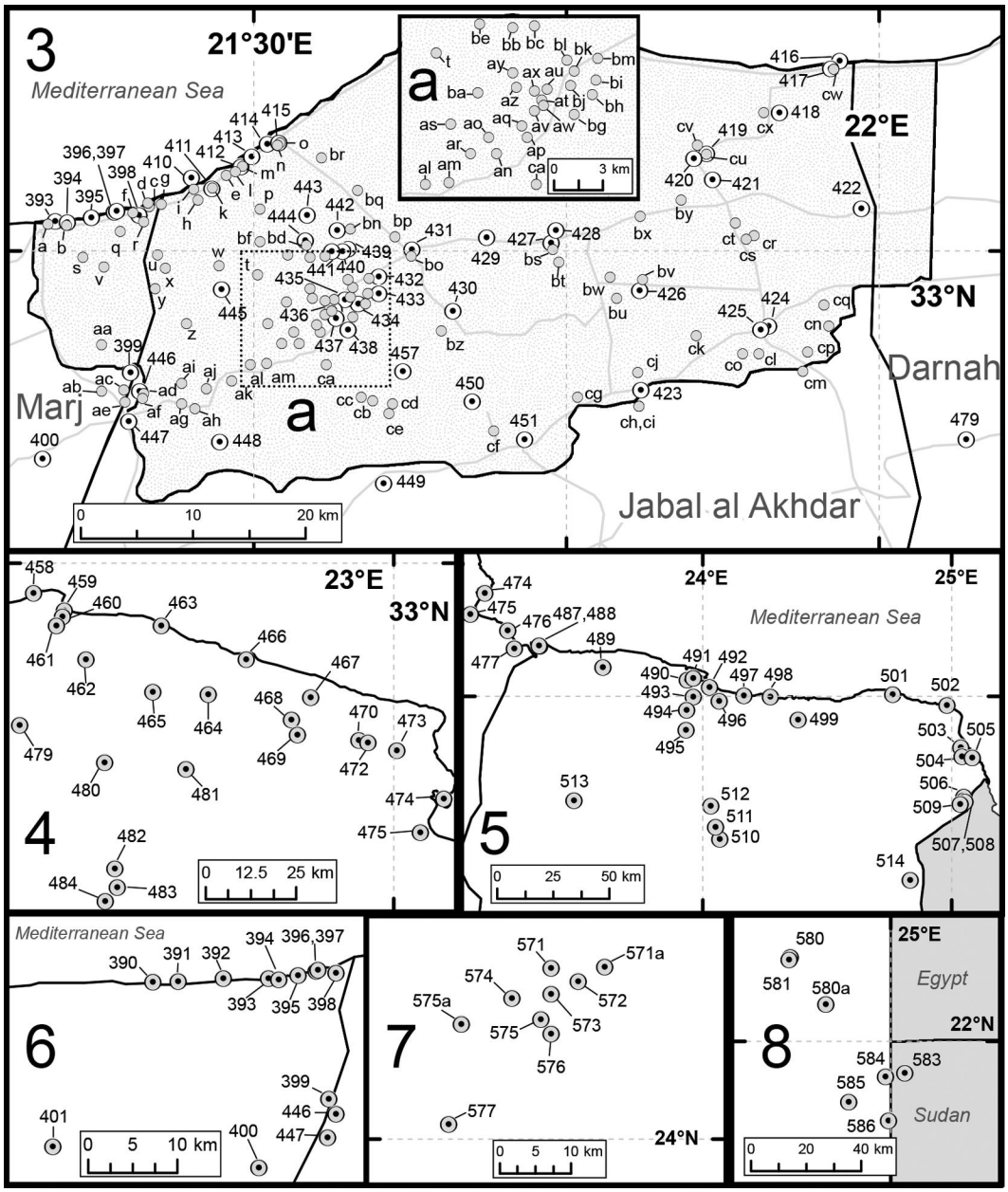


FIGURE 6. Index maps of Cyrenaica showing numbers used for localities in this atlas (see also Fig. 5). Inset maps are 3) El-Kouf National Park in Jabal al Akhdar and adjacent eastern MarjsMuzuq-Sabha area, with inset "a" showing additional localities near Wadi El-Kouf, 4) northern Darnah (= Derna), 5) northern Butnan, 6) northern Marj, 7) Al Kufrah Oasis, and 8) Jabal Arkenu and Jabal Al Uwaynat. See APPENDIX for corresponding coordinates and locality names.

matches, which triggered reexamination and subsequent acceptance or rejection of outlying records. Locality coordinates were also compared with one another to check for consistency (e.g., did the georeferenced coordinates for the locality "30 km west of Ajdabiya" actually correspond to a point 30 km west of the coordinates determined for "Ajdabiya"?). We also made informed deci-

sions about the likely meaning of verbatim localities. For example, a point "15 km north of Ras Lanuf, " if interpreted literally, would lie in the western Gulf of Sirte, so we interpreted this to mean 15 km by road in the most northerly direction possible, or in this case 15 km WNW of Ras Lanuf on the coast road. In most cases, unless there was information to the contrary, we interpreted distances as road distances and we assumed that points between two named localities were along the most direct or largest road. Undoubtedly some of our assumptions will have resulted in errors, but we are generally confident in our georeferencing. Difficult or contentious cases are discussed individually in the relevant species accounts. To facilitate future work, we provide a gazetteer (see **Appendix**) of all of the unique localities cited herein along with relevant caveats about its use and interpretation. Localities have all been numbered and listed by current name (or one of several romanizations in current use), with alternative place names, especially those used in the herpetological literature) listed secondarily.

In the gazetteer, some named localities have more than one set of corresponding coordinates. This apparent inconsistency stems from a variety of sources. In some cases coordinates reflect precise values provided with the record (i.e., previously georeferenced museum records), in other cases these may be rounded to the nearest quarter degree (e.g., some records from Kramer and Schnurrenberger 1963, see above), or we may have georeferenced them ourselves using a variety of sources. For example, many localities could not be located in existing hard copy or on-line gazetteers and necessitated the use of older maps, with varying degrees of accuracy. In other cases, for example many oases, one place name (e.g., Kufrah, Jufra, etc.) refers to a large area and unless specific information is available different authors may have interpreted these place names differently. Urban areas are another problem. Many species have been cited from Tripoli and/or Benghazi, but both are sprawling urban areas and where, precisely, any specimen may have originated is generally unknown and unknowable. Indeed, many specimens with the locality "Tripolis" may be from outside the city. In compiling these data we estimated uncertainty levels, but we consider these estimates to be crude at best. As a result, we believe that the data may be used reliably to gain a general idea of species distribution within Libya (at least for those areas that have been sampled) or to interpret correlations with major vegetation types, biogeographic barriers or other gross environmental variables. However, detailed analyses requiring fine scale distributional data, such as predictive niche modeling, would not be advised given the nature of the spatial data.

Atlas of the Reptiles of Libya

Organization of Accounts.— Each species occurring in Libya is listed by family under the currently accepted scientific name with authority, date and page of description (plus figures or plates, if relevant). The full citation to the corresponding description is provided, as are those of any synonyms based on Libyan material (or to which Libyan material might refer if the taxonomic status of Libyan populations is unresolved), each with data about the corresponding type material, including the identity and whereabouts of the type or types and a verbatim statement of the published type locality. This is followed by abbreviated citations to the taxon in several standard references for the herpetology of the North Africa which include Libya. These are: Le Berre (1989) covering the Sahara broadly, Schleich et al. (1996) covering North Africa, Kramer and Schnurrenberger (1963) on the snakes of Libya, Sindaco and Jeremčenko (2008; lizards, crocodylians and chelonians) and Sindaco et al. (2013; snakes) covering the reptiles of the Western Palearctic, and Trape et al. (2012) treating the lizards, crocodiles, and turtles of West Africa and the Sahara. Schleich et al. (1996), in particular should be consulted for biological information and for vernacular names in Arabic and other languages. Specific distributional data, along with a gazetteer are pro-

vided in Kramer and Schnurrenberger (1963). Le Berre (1989) and Schleich et al. (1996) give maps showing the approximate extent of each species' distribution, whereas the remaining sources present occurrence data at the one degree square level.

A subsequent section on distribution provides a statement of the taxon's global distribution and a summary of its occurrence in Libya, with relevant comments, if any. This is followed by a list of specific Libyan localities, these are organized by district (*shabiyah*), starting in Tripolitania, then Fezzan, and finally Cyrenaica. When Libya was under Ottoman and later Italian rule it was, at times, governed as there separate provinces or governorates, Tripolitania, Cyrenaica and Fezzan, roughly corresponding to regions recognized since antiquity. Although these regional subdivisions have, especially in modern times, not always been recognized officially, they nonetheless have remained in common use, both within Libya and outside. In the post-colonial era several different schemes of subdivision have been in sequential use. A system of 25 administrative divisions (*baladiyat*) was used beginning in 1988 (Fig. 7), but the country was reorganized into 13 districts (*shabiyat,* singular *shabiyah*) in 1995. This number increased to 26 in 1998 and 32 in 2001, and most recently was reduced to 22 in 2007 (Fig. 8). Rather confusingly some of the former *baladiyat* correspond exactly or nearly so to *shabiyat*, but others

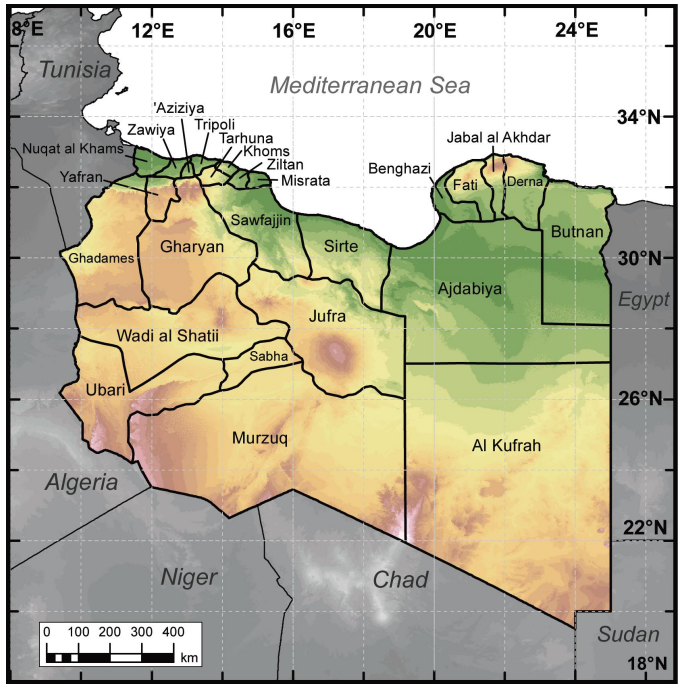


FIGURE 7. Map of Libya showing the 25 baladiyat (administrative districts) in use in Libya in 1988.

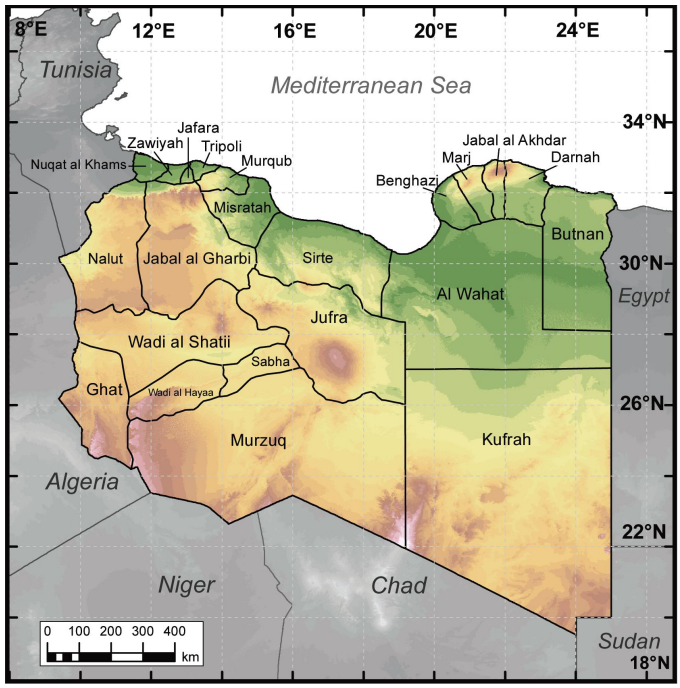


FIGURE 8. Map of Libya showing the 22 shabiyat (districts) currently in use in Libya.

do not. We illustrate both the 1988 and 2007 systems to facilitate the interpretation of localities that might be confusing, but only the 2007 *shabiyat* are given in the list of localities.

Each locality is numbered and corresponds to an entry in the gazetteer provided in the **Appendix** which gives the current name of the locality as well as older names or variants recorded in published records or associated with museum specimens. Both museum specimens and published sources are given for each locality. Specimens and citations too imprecise to allow for mapping are listed at the end of each set of localities, with whatever details are known. A comments section includes discussion of taxonomic and distributional issues for the taxon in general and as they relate to Libya in particular. Finally, the IUCN threat category for each species is provided, based on the information available at *www.iucnredlist.org/*.

Chelonia
Family Cheloniidae

Caretta caretta (Linnaeus 1758:197)

1758 *Testudo caretta* Linnaeus, Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio decima, reformata. Laurentii Salvii, Holmiæ [(Stockholm], Sweden. (4) + 823 + (I) pp.

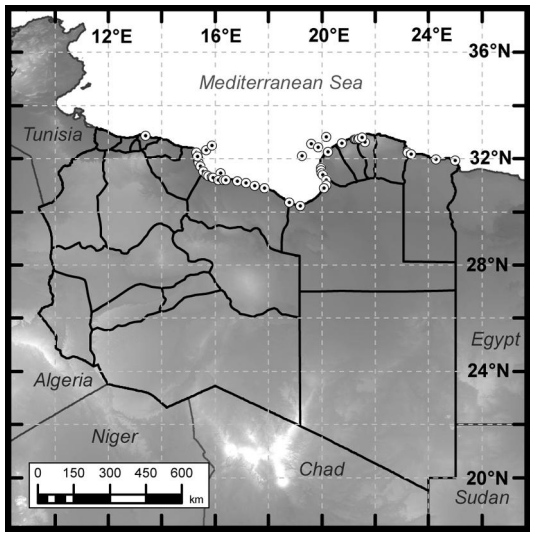
Syntypes.— Specimens illustrated in plate 39 of Catesby (1736 [see Overstreet (2015) for dating of Catesby's plates]) and described by Gronovius (1756), "insulas Americana" [restricted to "Bermuda Islands" by Smith and Taylor (1950b) and to "Bimini, British Bahamas by Schmidt (1953)]. Smith and Taylor (1950b) indicated that the type was unknown and King and Burke (1989) and Dodd (1990) stated that no type had been designated, whereas Parker (1939) and Wallin (1985) stated that the name was based entirely on literary sources for which there were no surviving specimens. Bauer (2012) explicitly identified two specimens as syntypes. Neither is believed to be extant. Although Gronovius's fish collection ultimately was obtained by the British Museum of Natural History (now The Natural History Museum, London) (Wheeler 1958), the fate of the herpetological portion of the collection is uncertain. Wallin (1985) identified three presumed types of *Testudo mydas* Linnaeus, 1758 as belonging to this species.

Caretta caretta, Schleich, Kästle, and Kabisch 1996:159.
Caretta caretta, Sindaco and Jeremčenko 2008:76.

Distribution.— Widely distributed in tropical to temperate waters of the Pacific, Indian, and Atlantic Oceans, including the Mediterranean Sea. In the Mediterranean nesting sites occur in Libya, Italy, Turkey, and the Aegean islands. There are numerous non-nesting records along the Egyptian coast (Baha El Din 2006a). In Libya they nest primarily between Sirte and Kouf National Park (Resetar 1981; Laurent et al. 1997; Saied et al. 2012).

Libyan Records (Map 1): TRIPOLITANIA: Tripoli: **44**: Haddoud and El Gomati 2011. Misratah: **89**: Hamza et al. 2009; Hamza 2010. **90**: Hamza 2010. **91**: Hamza 2010. **92**: Hamza et al. 2009; Hamza 2010. **93**: Hamza 2010. **94**: Hamza 2010. **95**: Hamza 2010. **96**: Hamza 2010. **98**: Hamza 2010. Sirte: **165**: Hamza 2010. **167**: Hamza 2010. **168**: Hamza 2010. **169**: Hamza 2010. **170**: Hamza 2010. **171**: Hamza et al. 2009; Hamza 2010. **172**: Hamza 2010. **173**: Hamza et al. 2009; Hamza 2010; Haddoud and El Gomati 2011. **177**: Laurent et al. 1997. **179:** Laurent et al. 1997. **180**: Laurent et al. 1997. **183**: Laurent et al. 1997. **193**: Laurent et al. 1997. CYRENAICA: Benghazi: **339**: Haddoud and El Gomati 2011. **369**: Hamza 2010. **370**: Hamza 2010. **371**: Hamza 2010. **373**: Hamza 2010. **375**: Laurent et al. 1997. Marj: **386**: Laurent et al. 1997. **390**: Hamza 2010. **391**: Schleich 1987. **392**: Schleich 1987. **393**: Hamza 2010. **394**: Schleich 1987. **395**: Hamza 2010. **396**: Schleich 1987. **397**: Hamza 2010. Jabal al Akhdar: **410**: Laurent et al. 1997. **413**:

Schleich 1987. **457**: KNP 1981 [5 specimens]; Resetar 1981; Schleich 1987. DARNAH: **476**: Laurent et al. 1997; Haddoud and El Gomati 2011. BUTNAN: **487**: Laurent et al. 1997; Hamza et al. 2009; Hamza 2010; Haddoud and El Gomati 2011. **488**: Hamza 2010; Haddoud and El Gomati 2011. **498**: Laurent et al. 1997. **502**: Laurent et al. 1997. AL WAHAT: **525**: Laurent et al. 1997; Haddoud and El Gomati 2011. **526**: Laurent et al. 1997. **545**: Laurent et al. 1997. OFF SHORE LOCALITIES: **588**: Haddoud and El Gomati 2011. **589**: Haddoud and El Gomati 2011. **590**: Haddoud and El Gomati 2011. **591**: Haddoud and El Gomati 2011. **592**: Haddoud and El Gomati 2011. **593**: Haddoud and El Gomati 2011. **594**: Haddoud and El Gomati 2011.



MAP 1. Distribution of *Caretta caretta* in Libya showing nesting beaches and marine observation/collection points.

COMMENTS.— This is the only species of sea turtle known to nest in Libya (van Dijk et al. 2014). Libyan sites constitute a significant proportion of Mediterranean nesting for the species (Laurent et al. 1998; Saied et al. 2012). Libyan nesting turtles have been inferred to disperse to feeding grounds throughout the Mediterranean, Macaronesia and eastern United States (Saied et al. 2012). The continental shelf off of Tunisia and Tripolitania is a particularly important neritic feeding area for Libyan populations (Casale et al. 2008). The Misratah and Sirte area populations appear to be distinct from one another (Carreras et al. 2014). In addition to the publications cited here, there are many additional gray literature reports mentioning *C. caretta*, although these generally mention the same nesting beaches given here (e.g., Laurent et al. 1999; Hamza and El Ghmati 2006; Hamza 2007).

IUCN THREAT STATUS.— Vulnerable A2b.

Chelonia mydas (Linnaeus, 1758:197)

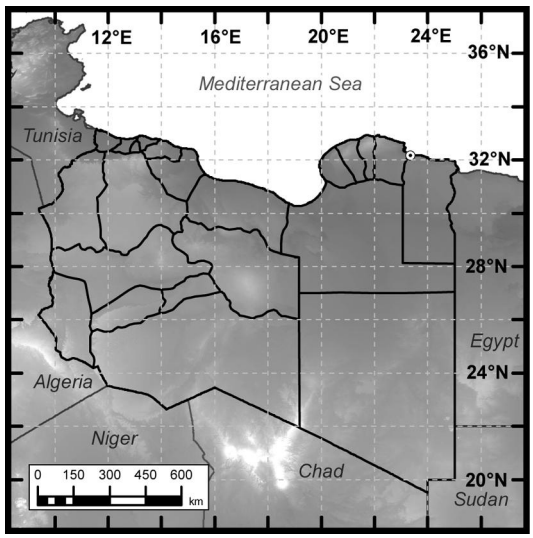
1758 *Testudo mydas* Linnaeus, Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio decima, reformata. Laurentii Salvii, Holmiæ [Stockholm], Sweden. (4) + 823 + (I) pp.

SYNTYPES.— NRM 5000?, 31488?, 31493? and UUZM 19, 26, 231 (*fide* Wallin 2001, but see below) "insulas Pelagi: insulam Adscensionis andc." [islands of the sea: Ascension Island, South Atlantic, etc.], given by Smith and Taylor (1950b) as "Ascension Island." Wallin (1985) demonstrated that surviving UUZM (Uppsala) syntypes underlying the description of *C. mydas* are, in fact, referable to *Caretta caretta*. One or more of three extant specimens of *C. mydas* in Stockholm (NRM) may also belong to the type series. Given the uncertainty, Wallin (1985) recommended that one of these specimens be designated as a neotype in order to stabilize the application of the name to follow prevailing usage. Type material had earlier been considered by Lönnberg (1896), Andersson (1900), and Holm (1957). Although Wallin (1985) concentrated on Linnaeus' own material in Swedish collections, numerous indications to works by other authors are provided in the description, including Gesner, Aldrovandi, Grew, Olearius, Bradley, Seba, Marcgrave, and Ray (see Bauer 2012 for citations to the relevant works). To the extent that these earlier authors made reference to particular individuals, whether or not they are figured or traceable, these would also have syntype status. Although Ascension Island is usually given as the type locality (e.g., Smith and Taylor 1950b), in the absence of the

designation of a neotype, the type locality in its entirety also should include any localities associated with the specimens in indicated works.

Chelonia mydas, Sindaco and Jeremčenko 2008:77.

Distribution.— Widely distributed in tropical to temperate waters of the Western Pacific, Indian, and Atlantic Oceans, including the Mediterranean Sea. In the Mediterranean nesting sites occur in Turkey and Cyprus. Numerous non-nesting records along the Egyptian coast (Baha El Din 2006a) and at scattered localities in Libya.



Map 2. Distribution of *Chelonia mydas* in Libya.

Libyan Records (Map 2): TRIPOLITANIA: "**Along the coasts between Sirte and Misratah**": Hadoud and El Gomati 1996 in Hamza 2010. CYRENAICA: Butnan: **487**: Hadoud and El Gomati 1996 in Hamza 2010; Laurent et al. 1997.

Comments.— Libyan waters have been hypothesized to be important feeding grounds for both juveniles and adults over-wintering in the Mediterranean (Hamza 2010; van Dijk et al. 2014). Hazma (2010) suggested that nesting might be possible as suitable beaches are present. Although no evidence of nests or tracks has yet been found, juveniles have been found close to the beach at Ain al Ghazalah in Butnan.

IUCN Threat Status.— Endangered A2bd.

Family Dermochelyidae

***Dermochelys coriacea* (Vandelli, 1761:7, pl. 2)**

1761 *Testudo coriacea* Vandelli, Epistola de *Holoturio*, et *Testudine coriacea* ad Celeberrimum Carolum Linnaeum Equitem naturae curiosum. Dioscoridem II. Typographia Conzatti, Patavii [Padua]. 12 pp., 2 pls.

Holotype.— Museo Zoologico, Università degli Studi di Padova, no number (*fide* Fretey and Bour 1980), "maris Tyrrheni oram in agro Laurentiano" [Tyrrhenian Sea coast at Laurentum], restricted to "Palermo" without comment by Smith and Taylor (1950b). Fretey and Bour (1980) noted two possible specific sites that could have been intended and, therefore, generalized the type locality to "la côte romaine (Italie), Mer Tyrrhénienne, Méditerranée occidentale."

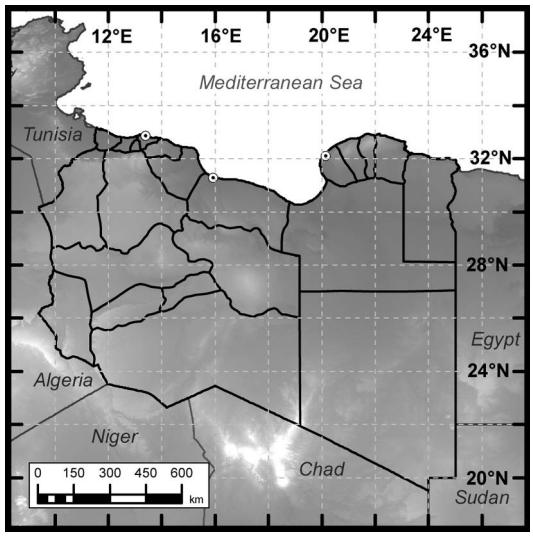
Dermochelys coriacea, Sindaco and Jeremčenko 2008:76.

Distribution.— Widely distributed in tropical to colder waters of the Pacific, Indian, and Atlantic Oceans, including the Mediterranean Sea, although no regular nesting takes place in the Mediterranean. Several nearshore records from Mediterranean Sinai and Egypt west of the Nile Delta. There is a single reported Libyan record of a beached individual from Al Khowda Beach (Hamza et al. 2009).

Libyan Records (Map 3): TRIPOLITANIA: Tripoli: **44**: Hamza 2010. Sirte: **169**: Hamza et al. 2009. "**Sella**": Capra 1949. CYRENAICA: Benghazi: **356**: Capra 1949.

Comments.— Although not breeding in the Mediterranean, the species forages in Libyan waters (van Dijk et al. 2014). In addition to the single beached record, an individual was pulled from nearshore waters of the Tajura coast in 1996 and died in the rehabilitation facility of the Marine Biology Research Centre (MBRC) at Tajura, where it was subsequently taxidermied at the MBRC Museum (Hamza 2010). Capra's (1949) records were based on a report in "L'Idea Coloniale" for 2 May 1927 (Mongàr) and an unspecified specimen in the Museo Civico di Storia Naturale di Trieste (Sella).

IUCN Threat Status.— Vulnerable A2bd.



Map 3. Distribution of *Dermochelys coriacea* in Libya showing stranding site records.

Family Geomydidae

***Mauremys leprosa saharica* Schleich 1996:29, fig. 2.2, pl. 5**

1996 *Mauremys leprosa saharica* Schleich, Beitrag zur Systematik des Formenkreises von *Mauremys leprosa* (Schweigger) in Marokko. Spixiana, Supplement 22:29, pl. 5, fig. 2.2.

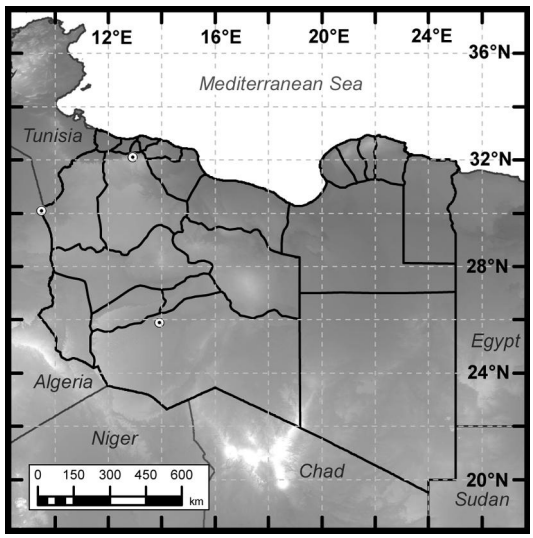
Holotype.— ZSM 1993/200, "Fort Bou Jerif, Goulmime" [Morocco].

Mauremys leprosa, Le Berre 1989:108.
Mauremys leprosa, Schleich, Kästle and Kabisch 1996:145.
Mauremys leprosa, Sindaco and Jeremčenko 2008:80.
Mauremys leprosa, Trape, Trape, and Chirio 2012:442.

Distribution.— North Africa, from southern Morocco to northwestern Libya. Scattered localities in the central and southern Sahara, including near Murzuq in Libya. Northern Moroccan and some Algerian populations are referable to the nominotypic subspecies.

Libyan Records (Map 4): TRIPOLITANIA: Nalut: **127**: Bour and Maran 1999. Jabal al Gharbi: **147**: FMNH 83188; Busack and Ernst 1980. Murzuq: **298**: Lortet 1887; Loveridge and Williams 1957. "**Tripolitania**": Loveridge and Williams 1957. "**Eastern Tripolitania**": Lortet 1887.

Comments.— Schleich (1996) and Bour and Maran (1999) described a number of North African subspecies of *Mauremys leprosa*, all



Map 4. Distribution of *Mauremys leprosa saharica* in Libya.

from Morocco. Ducotterd and Bour (2002) considered two of these, *M. l. saharica* and *M. l. vanmeerhaeghei*, each from restricted areas of southern Morocco, to be valid. Fritz et al. (2005), however, found weak genetic differentiation of populations north and south of the Atlas Mountains and no support for the distinction between *M. l. saharica* and *M. l. vanmeerhaeghei.* Subsequently, all of the named subspecies from southern Morocco have all been synonymized under *M. l. saharica* (Fritz and Havaš 2006, 2007; van Dijk et al. 2014), with populations from Tunisia, parts of Algeria, and "probably western Libya" as referable to this subspecies as well.

Loveridge and Williams (1957) mentioned localities in "Murzuch (Murzouk) in Fezzan" and "Tripolitania." Northwestern Libya was included in the distribution maps of Le Berre (1989) and Schleich et al. (1996), whereas northwestern Libyan localities were acknowledged, but not plotted by Sindaco and Jeremčenko (2008). Trape et al. (2012) did not plot the record of Busack and Ernst (1980), but showed a single degree square (25°N, 13°E) near Murzuq, presumably that signaled by Loveridge and Williams (1957). Three points were plotted by Iverson (1986, 1992), presumably Murzuq, Busack and Ernst's (1980) locality in Jabal al Gharbi, and one more slightly further to the east. However, this last locality does not appear on World Turtle Database (*http://emys.geo.orst.edu/*), which links to points on Iverson's maps. Bour and Maran (1999) also plotted Ghadames as a locality for *Mauremys*, but provided no specimen details. There are also isolated records from northern Mauritania, southern Algeria and northern Niger (Loveridge and Williams 1957; Iverson 1986, 1992), suggesting relict or translocated populations in areas with permanent water.

IUCN Threat Status.— Vulnerable A2ac + 3c.

Family Testudinidae

Testudo graeca Linnaeus, 1758

Testudo graeca nabeulensis Highfield 1990:32

1990 *Furculachelys nabeulensis* Highfield, Tortoises of north Africa; taxonomy, nomenclature, phylogeny and evolution with notes of field studies in Tunisia. Journal of Chelonian Herpetology 1(2):1–56.

Holotype.— No specimen number or collection repository stated, "the region of Nabeul, Tunisia."

Testudo graeca cyrenaica Pieh and Perälä, 2002:8, figs. 1–5 (Fig. 9)

2002 *Testudo graeca cyrenaica* Pieh and Perälä, Variabilität von *Testudo graeca* Linnaeus, 1758 im östlichen Nordafrika mit Beschreibung eines neuen Taxons von der Cyrenaika (Nordostlibyen). Herpetozoa 15(1/2):3–28.

Holotype.— MTKD 31880, "Derna (32°46′N, 22°39′E (= Darnah, Cyrenaika Ostlibyen)."

Testudo graeca [part], Le Berre. 1989:102.

Testudo graeca [part], Schleich, Kästle, and Kabisch 1996:148.

Testudo graeca, Sindaco and Jeremčenko 2008:84.

Distribution.— *Testudo graeca* as a whole is widely distributed across North Africa from southern Morocco to Cyrenaica, Libya, though with a gap in the Gulf of Sirte. In the Near and Middle East it ranges from the western Negev Desert of Israel as far as Turkmenistan and eastern Iran. Widespread in Turkey and into the Caucusus, Balkans and Greece. Introduced populations occur in the Canary Islands, France, Spain (including the Balearic Islands), Malta, and Italy, including Sardinia and Sicily.

Schleich et al. (1996) reported *Testudo graeca* from Egypt, but it does not occur there (Flower

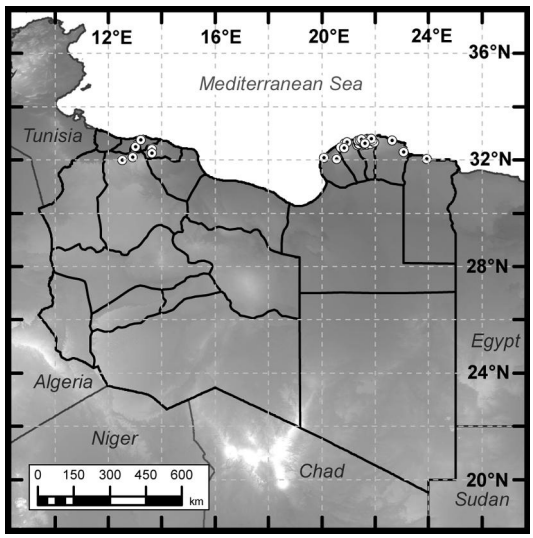
FIGURE 9. *Testudo graeca cyrenaica* from the archaeological site of Cyrene, Jabal al Akhdar, Cyrenaica, Libya (32.8239, 21.8519), 1998. Photo courtesy of Natural History Museum of Crete © A. Trichas.

1933; Buskirk 1996), although it approaches the eastern Sinai just south of the Gaza Strip at Kerem Shalom in Israel (Buskirk 1996; Baha El Din 2006a; Werner 2016). See Pieh and Perälä (2002) for a discussion of supposed Egyptian specimens.

Testudo g. cyrenaica is endemic to Libya, occurring in Cyrenaica from the region of Jabal al Akhdar [the Green Mountain] to the coast, and from west of Al Marj to as far east as El Adem. *Testudo g. nabeulensis* occurs in northwestern Tripolitania and in Tunisia.

Libyan Records (Map 5): (*Testudo graeca nabeulensis*): TRIPOLITANIA: JAFARA: **29**: MZUT R3682; Andreone et al. 2007. TRIPOLI: **45**: Werner 1909; Ghigi 1913; Zavattari 1934. MURQUB: **58**: Peters 1880, 1881; Anderson 1898; Werner 1909; Ghigi 1913; Zavattari 1934; Loveridge and Williams 1957. NALUT: **105**: Ibrahim and Ineich 2005. JABAL AL GHARBI: **140**: USNM 146811. **147**: MTKD 184072.

(*Testudo graeca cyrenaica*): CYRENAICA: BENGHAZI: **346**: MTKD 35834; Pieh and Perälä 2002. **357**: MZUF 17264; USNM 139091; Ghigi 1913; Calabresi 1923; Zavattari 1929; Loveridge and Williams 1957; Pieh and Perälä 2002. MARJ: **384**: USNM 142155. **385**: MZUT R2024; Calabresi 1923; Zavattari 1929, 1930, 1934, 1937; Loveridge and Williams 1957; Pieh and Perälä 2002; Andreone et al.



MAP 5. Distribution of *Testudo graeca* in Libya. Points in Tripolitania are records of *T. g. nabeulensis*, those in Cyrenaica are *T. g. cyrenaica*.

2007. **387**: SMF 37598. **389**: MZUT R2031; Calabresi 1923; Loveridge and Williams 1957; Zavattari 1929, 1930, 1934; Andreone et al. 2007. **400**: Frynta et al. 2000. **457aa**: Schleich 1987. **457ab**: Schleich 1987. **457ac**: Schleich 1987. **457ad**: Schleich 1987. **457ae**: Schleich 1987. **457b**: Schleich 1987. Jabal al Akhdar: **410**: Resetar 1981. **419**: FMNH 214920; Resetar 1981; Frynta et al. 2000; Pieh and Perälä 2002. **423**: USNM 140247; Pieh and Perälä 2002. **434**: USNM 146810. **438**: FMNH 214919; Resetar 1981; Pieh and Perälä 2002. **440**: MTKD 103734. **446**: ZSM 106193; Resetar 1981. **447**: CUP R 141; Frynta et al. 2000. **448**: USNM 146811. **457**: KNP 1981/184, 192, 216, 290, 316, 317, 463, 466, 488, 497, 510, 1983/[2 specimens, no number given]; ZSM 108–109/1983, 110/1997, 125/1997, 127/1997; Schleich 1987, 1989; Pieh and Perälä 2002; Schneider and Schneider 2006a, b. **457ar**: Schleich 1987. **457at**: Schleich 1987. **457au**: Schleich 1987. **457ba**: Schleich 1987. **457bb**: Schleich 1987. **457bc**: Schleich 1987. **457bm**: Schleich 1987. **457bn**: Schleich 1987. **457bo**: Schleich 1987.**457bs**: Schleich 1987. **457bv**: Schleich 1987. **457bx**: Schleich 1987. **457c**: Schleich 1987. **457ce**: Schleich 1987. **457cf**: Schleich 1987. **457ch**: Schleich 1987. **457ci**: Schleich 1987.**457cn**: Schleich 1987. **457cr**: Schleich 1987. **457cs**: Schleich 1987. **457cv**: Schleich 1987. **457e**: Schleich 1987). Darnah: **466**: MTKD 31880, SMF 36127; Pieh and Perälä 2002. **475**: MTKD 184073. Butnan: **490**: SMF 39035; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Loveridge and Williams 1957; Pieh and Perälä 2002. **495**: Loveridge and Williams 1957. **Cyrenaica**: "**Marmarica**": Zavattari 1937. **Eastern Libya**: MTKD 28774, 31879, 34852, 34853; Pieh and Perälä 2002.

(*Testudo graeca* ssp.): LIBYA: MTKD 12488–89, 14554; NHMW 34351; Andreone et al. 2007.

Comments.— Many subspecific entities have been recognized within *Testudo graeca* at various times. Van der Kuyl et al. (2002, 2005) recognized only four subspecies, but their taxonomy was criticized by Perälä (2004). Fritz and Havaš (2007) listed 17 subspecies. Van Dijk et al. (2014) recognized 10 subspecies, two of which occur in Libya. The nominate form, *T. g. marokkensis* Pieh and Perälä, 2004, and *T. g. soussensis* Pieh, 2001 occupy portions of western North Africa. *Testudo g. cyrenaica* Pieh and Perälä, 2002 occurs in Cyrenaica and *T. g. nabeulensis* (Highfiled, 1990) is in Tripolitania and Tunisia (Fritz and Havaš 2006, 2007; Van Dijk et al. 2014).

Cyrenaican populations were previously included in the nominotypical form (e.g., Iverson 1992), or assigned to *T. g. terrestris* (e.g., Wermuth and Mertens 1961). Graciá et al. (2017) found that *T. g. nabeulensis* is sister to all remaining subspecies. They also identified a new lineage of *T. graeca* based on a single individual obtained from a Cyrenaican market.

Schleich et al. (1996) suggested that the distribution of *T. graeca* in Libya was limited to the Mediterranean of Cyrenaica, with a gap westwards to the Tunisian border. However, Iverson (1986, 1992) plotted records from Tripolitania, showing a gap only across the Gulf of Sirte, and Le Berre (1989) implied a more or less continuous range across the Mediterranean coast of Libya. Schneider and Schneider (2008) mapped 4 localities for *T. g. nabeulensis* and 11 for *T. g. cyrenaica*, but did not specify place names.

Several historical records of Libyan tortoises have caused particular confusion. Peters (1880, 1881) referred to *T. campanulata* [= *T. marginata*] from Bir-Milrha. Werner (1909) suggested that this record might actually refer to *T. ibera* [= *T. graeca*] but Schneider and Schneider (2008) argued that the likely species intended was *T. kleinmanni*, based on the similarity of plastron pattern between adult *T. kleinmanni* and juvenile *T. marginata.* Another record reported by Peters (1880, 1881) from "Uadi Tessiua" was for many years placed in Kufra, deep in the desert and more than 700 km south of the nearest legitimate Libyan record of any *Testudo*. Schneider and Schneider (2008) convincingly argued that the Kufra error stems from miscitations of Werner (1909) who mentioned "Uadi Tessina [*sic*] (Rohlfs, Kufra)," referring to Rohlfs' book, entitled "Kufra" (1881)

in which Peters' records appeared. The locality is, in fact, near Gharyan, Tripolitania, and the specimen (now lost) is likely assignable to *T. g. nabeulensis*.

IUCN Threat Status.— Vulnerable A1cd.

Testudo kleinmanni Lortet, 1883:188

1883 *Testudo kleinmanni* Lortet, Études zoologiques sur la faune du Lac de Tibériade suivies d'un apercu sur la faune des lacs d'Antioche et de Homs. I. Poissons et Reptiles du Lac de Tibériade et de quelques autres parties de la Syrie. Archives du Muséum d'Histoire Naturelle. Lyon 3:99–194, pls. VI–XIX.

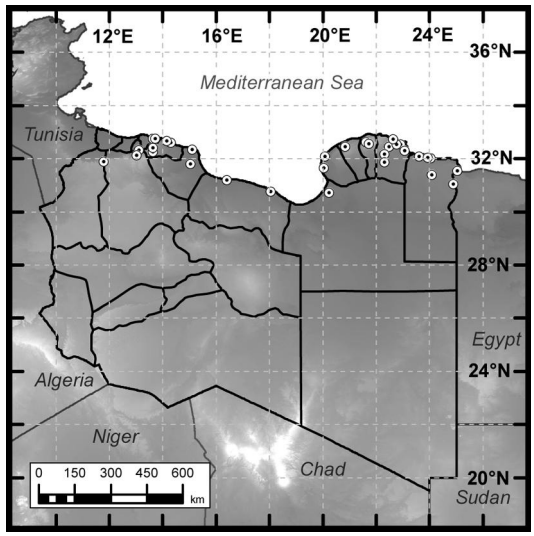
Lectotype.— MHNL 42000414 designated by Perälä (2001), "dans les sables de la basse Egypte, surtout dans les environs d'Alexandrie." A previous lectotype designation (Mertens 1967) is invalid as it is based on a specimen that was not part of the original type series *fide* Perälä (2001), which see for a further discussion and a listing of paralectotypes.

Testudo leithii, Le Berre 1989:104.

Testudo (*Pseudotestudo*) *kleinmanni*, Schleich, Kästle, and Kabisch 1996:152.

Testudo kleinmanni, Sindaco and Jeremčenko 2008:86.

Distribution.— From northwestern Libya across coastal Libya (or with a gap in the Gulf of Sirte, see Comments) and Egypt, through Sinai and Gaza (Palestinian Authority), where it has been extirpated, to southern Israel. Libyan localities fall within coastal and semi-desert regions from Qarabulli to Tobruk, inland of the Jabal al Akhdar in Cyrenaica (Schleich 1989; Schneider and Schneider 2008). There are historical records almost to the Egyptian border. In 2005 the Tripolitanian and Cyrenaican extents of occurrence/areas of occupancy were estimated at 5500 km^2/550 km^2 and 11,100 km^2/5025 km^2 (Perälä 2005) respectively, although Schneider and Schneider (2006a, b, 2008) considered these to be underestimates.



Map 6. Distribution of *Testudo kleinmanni* in Libya.

Libyan Records (Map 6): TRIPOLITANIA: Jafara: **33**: SMF 65704, 66773. Tripoli: **54**: Perälä 2005. **55**: NMP6V 72917*; Široký and Fritz 2007. Murqub: **58**: Rohlfs 1881. **60**: Peters 1880, 1881; Werner 1909; Zavattari 1934; Loveridge and Williams 1957. **66**: Sindaco, pers. obs. 4/29/2008. **68**: ZMH R 00616; Fritz and Buskirk 1997; Frynta et al 2000; Perälä 2005; Schneider and Schneider 2006a, b. **69**: Perälä 2005; Schneider and Schneider 2006a, b. Misratah: **80**: Schneider and Schneider 2006a, b. **85**: Hlawtsch 2009. Nalut: **108**: NMP6V 72917*; Široký and Fritz 2007. Jabal al Gharbi: **154**: Fritz and Buskirk 1997; Perälä 2005. Sirte: **173**: Schneider and Schneider 2006a, b. **186**: MTKD 47391. **188**: Schneider and Schneider 2006a, b. "**between Tarhuna and Bin Ghashir**": RMNH RENA 11362; Fritz and Buskirk 1997; Perälä 2005. "**Sirtica"**: Zavattari 1937; Lambert and Buskirk *in* Schneider and Schneider 2008. FEZZAN: Ghat: **253**: FMNH [no specific number given]; Perälä 2005. CYRENAICA: Benghazi: **357**: MZUT R3681; Werner 1909; Zavattari 1929, 1934; Andreone et al. 2007; Schneider and Schneider 2008. **367**: FMNH [no specific number given]; USNM 139092–94; Perälä 2001, 2005. Marj: **385**: FMNH [no specific number given]; Zavattari 1937; Perälä 2005.

Jabal al Akhdar: **451**: Schleich 1989; Perälä 2005. **457**: FMNH [no specific number given]; Perälä 2005. Darnah: **466**: MTKD D 31598; MZUT R2026; SMF 36124; Zavattari 1929, 1930, 1934; Calabresi 1923; Perälä 2001; Perälä 2005; Andreone et al. 2007; Schneider and Schneider 2008. **468**: Perälä 2005. **469**: Schneider and Schneider 2006a, b. **470**: Schleich 1989. **475**: MTKD 47390; Schneider and Schneider 2006a, b. **481**: Perälä 2005. **483**: Perälä 2005. **484a**: Schleich 1989; Perälä 2005. Butnan: **489**: Perälä 2005. **490**: SMF 35406, 37643; Schleich 1989. **492**: Perälä 2005. **509**: Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinceguerra 1931; Perälä 2005; Schneider and Schneider 2008. **510**: Schleich 1989. **515**: Vinciguerra 1929; Zavattari 1929; Loveridge and Williams 1957. **521**: Iverson 1992; Perälä 2005; Schneider and Schneider 2008. Al Wahat: **529**: Iverson 1992; Perälä 2005; Schneider and Schneider 2008. "**Cyrenaica**": Werner 1909. "**Northeastern Libya**": PCHP 4319, 4321, 4323, 4340, 4341, 4438, 4441-43, 4445, 4446, 4484; Perälä 2001. LIBYA: MTKD D 26016, 28287, 29119; NMP 71036, 71070, 72917; RMNH RENA 11364; SMF 35546, 36061, 41201; Perälä 2001.

Comments.— *Testudo leithi* Günther, 1869, although a senior synonym of *T. kleinmanni*, is unavailable as it is also a junior homonym of a nomen applying to another species. *Testudo werneri* Perälä, 2001, with its type locality in Israel, was synonymized with *T. kleinmanni* by Baha El Din (2006) and this action has subsequently been supported by several studies (Široký and Fritz 2007; Attum et al. 2007), although it is retained as subspecifically distinct by some authors (e.g., Werner 2016).

Loveridge and Williams (1957) summarized Libyan records known at the time as "Barca; between Bir Sceferzen and Esc-Scegga on the Giarabub to Tobruk road; Sirtica; Wadi Tessina in Kufra Oasis." The Kufra record noted by Loveridge and Williams (1957) traces to Werner's (1909) reference to the book title "Kufra" in which the specimen was noted by Wilhelm Peters (1880, 1881), and not the locality (see Comments under *T. graeca*). Anderson (1898) and Werner (1909) considered this specimen — listed as a *T. graeca* by Peters — to be *T. leithi* [= *T. kleinmanni*]. Although the specimen is now lost (Schneider and Schneider 2008) and its identity cannot now be confirmed, we consider Peters' original identification to be correct. We accept the interpretation of Peters' other Libyan tortoise record, from Bir-Milhra, as *T. kleinmanni*, as argued by Schneider and Schneider (2008), who investigated all earlier records for *T. kleinmanni* in Libya.

Arbel (1984) did not include even eastern Libya in the range of *T. kleinmanni* (*fide* Fritz and Buskirk 1997), but records from northern Cyrenaica have generally been regarded as valid (e.g., Buskirk 1985; Le Berre 1989; Schleich et al. 1996). However, localities to the west, e.g. "Sirtica" [= Sirte, or perhaps the general region of northern Libya west of the heavily populated areas of Cyrenaica (Schneider and Schneider 2008)] have been controversial (e.g., Perälä 2005). Iverson (1986, 1992) mapped the Sirte locality as well as one (1992) or two (1986) localities in the vicinity of Tripoli. According to Fritz and Buskirk (1997) these localities correspond to "Homs" = Al Khums (ZMH R 00616) and "between Tarhuna and Bin Ghashir" (RMNH 11362) and suggest that the Tripolitanian records for this species are valid. Fritz and Buskirk (1997) also enumerated other vouchered and unvouchered records from Tripolitania and Hlawatch (2009) confirmed the presence of the species near Misratah. Schneider and Schneider (2008) mapped additional localities without providing exact coordinates, these are not included in our list.

Localities listed above with an asterisk (*) are vouchered by specimens NMP6V 72917/1–4. However, as noted by Široký and Fritz (2007), it is unclear which of the four specimens is associated with which of the two localities.

IUCN Threat Status.— Critically Endangered A2abcd + 3d. Ongoing decline is largely due to agriculture and the pet trade (Perälä 2003). This species is now extirpated in portions of its range (Gaza, and much of its former Egyptian range).

Squamata
Family Agamidae

***Agama tassiliensis* Geniez, Padial and Crochet, 2011: 32, figs. 2, 3, 4, 6a (FIGS. 10–11)**

2011 *Agama tassiliensis* Geniez, Padial and Crochet, Systematics of North African *Agama* (Reptilia: Agamidae): a new species from the central Saharan mountains. Zootaxa, 3098:26–46.

HOLOTYPE.— MNHN 2010.0632; "Tassili n'Ajjer (south-eastern Algeria), 5 km south-south-west from Iherir [WGS84 25.3500°N/ 8.3911°E/ 1428m a.s.l.]."

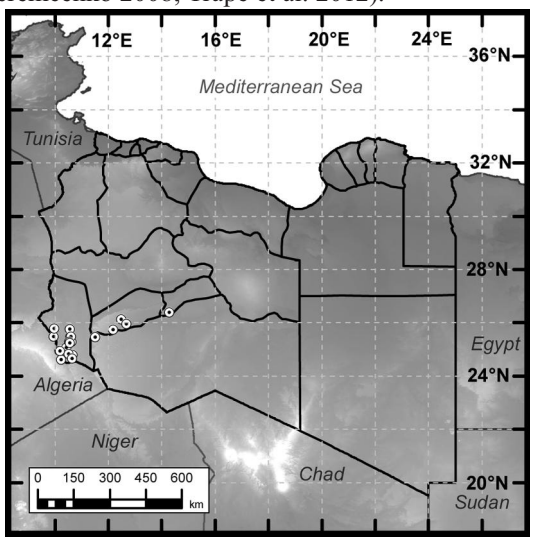
Agama impalearis [part], Le Berre 1989:120.

Agama impalearis [part], Schleich, Kästle, and Kabisch 1996:285.

Agama impalearis [part], Sindaco and Jeremčenko 2008:143.

Agama tassiliensis, Trape, Trape and Chirio 2012:154.

DISTRIBUTION.— The central Sahara, in the highland areas surrounding the Tassili n'Ajjer and Ahaggar (Hoggar), Algeria, Aïr Mountains, Niger, Adjar des Ifhoras, Mali, and Tibesti, Chad. In Libya it occurs in the southwest of the country in the region of the Akakus Mountains (Tadrart Acacus) and Messak Settafet Plateau (Sindaco and Jeremčenko 2008; Trape et al. 2012).



MAP 7. Distribution of *Agama tassiliensis* in Libya.

Libyan records (Map 7): FEZZAN: GHAT: **230**: PGe.860; Geniez et al. 2011. **231**: PGe.999; Geniez et al. 2011. **234**: Essghaier et al. 2015. **237**: Sindaco, pers. obs. 4/20/2008. **238**: Sindaco, pers. obs. 4/21/2008. **240**: Sindaco, pers. obs. 4/21/2008. **241**: Sindaco, pers. obs. 4/21/2008. **242**: CUP R 139; Frynta et al. 2000. **246**: Kratochvíl et al. 2002; Essghaier et al. 2015. **248**: ZCT 2006.73; Ibrahim 2008a. **249**: MCSN 1855; Zavattari 1937. **256**: MCSN 1786, 1828; Scortecci 1934, 1937b. **257**: Sindaco, pers. obs. 4/21/2008. **258**: CUP R 134; Frynta et al. 2000. **260**: Sindaco, pers. obs. 4/22/2008. **261**: PGe.854; Geniez et al. 2011. **263**: CUP R 132; Frynta et al. 2000. WADI AL HAYAA: **266**: PGe.920; Geniez et al. 2011. **267**: Sindaco pers. comm. 4/24/2008. SABHA: **281**: MCSN 1773. MURZUQ: **265**: CUP R 135; Frynta et al. 2000; NMBA-REPT 17812; ZFMK 63669; Geniez et al. 2011; Sindaco pers. comm. 4/24/2008. **292**: PGe.867; Geniez et al. 2011. "**Sahara tripolitain**": Angel and Lhote 1938.

COMMENTS.— Geniez et al. (2011) recently described this central Saharan endemic from the *Agama impalearis* complex. *Agama impalearis sensu stricto* is now restricted to Western Sahara, Morocco, and adjacent areas of northwestern Algeria (Gonçalves et al. 2012). Trape et al. (2012) plotted the records of Geniez et al. (2011) at a 1° scale. *Agama tassiliensis* is the only member of its genus occurring in Libya and we have assumed that all pre-2011 references to *A. impalearis* are referable to it. MCSN 1787 is purportedly from near coastal town of Misratah (not mapped), and this is certainly in error. Although most earlier authors suggested a Libyan distribution similar to that depicted here, Le Berre (1989) included all but the far southeastern portion of the country within the distribution of *A. impalearis*.

IUCN THREAT STATUS.— Least Concern.

FIGURE 10. *Agama tassiliensis* male from Tadrart Akakus, Ghat, Fezzan, Libya, 2008. Photo © Roberto Sindaco.

FIGURE 11. *Agama tassiliensis* female from Adadh area, Tadrart Akakus, Ghat, Fezzan, Libya, 2008. Photo © Roberto Sindaco.

Pseudotrapelus chlodnickii Melnikov, Śmiełowski, Melnikova, Nazarov, and Ananjeva 2015:55, figs. 2, 3

2015 *Pseudotrapelus chlodnickii* Melnikov, Śmiełowski, Melnikova, Nazarov and Ananjeva. Red'n'blues: a new species of *Pseudotrapelus* (Agamidae, Sauria) from Sudan, Africa. Russian Journal of Herpetology 22(1):53–60.

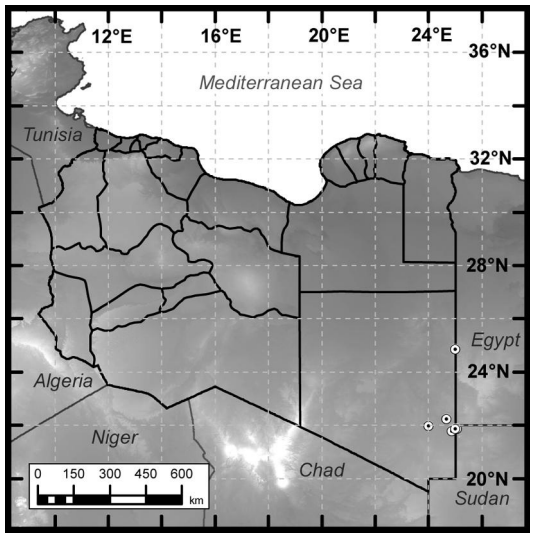
HOLOTYPE.— ZISP 28540, "Gamamiya, Bayuda Desert, Sudan, Africa (19°27′18.3″N 32°48′40.5″E)."

Agama sinaita, Le Berre, Faune du Sahara 1989:128.
Pseudotrapelus sinaitus [part], Schleich, Kästle, and Kabisch 1996:290.
Pseudotrapelus sinaitus [part], Sindaco and Jeremčenko 2008:159.
Pseudotrapelus sinaitus, Trape, Trape, and Chirio 2012:160.

DISTRIBUTION.— Northern Sudan, southern and eastern Egypt (including part of the Sinai Peninsula), and extreme southeastern Libya (Sindaco and Jeremčenko 2008; Trape et al. 2012). The map presented by Tamar et al. (2016a) also implies that the species is present in northeastern Chad,

but this is not currently supported by voucher specimens.

Libyan Records (Map 8): CYRENAICA: KUFRAH: **581**: BMNH 1975.1228. **582**: Sindaco and Jeremčenko 2008; Trape et al. 2012. **583**: MZUF 721. **584**: Scortecci 1935c; Zavattari 1937. **586**: MZUF 722; Scortecci 1935c. **587**: MZUF 720; Scortecci 1935b,c, 1939.



MAP 8. Distribution of *Pseudotrapelus chlodnickii* in Libya.

COMMENTS.— This recently described species was previously included within *Pseudotrapelus sinaitus* (Heyden, 1827), a species now restricted to the Sinai Peninsula, parts of Jordan, southern Syria, western Iraq, and northwestern Saudi Arabia (Tamar et al. 2016a). The original authors of *P. chlodnickii* (Melnikov et al. 2015) provided only a few localities for the taxon, all in Sudan. As noted by Tamar et al. (2016a), the piecemeal reevaluation of the *Pseudotrapelus sinaitus* complex by Melnikov and colleagues (Melnikov et al. 2012, 2013a, 2013b, 2014, 2015; Melnikov and Pierson 2012; Melnikov and Melnikova 2013; Melnikova et al. 2015), based on small samples form restricted localities, left the taxonomic status of many populations of *Pseudotrapelus* unresolved. Tamar et al. (2016a) sampled sufficiently broadly to confirm that a specimen from southwestern Egypt, close to the Kufrah records, was conspecific with near-topotypical *P. chlodnickii*.

Le Berre (1989) did not include Libya in his map of the distribution of *Agama sinaita*, but explicitly mentioned Scortecci's (1939) record from Jabal Al Uwaynat. This locality straddles the Libyan, Sudanese and Egyptian borders and historical records from Jabal Al Uwaynat and Ayn Murr have been variously interpreted by different authors as being Libyan (e.g., Kramer and Schnurrenberger 1963) or Sudanese (Baha El Din 2006a). We here treat the record as Libyan.

IUCN THREAT STATUS.— Not evaluated, but anticipated to be Least Concern.

Trapelus mutabilis (Merrem, 1820)

Trapelus mutabilis mutabilis (Merrem, 1820:50) (FIG. 12)

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

NEOTYPE.— ZFMK 64395 designated by Wagner et al. (2011), "Egypt, 10 km northwest of Cairo." Original type locality "Egypto"/"in Aegypto" (Merrem, 1820). Merrem (1820) based his description on specimens figured by Geoffroy Saint-Hilaire (1809, pl. 5, figs. 3–4) in the "Description de l'Égypte". According to Wagner et al. (2011) there is no corresponding type in MNHN, where specimens figured in the "*Description de l'Égypte*" would be expected to be deposited, nor in the University of Marburg, where Merrem had been based. Likewise there are no possible types in BMNH, where Baha El Din (2006) suggested the type was housed.

Trapelus mutabilis poppeki Wagner, Melville, Wilms and Schmitz 2011:896, fig. 7

2011 *Trapelus mutabilis poppeki* Wagner, Melville, Wilms and Schmitz, Opening a box of cryptic taxa – the first review of the North African desert lizards in the *Trapelus mutabilis* Merrem, 1820 complex (Squamata: Agamidae) with descriptions of new taxa. Zoological Journal of the Linnaean Society, 163:884–912.

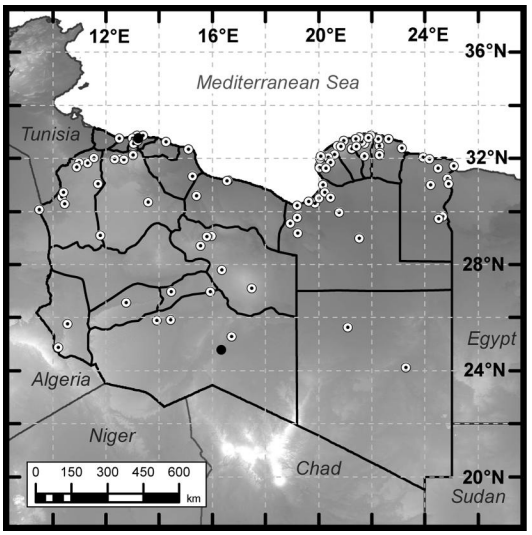
FIGURE 12. *Trapelus mutabilis mutabilis* from 5 km south of Gadamis, Nalut, Tripolitania, Libya, 2008. Photo © Roberto Sindaco.

HOLOTYPE.— ZFMK 63678, "Libya: east of Tarbu, 24.48.27N, 16.19.11E, 490m a.s.l."

Agama mutabilis [part], Le Berre 1989:116.
Trapelus mutabilis [part], Schleich, Kästle and Kabisch 1996:291
Trapelus mutabilis [part], Sindaco and Jeremčenko 2008:162.
Complexe *Trapelus mutabilis*, Trape, Trape, and Chirio 2012:162.

DISTRIBUTION.— Following the taxonomic conclusions of Wagner et al. (2011), this species as a whole occurs from Algeria east through Libya to the Nile (*T. m. mutabilis*), and eastwards to Iraq, Kuwait and the western shore of the Persian Gulf (*T. m. pallidus*). *Trapelus m. poppeki* is known only with certainty from two disjunct localities in western Libya.

Libyan Records (Map 9): (*Trapelus mutabilis mutabilis*): TRIPOLITANIA: ZAWIYAH: **11**: BMNH 1965.1186–87. **22**: MCSN 3029. JAFARA: **28**: Andreucci 1913. TRIPOLI: **36**: BMNH 1954.1.5.63–65. **39**: FMNH 82950. **44**: SMNS 438. **45**: MCSN 4231; MZUT R313; ZMB 15276–80, 15296, 15316–17, 54582, 54585–86, 54591–97; Condorelli-Francaviglia 1896; Werner 1909; Andreucci 1913; Ghigi 1913; Zavattari 1934. **46**: Sayers 1964. MURQUB: **68**: Peters 1880, 1881. MISRATAH: **80**: MSNG 52507; Boulenger 1914; Zavattari 1934. **88**: RMNH RENA 13915. NALUT: **101**: Sindaco, pers. obs. 4/30/2008. **103**: Sindaco, pers. obs. 4/30/2008. **104**: BMNH 1965.1183. **105**: AIC no number provided; MNHN 2004.0085; Ibrahim and Ineich 2005. **109**: BMNH 1965.1185. **113:** Sindaco, pers. obs. 5/2/2008. **114**: BMNH 1954.1.5.66. **116**: Sindaco, pers. obs. 5/2/2008. **130**: Sindaco, pers. obs. 4/1/2008. JABAL AL GHARBI: **137**: ZSM 116/1994/1, 116/1994/2. **140**: BMNH 1965.1184. **143**: NHMC 80.3.90.20. **154**: MCSN 4230; MZUT R336; Andreucci 1913; Zavattari 1934. **160**: BMNH 1954.1.5.67. **163**: Brito et al. 2008. SIRTE: **174**: MCSN 1947; Peters 1880, 1881. **175**: ZMB 37010, 54429–30. **199**: MCSN 1832; MCSN 4229. "**Tripolitania settentrionale**": Zavattari 1937. "**Ras Wagis**": BMNH 1901.10.28.4. FEZZAN: JUFRA: **213**: BMNH 1954.1.5.69. **216**: MCSN 1950. **218**: MCSN 1778. **226**: MCSN 1780, 4226; Scortecci 1935b. **228**: BMNH 1954.1.5.68. GHAT: **234**: Essghaier et al. 2015. **252**: MCSN 1843. **253**: MCSN 1839. WADI AL HAYAA: **269**: Essghaier et al. 2015. SABHA: **286**: BMNH 1954.1.5.72. **291**: NMBA-



Map 9. Distribution of *Trapelus mutabilis* in Libya. White dots represent the nominotypical form, black dots are *T. m. poppeki*.

REPT 15306–09, 15395. Murzuq: **298**: SMF 30275. **303**: Zavattari 1937. **331**: MCSN 1781; Scortecci 1935b. "**Fezzan**": MCSN 1831, 1848; MNHN 1966.1101; NHMW 24732. "**nella valletta che conduce alla ghelta di Uantekèli**": MCSN 2570; Scortecci 1937a. CYRENAICA: Benghazi: **344**: BMNH 1954.1.5.73; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **348**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **350**: BMNH 1954.1.5.74. **354**: BMNH 1955.1.1.43–45. **357**: BMNH 1945.11.9.6; MZUF 662, 2772, 4750; SMF 34455; UMNH 4241; von Martens 1883; Werner 1909; Andreucci 1913; Ghigi 1913, 1920; Calabresi 1923; Vinciguerra 1927; Gestro and Vinciguerra 1931; Zavattari 1922, 1929, 1930, 1934. **361**: Ghigi 1920. **364**: Cornalia in Haimann 1882, 1886; Zavattari 1934. **367**: MZUF 843; MZUT R303; NHMC 80.3.90.22–23; Calabresi 1923; Zavattari 1929, 1930. **376**: MCSN 2440; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Scortecci 1935b. Marj: **384**: MCZ R 4454. **385**: MCSN 1823; MZUT R342; Calabresi 1923; Zavattari 1929, 1930, 1934, 1937. **389**: MZUT R300; Ghigi 1920; Calabresi 1923; Zavattari 1929, 1930, 1934. **403**: NHMC 80.3.90.1–9. **404**: MZUF 723. **457q**: Schleich 1987. Jabal al Akhdar: **410**: FMNH 82949, 214945; Resetar 1981. **417**: Ghigi 1920; Calabresi 1923; Zavattari 1922, 1929, 1930, 1934. **421**: Zavattari 1929, 1930, 1934. **448**: SMF 55850–51, 69347. **451**: Schleich 1987. **452**: Calabresi 1923; Zavattari 1929, 1930. **454**: Schleich 1987. **457**: KNP 1981/330, 358, 1983/519; Schleich 1987. **457c**: Schleich 1987. **457f**: Schleich 1987. **457g**: Schleich 1987. **457h**: Schleich 1987. **457i**: Schleich 1987. **457k**: Schleich 1987. **457m**: Schleich 1987. **457n**: Schleich 1987. Darnah: **462**: Schleich 1987. **466**: BMNH 1954.1.5.75; MZUT R332; NHMW 24874; Werner 1909; Andreucci 1913; Ghigi 1913; Calabresi 1923; Zavattari 1929, 1930, 1934. **474**: Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931. **480**: ZSM 141/1983; Schleich 1987. **482**: Schleich 1987. **484**: MZUT R304; Calabresi 1923; Zavattari 1929, 1930, 1934. Butnan: **490**: MSNG 27770. **497**: USNM 146805. **505**: Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931. **509**: Vinciguerra 1927; Zavattari 1934. **514**: Vinciguerra 1927; Zavattari 1929, 1930. **516**: USNM 146793. **520**: Zavattari 1929, 1930. **521**: Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931. Al Wahat: **529**: MNHN 1966.1098–1100. **530**: Peters 1880, 1881; Werner 1909; Zavattari 1930, 1934. **525**: BMNH 1965.1190. **559**: MCSN 1783–84, 1838; Scortecci 1935b. **533**: Schleich 1987. **540**: BMNH 1965.1181–82; ZSM 139/1983, 142/1983; Schleich 1987. **538**: NMBA-REPT 15305. **544**: SMF 69050; Zavattari 1929, 1934; Vinciguerra 1931. **551**: SMF 55852–4. **553**: ZSM 140/1983; Zavattari 1937; Schleich 1987. **554**: MCSN 1941; Scortecci 1935b. **564**: Zavattari 1929, 1930, 1934. Kufrah: **566**: MCSN 1834. **575**: ZMB 17919–21; Peters 1880, 1881; Werner 1909. "**Cyrenaica**": BMNH 1954.1.6.90–97; MZUT R3313; ZMB 10505. "**150 km South of Tobruk**": SMF 51823. "**60 km South of Kapuzzo**": SMF 51822. "**Butnan**": Vinciguerra 1927; Zavattari 1929, 1930; Gestro and Vinciguerra 1931. "**Sebkha Ayn al Zarag Dunes**": Schleich 1987. "**Marmarica**": Zavattari 1937. "**pressi Oasi di Tanarqa**": MCSN 4227. LIBYA: SNHM BS N 55783.

(*Trapelus mutabilis poppeki*): TRIPOLITANIA: Tripoli: **45**: ZFMK 20848; Wagner and Böhme 2007; Wagner et al. 2011. FEZZAN: Murzuq: **327**: ZFMK 63678; Wagner et al. 2011.

Comments.— *Trapelus mutabilis* was previously regarded as having a broad distribution across North Africa from Western Sahara to Egypt (Le Berre 1989). Wagner and Böhme (2007) described *T. schmitzi* from Ennedi Mountains of Chad. Subsequently, Wagner et al. (2011) revised the *T. mutabilis* complex and recognized an apparently endemic Libyan subspecies, *T. m. poppeki*, until now known only from two specimens from the north and south of western Libya. However, they did not explicitly refer other Libyan material to particular taxa within the *T. mutabilis* group. Their newly described *T. boehmei* occurs from Mauritania through Morocco and at least in one locality in northwestern Algeria (Wagner et al. 2011). Trape et al. (2012) considered that material from Libya and Egypt was referable to *T. mutabilis*, whereas material from further west, including Algeria, was *T. boehmei*, however, they did not differentially plot these two taxa on their map. Wagner et al. (2011) left open the possibility that *Agama aspera* Werner, 1893, with its type locality in the northeast of the Algerian Sahara, might be a valid species of *Trapelus*. It is possible that Libyan *Trapelus* from the west of the country, may be referable to this form. On the other hand, *T. mutabilis mutabilis*, with its neotype from near Cairo, Egypt, almost certainly is the correct name for Libyan specimens east of the *T. m. poppeki* sites. However, the two localities from which *T. m. poppeki* is known are very close to sites for *T. m. mutabilis* and we think it is likely that a single taxon may extend westwards from Egypt to at least eastern Algeria and that the genetic distance between the two forms is at least partly reflective of the more than 1500 km between the only samples used in the study by Wagner et al. (2011). We here treat Libyan material not explicitly assigned to *T. m. poppeki* by Wagner et al. (2011) as referable to the nominotypical form and tentatively regard *T. m. poppeki* as valid pending further study.

IUCN Threat Status.— Not evaluated, but anticipated to be Least Concern.

Family Uromastycidae

***Uromastyx acanthinura* Bell, 1825:457, pl. xvii. (Fig. 13)**

1825 *Uromastyx acanthinurus* Bell, Description of a new species of lizard. The Zoological Journal 1: 457–460, pl. xvii.

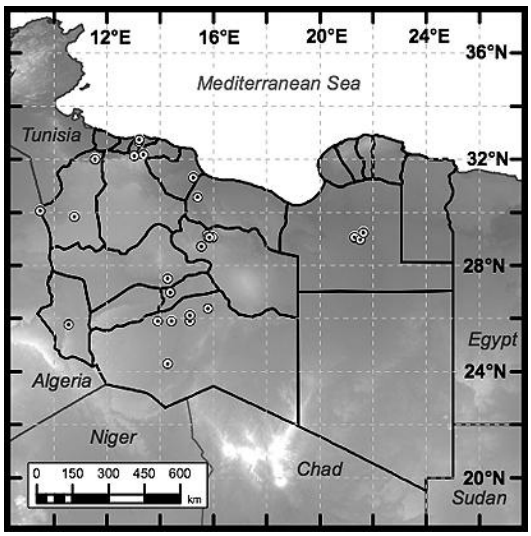
Holotype.— OUM 7845 *fide* Wilms et al. (2007) [originally stated by Bell as "In Mus. Nost." referring to his own collection, the majority of which was purchased by Rev. Frederick W. Hope and, following the latter's death in 1862, were donated to the Oxford University Museum in a series of transactions lasting well into the 20th century (Davies and Hull 1976).], "Habitat in Africâ." Restricted to "Algeria 'near Biskra, northwards to El Kantara" by Flower (1933), based on Hartert's (1913) description of the distribution of the nominotypical form of the species.

Uromastix acanthinura [part], Le Berre 1989:130.
Uromastyx acanthinura [part], Schleich, Kästle and Kabisch 1996:298
Uromastyx acanthinura, Sindaco and Jeremčenko 2008:165.
Complexe *Uromastyx acanthinura*, Trape, Trape, and Chirio 2012:168.

Distribution.— Northwestern Africa, from the northern border of Western Sahara to west-central Libya. Schleich et al. (1996) included all of Libya and Egypt west of Sinai in the distribution of the species and Sindaco and Jeremčenko (2008) plotted several localities in eastern Libya and Egypt as questionably referable to this taxon. However, Wilms (2001, 2005) and Wilms and Böhme (2007) excluded the northeastern quadrant of Libya from the distributional range of the genus *Uromastyx* and we regard records from this region to be in error.

FIGURE 13. *Uromastyx acanthinura* from vicinity of Gadamis, Nalut, Tripolitania, Libya, 2008. Photo © Roberto Sindaco.

Libyan Records (Map 10): TRIPOLI: **45**: NHMW 22116; ZSM 112/1983; Werner 1909; Wilms and Böhme 2001; Wilms et al. 2009. **47**: BMNH 1954.1.1.13. MURQUB: **57**: BMNH 1964.2075; Wilms and Böhme 2001; Wilms et al. 2009. MISRATAH: **88**: MZUT R401. NALUT: **105**: AIC (5 specimens) no number provided; MNHN 2004.0093; Ibrahim and Ineich 2005. **123**: Harris et al. 2007; Brito et al. 2008. **127**: SMNS 596. **130**: Sindaco obs. 4/1/2008. JABAL AL GHARBI: **154**: NMBA-REPT 8323; ZSM 472/79; Werner 1909; Ghigi 1913; Zavattari 1934; Wilms and Böhme 2001; Wilms et al. 2009. SIRTE: **199**: MZUF 743; Wilms and Böhme 2001; Wilms et al. 2009. FEZZAN: WADI AL SHATII: **210**: Essghaier et al. 2015. JUFRA: **213**: MCSN 1799, 1865; ZSM 18/1968 (1)–(4), 181/36; Scortecci 1934b; Wilms and Böhme 2001; Wilms et al. 2009. **215**: ZSM 510/1978; Wilms and Böhme 2001; Wilms et al. 2009. **216**: ZMB 18079; Peters 1880, 1881; Zavattari 1934. **217**: Zavattari 1937. **218**: MCSN 1880. GHAT: **234**: Essghaier et al. 2015. SABHA: **268**: Kramer and Schnurrenberger 1963; Schnurrenberger 1963. MURZUQ: **298**: MCSN 1798. **303**: Zavattari 1937; Essghaier et al. 2015. **313**: ZCT 2005.31; Ibrahim 2008a. **316**: ZCT 2006.70; Ibrahim 2008a. **318**: AIC 2006.1550; Ibrahim 2008a. **324**: Zavattari 1934. "**Fezzan**": AMNH R 71839. "**Sahara tripolitain**": Angel and Lhote 1938. CYRENAICA: AL WAHAT: **562**: Zavattari 1937. **564**: MCSN 1861; Zavattari 1937. **564a**: Zavattari 1934, 1937.



MAP 10. Distribution of *Uromastyx acanthinura* in Libya. Records from northern Cyrenaica are doubtful and have not been plotted.

Data in error (not mapped): CYRENAICA: Marj: **385**: MZUF 744; Werner 1909; Wilms and Böhme 2001; Wilms et al., 2009. Darnah: **466**: Werner 1909; Zavattari 1934.

Comments.— Libyan specimens are referable to the nominotypical subspecies. *Uromastyx acanthinura nigriventris* is restricted to the western portion of the species' distribution in Western Sahara, Morocco, and western Algeria (Wilms 2001, 2005)**.** Several authors have suggested that, while there are a large number of *U. acanthinura* samples from southwestern Libya, many of them might have been misidentified and should actually be referred to either *U. geyri*, or *U. alfredschmidti* (Wilms and Böhme, 2001; Sindaco et al. 2012), although there appear to be no vouchered Libyan *U. geyri* records. Schleich et al. (1996) and Trape et al. (2012) incorrectly gave Merrem (1820) as the author of this taxon name. In fact, Merrem's *Uromastyx acanthurus* is today the iguanid *Ctenosaura acanthurus*.

IUCN Threat Status.— Not evaluated, but anticipated to be Least Concern.

***Uromastyx alfredschmidti* Wilms and Böhme 2001:95, figs. 15, 16 (Fig. 14).**

2001 *Uromastyx alfredschmidti* Wilms and Böhme, Revision der *Uromastyx acanthinura* - Artengruppe, mit Beschreibung einer neuen Art aus der Zentralsahara (Reptilia: Sauria: Agamidae). Zoologische Abhandlungen des Staatliches Museum für Tierkunde in Dresden 51(8):73–104.

Holotype.— ZFMK 24643, "Algerien, Tassili N'Ajjr, Tamrit Plateau (1600 m), ca. 30 km nordöstlich von Djanet."

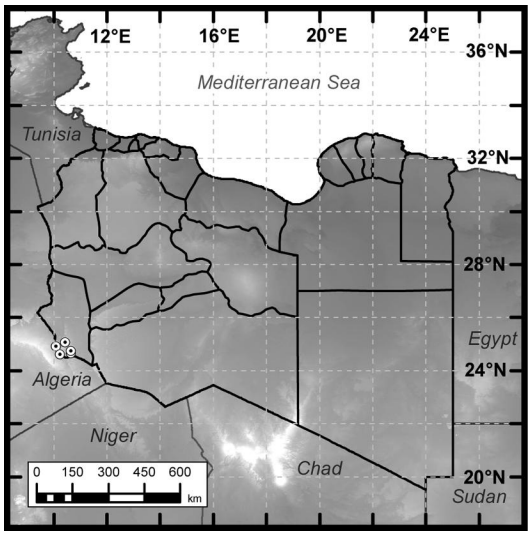
Uromastix acanthinura [part], Le Berre 1989:130.
Uromastyx acanthinura [part], Schleich, Kästle, and Kabisch 1996:298
Uromastyx alfredschmidti, Sindaco and Jeremčenko 2008:167.
Uromastyx alfredschmidti, Trape, Trape, and Chirio 2012:170.

Distribution.— The Tassili n'Ajjer of Algeria and adjacent Libya (Akakus Mountains), although it may be more wide-ranging in suitable habitats (Trape et al. 2012).

Libyan Records (Map 11): FEZZAN**:** Ghat: **246**: Wilms and Böhme 2001. **255:** Scortecci 1937a. **256**: Scortecci 1937a. **259**: Sindaco obs. 4/22/2008. **263**: Frynta et al. 2000. "**Akakus**": Scortecci 1937a.

Figure 14. *Uromastyx alfredschmidti* from Wadi Imlal, Tadrart Akakus, Ghat, Fezzan, Libya, 2008. Photo © Roberto Sindaco.

Comments.— The date of description on the title page of Wilms and Böhme's description is given as "15. Januar 2001." However, Wilms (2001) gave the year of publication of *U. alfredschmidti* as 2000, although citing the correct journal issue and page number for the description. The Libyan record of Wilms and Böhme (2001) is based on a photographic voucher. Sindaco et al. (2012) suggested several records formerly associated with *U. acanthinura* might be referable to *U. alfredschmidti.* This is the case for a specimen from Tamrit in the Tassili n'Ajjer (Joger 1981), and a specimen reported by Frynta et al. (2000) is here likewise assumed to be *U. alfredschmidti*. However, due to damage to this last specimen Wilms and Böhme (2001) were unable to verify its specific identity. Scortecci (1937a) noted the presence of a *Uromastyx*, presumably this species, as common in the Akakus Mountains.



Map 11. Distribution of *Uromastyx alfredschmidti* in Libya.

IUCN Threat Status.— Near Threatened.

Family Chamaeleonidae

Chamaeleo chamaeleon **(Linnaeus, 1758:204) (Fig. 15)**

1758 *Lacerta chamaeleon* Linnaeus, Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio decima, reformata. Laurentii Salvii, Holmiæ [Stockholm], Sweden. (4) + 823 + (I) pp.

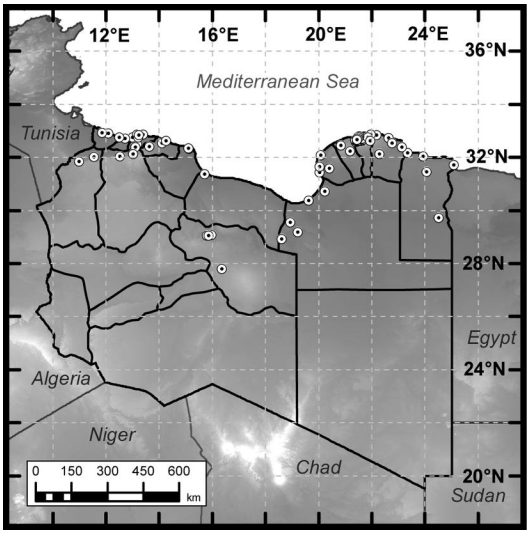
Syntypes.— NRM 140, 141 *fide* Andersson (1900), UUZM 34, 93 *fide* Wallin (2001), "Africa, Asia," restricted to "Nordafrika" by Mertens and Müller (1940). Klaver and Böhme (1997) stated the types were unlocated and associated them with specimens figured by Seba (1734) on pl. 82, figs. 2, 4 and 5. However, Linnaeus (1758) also provided indications to works by Aldrovandi, Gronovius, Olearius, Besler, Valentini, Jonstonus, Bellonius, Kircher, and Hasselquist (see Bauer 2012 for citations to the relevant works) as well as his own earlier publications (Linnaeus 1749, 1754), so there were numerous syntypes, deriving from several different species of chameleons.

Chamaeleo chamaeleon, Le Berre 1989:142.
Chamaeleo chamaeleon, Schleich, Kästle, and Kabisch 1996:312.
Chamaeleo chamaeleon, Sindaco and Jeremčenko 2008:173.
Chamaeleo chamaeleon, Trape, Trape, and Chirio 2012:186.

Distribution.— North Africa from Western Sahara to Egypt, around the eastern Mediterranean to coastal regions of the Asian portion of Turkey, and into the Arabian Peninsula, particularly along the southern Red Sea. Introduced into the Iberian Peninsula, Apulia (Italy) Malta, and Crete (Paulo et al. 2002; Sindaco et al. 2006a; Sindaco and Jeremčenko 2008) as well as Madeira (Wagner et al. 2012). In Libya they are distributed along the coast, with inland records chiefly associated with oases.

Libyan Records (Map 12): TRIPOLITANIA: Nuqat al Khams: **4**: UMNH 4242. **5**: MNHN 1966.1097. Zawiyah: **11:** BMNH 1964.2076; Frynta et al. 2000. **12**: ZMB 39328–29. **22**: MCSN

FIGURE 15. *Chamaeleo chamaeleon* from Farwah Island, Libya (33.1095, 11.7157), 2007. Photo courtesy of Natural History Museum of Crete © M. Avramakis.



MAP 12. Distribution of *Chamaeleo chamaeleon* in Libya..

1931, 1936. **23**: NMBA-REPT 15358. JAFARA: **32**: MZUT R672. TRIPOLI: **38**: Sayers 1964. **39**: NMV D 2303; USNM 146806. **42**: MZUT R671, R1300, R1310; Zavattari 1937. **44**: Werner 1909. **45**: AMNH R 125707; BMNH xxv.3.i; MCSN 1938; MNHN 1976.368; MZUT R1348–49; NHMW 2411, 7450, 7456, 7458–59, 37691; SMF 16164-66, 24969; ZMB 15281–87, 15331, 15340; ZSM 222/1975, 2446–47; Gray 1845; Boulenger 1887; König 1888; Condorelli Francaviglia 1896; Werner 1909; Ghigi 1913; Zavattari 1934; Sayers 1964. **48a**: MZUT R1309. MURQUB: **60**: Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1934. **64**: ZMB 17901. **68**: BMNH 1913.12.30.16; Andreucci 1913; Boulenger 1914; Zavattari 1934. MISRATAH: **80**: Boulenger 1914; Zavattari 1934. **81**: Boulenger 1914. NALUT: **101**: AIC no number provided; Ibrahim and Ineich 2005. **105**: AIC no number provided; MNHN 2004.0087, 2004.0092; Ibrahim and Ineich 2005. JABAL AL GHARBI: **141**: ZSM 246/1926. **154**: MZUT R1333; Andreucci 1913; Scortecci 1937a; Zavattari 1934. SIRTE: **166**: MCSN 1926. "**Tripolitania**": SMNS 270. "**Tripolitania settentrionale**": Zavattari 1937. FEZZAN: JUFRA: **216**: Peters 1880, 1881; Werner 1909;

Ghigi 1913; Zavattari 1934. **217**: MWNH 1674; Zavattari 1937. **218**: MCSN 1934; Scortecci 1937a. **226**: MCSN 1903; Scortecci 1935b, 1937a,b. "**Sahara Tripolitano**": Werner 1911; Zavattari 1934. CYRENAICA: Benghazi: **357**: SMF 34459, 35556, 36183; SMNS 1413; ZSM 162/1983; von Martens 1883; Werner 1909; Ghigi 1913; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **367**: MZUT R678; Calabresi 1923; Zavattari 1929, 1930, 1934. **372**: Frynta et al. 2000. **377**: NMV D 2304. Marj: **385**: MCSN 1929; NMV D 2305; Zavattari 1937. **407**: Zavattari 1929, 1930. **457aa**: Schleich 1987. **457ag**: Schleich 1987. **457ah**: Schleich 1987. **457z**: Schleich 1987. Jabal al Akhdar: **417**: Ghigi 1920; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **419**: Frynta et al. 2000. **425**: ZSM 114/1983; Schleich 1987. **430**: MZUT R652; Calabresi 1923; Zavattari 1929, 1930, 1934; Schleich 1987. **431**: BMNH 1965.1188. **433**: Cornalia in Haimann 1882, 1886; Werner 1909; Zavattari 1929, 1930, 1934. **434**: FMNH 214950; Resetar 1981. **445**: Schleich 1987. **447**: Calabresi 1923; Zavattari 1929, 1930. **457**: KNP 1981/174–175, 1983/428; MCZ R 56041–42; ZSM 115/1983, 416/1997; Schleich 1987. **457ak**: Schleich 1987. **457al**: Schleich 1987. **457am**: Schleich 1987. **457ap**: Schleich 1987. **457aq**: Schleich 1987. **457ar**: Schleich 1987. **457au**: Schleich 1987. **457bm**: Schleich 1987. **457bo**: Schleich 1987. **457by**: Schleich 1987. **457cm**: Schleich 1987. **457l**: Schleich 1987. **457n**: Schleich 1987. **457p**: Schleich 1987. **457w**: Schleich 1987. **457x**: Schleich 1987. Darnah: **460**: NHMC 80.3.91.2, 80.3.91.9. **466**: SMF 34410; SMF 35992; Ghigi 1920; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Gestro and Vinciguerra 1931. **469**: Zavattari 1930, 1934. **474**: MCSN 1927; Vinciguerra 1927; Zavattari 1929, 1930, 1934. **484**: MZUT R1318; Calabresi 1923; Zavattari 1929, 1930, 1934. Butnan: **487**: SMF 33777. **490**: MSNG 28194; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Vinciguerra 1927; Gestro and Vinciguerra 1931. **505**: Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931. **511**: ZSM 113/1983. **521**: MSNG 28193; Vinciguerra 1927; Zavattari 1929, 1930, 1934, 1937; Gestro and Vinciguerra 1931. Al Wahat: **529**: NMP 34931/1–3; NMP 34931; Moravec 1995. **540**: ZSM 116/1983. **553**: MCSN 1904; Desio 1931; Zavattari 1934, 1937; Scortecci 1935b. **554**: MCSN 1939–40. **556**: Cornalia in Haimann 1882, 1886; Werner 1909; Zavattari 1929, 1930, 1934. "**Cyrenaica**": Werner 1909; Ghigi 1913. "**Marmarica**": Zavattari 1937. LIBYA: MCSN 1935; NMBA-REPT 15357; SMF 34193; Condorelli-Francaviglia 1896.

Comments.— Only the nominate subspecies, which occurs as far east as the Nile Delta, is present in Libya, whereas the subspecies *C. c. musae* Steindachner, 1900 is limited to the area of the northern Eastern Desert and Sinai (Baha El Din, 2006; Ibrahim, 2013) and *C. c. orientalis* Parker, 1938 is present in the southern Arabian peninsula. *Chamaeleo c. recticrista* Boettger, 1889 from the Near and Middle East, was not recognized by Klaver and Böhme (1997), but was accepted by Sindaco and Jeremčenko (2008) and Werner (2016). Tilbury and Tolley (2009) provided a recent commentary on the status of the systematics of the genus *Chamaeleo*. *Chamaeleo c. saharicus* Müller, 1887, a desert morph with its type locality in north central Algeria, has not been recognized as valid in any recent treatments. Klaver and Böhme (1997) considered it as a synonym of the nominotypical subspecies, but differences in coloration and habitat preference from Mediterranean populations may warrant further investigation.

Many inland localities in Libya probably reflect intentional or accidental movement by humans, however, relict autochthonous populations may be present in oases that were once connected to larger areas of more appropriate habitat via suitable corridors along paleodrainages. Desio (1931) reported the presence of "camaleonti, gechi, serpi, vipere dal corno" from Maradah (locality 553), but as there is potential ambiguity as to which species were intended, we have included in this atlas only the chamaeleon record, which is unambiguous.

IUCN Threat Status.— Least Concern.

Family Gekkonidae

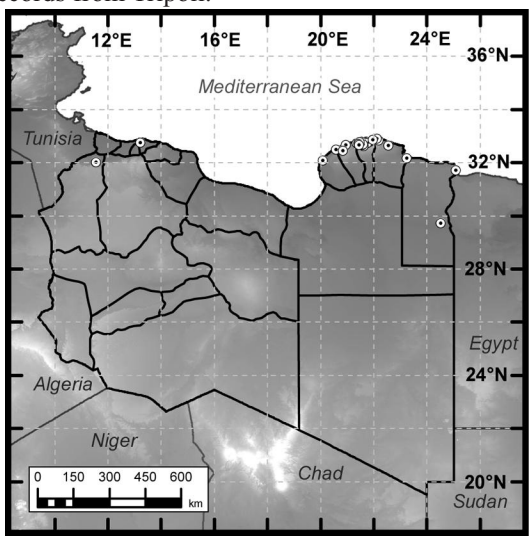
Hemidactylus turcicus (Linnaeus, 1758:202)

1758 *Lacerta turcica* Linnaeus, Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio decima, reformata. Laurentii Salvii, Holmiæ [Stockholm], Sweden. (4) + 823 + (I) pp.

HOLOTYPE.— Specimen figured on pl. 204 in Edwards (1751) *fide* Bauer (2012), unknown *fide* McCoy (1970), unlocated *fide* Anderson (1999), "in Oriente" [stated to be "Türkei" by Mertens and Müller (1928, 1940); restricted to "Cairo, Egypt" without comment by Smith and Taylor (1950a,b) and to "Turkey in Asia" by Schmidt (1953)].

Hemidactylus turcicus, Le Berre 1989:154.
Hemidactylus turcicus, Schleich, Kästle, and Kabisch 1996:236.
Hemidactylus turcicus, Sindaco and Jeremčenko 2008:116.

DISTRIBUTION.— Countries bordering the Mediterranean Sea, from Portugal and Spain, around southern Europe to Greece, Bulgaria and Turkey, thence to Syria, Jordan and Israel, and from Sinai westwards to Morocco and south to northern Sudan. Introduced populations occur in scattered localities across Mexico, Central and South America, and from more than half of the 50 United States, Mexico and parts of Central America, as well as from isolated localities in Pakistan and East Africa (Kraus 2009; Owusu et al. 2012; Werner 2016). Most Libyan records are from northern Cyrenaica, although there are isolated records from Tripoli.



MAP 13. Distribution of *Hemidactylus turcicus* in Libya.

Libyan Records (Map 13): TRIPOLITANIA: TRIPOLI: **45**: ZMB 15303, 15325, 15327–28; Condorelli Francaviglia 1896; Werner 1909; Zavattari 1934; Loveridge 1947. NALUT: **105**: Ibrahim and Ineich 2005. "**Tripolitania settentrionale**": Zavattari 1937. CYRENAICA: BENGHAZI: **357**: von Martens 1883; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Loveridge 1947. MARJ: **382**: CUP R 034; Frynta et al. 2000. **385**: MCSN 522, 579; Scortecci 1935b; Zavattari 1937; Loveridge 1947. **389**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Loveridge 1947. **393**: Resetar 1981. **398**: NHMC 80.3.87.21–27. **457b**: Schleich 1987. **457z**: Schleich 1987. JABAL AL AKHDAR: **410**: Resetar 1981. **414**: FMNH 214958; Resetar 1981. **417**: CUP R 046; Calabresi 1923; Loveridge 1947; Zavattari 1922, 1929, 1930, 1934; Frynta et al. 2000. **419**: CUP R 043; Frynta et al. 2000. **428**: ZSM 123/1983. **431**: SNHM BS 40234; Bshaena 2011. **434**: FMNH 214957; Resetar 1981. **440**: Resetar 1981. **441**: Resetar 1981. **457**: KNP 1981/152, 225, 233, 236, 269, 278, 285, 327, 336, 355, 360–361, 417–420, 434, 451–452, 505, 512, 1983/123; Resetar 1981; Schleich 1987. **457as**: Schleich 1987. **457at**: Schleich 1987. **457au**: Schleich 1987. **457az**: Schleich 1987. **457ba**: Schleich 1987. **457bc**: Schleich 1987. **457be**: Schleich 1987. **457bk**: Schleich 1987. **457d**: Schleich 1987. **457i**: Schleich 1987. **457k**: Schleich 1987. **457u**: Schleich 1987. DARNAH: **458**: NHMC 80.3.87.18. **460**: NHMC 80.3.87.19. **465**: Calabresi 1923; Zavattari 1929, 1930, 1934; Loveridge 1947. **477**: NHMC

80.3.87.28. Butnan: **505**: Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931; Loveridge 1947. **521**: Loveridge 1947. "**Cyrenaica**": Werner 1909; Ghigi 1913; Calabresi 1923; Loveridge 1947. LIBYA: RMNH RENA 10858. "**Gan Chenabi**" [unlocated]: Loveridge 1947.

Comments.— The nominate subspecies occurs in Libya and the remainder of mainland North Africa. *Hemidactylus t. spinalis* Buchholz, 1954 from Addaya Grande Island, Spain has recently been synonymized with the nominotypical form (Šmid et al. 2015), whereas *H. t. lavadeserticus* Moravec and Böhme, 1997 from the lava desert region of Jordan and adjacent Syria has been elevated to specific status (Moravec et al. 2011). *Hemidactylus turcicus* generally occurs close to the coast, at least in northern Africa (Rato et al. 2011, Moravec et al. 2011). Isolated inland localities may well represent introduced populations as the species is known to be highly invasive elsewhere, even in habitats and climatic zones not present within its native range (Kraus 2009).

IUCN Threat Status.— Least Concern.

Stenodactylus mauritanicus Guichenot 1850:5, pl. 1, figs. 1, 1a–d (Fig. 16)

1850 *Stenodactylus Mauritanicus* Guichenot, Histoire naturelle des reptiles et des poissons de l'Algérie. Exploration Scientifique de l'Algérie pendant les annees 1840, 1841, 1842. Imprimerie Nationale, Paris. 144 + [4] pp. and Histoire naturelle des reptiles et des poisons. Atlas. Imprimerie Nationale, Paris. 12 pls [4 reptiles, 8 Poissons, separately numbered].

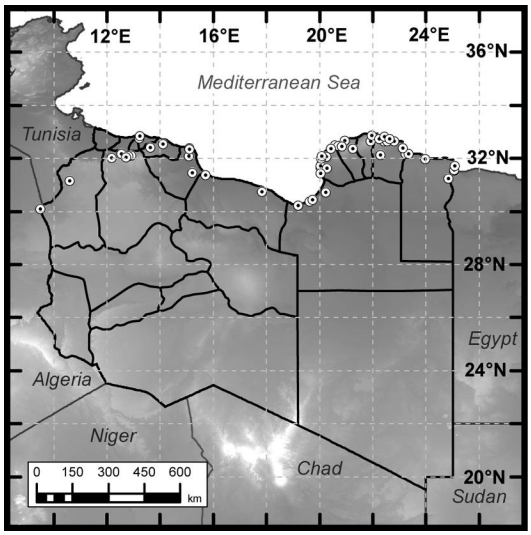
Syntypes.— MNHN 2339, 6768, 6769, "environs d'Oran" [Algeria].

Stenodactylus sthenodactylus [part], Le Berre 1989:166.
Stenodactylus sthenodactylus [part], Schleich, Kästle, and Kabisch 1996:261.
Stenodactylus sthenodactylus mauritanicus, Sindaco and Jeremčenko 2008:131.
Stenodactylus sthenodactylus [part], Trape, Trape, and Chirio 2012:256.

Distribution.— From coastal and near coastal Mauritania and Western Sahara through northern Morocco, Algeria and Tunisia and east to the area of the Nile Delta (Metallinou et al. 2012). In Libya they are found only along the Mediterranean coast and adjacent areas.

Libyan Records (Map 14): TRIPOLITANIA: Tripoli: **42**: Zavattari 1937; Loveridge 1947. **45**: BMNH 1858.4.20.53; FMNH 82944; Condorelli Francaviglia 1896; Werner 1909; Ghigi 1913; Zavattari 1934; Loveridge 1947; Sayers 1964. Murqub: **60**: BMNH 1965.1128. **64**: MCZ R 21906, 21908. Misratah: **79**: NHMC 80.3.88.45; Metallinou et al. 2012. **80**: BMNH 1913.12.30.1–2; MCSN 1983; Boulenger 1914; Zavaratti 1934; Loveridge 1947. **82**: NHMC 80.3.152.1. **87**:

Figure 16. *Stenodactylus mauritanicus* male from Hotel Ghadames, Gadamis, Nalut, Tripolitania, Libya, 2008. Photo © Roberto Sindaco.



MAP 14. Distribution of *Stenodactylus mauritanicus* in Libya. The distribution of this species is primarily in more mesic areas in Mediterranean regions of Libya. The allocation of many records to this species and its sister species, *S. sthenodactylus*, a more xeric adapted form, are tentative and based on geography rather than confirmation of specimens.

NHMC 80.3.152.24. NALUT: **111**: Sindaco, pers. obs. 5/2/2008. **129**: Sindaco, pers. obs. 4/30/2008. JABAL AL GHARBI: **135**: BMNH 1965.1173. **142**: BMNH 1965.1170. **145**: NHMC 80.3.88.42, 80.3.152.21–22; Metallinou et al. 2012. **146**: NHMC 80.3.152.2; Metallinou et al. 2012. **147**: FMNH 82943; MCZ R 127837, 127838, 127836. SIRTE: **166**: BMNH 1970.2127. **185**: BMNH 1965.1167–68. "**Tripolitania settentrionale**": Zavattari 1937. **Misurata to Tripoli**: Loveridge 1947. "**Sirtica**": Zavattari 1937; Loveridge 1947. CYRENAICA: BENGHAZI: **335**: NHMC 80.3.88.44, 80.3.152.23; Metallinou et al. 2012. **350**: BMNH 1954.1.5.26. **351**: BMNH 1965.1161. **357**: BMNH 1945.11.9.2–3; MZUF 710; SMF 36490; Werner 1909; Ghigi 1913, 1920; Umani 1922; Zavattari 1929, 1930, 1934; Loveridge 1947. **361**: Calabresi 1923; Zavattari 1929, 1930; Loveridge 1947. **366**: NHMC 80.3.88.47, 80.3.152.3–4, 80.3.152.25, 80.3.153.1–2; Metallinou et al. 2012. **367**: BMNH 1965.1155–56. **372**: Frynta et al. 2000. **376**: SMF 34589. MARJ: **383**: FMNH 214966. **384**: MCZ R 127839. **385**: MCSN 2013; Zavattari 1937; Loveridge 1947. **389**: MZUT R2523; Calabresi 1923; Zavattari 1929, 1930, 1934; Loveridge 1947. **403**: NHMC 80.3.88.9, 80.3.88.28, 80.3.152.9–10; 80.3.152.26–47; Metallinou et al. 2012. JABAL AL AKHDAR: **417**: Calabresi 1923; Zavattari 1922, 1929, 1930, 1934; Loveridge 1947. **425**: Loveridge 1947. DARNAH: **462**: Ghigi 1920; Calabresi 1923; Zavattari 1929, 1930, 1934; Loveridge 1947. **463**: Calabresi 1923; Zavattari 1929, 1930, 1934; Loveridge 1947. **464**: Calabresi 1923. **465**: MZUT R2524; Zavattari 1929, 1930; Loveridge 1947. **466**: SMF 34229; Calabresi 1923; Zavattari 1929, 1930, 1934; Loveridge 1947. **467**: Zavattari 1929, 1930. **474**: Vinceguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931; Loveridge 1947. **477**: NHMC 80.3.88.29, 80.3.152.11; Metallinou et al. 2012. **484**: MZUF 825, 13123; MZUT R2518; Calabresi 1923; Zavattari 1929, 1930; Loveridge 1947. BUTNAN: **487**: SMF 34357. **493**: NHMC 80.3.152.12. **505**: Vinceguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931; Loveridge 1947. **506**: Loveridge 1947. **507**: BMNH 1962.560; Vinceguerra 1927; Zavattari 1934. **508**: NHMC 80.3.88.1, 80.3.152.5–8 Metallinou et al. 2012. **514**: Vinciguerra 1927; Zavattari 1929, 1930. AL WAHAT: **529**: BMNH 1932.3.6.3; NMP 34928/1–2; NMP 34928; Vinciguerra 1931; Zavattari 1934; Moravec 1995. **539**: BMNH 1965.1160. **540**: BMNH 1965.1157–59. **544**: Vinciguerra 1931; Zavattari 1934; Loveridge 1947. "**Marmarica**": Zavattari 1937; Loveridge 1947. "**Nordost-Libyen**": ZMB 62960–63. LIBYA: KC190582, 190785; Metallinou et al. 2012.

COMMENTS.— *Stenodactylus mauritanica* has been variously accepted as specifically or subspecifically valid, or regarded as a synonym of *S. sthenodactylus* since its description (see Crochet et al. 2014). It had been treated as a synonym of *S. sthenodactylus* by Arnold (1980b) and as a subspecies by Loveridge (1947) and Sindaco and Jeremčenko (2008), but was elevated to full species by Baha El Din (2006), who found the two forms in sympatry in northern Egypt. Although morphologically similar to *S. sthenodactylus*, *S. mauritanicus* is mostly limited to mesic coastal semi-

desert, within 50 km of the coast, at least in Egypt (Baha El Din 2006a), whereas *S. sthenodactylus* inhabits more arid regions along the northern edge of the Sahara Desert. Metallinou et al. (2012) found *S. mauritanica* and *S. sthenodactylus* to be reciprocally monophyletic and deeply divergent from one another. Although specimens from near coastal localities in Libya may be assigned with confidence to *S. mauritanicus*, some populations from intermediate areas will require reexamination to confirm correct species allocation. The two species may occur in sympatry or near sympatry in northern Nalut. Metallinou et al. (2012) found Libyan lineages were sister to Egyptian and Tunisian ones and more distantly related to conspecifics from Morocco and Western Sahara.

IUCN Threat Status.— Not evaluated, but anticipated to be Least Concern.

Stenodactylus petrii Anderson 1896:96

1896 *Stenodactylus petrii* Anderson, A Contribution to the Herpetology of Arabia, with a preliminary list of the reptiles and batrachians of Egypt. R.H. Porter, London, 124 pp.

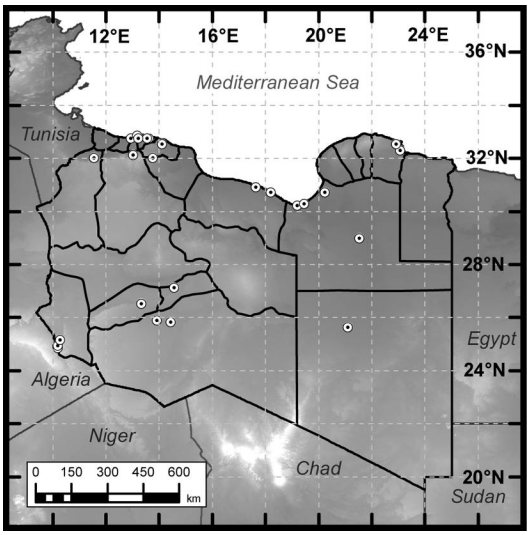
Syntypes.— BMNH 1946.8.23.27–29 (formerly BMNH 97.10.28.23–25), "Tel el Amarna" [Egypt].

Stenodactylus petrii [part], Le Berre 1989:164.
Stenodactylus petrii [part], Schleich, Kästle, and Kabisch 1996:259.
Stenodactylus petrii, Sindaco and Jeremčenko 2008:130.
Stenodactylus petrii [part], Trape, Trape, and Chirio 2012:186.

Distribution.— Across northern Africa from Mauritania and Western Sahara to Egypt and northern Sudan (although absent from most of Mediterranean Morocco and Algeria as well as much of southern Algeria), with scattered records from the northern Sahel of Mali and Niger. Also in Sinai and southern Israel. Sindaco and Jeremčenko (2008) considered Senegalese records erroneous, although several were plotted by Trape et al. (2012). Sindaco and Jeremčenko (2008) appear to plot this species in southern Jordan, but this is not noted in their text, nor is a Jordanian occurrence supported by Disi et al. (2001), Disi (2002) or Werner (2016).

In Libya they are primarily found in Tripolitania and south into the regions of Ghat and Sabha (Sindaco and Jeremčenko 2008).

Libyan Records (Map 15): TRIPOLITANIA: Zawiyah: **21**: MZUT R3240. Tripoli: **38**: USNM 33877. **39**: MCZ R 21910; USNM 59000. **45**: MZUT R2525; NHMW 17282; NMBA-REPT 5248, 5445; ZMB 15301–02; ZSM 236/0; Werner 1909; Ghigi 1913; Zavattari 1934; Loveridge 1947. **51**: NMBA-REPT 15394. **53**: NMBA-REPT 15292–95. Murqub: **64**: ZMB 17979. Misratah: **72**: ZSM 26/1968/1–2. Nalut: **105**: AIC (4 specimens) no number provided; MNHN 2003.2962; Ibrahim and Ineich 2005. Jabal al Gharbi: **154**: MCZ R 170078. Sirte: **182**: BMNH 1965.1175. **189**: Arnold 1980b; Sindaco and Jeremčenko 2008. "**Tripolitania settentrionale**": Zavattari 1937. "**Jebel Erdcul**" [unlocated]: BMNH 1901.10.28.2. FEZZAN: Ghat: **245**: Scortecci 1937b. **249**: MCSN 1979; ZCT 2006.74; Scortecci 1937a; Ibrahim 2008a. **251**:



Map 15. Distribution of *Stenodactylus petrii* in Libya. Some records may be attributable to *S. stenurus*. Reexamination of northwestern Tripolitanian specimens is required.

CUP R 084; Frynta et al. 2000. **253**: MCSN 1978; Scortecci 1937a. Wadi al Hayaa: **274**: CUP R 085, 138; Frynta et al. 2000. Sabha: **287**: CUP R 015, 017–19, 056, 082–83, 086–87, 100, 115–119, 124; Frynta et al. 2000. Murzuq: **298**: MCSN 2010. **304**: ZCT 2006.54; Ibrahim 2008a. CYRENAICA: Darnah: **470**: ZSM 118/1983/1–2. **475**: CAS 12717. Al Wahat: **529**: NMBA-REPT 15296. **543**: Arnold 1980b; Sindaco and Jeremčenko 2008. **544**: BMNH 1965.1176–80. **564**: BMNH 1932.3.6.4; Vinciguerra 1931; Zavattari 1934, 1937; Loveridge 1947. Kufrah: **566**: Scortecci 1935b; Zavattari 1937; Loveridge 1947.

Comments:.— The nomen *Stenodactylus guttatus* Cuvier, 1829 has generally been placed in the synonymy of *S. sthenodactylus*, but Metallinou and Crochet (2013) discovered that the type series is compound, with one syntype referable to *S. petrii* and the other to *Ptyodactylus hasselquistii* (Dondorff, 1798). To maintain the prevailing use of *S. petrii*, they selected as a lectotype the latter specimen. Metallinou et al. (2012) demonstrated that *S. petrii* was paraphyletic with respect to *S. stenurus*, with the latter more closely allied to western populations of *S. petrii* (represented by material from Mauritania, Western Sahara, Morocco, Algeria and Tunisia in their sampling) than to true *S. petrii* from Egypt and Israel. In the absence of sampling in critical intervening areas, most notably Libya, they left open the question of whether *S. stenurus* should be considered conspecific with *S. petrii*, a broad ranging species across most of North Africa, or a restricted form distinct from both clades of *S. petrii*. Additional sampling in Egypt and Libya is critical to properly delimiting the two species.

IUCN Threat Status.— Not evaluated, but anticipated to be Least Concern.

Stenodactylus stenurus Werner, 1899:16, fig. c

1899 *Stenodactylus stenurus* Werner, Allerlei aus dem Kriechtierleben im Käfig II. Der Zoologische Garten, 40:12–24.

Syntypes.— BMNH 1946.8.23.56 (formerly 99.2.1.10), BMNH 94.7.25.1, NHMW 17281:1–2, plus 9 other syntypes not identified by Metallinou and Crochet (2013), "Ostalgerien (Meraïer, Tuggurth)" [El Meghaier and Touggourt, Algeria], "Tunis" [Tunisia] and "Tripolis" [Tripoli, Libya]. As noted by Metallinou and Crochet (2013) and Crochet and Metallinou (2013), the lectotype designation by Kratochvíl et al. (2001) is invalid.

Stenodactylus petrii [part], Le Berre 1989:164.

Stenodactylus petrii [part], Schleich, Kästle, and Kabisch 1996:259.

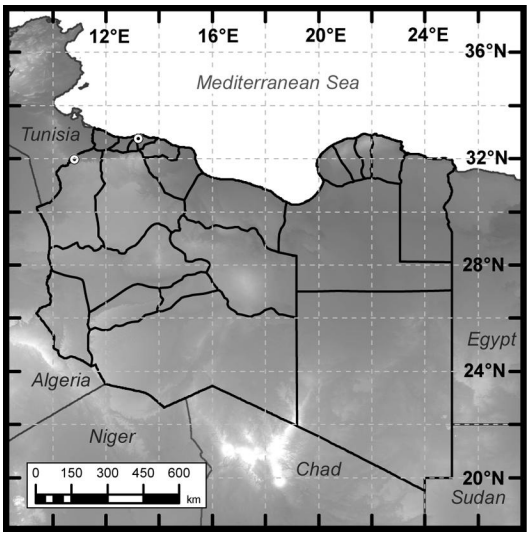
Stenodactylus stenurus, Sindaco and Jeremčenko 2008:130.

Stenodactylus petrii [part], Trape, Trape, and Chirio 2012:254.

Distribution.— Northeast Algeria through central and southern Tunisia to northwestern Libya.

Libyan Records (Map 16): TRIPOLITANIA: Tripoli: **45**: BMNH 1946.8.23.56; Werner 1899. Nalut: **100**: CUP R 054; Frynta et al. 2000.

Comments.— After many years in the synonymy of *S. petrii*, Kratochvíl et al. (2001) resurrected *S. stenurus* on morphological grounds. Sindaco and Jeremčenko (2008)



Map 16. Distribution of *Stenodactylus stenurus* in Libya.

noted that the populations of "*S. petrii*" from Algeria, Tunisia and Libya were likely *S. stenurus*. Metallinou et al. (2012) demonstrated that *S. petrii* was paraphyletic with respect to *S. stenurus*, with *S. stenurus* more closely allied to western populations of *S. petrii* (represented by material from Mauritania, Western Sahara, Morocco, Algeria and Tunisia in their sampling) than to true *S. petrii* from Egypt and Israel. In the absence of sampling in critical intervening areas, most notably Libya, they left open the question of whether *S. stenurus* should be considered conspecific with *S. petrii*, a broadly ranging species across most of North Africa, or a restricted form distinct from both clades of *S. petrii*. Based on the diagnostic differences signaled by Kratochvíl et al. (2001), we recognize *S. stenurus* as a full species. Specimens of *S. petrii* from northwestern Libya should be reexamined to confirm their species allocation and additional genetic sampling in Egypt and Libya is critical to properly delimiting the two species.

IUCN Threat Status.— Not evaluated, but anticipated to be Least Concern.

Stenodactylus sthenodactylus (Lichtenstein, 1823:102) Fig. 17

1823 *Ascalabotes sthenodactylus* Lichtenstein, Verzeichniss der Doubletten des zoologischen Museums der Königl. Universität zu Berlin nebst Beschreibung vieler bisher unbekannter Arten von Säugethieren, Vögeln, Amphibien und Fischen. T. Trautwein, Berlin. x + 118 pp., 1 pl.

Neotype.— MNHN 2012.0250 designated by Crochet et al. (2014), "Wadi El Natrun, Egypt (Lat: 30.4233/Long: 30.2928)." A lectotype, ZMB 437A from "Aegypten" had previously been designated by Bauer and Günther 1991) [see Bauer and Günther 1991, Bauer 2000, and Metallinou and Crochet 2013) for more detail]. Metallinou and Crochet (2013), however, demonstrated that the type is actually representative of the species now regarded as *S. mauritanicus* and, in order to conserve current usage and maintain stability, Crochet et al. (2014) applied to the ICZN (Case 3641) to set aside all previous type fixations in favor of a neotype representing the form to which the name *sthenodactylus* has been applied.

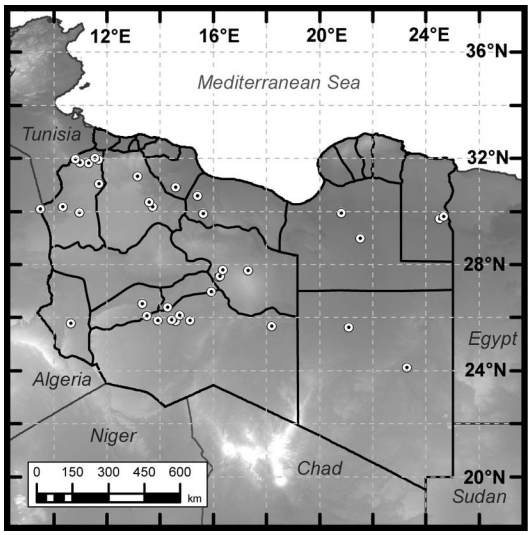
1976 *Garzoniella longipes* Perret, *Garzoniella*: Un nouveau genre de Gekkonidae saharien. Revue Suisse de Zoologie, 83:761–764, pls. 1–3.

Holotype.— MHNG 1520.20, "Sud Sahara central, probablement entre Ghat et Sebha, Fezzan, Lybie" [the type locality was uncertain because the specimen was collected somewhere on a trip from Tunis to Tripoli to Sebha to Ubari (=Abwari) to Ghat to Madama (Niger) to Djanet (Algeria) to Ghadamès (Libya) to Tozeur (Tunisia) and return to Tunis (Perret 1976)].

Stenodactylus sthenodactylus [part], Le Berre 1989:166.
Stenodactylus sthenodactylus [part], Schleich, Kästle, and Kabisch 1996:261.
Stenodactylus sthenodactylus sthenodactylus, Sindaco and Jeremčenko 2008:131.
Stenodactylus sthenodactylus [part], Trape, Trape, and Chirio 2012:256.

Distribution.— Widely distributed across North Africa from northern Senegal and Mauritania east through Egypt and south to Lake Turkana, Kenya (although apparently absent from the Ethiopian Highlands), with scattered populations across the northern Sahel. Also in Sinai, Israel and western Jordan (Metallinou et al. 2012). In North Africa *Stenodactylus sthenodactylus* occupies more inland areas than its sister species, *S. mauritanicus*, and its habitat can be typified as gravelly and coarse sandy plains and poorly vegetated arid areas. In Libya they occur country-wide exclusive of the coastal areas.

Figure 17. *Stenodactylus sthenodactylus* and egg from Um Al-Aranib, Murzuq, Fezzan, Libya. Photo © Adel Ibrahim.



MAP 17. Distribution of *Stenodactylus sthenodactylus* in Libya. The distribution of this species is primarily in more xeric areas in Libya. The allocation of many records to this species and its more mesic adapted sister species, *S. mauritanicus*, are tentative and based on geography rather than confirmation of specimens.

Libyan Records (Map 17): TRIPOLITANIA: MISRATAH: **77**: Zavattari 1930. NALUT: **100**: Frynta et al. 2000. **101**: BMNH 1965.1169., 1965.1172; MCSN 1981. **104**: BMNH 1965.1171. **105**: AIC no number provided; MNHN 2003.2963; Ibrahim and Ineich 2005. **106**: BMNH 1965.1162–64. **118**: NHMC 80.3.88.4, 80.3.88.46; Metallinou et al. 2012. **124**: MZUF 39089. **127**: MCCI R1449; Metallinou et al. 2012. JABAL AL GHARBI: **159**: BMNH 1965.1165–66. **160**: MCSN 1982. **161**: CUP R 094, 099, 113, 114; Frynta et al. 2000. SIRTE: **198**: NMBA-REPT 17791. **199**: ZMB 17977–78; Peters 1880, 1881; Werner 1909; Zavattari 1934; Loveridge 1947. "**Tripolitania**": FMNH 82945. "**Jebel Erdcul**" [unlocated]: BMNH 1901.10.28.3. FEZZAN: JUFRA: **224**: NMBA-REPT 15436–38; Schnurrenberger 1962. **226**: MCSN 2011; Scortecci 1935b; Loveridge 1947. **227**: Loveridge 1947. GHAT: **235**: CUP R 057, 089, 125; Frynta et al. 2000. WADI AL HAYAA: **274**: CUP R 020; Frynta et al. 2000. **296**: ZCT 2006.49; Ibrahim 2008a. SABHA: **281**: ZCT 2005.11–12; Ibrahim 2008a. **291**: NMBA-REPT 15289–91, 15396. MURZUQ: **298**: ZCT 2005.32; Ibrahim 2008a. **303**: ZCT 2006.56; Ibrahim 2008a; Essghaier et al. 2015. **308**: ZCT 2006.25; Ibrahim 2008a. **310**: ZCT 2006.58; Ibrahim 2008a. **313**: ZCT 2005.24; Ibrahim 2008a. **334**: MCZ R 21907; UMNH 4237. "**Fezzan**": Loveridge 1947. "**probably between Ghat and Sebha**": MHNG 1520.20; Perret 1976. CYRENAICA: BUTNAN: **520**: Vinciguerra 1931; Zavattari 1934; Loveridge 1947. **521**: Vinciguerra 1927; Zavattari 1929, 1930, 1934, 1937; Gestro and Vinciguerra 1931. AL WAHAT: **560**: Scortecci 1935b; Loveridge 1947. **564**: Zavattari 1929, 1930, 1934, 1937; Loveridge 1947. KUFRAH: **566**: MCSN 2001. **575**: MZUF 21100. **Cyrenaica**: "**between Agedabia and Gialo"**: Vinciguerra 1931.

COMMENTS.— Many early records of this species refer to *Stenodactylus elegans* Fitzinger, 1826, a junior synonym of *S. sthenodactylus*. Metallinou et al. (2012) found *S. mauritanicus* and *S. sthenodactylus* to be reciprocally monophyletic and deeply divergent from one another. Libyan specimens were sister to specimens from western North Africa, especially Algeria, and more distantly related to geckos from the Red Sea coast of Egypt and Kenyan material, and even more distantly related to material from northern Egypt, Israel and Jordan. Metallinou and Crochet (2013) regarded *S. s. zavattarii* Scortecci, 1943 based on Kenyan material, as conspecific with the nominate form, pending a more complete study. Although desert records are unambiguously attributable to this species, some records closer to the Mediterranean coast could be referable to *S. mauritanicus* and require careful reexamination. A locality "Bosco" listed by Loveridge (1947) in an error for "Bosco fra Sidi Garbaa e Gubba" [woods between Sidi Garbaa and Gubba], a locality given by Calabresi (1923).

IUCN THREAT STATUS.— Not evaluated, but anticipated to be Least Concern.

***Tropiocolotes steudneri* (Peters, 1869:788)**

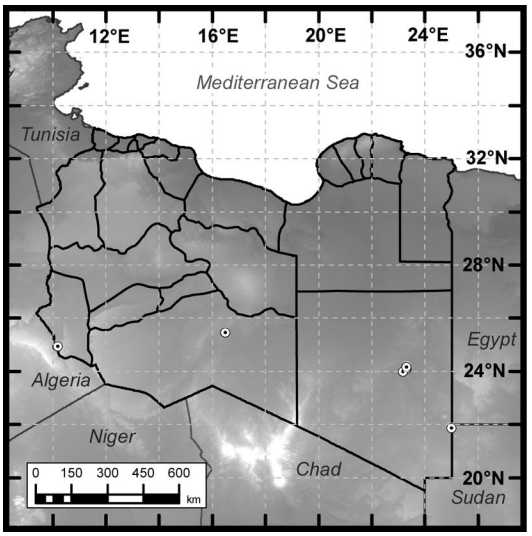
1869 *Gymnodactylus Steudneri* Peters, Über neue Saurier (*Chaunolæmus multicarinatus*, *Tropidolepisma Richardi* und *Gymnodactylus Steudneri*) und Batrachier (*Cyclorhamphus fasciatus* und *Hyla gracilenta*). Monatsberichte der königlichen Akademie der Wissenschaften zu Berlin, 1869:786–790.

HOLOTYPE.— ZMB 5476, lost *fide* Bauer et al. (1995), "Aus dem Sennâr, ohne nähere Angabe des Fundorts" [from the Sennâr (state of Sennar, Sudan), without further details of locality].

Tropiocolotes steudneri, Le Berre 1989:182.
Tropiocolotes steudneri, Schleich, Kästle, and Kabisch 1996:280.
Tropiocolotes steudneri, Sindaco and Jeremčenko 2008:140.
Tropiocolotes steudneri, Trape, Trape, and Chirio 2012:260.

DISTRIBUTION.— Southern Algeria and southern Libya to the Suez Canal and south into Sudan. Baha El Din (2006) reported specimens from the Tibesti of Chad and from Nouakchott, Mauritania. In Libya known localities are in accessible areas of the Sahara around Ghat in the southwest and Kufrah in the southeast.

Libyan Records (Map 18): FEZZAN: GHAT: **249**: MCSN 2360; Scortecci 1937a. MURZUQ: **329**: Schnurrenberger 1962. CYRENAICA: KUFRAH: **571**: MZUF 708; Scortecci 1935b; Zavattari 1937; Loveridge 1947. **573**: Vinciguerra 1931; Zavattari 1934, 1937; Loveridge 1947. **575**: Vinciguerra 1931; Loveridge 1947. **576**: Vinceguerra 1931; Zavattari 1934. **577**: BMNH 1932.3.6.2; Vinciguerra 1931, 1934; Loveridge 1947. **584**: MZUF 709; Scortecci 1935b, 1935c; Zavattari 1937; Loveridge 1947. LIBYA: "**Libyschen Wüste**": Werner 1909.



MAP 18. Distribution of *Tropiocolotes steudneri* in Libya.

COMMENTS.— Populations from Saudi Arabia (Arnold 1977; Kordges 1998) and Bandar-e Langeh, Iran sometimes allocated to this species are probably incorrectly assigned (Sindaco and Jeremčenko 2008). Saleh (1997) reported two localities in north Sinai, but these were questioned by Baha el Din (2006) and rejected by Werner (2016).

IUCN THREAT STATUS.— Not evaluated, but anticipated to be Least Concern.

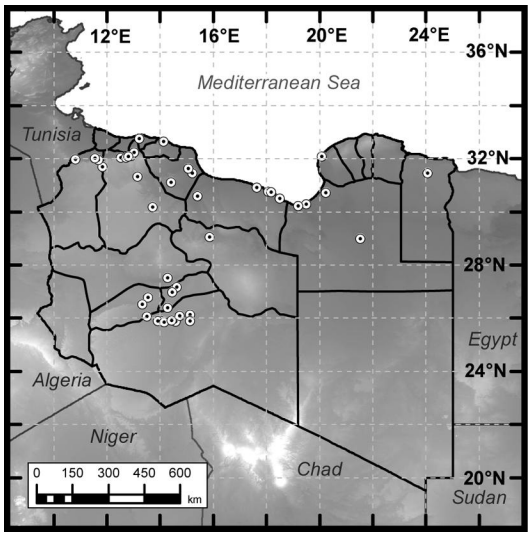
***Tropiocolotes tripolitanus* Peters, 1880:306, pl., figs. 1, 1a–e (FIG. 18)**

1880 *Tropiocolotes tripolitanus* Peters, Über die von Hrn. Gerhard Rohlfs und Dr. A. Stecker auf der Reise nach der Oase Kufra gesammelten Amphibien. Monatsberichte der Königlich Preussischen Akademie der Wissenschaften zu Berlin, 1880: 305–309, 1 pl.

LECTOTYPE.— ZMB 9668A designated by Bauer and Günther (1991); "Uadi M'bellem" [Wadi Muballum, Libya].

Tropiocolotes tripolitanus, Le Berre 1989:184.
Tropiocolotes tripolitanus tripolitanus, Schleich, Kästle, and Kabisch 1996:283.
Tropiocolotes tripolitanus, Sindaco and Jeremčenko 2008:140.
Tropiocolotes tripolitanus, Trape, Trape, and Chirio 2012:262.

FIGURE 18. *Tropiocolotes tripolitanus* from Tsawah, Murzuq, Fezzan, Libya. Photo © Adel Ibrahim.



MAP 19. Distribution of *Tropiocolotes tripolitanus* in Libya.

DISTRIBUTION.— From Mauritania and Western Sahara across northern Africa into Egypt west of the Nile and across Mali and western Niger. In Libya the species is widely distributed, although potentially absent from the southernmost portions of Cyrenaica.

Libyan Records (Map 19): TRIPOLITANIA: TRIPOLI: **45**: FMNH 82938; Boulenger 1885; Werner 1909. MURQUB: **65**: NHMC 80.3.120.23–24. MISRATAH: **76**: BMNH 1965.1153; Krause et al. 2013. **86**: ZMB 9668A–B; Peters 1880, 1881; Boulenger 1891; Werner 1909; Ghigi 1913; Zavattari 1930, 1934; Loveridge 1947; Bauer et al. 1995. **87**: NHMC 80.3.120.18–22. NALUT: **100**: CUP R 005; Frynta et al. 2000. **105**: MNHN 2003.2964–65; ZCT 2005.26–28; Ibrahim and Ineich 2005, Ibrahim 2008a; Krause et al. 2013. **106**: NMP 71528. JABAL AL GHARBI: **133**: NHMC 80.3.120.9. **141**: BMNH 1965.1150; Krause et al. 2013. **145**: NHMC 80.3.120.3. **146**: NHMC 80.3.120.8**. 147**: FMNH 83061–63. **149**: BMNH 1954.1.5.30–36; Krause et al. 2013. **150**: NHMC 80.3.120.4–7, 80.3.120.29. **159**: BMNH 1965.1149; Krause et al. 2013. **161**: CUP R 006–7; Frynta et al. 2000. SIRTE: **181**: NHMC 80.3.120.16–17. **187:** BMNH 1965.1151–52; Krause et al. 2013. **188**: NHMC 80.3.120.10–15. **191**: BMNH 1985.1187–1189. **199**: MCSN 2382. "**Sirtica**": Zavattari 1937; Loveridge 1947. FEZZAN: WADI AL SHATII: **210**: Essghaier et al. 2015. JUFRA: **217**: Zavattari 1937; Loveridge 1947. WADI AL HAYAA: **274**: CUP R 022, 058; Frynta et al. 2000. **277**: BMNH 1983.1283. SABHA: **281**: AIC 2006.1568–71, ZCT 2005.14; Ibrahim 2008a. **286**: BMNH 1954.1.5.28, 1954.1.5.29; Krause et al. 2013; Essghaier et al. 2015. **287**: CUP R 060–61; Frynta et al. 2000. **288**: MCSN 2402. MURZUQ: **296**: ZCT 2005.15, 2006.28–32, 2006.65; Ibrahim 2008a. **298**: ZCT 2005.16; Ibrahim 2008a. **300**: ZCT 2005.02; Ibrahim 2008a. **301**: ZCT 2006.09–13; Ibrahim 2008a. **303**: ZCT 2006.01–05, 2006.71; Ibrahim 2008a; Essghaier et al. 2015. **308**: ZCT 2006.26–27, 2006.57; Ibrahim 2008a. **310**: ZCT 2006.59; Ibrahim 2008a. **313**: ZCT 2005.16, 2006.15–21; Ibrahim 2008a. **316**: NHMW 17298; NMBA-REPT 15300; ZCT 2005.25; Ibrahim 2008a. CYRENAICA: BENGHAZI: **357**: FMNH 82937. BUTNAN: **511**: ZSM 116/1983, 116/1986; Krause et al. 2013. AL WAHAT: **529**: NMP 34930; NMP 34930; Moravec 1995. **542**: BMNH 1965.1154; Krause et al. 2013. **544**: BMNH 1932.3.6.1; Krause et al. 2013; Vinciguerra 1931; Zavattari 1934; Loveridge 1947. **564**: Zavattari 1929, 1930, 1934, 1937; Loveridge 1947. LIBYA: "**Libyschen Wüste**": Werner 1909.

COMMENTS.— Sindaco and Jeremčenko (2008) recognized four subspecies within *T. tripolitanus*: *T. t. algericus* Loveridge, 1947, *T. t. apoklomax* Papenfuss, 1969, *T.t. occidentalis* Parker, 1942 and the nominate form. Baha El Din (2001, 2006) recognized the first of these as a full

species, the second as a synonym of the third, and considered another member of the group, *T. somalicus* Parker, 1942, as a full species as well. The nominate form occurs in Libya and the eastern portions of the species range as far west as Tunisia. The Libyan distribution of this species has been variously interpreted. Le Berre (1989) showed a near coastal distribution and an isolated area corresponding to northern Al Kufrah, along the Egyptian border. Schleich et al. (1996) considered the species to be limited in Libya to Cyrenaica. We concur with Sindaco and Jeremčenko (2008) that the species occurs throughout most of Libya. Note that Ibrahim (2008a) listed the same specimen number (ZCT 2005.16) for both localities 386 and 387.

IUCN Threat Status.— Least Concern.

Family Phyllodactylidae

***Ptyodactylus togoensis* Tornier, 1901:68 (Fig. 19)**

1901 *Ptyodactylus hasselquisti* var. *togoensis* Tornier, Die Crocodile, Schilkröten und Eidechsen in Togo. Archiv für Naturgeschichte 1901 Beiheft:65–88.

Syntypes.— ZMB 16312, 16622, "Mangu" [= Mango, formerly Sansanné-Mango,Togo].

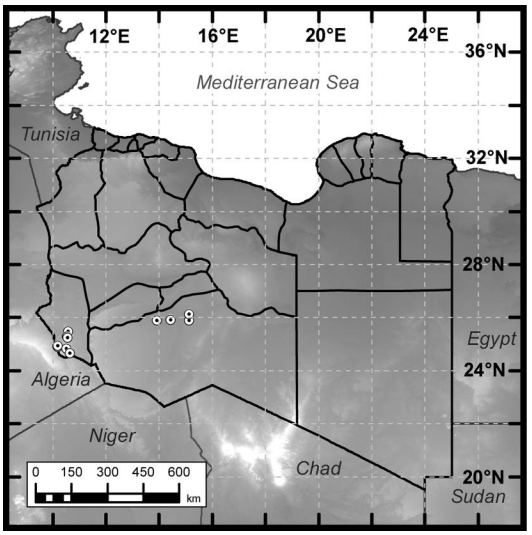
Ptyodactylus hasselquistii [part], Le Berre 1989:158.
Ptyodactylus ragazzii [part], Schleich, Kästle, and Kabisch 1996:244.
Ptyodactylus ragazzii [part], Sindaco and Jeremčenko 2008:124.
Ptyodactylus ragazzii [part], Trape, Trape, and Chirio 2012:266.

Distribution.— Mauritania, Mali and Niger through southern Algeria, southwestern Libya, and northern Chad. South across the Sahel from Burkina Faso to Togo and Nigeria, northern Cameroon and extreme southwestern Chad.

Libyan Records (Map 20): FEZZAN: Ghat: **237**: Sindaco, pers. obs. 4/20/2008. **241**: Sindaco, pers. obs. 4/21/2008. 240: Sindaco, pers. obs. 4/21/2008. **249**: CUP R 080–81; MCSN 1971–

Figure 19. *Ptyodactylus togoensis* from Awiss area, Tadrart Akakus, Ghat, Fezzan, Libya, 2008. Photo © Roberto Sindaco.

72, 1975–76 ; ZCT 2006.72; Zavatari 1934, 1937; Scortecci 1937a; Loveridge 1947; Frynta et al. 2000; Ibrahim 2008a. **251**: CUP R 011, 072–79, 103; Frynta et al. 2000. **257**: Sindaco, pers. obs. 4/21/2008. **261**: Sindaco, pers. obs. 4/22/2008. **263**: CUP R 071; Frynta et al. 2000. "**Zone of Ghat**": Scortecci 1934b. MURZUQ: **298**: Essghaier et al. 2015. **303**: Zavattari 1937. **313**: AIC 2006.1573, ZCT 2006.47–48; Ibrahim 2008a. **316**: NMBA-REPT 15301–03; ZCT 2006.63–64, 69; Zavattari 1934; Ibrahim 2008a.



MAP 20. Distribution of *Ptyodactylus togoensis* in Libya.

COMMENTS.— The distribution of *Ptyodactylus ragazzii* according to Sindaco and Jeremčenko (2008) and subsequently modified (Riva and Padial 2008; Perera and Harris 2010) extends from Mauritania to the Horn of Africa. Metallinou et al. (2015) demonstrated that western populations of *P.* "*ragazzii*" as far east as the Tassili, Ahaggar (Algeria), and Aïr Mountains (Niger) were not sister to true *P. ragazzii* from Djibouti and Ethiopia and resurrected the name *P. togoensis* from synonymy for these western forms, which are themselves geographically and genetically fragmented (Froufe et al. 2013). However, the sampling gap of Metallinou et al. (2015) included all of Libya. Thus, genetic information is lacking regarding the identity of Libyan specimens of *Ptyodactylus*. Based on the relative proximity of southwestern Libyan records to *P. togoensis* in the Tassili and elsewhere in southern Algeria, we hypothesize that Libyan material can be referred to this species, although this is subject to genetic confirmation.

IUCN THREAT STATUS.— Not evaluated, but anticipated to be Least Concern.

Tarentola annularis (I. Geoffroy Saint-Hilaire, 1827:130)

1827 *Gecko annularis* Geoffroy Saint-Hilaire, Description des reptiles qui se trouvent en Égypte, pp. 121–160 *in* M. J.-C. L. de Savigny, (ed.), Description de l'Égypte, ou Recueil des Observations et des Recherches qui ont été Faites en Égypte Pendant l'Expédition de l'Armée Française. Histoire Naturelle. Tome premier. Partie premier. Imprimerie Impériale, Paris, France.

LECTOTYPE:— MNHN 6697a designated by Joger (1984), "Égypte" by implication.

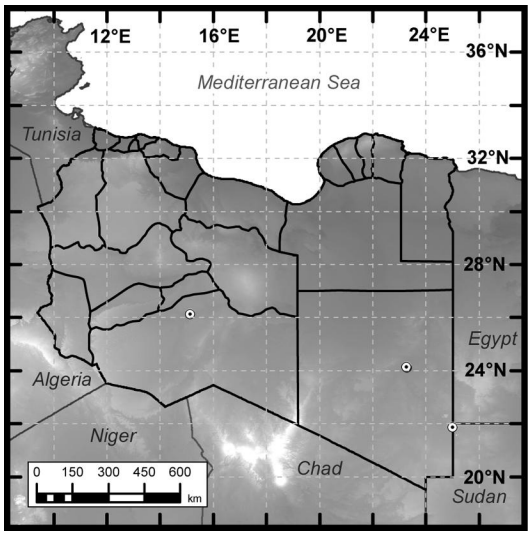
Tarentola annularis, Le Berre 1989:168.
Tarentola (*Sahelogecko*) *annularis*, Schleich, Kästle, and Kabisch 1996:266.
Tarentola annularis, Sindaco and Jeremčenko 2008:133.
Tarentola annularis, Trape, Trape, and Chirio 2012:268.

DISTRIBUTION.— North Africa from Western Sahara, Mauritania and Senegal through Mali, Niger, Burkina Faso, northern Cameroon, Central African Republic, and Sudan to Ethiopia, Eritrea and Somalia but absent from most of Morocco, Algeria and Libya (Sindaco and Jeremčenko 2008). Recently introduced into Israel (Jamison et al. 2017). In Libya they are found scattered across the southern portions of the country.

Libyan Records (Map 21): FEZZAN: MURZUQ: **316**: NHMW 17969. CYRENAICA: KUFRAH: **574**: MZUF 693; Scortecci 1935c; Loveridge 1947. **575**: Loveridge 1947; Joger 1984. **584**: MZUF 692; Scortecci 1935c; Zavattari 1937; Loveridge 1947; Joger 1984.

Comments.— Schleich et al. (1996) and Sindaco and Jeremčenko (2008) suggested that this species was limited to southeastern Libya, but a record from Murzuq suggests a wider range across the northern Sahara. The Jabal Al Uwaynat record of Scortecci (1935c) is matched by several records on the Egyptian side of the border. Bshaena (2011) mapped two localities in Libya, presumably corresponding to Jabal Al Uwaynat and Kufrah. The complicated dating of the natural history portions of *Description de l'Égypte* has been elucidated by Sherborn (1897) and Tollitt (1986).

IUCN Threat Status.— Not evaluated, but anticipated to be Least Concern.



Map 21. Distribution of *Tarentola annularis* in Libya.

Tarentola deserti Boulenger, 1891:115, pl. 13, figs. 3a–c (Fig. 20)

1991 *Tarentola mauritanica* var. *deserti* Boulenger, Catalogue of the reptiles and batrachians of Barbary (Morocco, Algeria, Tunisia), based chiefly upon the notes and collections made in 1880–1884 by M. Fernand Lataste. Transactions of the Zoological Society of London 13: 93–164, pls. 13–18.

Holotype.— BMNH 1885.3.27.5 *fide* Joger (1984), "Wargla" [= Ouargla, Oargla Province, Algeria].

Tarentola deserti, Schleich, Kästle, and Kabisch 1996:270.
Tarentola deserti, Sindaco and Jeremčenko 2008:135.
Tarentola deserti, Trape, Trape, and Chirio 2012:274.

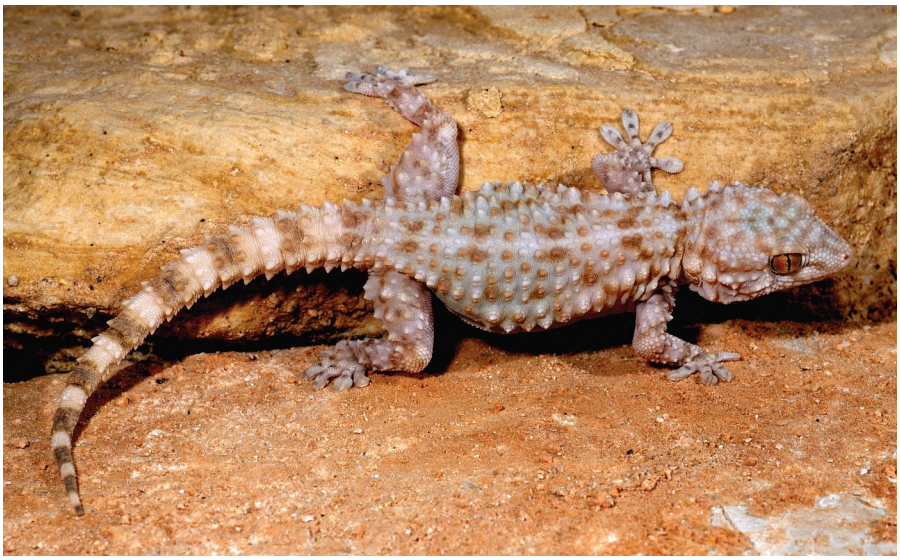
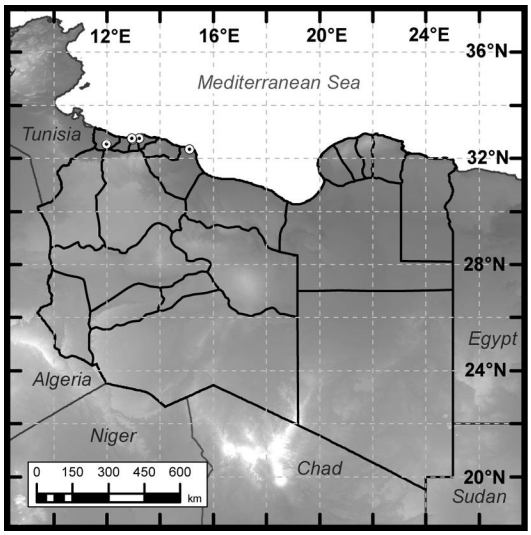


Figure 20. *Tarentola deserti* from Hotel Dar Ghadames, Gadamis, Nalut, Tripolitania, Libya, 2008. Photo © Roberto Sindaco.

Distribution.— From Morocco through northern Algeria and Tunisia to Tripolitania, Libya. In Libya they are found in Tripoli and the northwest (Sindaco and Jeremčenko 2008) as far east as approximately Misratah (Bshaena 2011).

Libyan Records (Map 22): TRIPOLITANIA: Nuqat al Khams: **10**: SNHM-BS 40102-5, 40107-25; Bshaena 2011. Zawiyah: **18**: SHNM-BS 39945-46, 39948, 39950, 39952-57, 39997; Bshaena 2011. **20:** SNHM-BS 40079-101; Bshaena 2011. Tripoli: **45**: SMF 57997. Misratah: **80**: SNHM-BS 40127, 40129; Bshaena 2011. Nalut: **129**: Sindaco, pers. obs. 4/30/2008. "**Tripolitania**": FMNH-82947.



Map 22. Distribution of *Tarentola deserti* in Libya. Only records of *Tarentola deserti* (*sensu stricto*) are illustrated. Records associated with several undescribed subspecies of *T. deserti* (Bshaena 2011) are plotted as *T. fascicularis* Complex.

Comments.— This taxon was formerly treated as a subspecies of *T. mauritanica* until elevated by Joger (1984). For a description of recent taxonomic revisions relating to this genus see Joger and Bshaena (2010) and Rato et al. (2012). Harris et al. (2004) and Rato et al. (2012), the latter authors using a multilocus dataset, identified *T. deserti* as a lineage embedded within "*T. fascicularis*" (see following species account). Joger (1984) and Le Berre (1989) did not mention any specimens from Libya. Trape et al. (2006) plotted a single degree square in Tripolitania (32°N, 13°E) as did Schleich et al. (1996) and Sindaco and Jeremčenko (2008).

Joger and Bshaenia (2010) and Bshaena and Joger (2013) presented substantially identical phylogenetic trees based on mtDNA derived Bayesian trees. These included numerous Libyan samples, including two, from Rass El Lifa and Azzawiyah, in their clade F, which also includes presumably "true" *T. deserti* from Tunisia. On the basis of the affinities of these specimens, we tentatively assign the associated localities to *T. deserti*. Bshaena (2011), however, recognized *T. deserti* ssp. nov. from these localities in northwestern Tripolitania, suggesting that they differed slightly form the typical form from Tunisia and Algeria. Cyrenaican records of *T. deserti* cited by Bshaena apply to an undescribed taxon believed by him to be allied to *T. deserti*, but at present, this is included, along with other unnamed *Tarentola*, within the *T. fascicularis* Complex. [Note that the various spellings of the name Bshaena/Bshaenia/Bshena all refer to the same author].

IUCN Threat Status.— Not evaluated, but anticipated to be Least Concern.

Tarentola fascicularis Complex (Daudin, 1802:144) (Fig. 21)

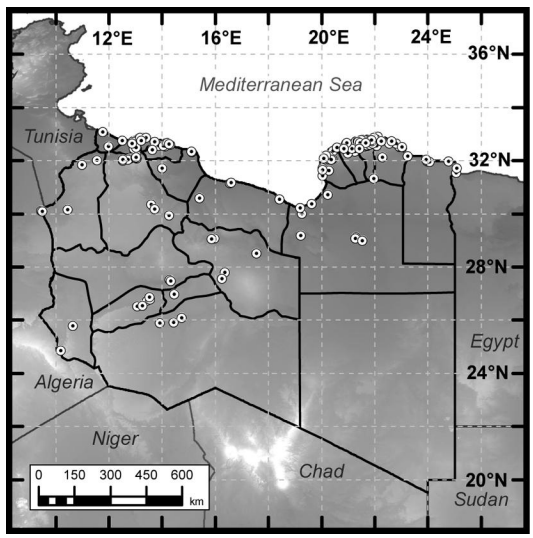
An XI [1802] *Gecko fascicularis* Daudin, Histoire Naturelle, Générale et Particulière des Reptiles, Ouvrage faisant Suite aux Oeuvres de Leclerc de Buffon, et Partie du Cours Complet d'Histoire Naturelle Rédigé par C.S. Sonnini, Membre de Plusieurs Sociétés Savantes. Quatrième Tome. F. Dufart Paris, 397 pp, pls xlvi–lviii.

Neotype: ZFMK 35631 designated by Joger (1984), "Ain Zeyanah, 20 km südlich von Benghazi, Libyen" *fide* Joger 1984. The original holotype specimen was studied by Lacépède and described by Daudin (1802) but is lost *fide* Joger (1984). The original type locality was "Tripoli" [Libya] by implication form the common name "geckotte de Tripoli" (see Comments below).

Tarentola mauritanica [part], Le Berre 1989:174.
Tarentola mauritanica fascicularis, Schleich, Kästle, and Kabisch 1996:276.
Tarentola mauritanica fascicularis [part], Sindaco and Jeremčenko 2008:136.
Complexe *Tarentola mauritanica* [part], Trape, Trape, and Chirio 2012:280.

Distribution.— Southern Tunisia (e.g., Gafsa, Gabés and Douz *fide* Sarra et al. 2013) through Egypt, with scattered records in northwestern Sinai (Werner 2016). In Libya they are found mostly in the north, with numerous scattered records further inland (Sindaco and Jeremčenko 2008; Joger and Bshaenia 2010; Bshaena 2011). Bshaena (2011) considered true *T. fascicularis* to be limited to areas relatively close to the coast in Cyrenaica (see Comments below). Tlili et al. (2014) incorrectly stated that this species is a central Tunisian endemic, presumably in error for *T. f. wolfgangi*, which is limited to that region.

Figure 21. *Tarentola fascicularis* Complex species from Sabha, Fezzan, Libya. Photo © Adel Ibrahim.



Map 23. Distribution of the *Tarentola fascicularis* Complex in Libya. The neotype locality of *T. fascicularis* is in northeastern Cyrenaica and most points outside of this region represent undescribed members of the broader *T. fascicularis* Complex, which also includes taxa more closely related to *T. deserti*.

Libyan Records (Map 23): TRIPOLITANIA: Nuqat al Khams: **3**: NHMC 80.3.86.101–104. Zawiyah: **10**: SNHM BS 40106; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013. **11**: CUP R 142; Frynta et al. 2000; Sindaco, pers. obs. 4/26/2008. **16**: BMNH 1975.1195; ZSM 79/1938/01–15; Werner 1909; Ghigi 1913; Zavattari 1934. **18**: SNHM BS 39947, 39949; Bshaena 2011. **19**: BMNH 1965.1146. **22**: MCSN 3213, 2004, 2452. Jafara: **29**: Sayers 1964. **31**: SNHM BS 39998–40015; Bshaena 2011; Joger and Bshaenia 2010; Bshaena and Joger 2013. Tripoli: **36**: BMNH 1954.1.5.51–54. **37**: MZUF 689. **38**: USNM 148484; ZFMK 106936; Joger and Bshaena 2010. **39**: USNM 148483. **42**: MZUT R2557. **43**: MCSN 1995; 3214. **44**: ZSM 1463–67/2009; SNHM BS 39944, 39958–59, 40071–78; Bshaena 2011; Joger and Bshaenia 2010; Bshaena and Joger 2013.**45**: BMNH 1955.1.8.46, 1965.1126–27, xxi.58.e; NHMW 17953, 18097; ZMB 15297–300, 15323–24, 15326; Gray 1845; Peters 1880, 1881; Boulenger 1885; Condorelli Francaviglia 1896; Werner 1909; Ghigi 1913; Zavattari 1934; Loveridge 1947. **56**: SNHM BS 39933–43, 39995–96; Bshaena 2011. Murqub: **60**: SNHM BS 40067–70; Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1934; Loveridge 1947; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013. **61**: BMNH 1901.10.28.1. **62**: Frynta et al. 2000. **63**: SNHM BS 40043–66, 40216–24; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013. **64**: SMNS 207. **66**: Sindaco, pers. obs. 4/29/2008. **67**: Sindaco pers. obs. 4/29/2008. **68**: BMNH 1913.12.30.3–5, 1965.1125; CUP R

069, 096–098, 106, 129; Boulenger 1914; Zavettari 1934; Frynta et al. 2000. **69**: BMNH 1965.1147–48; Sayers 1964; Sindaco, pers. obs. 4/28/2008. Misratah: **73**: SNHM BS 42538, 42539; Bshaena 2011. **80**: SNHM BS 40241–46, 40126–30; Zavattari 1934; Loveridge 1947; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013. **81**: Boulenger 1914. Nalut: **101**: Frynta et al. 2000. **105**: MNHN 2004.0082; Ibrahim and Ineich 2005. **120**: NHMC 80.3.86.105–106; DB2156, 2159; Rato et al. 2012. **126**: NHMC 80.3.86.91–100; DB2163; Rato et al. 2012. **127**: CUP R 012, 121; Frynta et al. 2000. **128**: CUP R 001, 009–10, 021, 038, 120; Frynta et al. 2000. Jabal al Gharbi: **140**: MCSN 4224. **141**: SNHM BS 39960–81, 39994; Bshaena 2011. **145**: NHMC 80.3.86.90. **146**: NHMC 80.3.86.89. **150**: NHMC 80.3.86.112. **154**: MZUT R2558; NHMW 17952; SNHM BS 40016–42, 40215; Werner 1909; Ghigi 1913; Zavattari 1934; Loveridge 1947; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013. **155**: Werner 1909. **156**: Sayers 1964. **160**: BMNH 1954.1.5.49. **161**: CUP R 095, 107; Frynta et al. 2000. **162**: SNHM BS 42534–37; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013. Sirte: **174**: MCSN 1985. **175**: SNHM BS 40146–49, 40230–33; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013. **190**: SNHM BS 40138–42, 40189; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013. **199**: MCSN 1992. "**Tripolitania**": ZIBU 15434–35, 17338; 20995. "**Tripolitania settentrionale**": Zavattari 1937. "**Meschia**": Loveridge 1947. "**Sirtica**": Zavattari 1937; Loveridge 1947. FEZZAN: Wadi al Shatii: **210**: Essghaier et al. 2015. **211**: Scortecci 1937a. Jufra: **217**: Zavattari 1937; Loveridge 1947. **218**: MCSN 1996; ZSM 120/1983/1–4. **221**: MCSN 1986, 1991, 2000; Scortecci 1935b; Loveridge 1947. **226**: MCSN 4223. Ghat: **235**: Zavattari 1934. **253**: SNHM BS 42527; Bshaena 2011. Wadi al Hayaa: **271**: SNHM BS 42530; Bshaena 2011. **272**: MCSN 1988, SNHM BS 42525; Joger and Bshaenia 2010; Bshaena 2011; Bhsaena and Joger 2013. **275**: SNHM BS 42522; Bshaena 2011. **277**: SNHM BS 42523–24; Bshaena 2011. **278**: SNHM BS 42526; Bshaena 2011. Sabha: **286**: BMNH 1954.1.5.47–48; SNHM BS 40177–88, 42528, 29, 31–33; ZCT 2005.01; Ibrahim 2008a; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013; Essghaier et al. 2015. Murzuq: **298**: Essghaier et al. 2015. **303**: Essghaier et al. 2015. **310**: AIC 2006.1574; ZCT 2006.45; Ibrahim 2008a. CYRENAICA: Benghazi: **335**: NHMC 80.3.86.109; DB2155; Rato et al. 2012. **336**: BMNH 1965.1142–1143. **337**: CUP R 108, 109; Frynta et al. 2000. **340**: DB2146, 2165; NHMC 80.3.86.107–108; ZFMK 35631; Rato et al. 2012. **343**: SMF 37664. **347**: SMF 58514-18. **348**: SMF 58519–20. **350**: BMNH 1954.1.6.8.; SMF 33452. **357**: BMNH 1945.11.9.4–5, 1955.1.1.34–35; MZUF 688; MZUT R2562; SMF 34472; SNHM BS 40162–65, 251–54; Cornalia in Haimann 1882, 1886; Werner 1909; Ghigi 1913, 1920; Umani 1922; Zavattari 1922, 1929, 1930; Calabresi 1923; Loveridge 1947; Bshaena 2011. **366**: DB2152; NHMC 80.3.86.113; Rato et al. 2012. **367**: CAS 12718; MZUT R2570; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Loveridge 1947. **372**: CUP R 030–032, 062–064; Frynta et al. 2000. **376**: MCSN 1998, 2467; SMF 34466, 34467–69; Scortecci 1935b; Loveridge 1947; Bshaena 2011. Marj: **382**: CUP R 036; Frynta et al. 2000. **383**: MZUT R2560; Calabresi 1923; Zavattari 1929, 1930, 1934; Loveridge 1947. **385**: MCSN 2005; MZUT R2571; Calabresi 1923; Zavattari 1929, 1930, 1937; Loveridge 1947; Joger and Bshaenia 2010; Bshaena and Joger 2013. **388**: NHMC 80.3.86.110–111. **389**: CUP R 037, 133; DB2143, 2158; MZUT R2563; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Frynta et al. 2000; Rato et al. 2012. **398**: NHMC 80.3.86.12. **400**: CUP R 070; Frynta et al. 2000. **401**: Tm22; Harris et al. 2004; Rato et al. 2012. **402**: MZUT R2567; SNHM BS 40166–71; Calabresi 1923; Zavattari 1929, 1930; Loveridge 1947; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013. **403**: NHMC 80.3.86.6. **404**: SNHM-BS 40000, 40002-3, 40005-6, 40009; Bshaena 2011. **406**: ZSM 243/1980. **457ad**: Schleich 1987. **457b**: Schleich 1987. **457v**: Schleich 1987. **457z**: Schleich 1987. Jabal al Akhdar: **414**: Resetar 1981. **417**: CUP R 137; MCSN 2465; Calabresi 1923; Zavattari 1922, 1929, 1930, 1934; Frynta et

al. 2000. **419**: FMNH 214956; Resetar 1981; Frynta et al. 2000. **421**: Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931. **425**: Zavattari 1929, 1930; Loveridge 1947. **428**: ZSM 121/1983/1–7; Schleich 1987. **430**: BMNH 1965.1140; MZUT R2566; Ghigi 1920; Calabresi 1923; Zavattari 1929, 1930, 1934; Loveridge 1947. **431**: SNHM BS 40235–38, 40153–61; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013. **434**: FMNH 214954; USNM 148482; Resetar 1981. **439**: FMNH 214955; Resetar 1981. **440**: Resetar 1981. **441**: Resetar 1981. **443**: FMNH 214952; Resetar 1981. **444**: FMNH 214951; Resetar 1981. **446**: FMNH 214953; Resetar 1981. **447**: Frynta et al. 2000. **448**: SMF 55407-08. **449**: NHMC 80.3.86.7–9, DB2168; Rato et al. 2012. **451**: Frynta et al. 2000. **452**: Ghigi 1920; Calabresi 1923; Zavattari 1929, 1930, 1934. **456**: SNHM-BS40131-32; Bshaena 2011. **457**: FMNH 82946, 82948; KNP 1981/140–143, 148, 150–151, 153–156, 168, 171, 177, 224, 226–228, 233, 239–241, 244–245, 258–259, 268, 276, 284, 288–289, 293, 304, 314, 328, 337, 345–346, 359, 408, 412, 436, 442, 459–460, 462, 486, 493, 500, 504; ZSM 1471/2009; Resetar 1981; Schleich 1987. **457an**: Schleich 1987. **457ap**: Schleich 1987. **457aq**: Schleich 1987. **457at**: Schleich 1987. **457au**: Schleich 1987. **457av**: Schleich 1987. **457aw**: Schleich 1987. **457ba**: Schleich 1987. **457bb**: Schleich 1987. **457bc**: Schleich 1987. **457bd**: Schleich 1987. **457be**: Schleich 1987. **457bf**: Schleich 1987. **457bh**: Schleich 1987. **457bj**: Schleich 1987. **457bl**: Schleich 1987. **457c**: Schleich 1987. **457ca**: Schleich 1987. **457cc**: Schleich 1987. **457ce**: Schleich 1987. **457cf**: Schleich 1987. **457ch**: Schleich 1987. **457ci**: Schleich 1987. **457cl**: Schleich 1987. **457ct**: Schleich 1987. **457cu**: Schleich 1987. **457cv**: Schleich 1987. **457d**: Schleich 1987. **457e**: Schleich 1987. **457i**: Schleich 1987. **457l**: Schleich 1987. **457m**: Schleich 1987. Darnah: **458**: NHMC 80.3.86.11. **461**: NHMC 80.3.86.10; DB2160; Rato et al. 2012. **462**: Ghigi 1920; Calabresi 1923; Zavattari 1929, 1930; Loveridge 1947. **465**: Calabresi 1923; Zavattari 1929, 1930; Loveridge 1947. **466**: MCSN 1989; SMF 34298, 35588, 52996; Werner 1909; Ghigi 1913; Calabresi 1923; Zavattari 1929, 1930, 1934; Loveridge 1947; Bshaena 2011. **467**: Zavattari 1929, 1930. **470**: ZSM 119/1983. **472**: NHMC 80.3.86.13–16. **473**: MZUT R1559; SNHM BS 40150–52; Tm23; Calabresi 1923; Zavattari 1929, 1930; Loveridge 1947; Harris et al. 2004; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013; Rato et al. 2013. **477**: NHMC 80.3.86.27–30. **479**: MCSN 1997; Scortecci 1935b. **484**: BMNH 1965.1144–45, MZUT R2564; Calabresi 1923; Zavattari 1929, 1930, 1934; Loveridge 1947. Butnan: **490**: NHMC 80.3.86.17; SNHM BS 40133–37, 40247–50; Tm26; Harris et al. 2004; Rato et al. 2010, 2012; Bshaena 2011. **493**: NHMC 80.3.86.18. **496**: SMF 34351-52. **505**: Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931; Loveridge 1947. **508**: NHMC 80.3.86.5; Tm21; Harris et al. 2004; Rato et al. 2010, 2012. Al Wahat: **529**: MCSN 1987, 1990 ; MNHN 1990.1631–35; NMP 34929; NMP 34929; SNHM BS 40172–76, 40226–29; ZSM 122/1983; Vinciguerra 1931; Zavattari 1934; Scortecci 1935b; Moravec 1995; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013. **540**: BMNH 1965.1141, 1287–88; SNHM BS 40143–45, 40239, 40240; Joger and Bshaenia 2010; Bshaena 2011; Bshaena and Joger 2013. **544**: BMNH 1965.1139; Vinciguerra 1931; Zavattari 1934; Loveridge 1947. **548**: HUJR 1008. **553**: MCSN 1993; Scortecci 1935b; Zavattari 1937; Loveridge 1947. **561**: SNHM BS 39982–93; Bshaena 2011. **563**: Loveridge 1947. **564**: MCSN 2002; Vinciguerra 1931; Zavattari 1929, 1930, 1934, 1937; Loveridge 1947. "**Cyrenaica**": BMNH 1954.1.5.45–46. "**Marmarica**": Zavattari 1937, Loveridge 1947. LIBYA: NHMW 17963.

Comments.— The *Tarentola mauritanica* group *sensu lato* has been revised and revisited many times (e.g., Harris et al. 2004, 2009; Rato et al. 2010, 2012, 2016). *Tarentola mauritanica* itself occurs in southern Europe (Iberian Peninsula, southern France, Italy, Adriadic coast, southern Greece and Crete) and northwestern Africa from Western Sahara to central Tunisia (Sindaco and Jeremčenko 2008), with the subspecies *T. m. juliae* Joger, 1984 and *T. m. pallida* Geniez et al., 1999 both in Morocco. Harris et al. (2004) demonstrated that northeastern African specimens of

T. mauritanica, to which the name *T. fascicularis* is applicable, were genetically distinct from the remainder of *T. mauritanica* and subsequently (Harris et al. 2009) that insular *Tarentola* from Lampedusa and Congli were assignable to *T.* [*m.*] *fascicularis*. They also showed that *T. fascicularis* is paraphyletic with respect to *T. deserti*. *Tarentola fascicularis* was considered a subspecies by many, including Sindaco and Jeremčenko (2008), until elevated to species level by Joger and Bshaena (2010). Sarra et al. (2013) provided morphometric and karyotypic data supporting the distinctiveness of *T. fascicularis* from *T. mauritanica*.

Rato et al. (2012), using a multilocus dataset, confirmed the reciprocal monophyly of the *Tarentola fascicularis* complex (including *T. deserti*, *T. neglecta* and *T. mindiae*) and the *T. mauritanica* complex. They also identified a great deal of substructure within *T. fascicularis sensu lato* and confirmed that *T. deserti* is a lineage embedded within "*T. fascicularis*." Libyan populations of "*T. fascicularis*" they sampled were grouped into three mitochondrial groups, two of which were sister to one another and account for the majority of their samples from coastal Cyrenaica, northwestern Egypt and the Tunisian/Libyan border area (their clades XI and XII); the third clade was represented by material from western Libya and the Libyan/Egyptian border area, as well as by material from the Italian islands of Lampedusa and Conigli (their clade VIII). Clade XI included the region in which the type locality of *T. fascicularis* is located and so unambiguously represents true *fascicularis*, should further taxonomic subdivision of the group take place. Rato et al. (2012) suggested that some clades within the *T. fascicularis* complex might deserve specific status, but took no action to name or elevate unnamed clades. Rato et al. (2016) subsequently provided molecular evidence to suggest that populations remaining in *T. fascicularis* represented additional undescribed taxa and Joger and Bshaenia (2010) explicitly stated that there were undescribed species within Libya. *Tarentola fascicularis wolfgangi* Joger and Bshaenia, 2010 (incorrectly referred to as *T. f. boehmei* in Bshaena and Joger 2013), a Tunisian endemic, is a member of Rato et al.'s (2012) clade IX and is deeply embedded within the *T. fascicularis* complex. Joger and Bshaenia (2010) and Bshaena and Joger (2013) presented substantially similar phylogenetic trees based on mtDNA, including many Libyan samples. In the earlier paper they recommended that their clades C, D, E, G, and H be considered as members of a single (unnamed) species, while they later included only D ("*T*. sp. Ajdabiya" and "*T*. sp. Ras Lanuf "), E (*T. f. wolfgangi*), G (*T*. sp. Sabha"), and H ("*T*. sp. NW Libya") in this complex and recommended that they be considered as subspecies of *T. fascicularis*. Clade C, which included specimens from Um Arrizam and Sidi Massod, Libya, also included a specimen from Egypt and were taken to be "typical" *T. fascicularis*. This is because Bshaena (2011) considered Tobruk to be the terra typica, although Joger (1984) had earlier designated a neotype from Benghazi. Neither of these populations is likely conspecific with Daudin's lost Tripolitanian holotype. According to Bshaena (2011), *T. fascicularis sensu stricto* occurs in Northeastern Cyrenaica up to 180 km from the Mediterranean coast.

Except for the endemic Tunisian *T. fascicularis wolfgangi* Joger and Bshaenia, 2010 and *T. neglecta lanzai* Bshaena and Joger, 2013 (which see below), none of the other clades in the *T. fascicularis* Complex have yet been named, although Bshaena (2011) provided diagnoses and descriptions in his unpublished and nomenclaturally unavailable doctoral dissertation. Because there are no names for these other Libyan clades, and because the taxonomy of *Tarentola*, especially the *T. fascicularis* complex, remains in a state of flux, we have chosen to include specimens of Libyan *Tarentola* not assignable to another named congener within this single account for the *T. fascicularis* Complex. In addition to the *T. fascicularis* forms signaled by Bshaena (2011), records listed may also include specimens referable to recognized or undescribed taxa of *T. deserti sensu lato* or *T. neglecta sensu lato* that have previously been referred to *T. mauritanica*, as well as any true *T. mauritanica* which might be represented by introduced populations in coastal urban centers.

Boulenger (1885) listed several specimens collected by Louis Fraser (corresponding to BMNH 1846.11.4.16–18) from "Susa, Tripoli." However, Fraser was based in 1846 in Tunis and is known to have collected other specimens from Susa (modern Sousse or Soussa), Tunis, approximately 130 km south of Tunis. It is thus likely that these specimens are not from Libya and they have been excluded from our dataset.

IUCN Threat Status.— Included within the assessment of *Tarentola mauritanica* which has the status Least Concern. Evaluated separately *Tarentola fascicularis* is also anticipated to be Least Concern.

Tarentola mindiae Baha el Din 1997:31, figs. 1–2

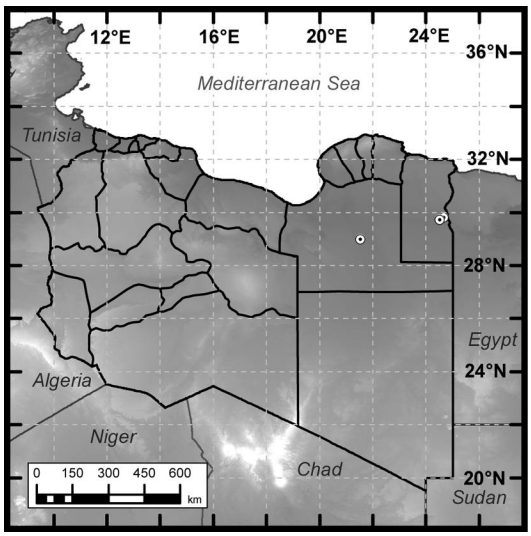
1997 *Tarentola mindiae* Baha el Din, A new species of *Tarentola* (Squamata: Gekkonidae) from the Western Desert of Egypt. African Journal of Herpetology 46:30–35.

Holotype.— FMNH 252492, "30°32′N 28°32′E south of Mingar Abu Dweis in the Qattara Depression, Egypt."

Tarentola mindiae, Sindaco and Jeremčenko 2008:136.

Distribution.— Northwestern Egypt west of the Nile and adjacent inland eastern Libya, chiefly in association with low-lying oases and other areas of relatively dense vegetation.

Libyan Records (Map 24): CYRENAICA**:** Butnan: **520**: Vinciguerra 1931; Zavattari 1934; Loveridge 1947. **521**: Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931; Zavattari 1937; Loveridge 1947; Ibrahim 2008b. Al Wahat: **564**: BMNH 1932.3.6.5; Baha El Din 2006a; Bshaena 2011.



Map 24. Distribution of *Tarentola mindiae* in Libya.

Comments:.— This species is only known with certainty in Libya from a single specimen. A distribution map in Bshaena (2011) mapped two Libyan localities near the Egyptian border, however, in the text the same author was explicit that there was only a single record. Baha El Din (1997, 2006a) suggested that the distribution of this species was likely to extend from the Qattara Depression and Siwa Oasis westward into Cyrenaica south of the Jabal al Akhdar, and this broad distribution has been depicted on the map accompanying the IUCN assessment of the species (Baha El Din 2006b). He further suggested that many inland Libyan records from *T. mauritanica* (i.e., *T. fascicularis*) might actually be referable to *T. mindiae* and explicitly mentioned the record of Loveridge (1947) from Giarabub (Jaghbub) as a probable example. Sindaco and Jeremčenko (2008) did not plot the confirmed Jalu record, but did plot the Giarabub locus. We here include both the Giarabub and nearby Hish as Sahabi (Es Sahabi) rcords as probable *T. mindiae*, although we have not confirmed this.

IUCN Threat Status.— Least Concern.

Tarentola neglecta Strauch, 1887:21, figs. 3–4

Tarentola neglecta neglecta Strauch 1887

1887 *Tarentola neglecta* 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, sér. 7, 35(2):1–72, [i]–ii, 1 pl.

HOLOTYPE.— ZISP 5376, "Batna. (Algerien)" [Batna, Batna Province, Algeria].

Tarentola neglecta lanzai Bshaena and Joger 2013:359, fig. 5.

2013 *Tarentola neglecta lanzai* Bshaena and Joger, A new gecko from Libya: *Tarentola neglecta lanzai* n. ssp. Amphibia-Reptilia 34:353–362.

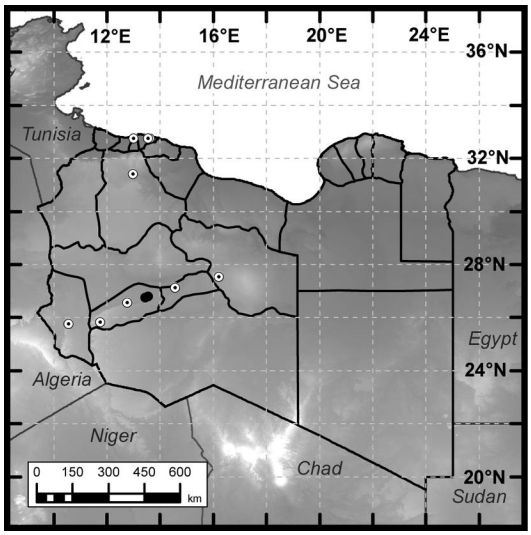
HOLOTYPE.— SNHM-BS N 44084 "Mandria Oasis (Libyan Sahara desert, N 26°45′40.73″, E 13°25′37.64″, 538 m above sea level), at ruins of an abandoned building."

Tarentola neglecta, Le Berre 1989:178.
Tarentola neglecta, Schleich, Kästle, and Kabisch 1996:277.
Tarentola neglecta, Sindaco and Jeremčenko 2008:136.
Tarentola neglecta, Trape, Trape, and Chirio 2012:282.

DISTRIBUTION.— Northern Algeria, into western Libya (Sindaco and Jeremčenko 2008). In Libya the nominate form is found in both western Tripolitania and Fezzan and *T. n. lanzai* occurs only in Fezzan.

Libyan Records (Map 25): *Tarentola neglecta neglecta*: TRIPOLITANIA: **22**: NMBA-REPT 15390–91. TRIPOLI: **51**: NMBA-REPT 15392. **53**: NMBA-REPT 15297–99. JABAL AL GHARBI: **158**: BMNH 1954.1.5.50; Salvador 1982; Joger 1984. FEZZAN: JUFRA: **224**: NMBA-REPT 15434–35. GHAT: **234**: Zavattari 1937; Loveridge 1947. WADI AL HAYAA: **269**: MCSN 2006–07; Scortecci 1937a. SABHA: **287**: Frynta et al. 2000. "**Fezzan**": Loveridge 1947.

***Tarentola neglecta lanzai*:** FEZZAN: WADI AL HAYAA: **275**: SNHM BS N 44084; Joger and Bshaenia 2010; Bshaena and Joger, 2013. **277**: SNHM BS N 44085–86; Frynta et al. 2000; Kratochvíl et al. 2002; Joger and Bshaenia 2010; Bshaena and Joger 2013.



MAP 25. Distribution of *Tarentola neglecta* in Libya. White dots with black centers represent localities of the nominotypical form and black dots are *T. n. lanzai*.

COMMENTS.— In light of the recent description of *T. n. lanzai*, all Libyan *T. neglecta* should be re-examined. We here have assumed that earlier references to *T. neglecta* that are from the same locality as some of those included by Bshaena and Joger (2013) in their description of the new subspecies, are referable to that form. We have retained all other records under the nominotypical form. Northern records from NMBA (Basel) are tentatively placed here based on identifications provided by the institution, but have not been verified. Sindaco and Jeremčenko (2008) plotted a locality apparently in eastern Nalut, but we did not capture this record. Tlili et al. (2014) also include Chad in the distribution of this species, citing Schleich et al. (1996), but neither these authors nor others (e.g., Sindaco and

Jeremčenko 2008; Trape et al. 2012) provide evidence of *T. neglecta* in Chad. Bshaena and Joger (2013) considered records from Chad to be misidentified *T. ephippiata* O'Shaughnessy, 1875. Joger (1984) incorrectly gave the date of Strauch's description as 1895.

IUCN Threat Status.— Least Concern.

Family Lacertidae

***Acanthodactylus boskianus asper* (Audouin, 1827:174, pl. I, fig. 10)**

1827 *Lacerta aspera* Audouin, Explication sommaire des planches de reptiles (supplément), publiées par Jules-César Savigny, Membre de l'Institut; offrant un exposé des caractères naturels des genres, avec la distinction des espèces. Pp. 161–184 In: M. J.-C. L. de Savigny, (ed.), Description de l'Égypte, ou Recueil des Observations et des Recherches qui ont été Faites en Égypte Pendant l'Expédition de l'Armée Française. Histoire Naturelle. Tome premier. Partie premier. Imprimerie Impériale, Paris.

Holotype.— Specimen figured in fig. 10, pl. 1 of the Atlas to the Description de l'Égypte, not located fide Brygoo (1988), "Egypte."

Acanthodactylus boskianus, Le Berre 1989:186.

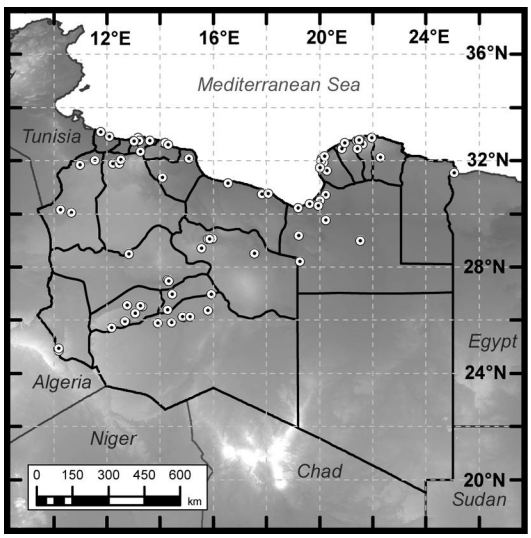
Acanthodactylus boskianus, Schleich, Kästle, and Kabisch 1996:378.

Acanthodactylus boskianus, Sindaco and Jeremčenko 2008:210.

Complexe *Acanthodactylus boskianus*, Trape, Trape, and Chirio 2012:294.

Distribution.— The range of *A. boskianus* as a whole extends from Mauritania and Western Sahara and as far south as northern Nigeria east to Eritrea, Sudan, and Egypt, and across Sinai and through the Levant to southeastern Anatolia, Iraq, Kuwait and western Iran (Sindaco and Jeremčenko 2008). The subspecies *A. b. asper* occupies most of North Africa (but see Comments for the confusion surrounding the delineation of taxa within this group). In Libya they are found across the country, except Kufrah (Sindaco and Jeremčenko 2008).

Libyan Records (Map 26): TRIPOLITANIA: Nuqat al Khams: **3**: NHMC 80.3.76.62–64. **5**: Werner 1909; Zavattari 1934. **6**: Werner 1909. Zawiyah: **23**: NMBA-REPT 15319; Zavattari 1934. **24**: Werner 1909. Jafara: **33**: BMNH 1975.1200; Salvador 1982. Tripoli: **39**: FMNH 82966. **45**: MCSN 2407; ZSM 172/1979; Werner 1909; Ghigi 1913; Zavattari 1934; Sayers 1964. **53**: NMBA-REPT 15320. Murqub: **66:** Sindaco, pers. obs. 4/29/2008. **67**: Sindaco, pers. obs. 4/29/2008. **68**: BMNH 1955.1.8.55; Boulenger 1914; Zavattari 1934; Salvador 1982. **69**: BMNH 1955.1.8.56; Salvador 1982; Sindaco obs. 4/26/2008. Misratah: **82**: NHMC 80.3.76.65–74. **75**: BMNH 1955.1.8.57; Salvador 1982. Nalut: **101**: BMNH 1965.1248; Salvador 1982. **105**: MNHN 2004.0083; Ibrahim and Ineich 2005. **119**: BMNH 1954.1.5.98; Salvador 1982. **122**: Brito et al. 2008. Jabal al Gharbi: **136**: BMNH 1965.1250; Salvador 1982. **138**: ZMA 13082. **141**: ZSM 169/1975. Sirte: **174**: ZMB 18007. **185**: BMNH 1965.1137, 1965.1247; Salvador 1982. **187**: BMNH 1965.1249. "**Tripolitania**": Latase 1885. "**Tripolitania settentrionale**":



Map 26. Distribution of *Acanthodactylus boskianus asper* in Libya.

Zavattari 1937. "**Sirtica**": Zavattari 1937. FEZZAN: Wadi al Shatii: **200**: Brito et al. 2008. **210**: NMBA-REPT 15470; ZMB 37603. **211**: Zavattari 1937. Jufra: **213**: BMNH 1954.1.6.3; ZSM 165/1979, 175/1979; Salvador 1982. **216**: ZMB 18008; ZSM 134/1983; Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1934. **217**: Zavattari 1937. **218**: MCSN 2062, 2073; ZSM 44/1981. **221**: MCSN 2074; Scortecci 1935b. Ghat: **249**: MCSN 2069, 2077, 2168. **253**: MCSN 2067, 2113; Scortecci 1937a. Wadi al Hayaa: **265**: MCCI R1452(1); Brito et al. 2008; Sindaco, pers. obs. 4/24/2008; Tamar et al. 2016b. **267**: Sindaco, pers. obs. 4/24/2008. **268**: Brito et al. 2008. **269**: Zavatarri 1934. **270**: Sindaco, pers. obs. 4/24/2008. **272**: MCSN 2061. **274**: CUP R 025; Frynta et al. 2000. Sabha: **281**: MCSN 2070. **285**: MCSN 2078; MSNG 50658; NMBA-REPT 15428–31; Kramer and Schnurrenberger 1963; Schnurrenberger 1963. **291**: NMBA-REPT 15310–17. Murzuq: **298**: AIC 2006.1572; BMNH 1954.1.5.9; MCSN 2076, 2165; ZSM 161/1979; Salvador 1982; Ibrahim 2008; Werner and Ibrahim 2012. **303**: BMNH 1956.1.1.7; MCSN 2060; ZCT 2005.04; Salvador 1982; Ibrahim 2008a. **311**: ZCT 2006.33, 2006.41, 2006.66; Ibrahim 2008a. **312**: MCSN 2083. **316**: ZSM 135/1983. **318**: Kramer and Schnurrenberger 1963; Schnurrenberger 1963. "**Fezzan**": BMNH 1954.1.5.91–97; Salvador 1982. CYRENAICA: Benghazi: **342**: MCSN 2173; MZUT R2278; USNM 146795; Salvador 1982. **357**: BMNH 1954.1.5.79–86; MTKD 17224–27; MZUF 769; NHMW 8216; SMF 34696; von Martens 1883; Werner 1909; Ghigi 1913; Calabresi 1923; Umani 1923; Zavattari 1929, 1930, 1934; Salvador 1982. **361**: BMNH 1987.1029. **363**: BMNH 1985.1191–92. **365**: SMF 34588. **376**: BMNH 1954.1.5.87–90; MCSN 2469; Salvador 1982. Marj: **385**: MCSN 1943; Zavattari 1937. **389**: SMF 34587; Calabresi 1923; Zavattari 1929, 1930, 1934. Jabal al Akhdar: **410**: FMNH 82940. **414**: FMNH 82935, 82939, 82967–68. **415**: FMNH 214941–44; Resetar 1981. **417**: Zavattari 1922, 1929, 1934; Calabresi 1923. **452**: Zavattari 1929, 1930. **457**: KNP 1981/149, 204, 277, 292, 298–299, 305–308, 311, 318, 324, 329, 339–341, 343–344, 347–349, 353, 357, 394, 396–397, 406, 409; Schleich 1987; **457f**: Schleich 1987. **457i**: Schleich 1987. **457l**: Schleich 1987. Darnah: **484**: MCSN 2364; MZUF 661, MZUT R2276; Calabresi 1923; Zavattari 1929, 1930, 1934. Butnan: **507**: BMNH 1965.1251–53; Salvador 1982. Al Wahat: **529**: MSNG 31604*; MCSN 2017, 2064, 2081; ZSM 138/1983; Vinciguerra 1931; Zavattari 1934; Scortecci 1935b. **533**: MSNG 31604*. **537**: SMF 55755. **540**: BMNH 1965.1254; Salvador 1982. **544**: MSNG 31604*; Vinciguerra 1931; Zavattari 1934. **553**: MCSN 2172; ZSM 137/1983. **557**: BMNH 1909.7.28.28–29; Salvador 1982. **558**: NMP 34932; Moravec 1995. **564**: Zavattari 1929, 1930, 1934, 1937. "**Cyrenaica**": ZMB 10502. "**Kouf National Park, Ras Latin**": ZSM 136/1983. LIBYA: NHMW 31123; NMP 34932.

Comments.— The complicated dating of the natural history portions of *Description de l'Égypte* has been elucidated by Sherborn (1897) and Tollitt (1986). The subspecies present in Libya and most of the North African range is *A. b. asper*. The *A. boskianus* species complex has long been believed to be paraphyletic (Harris and Arnold, 2000). The nominate form occupies the region of the Nile Delta and coastal north Sinai. *Acanthodactylus b. euphraticus* Boulenger, 1919 is in the region of Iraq. Trape and Trape (*in* Trape et al. 2012) named *A. b. khattensis* from western Mauritania and Trape, Chirio, and Geniez (*in* Trape et al. (2012) erected *A. b. nigeriensis* for material from Niger. The subspecific division of *A. boskianus* has been considered questionable (Sindaco and Jeremčenko 2008), but Werner and Ibrahim (2012) presented morphological evidence for the distinctness of *A. b. asper* and *A. b. boskianus*. Tamar et al. (2016b) recovered a "*boskianus* group" within which *A. boskianus asper* was made paraphyletic by *A. schreiberi schreiberi* + *A. s. ataturi*, *A. s. syriacus*, *A. b. nigeriensis*, and *A. b. khattensis*. Divergences within *A. b. asper* are relatively shallow. The sole Libyan sample in the study of Tamar et al. (2016b), from the southwest of the country, is in a clade including samples from Mauritania, Niger, Western Sahara, Morocco, Algeria, Tunisia, Egypt (west of the Suez Canal) and Sudan. This clade represents true *A. b. asper*

and its inclusion of both *A. b. nigeriensis* and *A. b. khattensis* suggests that these two taxa should be synonymized with *A. b. asper* (Tamar et al. 2016b). Material from Sinai, Israel, Jordan and Lebanon (including some specimens identified as *A. s. syriacus*), Yemen and southern Oman also form a relatively shallow clade and although labeled as *A. b. asper* in Tamar et al.'s (2016b) tree, correspond to the traditional concept of *A. b. boskianus*. Other clades in the *A. boskianus* group include: 1) specimens from the U.A.E., northern Oman, and the Jordanian panhandle, 2) *A. schreiberi schreiberi* + *A. s. ataturi* from Cyprus and the Cilician region of Turkey, respectively, and 3) Syrian *A. boskianus*.

IUCN Threat Status.— Not assessed, but assumed to be Least Concern.

Acanthodactylus dumerilii (Milne-Edwards, 1829:85, pl. VII, fig. 9)

1829 *Lacerta Dumerilii* Milne-Edwards, Recherches zoologiques pour servir à l'histoire des lézards, extraites d'une monographie de ce genre. Annales des Sciences Naturelles, Paris, sér. 1, 16: 50-89, pls. V–VIII.

Lectotype.— MNHN 2759 *fide* Brygoo (1988), "Sénégal" designated by Crochet et al. (2003).

1838 *Scapteira inornata* Gray, Catalogue of the slender-tongued saurians, with descriptions of many new genera and species. Part 1. Annals and Magazine of Natural History, series 1, 1:274–283 [281].

Lectotype.— BMNH 1946.9.3.76, "Tripoli" [Libya] designated by Crochet et al. (2003).

1885 *Acanthodactylus scutellatus* var. *exiguus* Lataste, Les acanthodactyles de Barbarie et les autres espèces du genre. Description d'une nouvelle espèce, du pays des Çomalis (*Acanthodactylus Vaillanti*). Annali del Museo Civico di Storia Naturale di Genova, ser. 2, 2:476–516 [493].

Lectotype.— BMNH 1920.1.20.1349, designated by Crochet et al. (2003), "en Algérie, à Biskra, Mraïer, Tougourt, Bled Ahmar, Hadjira, N'Gouça, Tilremt, Laghouat, Aïn-el-Hel et Bou-Sâada […] en Tunisie, à l'oued el Kreil (entre le plateau de Haouaïa et Ghumraçen), Kébili (dans le Nefzaoua), Tozeur, et Nefta (dans le Djérid)," restricted to "Hadjira, Algeria" by lectotype designation.

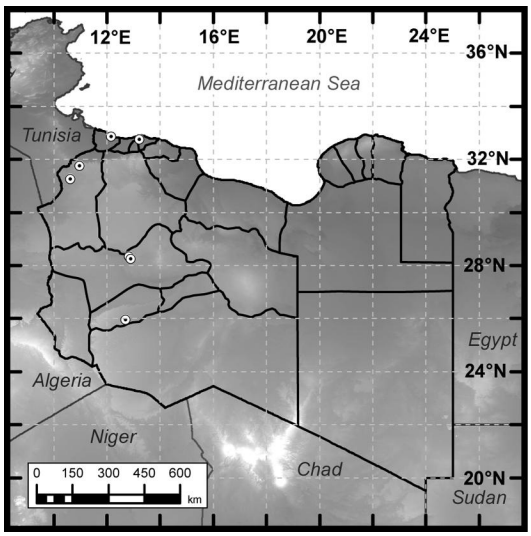
Acanthodactylus scutellatus [part], Le Berre 1989:190.

Acanthodactylus dumerili, Sindaco and Jeremčenko 2008:220.

Complexe *Acanthodactylus dumerili*, Trape, Trape, and Chirio 2012:304.

Distribution.— Northern Senegal and Mauritania across Western Sahara, Morocco, northern Algeria, southern Tunisia and northwestern Libya, although absent from Mediterranean Morocco and Algeria (Sindaco and Jeremčenko 2008; Tamar et al. 2016b). The Libyan records mark the easternmost extent of the species. It was not included in the Libyan fauna by Schleich et al. (1996).

Libyan Records (Map 27): TRIPOLITANIA: Nuqat al Khams: **7**: Brito et al. 2008. Tripoli: **45**: BMNH 1946.9.3.76; RMNH RENA 3493; Gray 1838, 1845; Boulenger 1887, 1918, 1921; Crochet et al. 2003; Sindaco and Jeremčenko 2008. Nalut: **102**: Brito et al. 2008. **115**: Brito et al. 2008. FEZZAN: Wadi al Shatii: **202**: Brito et al. 2008. **203**: Brito et al. 2008. Wadi al Hayaa: **268**: Brito et al. 2008.



Map 27. Distribution of *Acanthodactylus dumerilii* in Libya.

Comments.— Two subspecies are currently recognized within *A. dumerilii* by some authors (e.g., Salvador, 1982); the nominate form is West African, whereas the specimens found in North Africa, including Libya, belong to *A. d. exiguus* Lataste, 1885. *Acanthodactylus dumerilii* was synonymized with *A. scutellatus* by Boulenger (1887) and Arnold (1983), who considered the nature of variation in *A. scutellatus* to be too complex to warrant meaningful application of subspecific names. Sindaco and Jeremčenko (2008) did not recognize any subspecies in *A. dumerilii*. Tamar et al. (2016b) generated a multilocus phylogeny for the genus *Acanthodactylus* and found that *A. dumerilii* is made paraphyletic by *A. senegalensis* within the "*scutellatus* clade." Their sampling included no Libyan samples, however. Supposed *A. dumerilii* from Senegal, Mauritania and Western Sahara in their study grouped with *A. senegalensis*, suggesting that these southwestern records for *A. dumerilii* need to be verified. The type locality for *A. dumerilii* is "Sénégal" but, as noted by Crochet et al. (2003), this probably refers to an area in northwestern Africa outside of the nation of Senegal as currently recognized. Bons and Girot (1964) treated *A. inornatus* and *A. dumerilii* as different species and regarded the former as occurring across North Africa, although they plotted only two records in Libya, one in northwestern Tripolitania and the other along the Egyptian border and certainly referable to some congener. Crochet et al. (2003) showed that *A. inornatus* and *A. exiguus* are junior synonyms of *A. dumerilii.*

IUCN Threat Status.— Not assessed, but assumed to be Least Concern.

Acanthodactylus longipes Boulenger, 1918:154

1918 *Acanthodactylus scutellatus* var. *longipes* Boulenger, Sur les lézards du genre *Acanthodactylus* Wieg. Bulletin de la Société Zoologique de France 43:143–155.

Lectotype.— BMNH 1946.8.4.31, "Wargla, Algeria." designated by Crochet et al. (2003). Original published type locality "Sahara algérien."

Acanthodactylus scutellatus [part], Le Berre 1989:190.

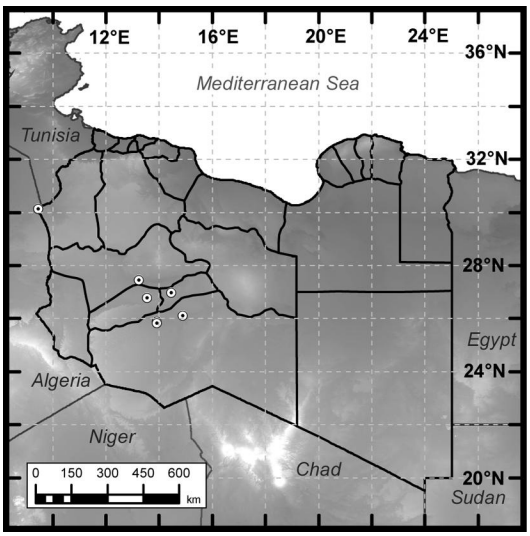
Acanthodactylus longipes, Schleich, Kästle, and Kabisch 1996:402.

Acanthodactylus longipes, Sindaco and Jeremčenko 2008:220.

Acanthodactylus longipes, Trape, Trape, and Chirio 2012:308.

Distribution.— Mauritania, Mali and southern Morocco through Algeria, Niger, Libya and Chad to Egypt west of the Nile Valley and Delta (Tamar et al. 2016b). Libyan records are few and restricted to the inland west of Tripolitania and Fezzan, although the global distribution suggests that *A. longipes* should also inhabit the inland regions of eastern Libya.

Libyan Records (Map 28): TRIPOLITANIA: Nalut: **125**: Brito et al. 2008. FEZZAN: Wadi al Shatii: **209**: Brito et al. 2008. Wadi al Hayaa: **277**: Brito et al. 2008. Sabha: **285**: BMNH 1954.1.6.42; Salvador 1982. Murzuq: **298**: BMNH (1) not cataloged; Salvador 1982. **299**: BMNH 1982.391. **312**: Brito et al. 2008. "**SW Libya**": photo, Sindaco and Jeremčenko 2008; Werner and Ibrahim 2012.



Map 28. Distribution of *Acanthodactylus longipes* in Libya.

Comments.— Baha El Din (1996) first

reported the species from Egypt, where it had previously been confused with *A. scutellatus*. Initial records were from across northern Egypt both east and west of the Nile and across northern Sinai (Baha El Din 1996). Specimens from east of the Nile Delta reported by Werner (1998) and Baha El Din (2006a) have since been allocated to *A. aegyptius* Baha El Din, 2007. Tamar et al. (2016b) generated a multilocus phylogeny for the genus *Acanthodactylus* and found *A. longipes* to be monophyletic and a member of the "*scutellatus* clade," although they included no Libyan samples. As noted by Crochet et al. (2003), there are a **s**mall number of vouchered specimens given that the species has been mentioned by several authors as extremely common in Libya (Salvador, 1982; Schleich et. al. 1996; Sindaco and Jeremčenko 2008). Bons and Girot (1964) considered the species to be distributed across inland Tripolitania.

IUCN Threat Status.— Not assessed, but assumed to be Least Concern.

Acanthodactylus maculatus (Gray, 1838:281) (Fig. 22)

Scapteira maculata Gray, Catalogue of the slender-tongued saurians, with descriptions of many new genera and species. Part 1. Annals and Magazine of Natural History, series 1, 1:274–283.

Syntypes.— BMNH 1946.9.3.53 and two other specimens (*fide* Boulenger 1887, although Boulenger 1921 mentioned only a single "type" and Salvador 19892 referred to the "Holotype"), "Tripoli" [Libya].

1918 *Acanthodactylus pardalis* Var. *Latastei* Boulenger, Sur les lézards du genre *Acanthodactylus* Wiegm. Bulletin de la Société Zoologique de France 43:143–155. [153]

Syntypes.— presumably BMNH, not located, "Tripoli, S. de la Tunisie, Algérie (Sahara et Hauts plateau)."

Acanthodactylus scutellatus [part], Le Berre 1989:190.

Acanthodactylus maculatus, Schleich, Kästle, and Kabisch 1996:392.

Acanthodactylus maculatus, Sindaco and Jeremčenko 2008:218.

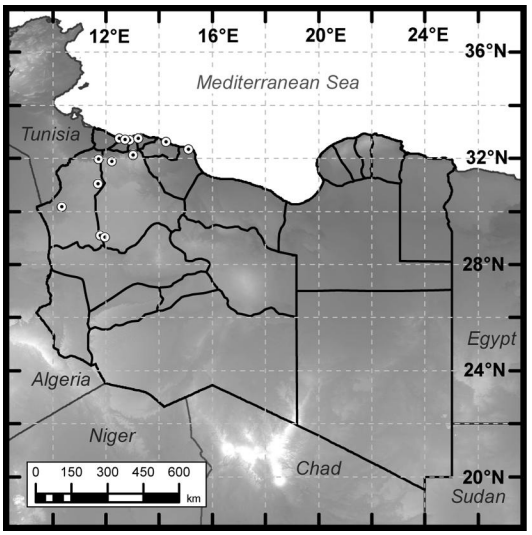
Acanthodactylus maculatus, Trape, Trape, and Chirio 2012:310.

Distribution.— From central Morocco and northern Algeria to Tunisia and Mediterranean Tripolitania (Tamar et al. 2016b). In Libya restricted to northwestern Tripolitania.

Libyan Records (Map 29): TRIPOLITANIA: Zawiyah: **11**: BMNH 1965.1256; Salvador 1982. **12**: MZUT R3265; ZMB 79710. **17**: BMNH 1954.1.6.61,1955.1.8.66; Salvador 1982. Tripoli: **45**: BMNH 1946.9.3.53; MZUT R2280; ZMB 14032, 15305, 15308–09, 15320–21, 15383, 18155; ZSM 484/1904; Gray 1838, 1845; Boulenger 1887, 1918, 1921; König 1888; Wern-

Figure 22. *Acanthodactylus maculatus* from 5 km east of Al Jawsh, Nalut, Tripolitania, Libya, 2008. Photo © Roberto Sindaco.

er 1909; Salvador 1982. Murqub: **68**: BMNH 1265.1258; Boulenger 1914; Salvador 1982. Misratah: **80**: BMNH 1913.12.30.11; Boulenger 1914, 1921; Salvador 1982. Nalut: **107**: MCCI R1456; Sindaco, pers. obs. 4/30/2008; Tamar et al. 2016b. **109**: BMNH 1965.1257–58; Salvador 1982. **118**: BMNH 1954.1.6.4; Salvador 1982. Jabal al Gharbi: **136**: BMNH 1965.1255; Salvador 1982. **154**: ZSM 173/1979. **163**: Brito et al. 2008; Fonseca et al. 2008. **164**: Brito et al. 2008; Fonseca et al. 2008. "**Cyrenaica**": BMNH 1920.1.20.649 [in error, not plotted].



Map 29. Distribution of *Acanthodactylus maculatus* in Libya.

Comments.— Tamar et al. (2016b) generated a multilocus phylogeny for the genus *Acanthodactylus* and identified *A. maculatus* as a member of their "Western clade." It is made paraphyletic by *A. beershebensis*, *A. pardalis* and *A. bedriagai*, although basal support values within their entire "*pardalis* group" are too low to infer meaningful support for this pattern. Their sole Libyan sample was weakly supported as sister to conspecifics from Morocco and Algeria. The subspecific epithet "*latastei*" was subsequently misspelled "*latastii*" by Boulenger (1921).

IUCN Threat Status.— Least Concern.

Acanthodactylus pardalis (Lichtenstein, 1823: 99)

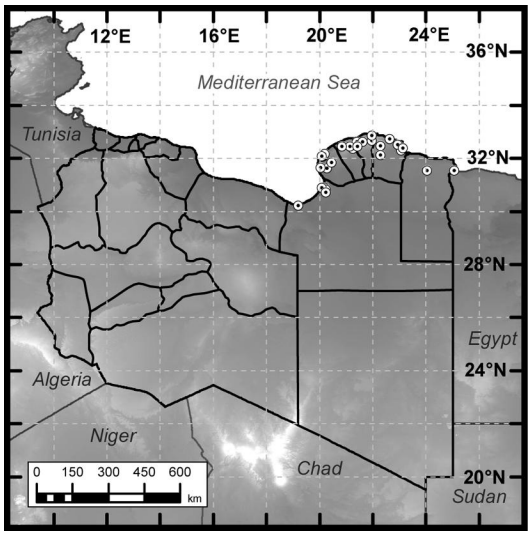
1823 *L*[*acerta*] *Pardalis* Lichtenstein, Verzeichniss der Doubletten des zoologischen Museums der Königl. Universität zu Berlin nebst Beschreibung vieler bisher unbekannter Arten von Säugethieren, Vögeln, Amphibien und Fischen. T. Trautwein, Berlin. x + 118 pp., 1 pl.

Lectotype.— ZMB 1077, "Aegyptus"designated by Moravec et al. (1999). The paralectotypes are ZMB 1072–1076 and ZMB 55905 (formerly part of ZMB 1077) (Bauer and Günther 1995).

Acanthodactylus pardalis, Le Berre 1989:188.
Acanthodactylus pardalis, Schleich, Kästle, and Kabisch 1996:388.
Acanthodactylus pardalis, Sindaco and Jeremčenko 2008:218.

Distribution.— Mediterranean coast from the Gulf of Sirte east to the Nile Valley of Egypt (Sindaco and Jeremčenko 2008; Tamar et al. 2016b), a single record from east of the Nile is discussed by Moravec et al. (1999). In Libya they are found along the coast from the eastern Gulf of Sirte to the Egyptian border, but are absent from the elevated regions of the Jabal al Akhdar.

Libyan Records (Map 30): CYRENAICA: Benghazi: **342**: MZUT R2289; Calabresi 1923; Zavattari 1929, 1930, 1934. **355**: BMNH 1954.1.6.5–7, Salvador 1982. **357**: BMNH 1988.189, 1988.191–92; MZUF 852, 12688; NHMW 8161; von Martens 1883; Werner 1909; Ghigi 1920; Calabresi 1923; Umani 1923; Zavattari 1929, 1930, 1934; Moravec et al. 1999. **358**: MZUF 853; Calabresi 1923; Zavattari 1929, 1930, 1934; Moravec et al. 1999. **364**: Cornalia in Haimann 1882, 1886; Zavattari 1934. **367**: MZUF 770; MZUT R2412; Calabresi 1923; Zavattari 1929, 1930, 1934; Moravec et al. 1999. **376**: BMNH 1965.1259; Salvador 1982. Marj: **385**: MCSN 2079; Zavattari 1937. **399**: Fonseca et al. 2008. **402**: MZUT R2297; Calabresi 1923; Zavattari 1929, 1930. **403**: NHMC 80.3.73.1. Jabal al Akhdar: **417**: Zavattari 1929, 1930. **452**: Ghigi 1920; Cal-



Map 30. Distribution of *Acanthodactylus pardalis* in Libya.

abresi 1923; Zavattari 1929, 1930, 1934. **457cq**: KNP 1983/513[2 specimens]; Schleich 1987. Darnah: **466**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **472**: NHMC 80.3.73.2; Fonseca et al. 2008. **474**: MSNG 28431; MZUF 669; Vinceguerra 1927; Zavattari 1929, 1930, 1934. **475**: BMNH 1965.1261; MCZ R 46799–800; Salvador 1982. **480**: ZSM 131/1983. **484**: ZSM 132/1983. Butnan: **507**: BMNH 1965.1260; Salvador 1982. **512**: ZSM 190/1979. Al Wahat: **526**: MSNG 31574*; Vinciguerra 1931. **527**: BMNH 1965.1265; Salvador 1982; Moravec et al. 1999. **528**: BMNH 1965.1266; Salvador 1982; Moravec et al. 1999. **529**: BMNH 1965.1262–64; MSNG 31574*; NMBA-REPT 15321; Vinciguerra 1931; Zavattari 1934; Scortecci 1935b; Salvador 1982; Moravec et al. 1999. **544**: BMNH 1932.3.6.7; MSNG 31574*; Vinciguerra 1931; Zavattari 1934. "**Cyrenaica**": ZMB 10503. "**between Darnah and Marsa al Brega**": BMNH 1965.1267; Salvador 1982. "**Marmarica**": Zavattari 1937. "**Nordost-Libyen**": ZMB 62964-67. "**deserto di Sahara**": Rizzardi 1896. "**Sirtica**": Zavattari 1937.

Comments.— Some early citations to *A. vulgaris* (e.g., Cornalia from "Uadi Ahmar") or *A. lineomaculatus* (von Martens from Benghazi) have been interpreted as referring to *A. pardalis.* However, the similarity of *Acanthodactylus* species to one another has probably resulted in the misidentifications of many specimens and unless confirmed by later specialists (e.g., Salvador 1982; Moravec et al. 1999) identifications provided in early citations are tentative at best.

Records from Tripoli cited by Ghigi (1913), Werner (1909) and Zavattari (1934) are all derived from Rizzardi (1896), but this author actually reports the species (as *Acantodactylus* [sic] *lineatomaculatus*) from the "deserto di Sahara." Moravec et al. (1999) reviewed the *A. pardalis* group and described *A. beershebensis* for the taxon inhabiting the Negev, restricting true *A. pardalis* to North Africa. Tamar et al. (2016b) generated a multilocus phylogeny for the genus *Acanthodactylus*. *Acanthodactylus pardalis* was represented by Egyptian material only in their study and was embedded within *A. maculatus*, but basal support values within their entire "*pardalis* group" are too low to infer meaningful support for this pattern. Salvador (1982) and Arnold (1983) recognized essentially the same Libyan taxa and boundaries as later molecular works, although Arnold (1983) included what are now *A. bedriagai* and *A. busacki* as subspecies within *A. pardalis*. Werner (1909) referred a juvenile specimen from Gherran (Garyān) to this species and this record was subsequently repeated by Ghigi (1913) and Zavattari (1934). Boulenger (1914, 1918, 1921) believed that this species extended to Tripoli and identified material from Al Khums and Misratah (e.g., MSNG 52517) as *A. pardalis.* These records, as well as the miscitations of Rizzardi (1896) noted above, are also the basis for Zavattari's (1937) inclusion of the species in the Tripolitanian fauna. Most recently Essghaier et al. (2015) noted a record from Murzuq. We regard these as misidentifications referable to some congener and have not included them in the accompanying map.

IUCN Threat Status.— Vulnerable A2c; B1ab(I,ii,iii).

***Acanthodactylus scutellatus audouini* Boulenger, 1918:154 (FIG. 23)**

1918 *Acanthodactylus scutellatus* Var. *Audouini* Boulenger, Sur les lézards du genre *Acanthodactylus* Wiegm. Bulletin de la Société Zoologique de France 43:143–155.

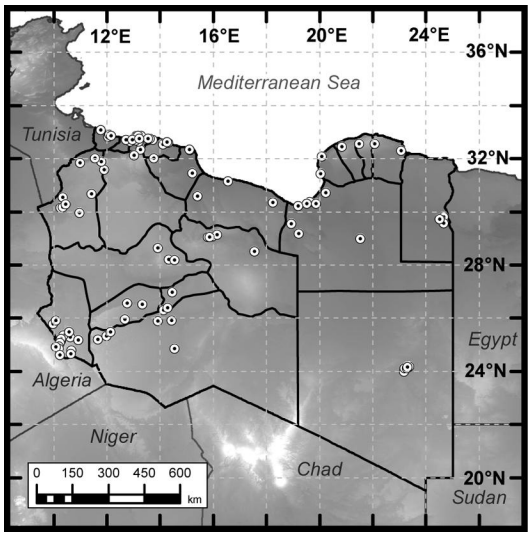
LECTOTYPE.— BMNH 1920.1.20.3006, "Wed El Kreil, Tunisia" designated by Crochet et al. (2003), [Tunisia]. Original type locality: "Egypte, Nubie, Tripoli, sud de la Tunisie."

Acanthodactylus scutellatus [part], Le Berre 1989:190.
Acanthodactylus scutellatus, Schleich, Kästle, and Kabisch 1996:397.
Acanthodactylus scutellatus audouini, Sindaco and Jeremčenko 2008:221.
Acanthodactylus scutellatus audouini, Trape, Trape, and Chirio 2012:312.

DISTRIBUTION.— Senegal, Mauritania and Western across Africa to Egypt (although absent from much of the Eastern Desert, Baha El Din 2006a) and Sudan, continuing through Sinai Israel, Jordan, Iraq, Kuwait and far northwestern, as well as eastern Saudi Arabia In Libya distributed across the country.

FIGURE 23. *Acanthodactylus scutellatus audouini* from Awiss area, Tadrart Akakus, Ghat, Fezzan, Libya, 2008. Photo © Roberto Sindaco.

Libyan Records (Map 31): CYRENAICA: NUQAT AL KHAMS: **3**: NHMC 80.3.110.10–17. **5**: BMNH 1955.1.8.61–62, 1965.1130, 1965. 1282; Salvador 1982. **5a**: AIC (3 specimens) no numbers provided; Ibrahim and Ineich 2005. **7**: Brito et al. 2008. ZAWIYAH: **12**: ZMB 39061. **17**: BMNH 1955.1.8.63; Salvador 1982. **16**: BMNH 1982.372–76. **23**: MZUT R3262. JAFARA: **26**: MZUT R3264. TRIPOLI: **35**: BMNH 1954.1.6.10–30, 1954.1.6.45–60; Salvador 1982. **36**: BMNH 1955.1.6.10–30, 45–60. **38**: MCZ R 22348; USNM 148485. **39**: FMNH 82967, 82970; MCZ R 22350–51; MNHN 1976.369–70; UMNH 4238. **43**: MZUT R3263; NHMW 31120. **45**: BMNH 1955.1.8.58–60; Crotchet et al. 2003; NHMW 8228; SMF 13648–51; ZMB 13781, 14031, 15304, 15307, 15322, 15329–30; Condorelli-Francaviglia 1896; König 1888; Werner 1909; Ghigi 1913; Boulenger 1918, 1921; Zavatari 1934. **50**: BMNH 1954.1.6.43–44; Salvador 1982. **51**: NMBA-REPT 15393. **53**: BMNH 1955.1.6.43–44; MSNG 31589*; NMBA-REPT 15323. **56**: BMNH 1955.1.8.65, 1965.1283; Salvador 1982. MURQUB: **62**: BMNH 1982.369–71. **64**: FMNH 82924; ZMB 18015–17. **68**: BMNH 1913.12.30.6–10, 1954.1.6.38–40, 1965.1129; CUP R 047–050; MSNG 28258, 52520, 52522; Boulenger 1914, 1921; Zavattari 1934;



MAP 31. Distribution of *Acanthodactylus scutellatus audouini* in Libya.

Bons and Girot 1964; Salvador 1982; Frynta et al. 2000; Crochet et al. 2003. **69**: MZUF 671. Misratah: **72**: MCZ R 22349. **80**: Boulenger 1914; Zavattari 1934. **81**: Boulenger 1914. **87**: NHMC 80.3.110.4. Nalut: **101**: BMNH 1975.1208–09; Salvador 1982.**105**: MNHN 2004.0089–91; Ibrahim and Ineich 2005. **108**: FMNH 82936. **110**: de Witte 1930. **114**: MCCI R1468(1); Tamar et al. 2016. **116**: MCCI R1465; Sindaco, pers. obs. 5/2/2008; Tamar et al. 2016. **118**: NHMC 80.3.110.119–120. **119**: BMNH 1954.1.6.31–37; Salvador 1982. **124**: MZUF 39095. Jabal al Gharbi: **132**: BMNH 1965.1279–81; Salvador 1982. **154**: FMNH 82941. Sirte: **174**: ZMB 18012. **194**: BMNH 1899.9.5.6; Salvador 1982. **199**: EPHE/CNHM 82965; Scortecci 1946; Bons and Girot 1964; Crochet et al. 2003. "**Tripolitania**": FMNH 82924; FMNH 82925. "**Tripolitania settentrionale**": Zavattari 1937. "**14 km S El Habila**": BMNH 1955.1.8.64; Salvador 1982. "**Sirtica**": Zavattari 1937. FEZZAN: Wadi al Shatii: **205**: BMNH 1965.1285; Salvador 1982. **206**: BMNH 1965.1286; Salvador 1982. **207**: MCSN 2096; Scortecci 1946. Jufra: **216**: ZMB 18013–14; Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1934. **217**: Zavattari 1937. **218**: MCSN 2084; Scortecci 1946. **219**: Scortecci 1946. **221**: MCSN 2108. Ghat: **231**: Scortecci 1946. **232**: Scortecci 1946. **237**: Sindaco, pers. obs. 4/20/2008. **239**: MCSN 2090; Scortecci 1946. **242**: MCCI-R1463–64; Frynta et al. 2000; Tamar et al. 2016b. **243:** Scortecci 1946. **244**: Scortecci 1946. **245**: MCSN 2099; Scortecci 1935b. **248**: MCSN 2097; Scortecci 1946. **249**: MCSN 2092, 2101, 2115; Scortecci 1946. **253**: MCSN 2089, 2100, 2105, 2109; Scortecci 1946. **255**: Scortecci 1946. **256**: MCSN 2098; Scortecci 1946. **258**: CUP R 013, 014; Frynta et al. 2000. **260**: Sindaco, pers. obs. 4/22/2008. Wadi al Hayaa: **267**: CUP R 028; Frynta et al. 2000. **269**: Scortecci 1946; Essghaier et al. 2015. **274**: CUP R 026–27; Frynta et al. 2000. Sabha: **280**: MCSN 2104. **281**: ZCT 2006.55; Ibrahim 2008a; Werner and Ibrahim 2012. **286**: BMNH 1954.1.6.41; MSNG 50657; NMBA-REPT 17808, 17811; Salvador 1982. Murzuq: **293**: Sindaco, pers. obs. 4/23/2008. **294**: Sindaco, pers. obs. 4/23/2008. **295**: Sindaco, pers. obs. 4/23/2008. **298**: BMNH 1945.11.9.8–9, 1956.1.1.8; MCSN 2103; ZCT 2005.41; Scortecci 1946; Salvador 1982; Ibrahim 2008a; Werner and Ibrahim 2012; Essghaier et al. 2015. **303**: Essghaier et al. 2015. **325**: MCSN 2088. **Fezzan**: "**Surual (Tasili)**": Scortecci 1946. "**Between Erg Ouan Kasa and Erg Murzuq**": MCCI R1466–67; Tamar et al. 2016b. CYRENAICA: Benghazi: **357**: BMNH 1965.1278; Umani 1923; Zavattari 1930, 1934; Salvador 1982. **358**: MCSN 2093. **371**: CUP R 024, 029, 033, 035; Frynta et al. 2000. Marj: **385**: MCSN 2091; Zavattari 1937. Jabal al Akhdar: **448**: SMF 55409. Darnah: **475**: FMNH 82926. **479**: MCSN 2086; Scortecci 1935b. Butnan: **520**: Vinciguerra 1931; Zavattari 1934. **521**: MSNG 28434, 37520; Vinciguerra 1927; Zavattari 1929, 1930, 1934, 1937. **524**: Vinciguerra 1927; Zavattari 1929, 1930, 1934. Al Wahat: **529**: BMNH 1955.1.1.46–47; MCSN 2110–11; NMP 34933; MSNG 31588*; NMP 34933; Salvador 1982; Moravec 1995. **538**: NMBA-REPT 15322. **540**: BMNH 1965.1268–73, 1965.1277; Salvador 1982. **541**: NHMC 80.3.110.18. **544**: BMNH 1965.1274–76; Vinciguerra 1931; Zavattari 1934; Salvador 1982. **553**: Zavattari 1937. **554**: MCSN 1841. **564**: BMNH 1932.3.6.9–10; MSNG 31588*; Zavattari 1929, 1930, 1934, 1937; Vinciguerra 1931; Salvador 1982. Kufrah: **571**: MZUF 771; Scortecci 1935c; Zavattari 1937. **571a**: MSNG 31589*; Vinciguerra 1931. **572**: BMNH 1932.3.6.8; Vinciguerra 1931; Salvador 1982. **573**: Vinciguerra 1931; Zavattari 1937. **575**: BMNH 1932.3.6.12; BMNH 1975.1229–36; BMNH 1982.381–82; MSNG 31589*; ZMB 18010–11; Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1929, 1930, 1934; Salvador 1982. **575a**: MSNG 31589*; Vinciguerra 1931. **577**: MSNG 31589*; Vinciguerra 1931. "**Kufrah**: **1000 km South of Benghazi**": BMNH 1987.1030–32. "**Cyrenaica**": MCSN 2094; MZUF 772; MSNG 52499. **"Between Agedabia and Gialo"**: MSNG 31588*–89*; Vinceguerra 1931. LIBYA: RMNH RENA 13917. "**Libysche Wüste**": ZMB 27456. **"dunes south of Ettoni**": MZUT R3266. [* = two different specimens with apparently the same number but different localities]

Comments.— *Acanthodactylus* species have proved particularly difficult for many authors to identify (Vinceguerra 1927, 1931; Zavattari 1930; Scortecci 1946) and the identity of *A. scutellatus* and its relatives has been considered in detail by Scortecci (1946) and Bons and Girot (1964). The latter authors plotted localities across Libya for *A. s. audouini*, which they considered as clearly distinct form the nonminotypical form occurring in Egypt and Sudan. Arnold (1983) considered the names *audouini*, *inornatus* and *dumerilii* as conspecific with *scutellatus* and declined to try to identify subspecific divisions among them, whereas Salvador (1982) separated *dumerilii* (see account above) as a different species. Three subspecies have typically been recognized: *A. s. scutellatus* (Egypt, Sinai, and southern Israel), *A. s. audouini* Boulenger, 1918 (Saharan), and *A. s. hardyi* Haas, 1957 (Iraq, Saudi Arabia, Kuwait) (Schleich et al. 1996; Sindaco and Jeremčenko 2008). Crochet et al. (2003) recently revised the *A. scutellatus* group and recognized six constituent taxa. Tamar et al. (2016b) found deep divergences between the reciprocally monophyletic *A. s. scutellatus* and *A. s. audouini*, with robust substructure in the latter. Libyan samples fall out in two clades, one allied to Tunisian populations and the other Egyptian + Mauritanian samples. The degree of divergence from the nominate form raises the question if specific status is warranted for *A. s. audouini*. Brygoo (1988) claimed that Boulenger had designated a specimen figured by Audouin in the *Déscription de l'Egypte* as the type of this taxon, although this does not appear to be the case, although this specimen may be considered as part of the original syntype series, which also includes various specimens in the BMNH collection.

IUCN Threat Status.— Not assessed, but assumed to be Least Concern.

Mesalina guttulata (Lichtenstein, 1823:101) (Fig. 24)

1823 *L*[*acerta*] *guttulata* Lichtenstein, Verzeichniss der Doubletten des zoologischen Museums der Königl. Universität zu Berlin nebst Beschreibung vieler bisher unbekannter Arten von Säugethieren, Vögeln, Amphibien und Fischen. T. Trautwein, Berlin. x + 118 pp., pl. 1.

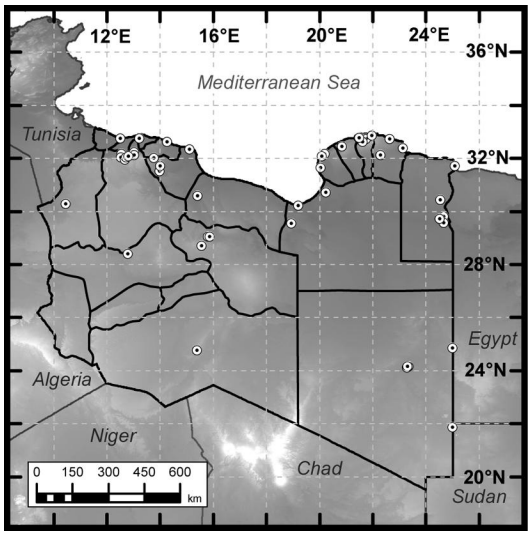
Lectotype:— ZMB 1119, "Aegypten" designated by Segoli et al. (2002). The original published type locality was "Aegpt. et Nubia." Paralectotypes are ZMB 1117–1118, 1120, 1121, 1122, 63004 (formerly included under ZMB 1122), and 63144 (formerly included under 1121), and BMNH 1946.8.7.76–77. ZMB 1117–1120 associated with the locality "Aegypten," ZMB 1121 and 63144 with "Nubien" and ZMB 1122 and 63004 with "Suez" (see Bauer and Günther 1995). The BMNH specimens are associated only with the locality "N. Africa" in the register in which their re-registration in 1946 was recorded. They are also the types of *Scapteira punctulata* Gray, 1838.

Mesalina guttulata, Le Berre 1989:194.
Mesalina guttulata, Schleich, Kästle, and Kabisch 1996:417.
Mesalina guttulata, Sindaco and Jeremčenko 2008:262.
Mesalina guttulata, Trape, Trape, and Chirio 2012:328.

Distribution.— Northern Western Sahara to Egypt, with additional localities in Niger and Eritrea and the Red Sea coast of Sudan (Abukashawa and Mahmoud 2015). According to Sindaco and Jeremčenko (2008) the species is also found in Sinai and in Asia from Israel and Jordan to western Iraq, east central Saudi Arabia and western Yemen and adjacent southern Red Sea Farasan Islands (Saudi Arabia). However, molecular data (Kapli et al. 2008, 2015) support the restriction of *M. guttulata* proper to North Africa west of Sinai (see Comments). In Libya records are widespread but scattered and lacking from Ghat and the southwest.

Libyan Records (Map 32): TRIPOLITANIA: Zawiyah: **11**: BMNH 1965.1131. Tripoli: **45**: ZMB 15306; Szczerbak 1975. Murqub: **68**: MCSN 2123; Boulenger 1914, 1921; Zavattari 1934. Misratah: **72**: ZSM 174/1979/1–4. **73**: ZSM 174/1979. **74**: BMNH 1955.1.8.53. **80**: BMNH

FIGURE 24. *Mesalina guttulata* from 15 km north of Dirj, Nalut, Tripolitania, Libya, 2008. Photo © Roberto Sindaco.



MAP 32. Distribution of *Mesalina guttulata* in Libya.

1913.12.30.12; MSNG 52506; Boulenger 1914; Zavattari 1934; Szczerbak 1975. NALUT: **116**: Sindaco, pers. obs. 4/2/2008. JABAL AL GHARBI: **141**: BMNH 1975.1210. **142**: BMNH 1965.1224–25. **143**: NHMC 80.3.72.28–30; Kapli et al. 2015. **145**: NHMC 80.3.72.31; Kapli et al. 2015. **146**: NHMC 80.3.72.25–27, 80.3.72.35; Kapli et al. 2015. **149**: BMNH 1955.1.8.52. **154**: BMNH 1965.1226, 29–34. SIRTE: **199**: MCSN 2120–21. "**Tripolitania settentrionale**": Zavattari 1937. "**Sirtica**": Zavattari 1937. "**Wadi Badran**": BMNH 1965: 1227. FEZZAN: WADI AL SHATII: **201**: NHMC 80.3.72.57; Beito et al. 2008; Kapli et al. 2015. JUFRA: **213**: BMNH 1954.1.6.79. **216**: Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1934. **217**: Zavattari 1937. MURZUQ: **326**: BMNH 1965.1228. CYRENAICA: BENGHAZI: **342**: Zavattari 1929, 1930. **357**: MZUF 756; Werner 1909; Ghigi 1913; Calabresi 1923; Umani 1923; Zavattari 1929, 1930, 1934. **367**: Calabresi 1923; Zavattari 1929, 1930, 1934. MARJ: **385**: Zavattari 1937. JABAL AL AKHDAR: **415**: FMNH 214946–49; Resetar 1981. **417**: Zavattari 1922, 1929, 1930, 1934. **428**: ZSM 129/1983; Schleich 1987. **457**: KNP 1981/169–170, 270, 279–280, 295, 300, 309–310, 315, 320, 322, 325, 331–332, 334, 342, 350–352, 395, 402–403, 468–474; Schleich 1987. **457i**: Schleich 1987. **457k**: Schleich 1987. **457l**: Schleich 1987. **457m**: Schleich 1987. DARNAH: **466**: MSNG 31576*; NHMW 12060; Werner 1909; Ghigi 1913; Zavattari 1929, 1930, 1934. **474**: Vinciguerra 1927; Zavattari 1929, 1930, 1934. **484**: Calabresi 1923; Zavattari 1934. BUTNAN: **505**: Vinciguerra 1927; Zavattari 1929, 1930, 1934. **518**: NHMC 80.3.72.8; Kapli et al. 2008, 2015. **520**: MCSN 2470. **521**: Vinciguerra 1927; Zavattari 1929, 1930, 1934, 1937. **524**:

MSNG 28438. Al Wahat: **529**: MCSN 2122; MSNG 31576*; Vinciguerra 1931; Zavattari 1934. **544**: MSNG 31576*. **554**: NMBA-REPT 15241–42. Kufrah: **572**: Vinciguerra 1931. **573**: Vinciguerra 1931; Zavattari 1934, 1937. **575**: MSNG 31576*; Vinciguerra 1931. **584**: Zavattari 1937. **587**: Scortecci 1935c. "**Cyrenaica**": MSNG 52498. Ghigi 1920. "**Altopiano di Cyrenaica**": Ghigi 1920; Zavattari 1934. "**Marmarica**": Zavattari 1937.

Comments.— Joger and Mayer (2002) emphasized the uncertainty regarding the relative relationships between many *Mesalina* species. Kapli et al. (2008) initially suggested that *M. guttulata* was a complex of several species. Kapli et al. (2008, 2015) found that *M. guttulata* was paraphyletic with respect to *M. bahaeldini*, with the more inclusive clade containing the latter (type locality in south Sinai), including Jordanian material. They recovered three main clades, a *M. bahaeldini* clade (suggesting that *M. guttulata* in Israel and Jordan should be reallocated to this species), a typical *M. guttulata* clade with samples from Egypt, Libya, Algeria, Tunisia and Morocco, and an Arabian clade, with samples from Saudi Arabia, Yemen and Kuwait. This implies that true *guttulata* occurs exclusively in North Africa, west of the Suez Canal. Nonetheless, there are some morphological and especially color pattern differences between typical *M. bahaeldini* from south Sinai and *M. guttulata* from Israel and Jordan (Segoli et al. 2002; Werner and Ashkenazi 2010; Werner 2016) and the possibility remains that true *M. guttulata* may co-occur with *M. bahaeldini* in north Sinai and in Israel, which were not sampled by Kapli et al. (2015), or that members of the *M. bahaeldini* clade from outside south Sinai retain the plesiomorphic *M. guttulata* morphotype and should be considered as a species distinct from either *M. guttulata sensu stricto* or *M. bahaeldini*. Sindaco and Jeremčenko (2008) plotted no localities in Fezzan or the Kufrah region of southern Cyrenaica. The identities of the specimens vouchering these localities need to be confirmed, although the occurrence of *M. guttulata* nearby in neighboring countries suggests that it should occur in suitable areas in southern Libya.

IUCN Threat Status.— Not assessed, but assumed to be Least Concern.

Mesalina olivieri **(Audouin, 1827:175, supplement pl. 1, fig. 11, pl. 2, figs. 1–2)**

1827 *Lacerta Olivieri* Audouin, Explication sommaire des planches de reptiles (supplément), publiées par Jules-César Savigny, Membre de l'Institut; offrant un exposé des caractères naturels des genres, avec la distinction des espèces. Pp. 161–184 In: M. J.-C. L. de Savigny, (ed.), Description de l'Égypte, ou Recueil des Observations et des Recherches qui ont été Faites en Égypte Pendant l'Expédition de l'Armée Française. Histoire Naturelle. Tome premier. Partie premier. Imprimerie Impériale, Paris.

Syntypes.— Specimens figured by Audouin (1827) on pl. 1, fig. 11 and pl. 2, figs. 1–2 of *Description de l'Égypte*, "Egypte." According to Brygoo (1988) no surviving specimens can be associated with these illustrations, so the types must be considered lost.

Mesalina olivieri, Schleich, Kästle, and Kabisch 1996:420.

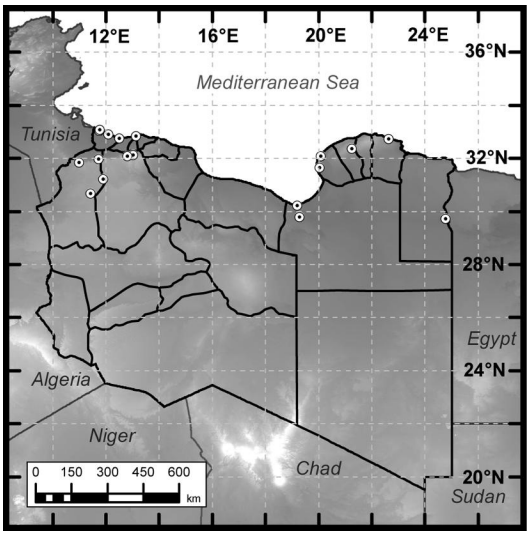
Mesalina olivieri, Sindaco and Jeremčenko 2008:263.

Mesalina olivieri, Trape, Trape, and Chirio 2012:330.

Distribution.— Western Sahara across Morocco, northern Algeria and Tunisia to far northwestern Tripolitania and from Cyrenaica across northern Egypt, Sinai, Israel, Jordan and southern Syria (southern Iraq according to Yousefkhani et al. 2015). Isolated localities in Senegal, southern Algeria, the Upper Nile Valley of Egypt and northcentral Saudi Arabia. (Sindaco and Jeremčenko 2008). There remains a large gap in the species distribution across northern Libya between the region of Al Khums and the eastern side of the Gulf of Sirte. Le Berre (1989) did not include the species in the Libyan fauna.

Libyan Records (Map 33): TRIPOLITANIA: Nuqat al Khams: **2**: BMNH 1955.1.8.51. **3**:

NHMC 80.3.164.19; Kapli et al. 2015. **5**: BMNH 1955.1.8.50, 1965.1235–37. Zawiyah: **11**: BMNH 1965.1239. Tripoli: **36**: BMNH 1954.1.6.87–89. Nalut: **101**: MCSN 2125. **107**: Sindaco pers. comm. 4/30/2008. **110**: BMNH 1954.1.6.80. Jabal al Gharbi: **131**: BMNH 1965.1240. **146**: NHMC 80.3.119.21–22; Kapli et al. 2015. **154**: BMNH 1965.1238. "**Hamata desert**": BMNH 1987.2199. CYRENAICA: Benghazi: **357**: BMNH 1945.11.9.10; MZUT R [no specific number given]. **367**: BMNH 1985.1186. MZUT R2252. Marj: **403**: NHMC 80.3.119.1–5, 80.3.119.8–7; Kapli et al. 2008, 2015. Darnah: **466**: BMNH 1954.1.6.81–86; Arnold 1986. Butnan: **522**: NHMC 80.3.119.8. Al Wahat: **544**: BMNH 1965.1241. **552**: BMNH 1965.1142. "**Boltet el Ramla**": BMNH 1965.1243. LIBYA: BMNH 1969.11. "**Beiana**" [unlocated]: MCSN 2127. "**dunes south of Ettoni**" [unlocated]: MZUT R3269.



Map 33. Distribution of *Mesalina olivieri* in Libya.

Comments.— The complicated dating of the natural history portions of *Description de l'Égypte* has been elucidated by Sherborn (1897) and Tollitt (1986). Audouin (1827) also recognized a "variété" which differed in color pattern and was figured on pl. 2, fig. 2, but Boulenger (1921) considered this plate to depict true *M. olivieri*, whereas he referred the animal on plate 1, figure 11 to *Acanthodactylus scutellatus audouini* and that on plate 2, figure 1 to *M. guttulata*. Sindaco and Jeremčenko (2008) recognized four subspecies: *M. o. latasti, M. o. olivieri, M. o. schmidti* (Haas, 1951), and *M. o. susana*, although most authors recognize only *M. o. schmidti* and the nominate form. The subspecies present in Libya is traditionally regarded as *M. o. olivieri*. Schleich et al. (1996) recognized six subspecies, with the typical form in Libya. Werner (2016) considered *M. o. schmidti* to be distributed east of the Nile Valley to Arabia and Iraq. Kapli et al. (2015) found that *M. pasteuri* (widespread in North Africa, although with no confirmed records from Libya) and *M. simoni* (Morocco north of the High Atlas Mountains) were embedded within the *M. olivieri* complex. Their Libyan material was polyphyletic and was placed in several clades, one with Egyptian material, one with Egyptian and Israeli material, and one with Tunisian material. These results suggest that the traditional division between *M. o. olivieri* and *M. o. schmidti* does not reflect evolutionary relationships. Existing sampling does not suggest a single satisfactory taxonomic solution to this problem, although the data minimally suggest that the nominate form may extend from Tripolitania to at least Sinai and Israel. Arnold (1986) suggested that Cyrenaican specimens might deserve species recognition because of hemipeneal differences from typical forms, but this prospect has not been further explored.

IUCN Threat Status.— Not assessed, but assumed to be Least Concern.

Mesalina rubropunctata (Lichtenstein, 1823:100) (Fig. 25)

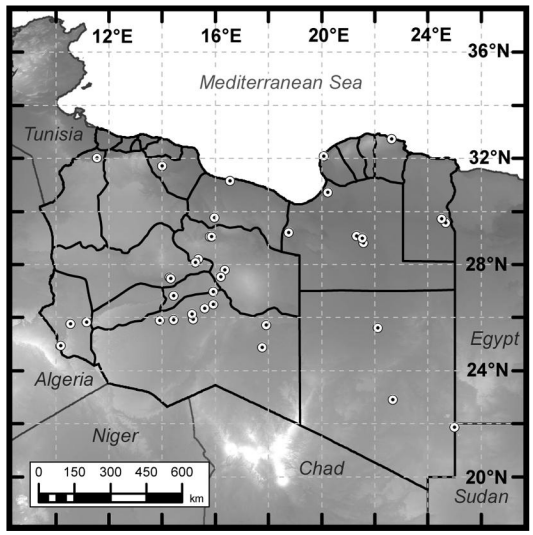
1823 *L*[*acerta*]. *rubropunctata* Lichtenstein, Verzeichniss der Doubletten des zoologischen Museums der Königl. Universität zu Berlin nebst Beschreibung vieler bisher unbekannter Arten von Säugethieren, Vögeln, Amphibien und Fischen. T. Trautwein, Berlin. x + 118 pp., pl. 1.

Syntypes.— ZMB 1113 (2 specimens) ("Nubien"), 114 (3 specimens), 1127 ("Suez"), 1115, 1116, 81374 (formerly under ZMB 1116) ("Aegypten"). Published type locality "Aegypt et Nubia."

Mesalina rubropunctata, Le Berre 1989:200.
Mesalina rubropunctata, Schleich, Kästle, and Kabisch 1996:425.
Mesalina rubropunctata, Sindaco and Jeremčenko 2008:263.
Mesalina rubropunctata, Trape, Trape, and Chirio 2012:334.

Distribution.— Mauritania and Western Sahara across northern Africa to western Sinai and the Nile Valley of northernmost Sudan. Southern Algerian distribution more-or-less contiguous with localities in eastern Mali and northwestern Niger. In Libya there are localities across the country.

Figure 25. *Mesalina rubropunctata* from Fezzan, Libya. Photo © Adel Ibrahim.



Map 34. Distribution of *Messalina rubropunctata* in Libya.

Libyan Records (Map 34): TRIPOLITANIA: Misratah: **73**: BMNH 1955.1.8.54. Nalut: **105**: AIC no number provided; Ibrahim and Ineich 2005. Sirte: **174**: ZMB 18327, 77682. **196**: BMNH 1954.1.6.78. "**Tripolitania**": BMNH 1965. 1244. "**Sirtica**": Zavattari 1937. FEZZAN: Wadi al Shatii: **207**: BMNH 1901.10.28.7. **208**: Boulenger 1921; Szczerbak 1975. **210**: BMNH 1954.1.6.75. **211**: Scortecci 1937a. Jufra: **212**: ZSM 189/1979/1–2. **216**: Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1930, 1934. **217**: Zavattari 1937. **224**: NMBA-REPT 15432–33; Schnurrenberger 1962. **226**: MCSN 2129; Scortecci 1935b. Ghat: **234**: MCSN 2128. **236**: ZMB 37948. **249**: BMNH 1965.1246. Sabha: **282**: ZSM 118/1975. **291**: NMBA-REPT 15324–53; ZMB 37947. Murzuq: **298**: Essghaier et al. 2015. **303**: Essghaier et al. 2015. **315**: NHMC 80.3.99.18 [= ZFMK 63675]; NHMC 80.3.99.19–20; NHMC 80.3.99.28 [= ZFMK 77484]; Kapli et al. 2015. **316**: ZCT 2005.29; Ibrahim 2008a. **317**: Schnurrenberger 1963. **319**: Kramer and Schnurrenberger 1963. **332**: ZMB 37949. **333**: FMNH 214967; NHMW 31121. "**Fezzan**": BMNH 1954.1.6.76. "**Jebel Fezzan**": BMNH 1965:1245. CYRENAICA: Benghazi: **357**: BMNH 1988.190. Darnah: **466**: SMNS 803. Butnan: **521**: Zavattari 1937. **524**: MSNG 28416; Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931. Al Wahat: **529**: NMP 34934/1–2; NMP 34934; Moravec 1995; Zavattari 1929, 1930, 1934. **555**: ZSM 133/1983. **562**: MSNG 31575*; Vinciguerra 1931; Zavattari 1934. **564**: Vinciguerra 1931, Zavattari 1934, 1937. **565**: Vinciguerra 1931. Kufrah: **567**: MSNG 31575*; Vinciguerra 1931; Zavattari 1934, 1937. **579**: BMNH 1982.385–87. **584**: Zavattari 1937. **"between Agedabia and Gialo"**: BMNH 1932.3.6.11; Werner 1909; Vinciguerra 1931; Zavattari 1934. **"Desert South of Giada"**: MSNG 31575*.

Comments.— Hypothesized relationships among *Mesalina rubropunctata*, *M. guttulata* and *M. bahaeldini* are poorly supported (Šmíd and Frynta 2012). There is also an extremely high level

of morphological similarity between some congeners (Werner and Ashkenaze 2010), which reveals a need for additional sampling to produce high resolution phylogenies to resolve the conflicts that are rampant in this complex. Kapli et al. (2015) found *M. rubropunctata* to be monophyletic and found moderate divergence between Egyptian samples and those from Libya and the Mahgreb.

IUCN Threat Status.— Not assessed, but assumed to be Least Concern.

Ophisops occidentalis Boulenger, 1887:75, pl. III, fig. 2 (Fig. 26)

1887 *Ophisops occidentalis* Boulenger, Catalogue of the Lizards in the British Museum (Natural History) III. Lacertidæ, Gerrhosauridæ, Scincidæ, Anelytropsidæ, Dibamidæ, Chamaeleontidæ. Trustees of the British Museum, London, United Kingdom. xii + 575 pp., pls. I–XL.

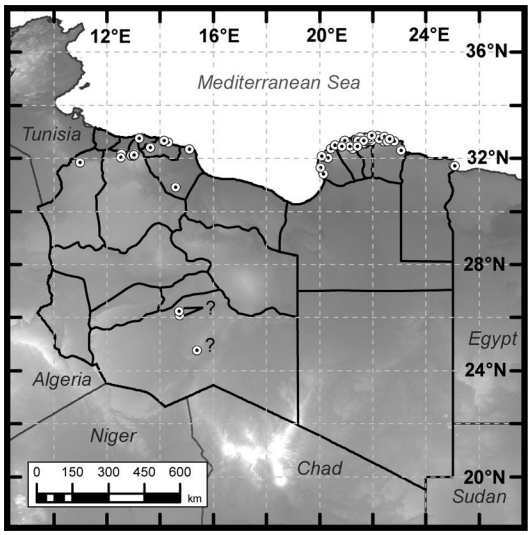
Syntypes.— ZBMNH 1946.9.4.18 (formerly BMNH 85.4.13.1) "Porte de Fer, Algiers" [Algeria], BMNH 1946.9.4.19 (formerly BMNH 85.4.13.2) "Youkous, Algeria," BMNH (not located) "Hadedj des Matmata, Tunis" [Tunisia] and BMNH 1946.9.4.16–17 (BMNH 46.11.4.12) "Susa, Tunis" [Tunisia].

Ophisops elegans [part], Le Berre 1989:206.
Ophisops elegans, Schleich, Kästle, and Kabisch 1996:430
Ophisops occidentalis, Schleich, Kästle, and Kabisch 1996:433
Ophisops occidentalis, Sindaco and Jeremčenko 2008:266.

Figure 26. *Ophisops occidentalis* from Al Khums, 5 km west of Villa Selin, Murqub, Tripolitania, Libya. Photo © Roberto Sindaco.

Distribution.— Northeastern Morocco across Mediterranean North Africa to Egypt west of the Nile Delta (Sindaco and Jeremčenko 2008). In Egypt *O. occidentali*s does not extend inland more than 10 km from the sea (Baha El Din 2006a). In Libya they are found coastally and near coastally in both Tripolitania and Cyrenaica, with a gap in the region of the Gulf of Sirte. Scattered records in Murzuq, though anomalous, seem legitimate.

Libyan Records (Map 35): TRIPOLITANIA: Tripoli: **45**: MCSN 2406; Boulenger 1891. Murqub: **60**: Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1934. **65**: NHMC 80.3.101.13–14. **66**: Sindaco obs. 4/29/2008. **69**: BMNH 1955.1.8.49. Misratah: **77**: Zavattari 1930. **80**: Boulenger 1914; Zavatari 1934. Nalut: **101**: BMNH 1965.1216; MCSN 2404. Jabal al Gharbi: **141**: BMNH 1975.1211. **142**: BMNH 1965.1217–20. **147**: MCZ R 38698. **153**: BMNH 1954.1.6.66–67. **154**: MZUT R2219; ZMB 38546; Werner 1909; Zavatarri 1934. **155**: Werner 1909; Ghigi 1913. "**Tripolitania settentrionale**": Zavattari 1937. FEZZAN: Murzuq: **309**: BMNH 1965.122. **310**: BMNH 1965.1221. **326**: BMNH 1965.1223. CYRENAICA: Benghazi: **335**: NHMC 80.3.70.410. **349**: NHMC 80.3.101.15. **351**: BMNH 1965.1212–13. **357**: MZUF 762, 764, 18012–14, 18000–11, 18018; Ghigi 1920; Calabresi 1923; Zavattari 1929, 1930, 1934. **358**: MZUT R2221; Calabresi 1923. **367**: Calabresi 1923; Zavattari 1929, 1930. **374**: BMNH



MAP 35. Distribution of *Ophisops occidentalis* in Libya.

1965.1215. MARJ: **383**: Calabresi 1923; Zavattari 1929, 1930, 1934. **385**: BMNH 1965.1214; MZUF 18017; MZUT R2226; Calabresi 1923; Zavattari 1929, 1930, 1934, 1937. **388**: NHMC 80.3.70.395–396. **389**: CUP R 039; MZUT R2212; Calabresi 1923; Zavattari 1929, 1930; Frynta et al. 2000. **400**: CUP R 040; Frynta et al. 2000. **402**: MZUF 761; MZUT R2217; Calabresi 1923; Zavattari 1929, 1930, 1934. **403**: NHMC 80.3.70.7–13, 80.3.101.2. **457ad**: Schleich 1987. **457b**: Schleich 1987. **457s**: Schleich 1987. **457y**: Schleich 1987. **457z**: Schleich 1987. JABAL AL AKHDAR: **398**: NHMC 80.3.70.18; NHMC 80.3.101.1. **417**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **418**: NHMC 80.3.70.3–4. **419**: CUP R 044, 045; Restar 1981; Frynta et al. 2000. **423**: FMNH 214938; Resetar 1981. **430**: BMNH 1954.1.6.74; MZUT R2224; Calabresi 1923; Zavattari 1929, 1930, 1934. **434**: FMNH 214933–34, 214939–40; Resetar 1981. **438**: NHMC 80.3.70.5. **440**: FMNH 214935; Resetar 1981. **443**: FMNH 214937; Resetar 1981. **446**: FMNH 214936; Resetar 1981. **449**: NHMC 80.3.70.20–22. **451**: BMNH 1954.1.6.62–65. **452**: Ghigi 1920; Calabresi 1923; Zavattari 1929, 1930, 1934. **457**: KNP 1981/145–147, 157–167, 176, 178–183, 185–191, 193, 197–199, 201–203, 206, 217–222, 229–231, 234–235, 238, 243, 254, 256, 274–275, 287, 294, 296–297, 302–303, 319, 323, 326, 356, 413, 415, 421–423, 439–441, 445–448, 455, 467, 484–485, 487; ZSM 128/1983; Resetar 1981; Schleich 1987. **457ar**: Schleich 1987. **457as**: Schleich 1987. **457at**: Schleich 1987. **457au**: Schleich 1987. **457ax**: Schleich 1987. **457az**: Schleich 1987. **457ba**: Schleich 1987. **457bc**: Schleich 1987. **457bf**: Schleich 1987. **457bh**: Schleich 1987. **457bi**: Schleich 1987. **457bj**: Schleich 1987. **457bu**: Schleich 1987. **457bw**: Schleich 1987. **457bz**: Schleich 1987. **457c**: Schleich 1987. **457ce**: Schleich 1987. **457cf**: Schleich 1987. **457cj**: Schleich 1987. **457ck**: Schleich 1987. **457cl**: Schleich 1987. **457cq**: Schleich 1987. **457cs**: Schleich 1987. **457cu**: Schleich 1987. **457cv**: Schleich 1987. **457i**: Schleich 1987. **457m**: Schleich 1987. **457n**: Schleich 1987. **457o**: Schleich 1987. DARNAH: **459**: BMNH 1954.1.6.69. **460**: NHMC 80.3.70.16–17. **461**: NHMC 80.3.70.14–15. **462**: Zavattari 1929, 1930. **463**: Calabresi 1923; Zavattari 1930, 1934. **464**: MZUF 18015; Calabresi 1923. **465**: Calabresi 1923; Zavattari 1929, 1930, 1934. **466**: BMNH 1954.1.6.71; MZUF 18016; MZUT R2216, R2229; Werner 1909; Ghigi 1920; Calabresi 1923; Zavattari 1929, 1930, 1934. **467**: Zavattari 1929, 1930. **475**: SMNS 1023. BUTNAN: **504**: Vinciguerra 1927; Zavattari 1929, 1930, 1934. **505**: Vinciguerra 1927; Zavattari 1929, 1930, 1934. "**Cyrenaica**": Colosi 1923. "**Marmarica**": Zavattari 1937.

COMMENTS.— Sindaco and Jeremčenko (2008) and Kyrazi et al. (2008) noted the morphological similarities between *O. occidentalis* and *O. elegans*, and commented on their parapatry. Both species have been recorded from Libya, although we interpret all *Ophisops* records in the country as referable to the former species. Werner (2016) regarded *O. elegans* as reaching its western distributional limit in southern Israel, with a single record from adjacent Sinai (Baha El Din 1992). Werner (1909) considered Peters' (1880, 1881) records of *O. elegans* from Bir Milhra to be referable to *O. occidentalis*. However, Werner himself identified seven specimens from Darnah as *O. elegans*. Schleich et al. (1996) reported *O. elegans* from Cyrenaica and *O. occidentalis* from

Tripolitania and from Ghemines (Qaminis, western Cyrenaica), based on Calabresi (1923). Several BMNH specimens purportedly from Fezzan (BMNH 1965.1221–23) have been examined and both their identities and localities appear correctly recorded. We accept these records provisionally, pending further investigation.

IUCN Threat Status.— Least Concern.

Philochortus zolii Scortecci, 1934

1934 *Philochortus zolii* Scortecci, Descrizione preliminare di una nuova specie del genere *Philochortus* (*Philochortus zolii*) della zona di Gat (Missione della reale Societa Geografica). Atti della Societa italiano di Scienze Naturali e del Museo Civico di Storio Naturale di Milano, 73:305–308.

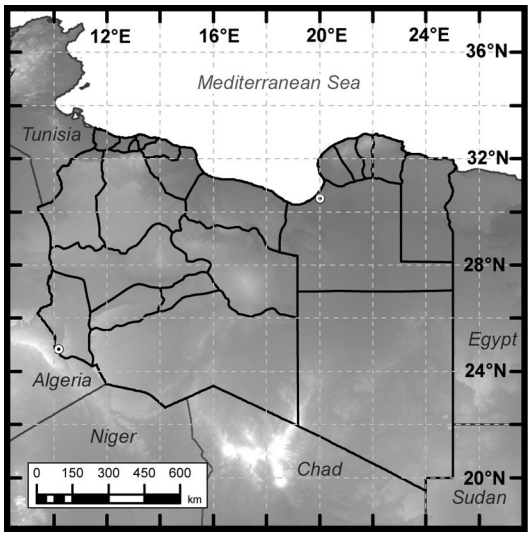
Holotype.— MCSN specimen number not known, destroyed in World War II (?), "oasi di Elbarkat, a pochi chilometri a sud di gat" [Oasis of El Barkat, a few kilometers south of Ghat].

Philochortus zolii, Le Berre 1989:212.
Philochortus zolii, Schleich, Kästle, and Kabisch 1996:435.
Philochortus zolii, Sindaco and Jeremčenko 2008:267.
Philochortus zolii, Trape, Trape, and Chirio 2012:336.

Distribution.— Scattered localities in Libya (Ghat and 35 miles west of Ajdabiya), Egypt (Wadi El Natrun; Kamal et al. 1966; Marx 1968; Baha El Din 2006a), Niger (In Abezou) and Mali (Bourem) (Trape et al. 2012).

Libyan Records (Map 36): FEZZAN: Ghat: **254**: Scortecci 1934a, 1937b; Zavattari 1937. **"Sahara tripolitain"**: Angel and Lhote 1938. CYRENAICA: Al Wahat: **534**: MCZ 46850; Marx 1968.

Comments.— Trape et al. (2012) synonymized *P. zolii* and *P. ihotei* Angel, 1936, the latter originally described from Niger. This species has a huge distribution with known localities stretching from the Sahel through Saharan oases to the edge of the Nile Delta.



Map 36. Distribution of *Philochortis zolii* in Libya.

IUCN Threat Status.— Endangered B2ab(ii, iii) *fide* Wagner et al. (2013), downgraded from its 2006 assessment as Critically Endangered.

Family Scincidae

Chalcides boulengeri Anderson, 1892:17, pl. 1, figs. 1–3 (Fig. 27)

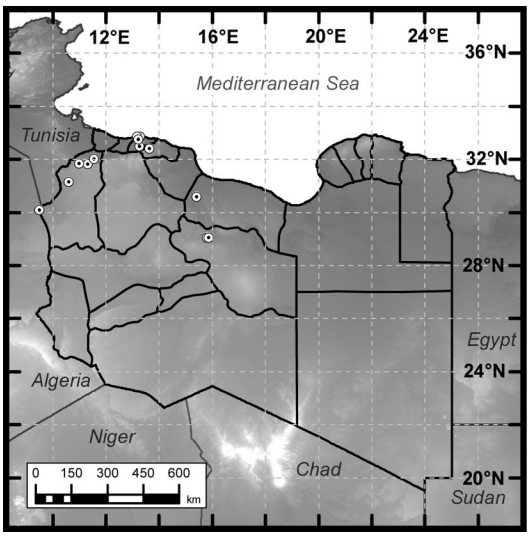
1892 *Chalcides boulengeri* Anderson, On a small collection of mammals, reptiles, and batrachians from Barbary. Proceedings of the zoological Society of London, 1892:3–24, pl. 1.

Syntypes.— ZBMNH 1946.8.2.77–78, "Duirat, Tunisia."

Sphenops sepoides [part], Le Berre 1989:230.
Sphenops boulengeri, Schleich, Kästle, and Kabisch 1996:366.
Sphenops boulengeri, Sindaco and Jeremčenko 2008:201.
Chalcides boulengeri, Trape, Trape, and Chirio 2012:340.

FIGURE 27. *Chalcides boulengeri* from 235 km north of Gadamis, Nalut, Tripolitania, Libya, 2008. Photo © Roberto Sindaco.

DISTRIBUTION.— Southern Morocco, across northern Algeria to Tunisia and the northwestern quadrant of Libya (Sindaco and Jeremčenko 2008).



MAP 37. Distribution of *Chalcides boulengeri* in Libya.

Libyan Records (Map 37): TRIPOLITANIA: TRIPOLI: **39**: USNM 37296. **43**: MCSN 4112. **45**: NHMW 10595; NMBA-REPT 5567; ZMB 15311–12, 75968–70, 75975–76; Werner 1909; Ghigi 1913; Zavattari 1934; CAS 12745–46, 55171; MZLU Lxx/6335. **49**: BMNH 1965.1201. MURQUB: **60**: Peters 1880, 1881; Zavattari 1934. NALUT: **101**: BMNH 1965.1200. **104**: BMNH 1965.1199. **105**: MNHN 2004.0088; Ibrahim and Ineich 2005. **111**: Sindaco obs. 5/2/2008. **128**: CUP R 016; Frynta et al. 2000. SIRTE: **199**: MCSN 4236. "**Tripolitania settentrionale**": Zavattari 1937. FEZZAN: JUFRA: **216**: ZMB 18004; Peters 1880, 1881; Werner 1909; Zavattari 1934. **217**: Schleich et al. 1996; Sindaco and Jeremčenko 2008; Zavattari 1937.

COMMENTS.— This species has been allocated to *Sphenops*, which has alternatively been regarded as a synonym of *Chalcides*, a subgenus of *Chalcides*, or a valid genus (e.g., Pasteur and Bons 1960; Caputo et al. 1993, Geniez et al. 2004, Kalboussi et al. 2006). Most recently, Carranza et al. (2008) presented evidence that a monophyletic *Chalcides* includes *Sphenops* spp. Records of Peters (1880, 1881) and Ghigi (1913) of *C. sepsoides* from Socna and Bir-Milrha, respectively, are in error and are correctly allocated to *C. boulengeri* according to Werner (1909).

IUCN THREAT STATUS.— Not assessed, but assumed to be Least Concern.

Chalcides chalcides vittatus (Leuckart, 1828:9)

1828 *Seps vittatus* Leuckart, Breves Animalium quorundam Maxima ex Parte Marinorum Descriptiones. Augusti Osswaldi, Heidelbergae [Heidelberg], Germany. 24 pp., 1 pl.

NEOTYPE.— MZUF 29898, designated by Caputo (1993), "environs of Musei (Province of Cagliari, Sardinia)," Italy. Original types ("non solum Europa meridionalis, Italia, Sicilia, Sardinia, Graecia, etc., sed etiam insula Cyprus, Syria, Lybia, Barbaria, etc.") not located.

Chalcides ocellatus [part], Le Berre 1989:216.

Chalcides chalcides, Schleich, Kästle, and Kabisch 1996:324.

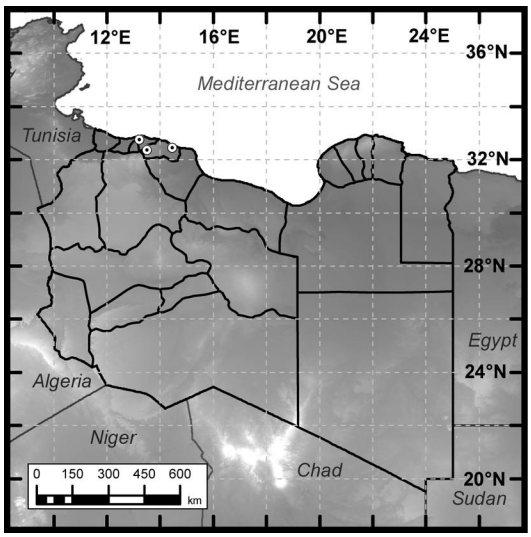
Chalcides chalcides vittatus, Sindaco and Jeremčenko 2008:184.

DISTRIBUTION.— Coastal Tunisia and Tripolitania, northwestern Libya, as well as Sardinia, where they are introduced (*C. c. vittatus*). The nominate form is found in Italy, including most of the peninsula as well as Sicily and Elba. (Caputo, 1993; Carranza et al. 2008).

Libyan Records (Map 38): TRIPOLITANIA: TRIPOLI: **45**: ZMB 42459; Caputo 1993; Caputo et al. 1995. MURQUB: **59**: NMBA-REPT 16695. **71**: MCSN 2281.

COMMENTS.— This taxon is exceedingly poorly known in Libya and requires further study to confirm its continued presence there and its actual distributional range. ZMB 42450, cited by Caputo (1993; Caputo et al. 1995) is an error for ZMB 42459.

IUCN THREAT STATUS.— Least Concern.



MAP 38. Distribution of *Chalcides chalcides vittatus* in Libya.

Chalcides ocellatus (Forskål, 1775:13) (FIG. 28)

1775 *Lacerta ocellata* Forskål, Descriptiones animalium, avium, amphibiorum, piscium, insectorum, vermium; quae in itinere Orientali observavit Petrus Forskål. Mölleri, Hauniae [Copenhagen], xxxiv + 164 pp.

TYPE(S).— Not located *fide* Šmíd et al. (2014), "In Ægypto ad ædes."

Chalcides ocellatus [part], Le Berre 1989:216.

Chalcides ocellatus ocellatus, Schleich, Kästle, and Kabisch 1996:337.

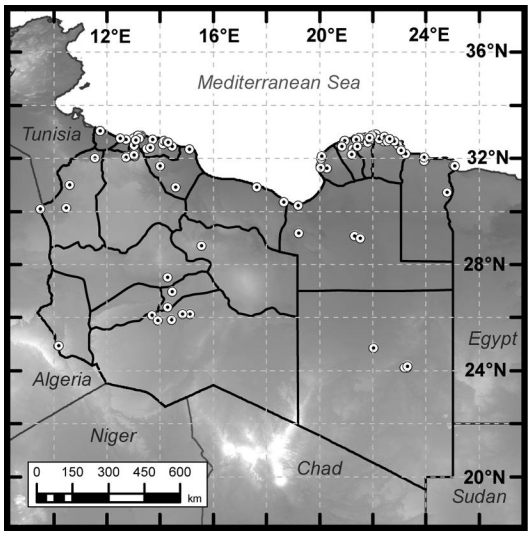
Chalcides ocellatus ocellatus, Sindaco and Jeremčenko 2008:186.

Chalcides ocellatus, Trape, Trape, and Chirio 2012:344.

DISTRIBUTION.— Extremely widespread in North Africa from Western Sahara and Morocco south of the Atlas Mountains east across the continent to Egypt, also in Somalia and with scattered localities in the Ahaggar (Hoggar) of Algeria and the Aïr Mountains of Niger. Outside of Africa, they are found through the Middle East (Israel, Jordan, Lebanon, Syria, Iraq, and across much of the Arabian Peninsula), and at scattered localities in Iran, Afghanistan, Turkmenistan, and Pakistan and on Cyprus, Sardinia, Sicily and many of the islands of the Tyrrhenian and Aegean Seas as well as parts of mainland Greece. A population has become established at Naples on the Italian mainland and the populations from coastal Iran and Pakistan, as well as from the Koper Mountains of Turkmenistan may also be introduced (Sindaco and Jeremčenko 2008). The species has also been introduced locally in Arizona, USA (Gunn et al. 2012) and in Sri Lanka (Karunarathna et al. 2008).

Its Libyan distribution includes most of the country although in desert areas it is restricted chiefly to oases.

FIGURE 28. *Chalcides ocellatus* from Dujal, Murzuq, Fezzan, Libya. Photo © Adel Ibrahim.



MAP 39. Distribution of *Chalcides ocellatus* in Libya.

Libyan Records (Map 39): TRIPOLITANIA: NUQAT AL KHAMS: **2**: MCSN 2286. ZAWIYAH: **11**: CUP R 053; MZUF 856; Frynta et al. 2000; Sindaco pers. comm. 4/27/2008. **12**: ZMB 74200–01. **22**: MCSN 2403, 2454; MZUF 9469. JAFARA: **26**: Andreucci 1913; Zavattari 1934. **29**: ZMB 80962. TRIPOLI: **36**: BMNH 1954.1.7.18–19. **37**: MZUF 1048, 9045–46. **38**: USNM 148486; Sayers 1964. **39**: UMNH 4243. **41**: BMNH 1955.1.8.69. **42**: MZUT R1914. **43**: 2279. **45**: BMNH xvii.3.c, xvii.3.q, 1958.1.3.71, 1965.1133–35; MCSN 2186, 2272, 2277, 2294, 2311; MZUF 9487–89, 32953–54; MZUT R1939; NHMW 10445; SMF 15955, 15957; ZMB 15310, 15313–15, 17187, 75890, 75892, 75895, 75920; Gray 1845; Boulenger 1887, 1891; Condorelli-Francaviglia 1896; Rizzardi 1896; Werner 1909; Andreucci 1913; Ghigi 1913; Zavattari 1934. **56**: MZUF 9470–73. MURQUB: **59**: NHMB 16694 (Greenbaum et al. 2006). **60**: ZMB 17997–98; Peters 1880, 1881; Werner 1909; Andreucci 1913; Ghigi 1913; Zavattari 1934. **64**: ZMB 18000–01, 75906–08. **66**: Sindaco, pers. obs. 4/29/2008. **68**: BMNH 1913.12.30.15; MSNG 51286; Boulenger 1914. **69**: Andreucci 1913; Zavattari 1934. MISRATAH: **73**: ZSM 25/1968. **77**: Zavattari 1929. **80**: BMNH 1913.12.30.13–14; 1965.1192–93; Boulenger 1914; Zavattari 1934. NALUT: **105**: MNHN 2004.0084; Ibrahim and Ineich 2005. **112**: NHMC 80.3.80.757; Kornilios et al. 2010. **121**: MZUF 39092–94. **127**: Sindaco, pers. obs. 4/1/2008. JABAL AL GHARBI: **145**: NHMC 80.3.80.1021. **146**: NHMC 80.3.80.1020. **151**: NHMC 80.3.80.980–981; Kornilios et al. 2010. **152**: ZCT 2005.42; Ibrahim 2008a. **154**: MZUF 9007; MZUT R1918; ZSM 492/1979, 675/1979; Werner 1909; Andreucci 1913; Ghigi 1913; Zavattari 1934. **156**: Sayers 1964. SIRTE: **181**: NHMC 80.3.80.982; Kornilios et al. 2010. "**Wadi Nefed**" [unlocated]: BMNH 1901.10.28.8. "**Tripolitania settentrionale**": Zavattari 1937. "**Beni Ulid and Tarhuna Road**": BMNH 1955.1.8.67–68; "**Sirtica**": Zavattari 1937. FEZZAN: WADI AL SHATII: **192**: NHMW 25551. **210:** MCSN 2202; Essghaier et al. 2015. JUFRA: **213**: BMNH 1954.1.7.17. GHAT: **249**: MCSN 2282, 2284, 2303, 2317, 4461. SABHA: **281**: ZCT 2006.62; Ibrahim 2008a. **286**: Essghaier et al. 2015. MURZUQ: **297**: ZCT 2005.45; Ibrahim 2008a. **298**: Essghaier et al. 2015. **303**: ZCT 2005.43, 2006.23; Ibrahim 2008a. **311**: ZCT 2006.67; Ibrahim 2008a. **316**: MZUT R3244. CYRENAICA: BENGHAZI: **357**: BMNH 1945.11.9.7, 1947.1.5.6–7; FMNH 214964; Resetar 1981; MDTK 17229; SMF 34460–62, 34464, 34488–95, 35552, 37264, 37671; Cornalia in Haimann 1882, 1886; von Martens 1883; Werner 1909; Andreucci 1913; Ghigi 1913; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Umani 1923; Greenbaum et al. 2006. **361**: Ghigi 1920; Calabresi 1923; Zavattari 1929, 1930. **366**: NHMC 80.3.80.978–979; Kornilios et al. 2010. **367**: MZUF

32958–69; MZUT R1942; Calabresi 1923; Zavattari 1929, 1930. **376**: BMNH 1965.1191. Marj: **385**: BMNH 1965.1190; MCSN 2192–93, 2204, 2322; SMF 58325; Ghigi 1920; Calabresi 1923; Zavattari 1929, 1930, 1934, 1937; Schleich 1987; Greenbaum et al. 2006. **388**: NHMC 80.3.80.976–977; Kornilios et al. 2010. **389**: MZUT R1937; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Frynta et al. 2000. **398**: NHMC 80.3.80.41, 80.3.80.43; Kornilios et al. 2010. **403**: NHMC 80.3.80.37–38; Kornilios et al. 2010. **408**: MZUT R1917; Calabresi 1923; Zavattari 1929, 1930. **457ai**: Schleich 1987. **457b**: Schleich 1987. **457v**: Schleich 1987. Jabal al Akhdar: **416**: NHMC 80.3.80.33–35; Kornilios et al. 2010. **417**: MCSN 2468; SMF 34463; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Frynta et al. 2000. **419**: FMNH 214963; Resetar 1981. **420**: NHMC 80.3.80.32, 80.3.80.722–723. **421**: Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931. **428**: ZSM 125/1983[5 specimens]; Schleich 1987. **432**: FMNH 214961; Resetar 1981. **434**: FMNH 83060, 214962; Resetar 1981. **436**: NHMC 80.3.80.36; Kornilios et al. 2010. **440**: FMNH 214960; Resetar 1981. **452**: Ghigi 1920; Calabresi 1923; Zavattari 1929, 1930, 1934. **457**: FMNH 83059; KNP 1981/172–173, 194–195, 242, 255, 257, 286, 362, 365, 405, 411, 424–427, 433–444, 454, 481, 491, 495, 499; SMNS 1094; ZSM 458–62/1997; Schleich 1987. **457at**: Schleich 1987. **457au**: Schleich 1987. **457av**: Schleich 1987. **457aw**: Schleich 1987. **457ay**: Schleich 1987. **457ba**: Schleich 1987. **457bb**: Schleich 1987. **457bc**: Schleich 1987. **457be**: Schleich 1987. **457bi**: Schleich 1987. **457bj**: Schleich 1987. **457bq**: Schleich 1987. **457bt**: Schleich 1987. **457ch**: Schleich 1987. **457cs**: Schleich 1987. **457cu**: Schleich 1987. **457l**: Schleich 1987. Darnah: **458**: NHMC 80.3.80.40. **460**: NHMC 80.3.80.39; Kornilios et al. 2010. **462**: Zavattari 1929, 1930. **463**: Calabresi 1923; Zavattari 1929, 1930, 1934. **465**: MZUT R1913; Calabresi 1923; Zavattari 1929, 1930, 1934. 243c: Calabresi 1923. **466**: MZUT R1920, R1933; SMF 34473; NHMW 10444; Werner 1909; Andreucci 1913; Ghigi 1913, 1920; Calabresi 1923; Zavattari 1929, 1930, 1934; Greenbaum et al. 2006. **467**: Zavattari 1929, 1930. **472**: NHMC 80.3.80.42; Kornilios et al. 2010. **475**: SMNS 1083. **477**: NHMC 80.3.80.44–47; Kornilios et al. 2010. Butnan: **490**: NHMC 80.3.80.48; Kornilios et al. 2010; SMF 54085; ZMB 62938; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Vinciguerra 1927; Gestro and Vinciguerra 1931. **493**: NHMC 80.3.80.49. **494**: ZSM 124/1983. **504**: Vinciguerra 1927; Zavattari 1929, 1930; Gestro and Vinciguerra 1931. **505**: Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931. **517**: Zavattari 1929, 1930. Al Wahat: **544**: BMNH 1965.1189; SMF 58326; Vinciguerra 1931; Zavattari 1934; Greenbaum et al. 2006. **553**: MCSN 2184, Zavattari 1934, 1937. **562**: ZMB 17999; Peters 1880, 1881; Werner 1909; Andreucci 1913; Ghigi 1913; Zavattari 1929, 1930, 1934. **564**: BMNH 1932.3.6.15; MCSN 2195; Zavattari 1929, 1930, 1937; Vinciguerra 1931. Kufrah: **568**: Zavattari 1937. **571**: MZUF 861; Scortecci 1935c. **573**: Vinciguerra 1931; Zavattari 1934, 1937. **575**: BMNH 1932.3.6.13–14; Vinciguerra 1931. **575a**: Vinciguerra 1931. "**Cyrenaica**": BMNH 1954.1.7.20–24; ZMB 10500, 74194. "**Marmarica**": Zavattari 1937. "**Nordost-Libyen**": ZMB 62931–37, 62948–54. LIBYA: ZMB 18002. "**deserto di Sahara**": Rizzardi 1896.

Comments.— Greenbaum et al. (2006) revalidated many sub-Saharan African congeners, in addition to synonymizing the central Saharan *C. ragazzii* Boulenger 1890 with *C. o. ocellatus* (Sindaco and Jeremčenko 2008). Schleich et al. (1996) and Sindaco and Jeremčenko (2008) recognized five subspecies, with only the nominate form in Libya. The nominate form occupies nearly all of the species' range except portions of northeast Morocco and northwest Algeria (*C. o. subtypicus* Werner, 1931), Mediterranean areas of North Africa from northeast Morocco to Tunisia as well as Sicily and Sardinia (*C. o. tiligugu* (Gmelin, 1789)), and Lampedusa and Lampione Islands (*C. o. zavattarii* Lanza, 1954) and Linosa Island (*C. o. linosae* Boulenger, 1920). Kornilos et al. (2010) found members of three different lineages in Libya, one in northwestern Tripolitania shared with most of Tunisia, Sardinia, Sicily and Malta, one occupying the north of Tripolitania to the western

Gulf of Sirte, and one in Cyrenaica that also occurs in Egypt, the Levant, southern Turkey and portions of mainland and insular Greece. This implies that *C. o. tiligugu*, if valid, may be present in Libya, in addition to the nominate form. North African members of the *C. ocellatus* group are under study by S. Baha El Din (pers. comm.) and further taxonomic changes may be anticipated.

IUCN Threat Status.— Not assessed, but assumed to be Least Concern.

***Chalcides sepsoides* (Audouin, 1827:180, supplement pl. 2, figs. 9–10)**

1827 *Scincus sepsoïdes* Audouin, Explication sommaire des planches de reptiles (supplément), publiées par Jules-César Savigny, Membre de l'Institut; offrant un exposé des caractères naturels des genres, avec la distinction des espèces. Pp. 161–184 In: M. J.-C. L. de Savigny, (ed.), Description de l'Égypte, ou Recueil des Observations et des Recherches qui ont été Faites en Égypte Pendant l'Expédition de l'Armée Française. Histoire Naturelle. Tome premier. Partie premier. Imprimerie Impériale, Paris.

Syntypes.— Specimens illustrated in figures 9 and 10 of Atlas supplement plate 2 of *Description de l'Égypte*, not located *fide* Brygoo (1985), "Égypte."

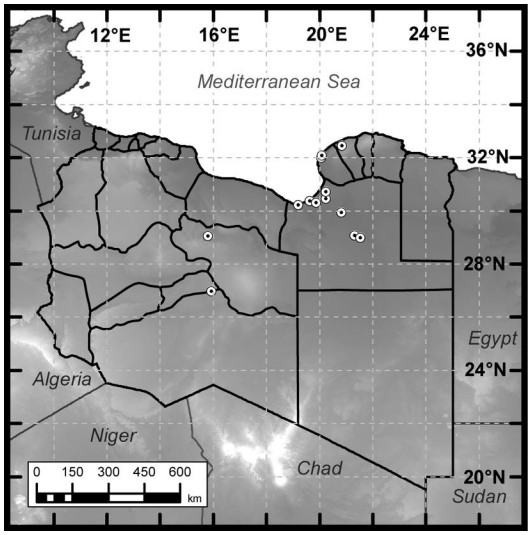
Sphenops sepoides [*sic*, part], Le Berre 1989:230.

Sphenops sepsoides, Schleich, Kästle, and Kabisch 1996:369.

Sphenops sepsoides, Sindaco and Jeremčenko 2008:202.

Chalcides sepsoides, Trape, Trape, and Chirio 2012:348.

Distribution.— From central Libya east through Cyrenaica to Egypt, Sinai, Israel, and western Jordan. Most Libyan localities occupy the northeast quadrant of the country.



Map 40. Distribution of *Chalcides sepsoides* in Libya.

Libyan Records (Map 40): FEZZAN: Jufra: **216**: Peters 1880, 1881; Zavattari 1934; Sindaco and Jeremčenko 2008. Sabha: **291**: NMBA-REPT 15354. CYRENAICA: Benghazi: **357**: Umani 1923; Zavattari 1930, 1934. **361**: BMNH 1987.1027, 1988.193. Marj: **385**: Zavattari 1937. Al Wahat: **529**: NMP 34935; NMBA-REPT 15355; NMP 34935; Vinciguerra 1931; Zavattari 1934; Moravec 1995. **531**: BMNH 1965.1202. **538**: NMBA-REPT 15356. **540**: BMNH 1965.1203. **544**: BMNH 1965.1204–11; MSNG 31595*; Vinciguerra 1931; Zavattari 1934. **560**: Vinciguerra 1931. **562**: Vinciguerra 1931; Zavattari 1934. **564**: BMNH 1932.3.6.16–17; Vinciguerra 1931; Zavattari 1934, 1937; Schleich et al. 1996. "**Nordost-Libyen**": ZMB 62956–59. "**Between Agedabia and Gialo**": MSNG 31595*. "**365 km SW of Benghazi**": BMNH 1987.1028. "**Sirtica**": Zavattari 1937. LIBYA: BMNH 1988.194; MZUF 20613.

Comments.— The complicated dating of the natural history portions of *Description de l'Égypte* has been elucidated by Sherborn (1897) and Tollitt (1986). This species has been allocated to *Sphenops*, which has alternatively been regarded as a synonym of *Chalcides*, a subgenus of *Chalcides*, or a valid genus (e.g., Pasteur and Bons 1960; Caputo et al. 1993, Geniez et al. 2004, Kalboussi et al. 2006). Most recently, Carranza et al. (2008) presented evidence that a monophyletic *Chalcides* includes *Sphenops* spp.

IUCN Threat Status.— Least Concern.

Eumeces schneiderii schneiderii (Daudin, 1802: 291)

An X [1802] *Scincus Schneiderii*, 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, Member de Plusieurs Sociétés Savants, Quatrième Tome. F. Dufart, Paris, France. 397 pp., pls. xlvi–lviii.

HOLOTYPE.— MNHN 2961, "Égypte" *fide* Brygoo (1985), stated as lost by Šmíd et al. (2014).

Eumeces schneiderii aldrovandii (Duméril and Bibron, 1839:701)

1839 *Plestiodon Aldrovandii* Duméril and Bibron, Erpétologie Générale ou Histoire Naturelle Complète des Reptiles. Tome Cinquième, Contenant l'Histoire de Quatre-vingt-trois Genres et de Deuc Cent Sept Espèces des Trois Dernières Familles de l'Ordre des Sauriens, Savoir: les Lacertiens, les Chalcidiens et les Scincoïdiens. Librairie Encyclopédique de Roret, Paris. viii + 854pp., errata, 4 folding tables, pls. 37, 39, 39bis, 41bis, 49, 51–54, 56–58.

Syntypes: MNHN 2961, "Égypte" and two other specimens, all now lost (*fide* Guibé 1954; Brygoo 1985; Šmíd et al. 2014). The original description noted two specimens from "Égypte" and one from "Algérie … de la province d'Alger." As reviewed by Brygoo (1985), Duméril and Duméril (1851) could only locate one of the Egyptian syntypes and the one from Algeria. Guibé (1954), a century later, could not locate the latter specimen and incorrectly referred to the single surviving syntype as a holotype. This action does not constitute a valid lectotype designation under Article 74.5 of the *International Code of Zoological Nomenclature* (ICZN 1999). According to Brygoo (1985) the surviving syntype (since lost; Šmid et al. 2014) is also the holotype of *Scincus Schneiderii* Daudin, 1802. Following the taxonomy that recognizes *E. s. aldrovandii* as a taxon distinct from the nominotypical form (e.g. Schleich et al. 1996; Sindaco and Jeremčenko 2008), potential nomenclatural instability would be caused by the recognition of the surviving syntype of *E. s. aldrovandii* as the lectotype, as this would result in the objective synonymy of *E. s. schneiderii* and *E. s. aldrovandii* and, as there are no other names in the synonymy of *E. s. aldrovandii*, the need to coin a new name for the taxon occurring from northeastern Algeria to the Nile. However, neither of the lost syntypes are good choices for lectotytpe designation either, as neither has been illustrated or explicitly described, and both come from areas near the edge of the presumed distribution of *E. s. aldrovandii*. Pending data establishing whether North African *E. schneiderii* are or are not distinct from populations east of the Nile Valley it may be advisable to petition the ICZN to set aside all members of the syntype series in favor of a neotype.

Eumeces schneideri, Le Berre 1989:218.

Eumeces schneiderii aldrovandii, Schleich, Kästle, and Kabisch 1996:351.

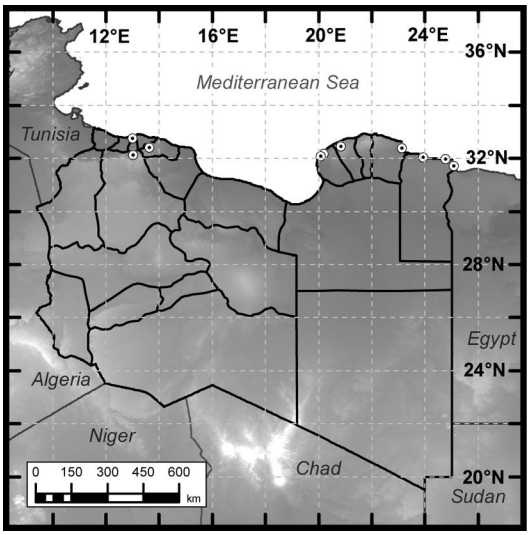
Eumeces schneideri aldrovandii, Sindaco and Jeremčenko 2008:189.

DISTRIBUTION.— From the Algerian/Tunisian border region east to the Nile Valley (*E. s. aldrovandii*) and from southern Sinai through the Levant, Cyprus, western Iraq and southeastern Turkey to the northern half of the Arabian Peninsula, and to Armenia, Azerbaijan, and Dagestan (Russia) through Iran to Pakistan, Afghanistan, parts of northern India and Middle Asia as far northeast as Kyrgystan (nominotypical form; Sindaco and Jeremčenko 2008). The subspecies *E. s. barani* occupies a disjunct area in the western portion of Asiatic Turkey (Kumlutaş et al. 2007). In Libya, all records are in Mediterranean portions of the country.

Libyan Records (Map 41): TRIPOLITANIA: ZAWIYAH: **22**: MCSN 2453. MURQUB: **60**: MZUF 874; Calabresi 1916; Zavattari 1934. JABAL AL GHARBI: **154**: Calabresi 1916; Zavattari 1934. "**Tripolitania settentrionale**": Zavattari 1937. CYRENAICA: BENGHAZI: **342**: MCSN 2464. **357**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. MARJ: **385**: Zavattari 1937. DARNAH: **474**: Vinciguerra 1927; Gestro and Vinciguerra 1931; Zavattari 1934. BUTNAN: **490**: USNM 146801; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **501**: Vinciguerra 1927; Zavattari 1929, 1930, 1934; Gestro and Vinciguerra 1931. **505**: Zavattari 1929, 1930.

Comments.— The specific epithet *schneiderii* was originally spelled with a double terminal "i," but this has been commonly incorrectly spelled *schneideri* by many modern authors.

Sindaco and Jeremčenko (2008) noted that there are six typically recognized subspecies. Five of these, including the nominate form occur outside of Africa west of the Suez Canal. *Eumeces algeriensis meridionalis* Doumergue, 1900 from eastern Morocco and adjacent northwestern Algeria may also belong within *E. schneiderii* (Sindaco and Jeremčenko 2008). The North African *Eumeces s. aldrovandii* was not accepted by Baha El Din (2006a), who considered the nominate form, *E. schneiderii* (Daudin, 1802) to occur in Egypt, both West of the Nile Delta and in Sinai and, by extension, also in Libya. Molecular phylogenetic work on *E. schneiderii* has not resolved the issue of the distinctiveness of *E. s. aldrovandi*, as sampling to date has not included any specimens from between northeastern Algeria and the Nile, the presumed distribution of this subspecies (Carranza et al. 2008; Perera et al. 2012).



Map 41. Distribution of *Eumeces schneiderii* in Libya.

IUCN Threat Status.— Not assessed, but assumed to be Least Concern.

***Heremites vittatus* (Olivier, 1804:103 [8to ed.], 59 [4to ed.], pl. 29, fig. 1 [Atlas])**

An XII [1804] *Scincus vittatus* Olivier, Voyage dans l'Empire Othoman, l'Egypte et la Perse, fait par ordre du Gouvernement, pendant les six premiéres années de la République, 8to edition, Tome Troisème. H. Agasse, Paris, France. [iv] + [1] + 359, 1 p. errata; An XII [1804] *Scincus vittatus* Olivier, Voyage dans l'Empire Othoman, l'Egypte et la Perse, fait par ordre du Gouvernement, pendant les six premiéres années de la République, 4to edition. Tome Second. Henri Agasse, Paris, France. [ii] + 466 pp. + 1 p. errata; An XII [1804] *Scincus vittatus* Olivier, Atlas pour server au Voyage dans l'Empire Othoman, l'Egypte et la Perse, fait par ordre du Gouvernement, pendant les six premiéres années de la République. Deuxième Livraison. H. Agasse, Paris, France. vii pp., pls. 18–33.

Holotype.— Presumably MNHN 197 *fide* Guibé (1954), Brygoo (1985), and Šmíd et al. (2014) "sur les sables à l'ouest de Rosette" [= on the sands to the west of Rosette (Rachid), Egypt]. This presumably corresponds to the specimen illustrated by Olivier on plate 29, figure 1 of his Atlas. The description itself does not make it clear if one or more specimens were associated with the description (see also Bauer and Adler 2003).

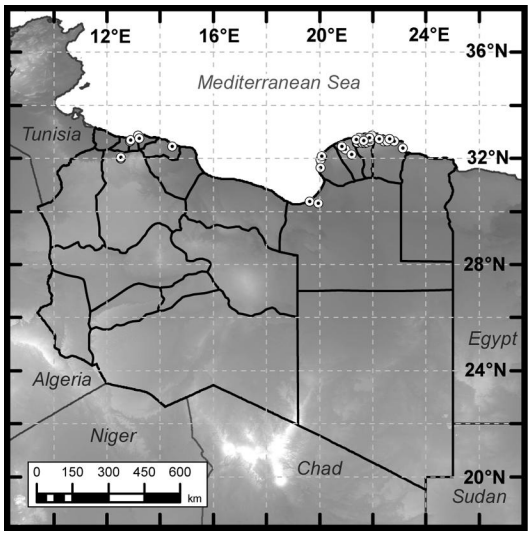
Mabuia vittata, Le Berre 1989:142.

Mabuya vittata, Schleich, Kästle, and Kabisch 1996:354.

Mabuya vittata, Sindaco and Jeremčenko 2008:195.

Distribution.— Northeastern Algeria through northern Libya and Egypt, northern Sinai, the Levant, Anatolia, Iraq, western Iran (Fattahi et al. 2013), and Cyprus (Tok et al. 1999). In Libya it occurs in both Tripolitania and Cyrenaica.

Libyan Records (Map 42): TRIPOLITANIA: Zawiyah: **16**: BMNH 1954.1.6.99. **17**: BMNH 1954.1.7.1–16. Tripoli: **39**: FMNH 82958–60. **45**: MCSN 2415; Werner 1909; Ghigi 1913; Zavattari 1934. Murqub: **71**: MCSN 3035. Jabal al Gharbi: **141**: MNHN 1990.382. **149**: MCSN 2285. "**Tripolitania settentrionale**": Zavattari 1937. CYRENAICA: Benghazi: **357**: MTKD 17228;



MAP 42. Distribution of *Heremites vittatus* in Libya.

MZUF 00886; Werner 1909; Ghigi 1913, 1920; Calabresi 1923; Zavattari 1929, 1930, 1934; Vinciguerra 1927. **358**: MZUT R422; Calabresi 1923. **362**: SMF 37244. **367**: Calabresi 1923; Zavattari 1929, 1930, 1934. MARJ: **385**: BMNH 1954.1.6.98; MZUT R448; Calabresi 1923; Zavattari 1929, 1930, 1934, 1937. **405**: BMNH 1987.1025. **408**: MZUT R461; Calabresi 1923; Zavattari 1929, 1930. **457ac**: Schleich 1987. **457af**: Schleich 1987. **457v**: Schleich 1987. JABAL AL AKHDAR: **412**: FMNH 214965; Resetar 1981. **417**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **419**: ZSM 126/1983/1–4; Schleich 1987; Frynta et al. 2000. **420**: NHMC 80.3.81.1. **421**: Zavattari 1929, 1930, 1934. **428**: KNP 1981/[no specific number given]; ZSM 1983/126; Schleich 1987. **430**: MZUF 00885; MZUT R468; Calabresi 1923; Zavattari 1929, 1930, 1934. **431**: BMNH 1965.1197–98; ZSM 1983/127; Schleich 1987. **437**: BMNH 1965.1195. **447**: CUP R 041–042, 067; Frynta et al. 2000. **450**: Schleich 1987. **457an**: Schleich 1987. **457aq**: Schleich 1987. **457ar**: Schleich 1987. **457bw**: Schleich 1987. **457bz**: Schleich 1987. **457cb**: Schleich 1987. **457cc**: Schleich 1987. **457cd**: Schleich 1987. **457ce**: Schleich 1987. **457cf**: Schleich 1987. **457cg**: Schleich 1987. **457cl**: Schleich 1987. **457co**: Schleich 1987. **457ct**: Schleich 1987. **457cv**: Schleich 1987. DARNAH: **462**: Zavattari 1929, 1930. **464**. MZUT R427. **465**: Calabresi 1923; Zavattari 1929, 1930. **466**: MZUT R441; NHMW 16210; Werner 1909; Ghigi 1913; Calabresi 1923; Zavattari 1929, 1930, 1934. **467**: Zavattari 1929, 1930. **474**: MSNG 28422; Vinciguerra 1927; Zavattari 1929, 1930, 1934. AL WAHAT: **537**: SMNS 1293. **540**: BMNH 1965.1196. "**Cyrenaica**": Condorelli-Francaviglia 1896; Werner 1909; Calabresi 1923.

COMMENTS.— Fattahi et al. (2013) plotted three localities in northern Libya, presumably based on BMNH material, but did not provide details. Karin et al. (2016) demonstrated that this species and other "*Trachylepis*" in North Africa, Turkey and the Middle East are not part of the same clade as true (sub-Saharan African) *Trachylepis* and resurrected the name *Heremites* Gray, 1845 for this group. 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. A number of published records of *Trachylepis quinquetaeniata* from Libya are assumed to represent this species (e.g., localities 357 and 417).

IUCN THREAT STATUS.— Least Concern.

Scincopus fasciatus (Peters, 1864:45)

1864 *Scincus* (*Scincopus*) *fasciatus* Peters, Über die Eidechsenfamilie der Scincoiden, insbesondere über die Schneider'schen, Wiegmann'schen und neue Arten des zoologischen Museums. Monatsber. Königlichen Akademie der Wissenschaften zu Berlin, 1864:44–58.

HOLOTYPE.— ZMB 3890, "Geryville in Algerien" [El Bayadh, Algeria].

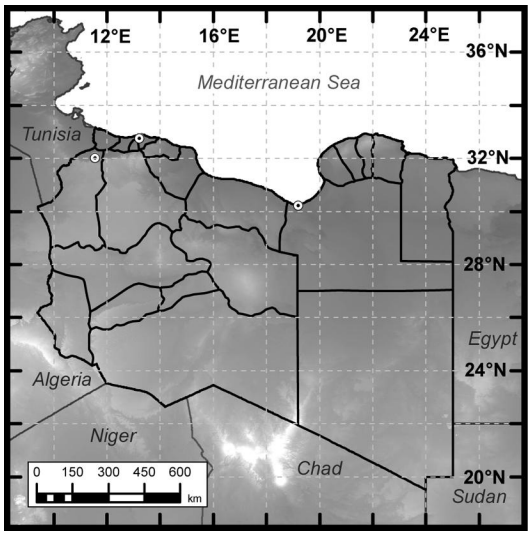
Scincopus fasciatus, Le Berre 1989:224.

Scincopus fasciatus, Sindaco and Jeremčenko 2008:199.

Scincopus fasciatus, Trape, Trape, and Chirio 2012:382.

Distribution.— Records for this species are scattered across Africa north of about 12°N. and extend from Mauritania to the Red Sea coast of Sudan, the few Libyan records are scattered across the north of the country.

Libyan Records (Map 43): TRIPOLITANIA: Tripoli: **45**: MZUT R1994 (Sindaco 1995). Nalut: **105**: AIC no number provided; MNHN 2004.0081; Ibrahim and Ineich 2005. CYRENAICA: Al Wahat: **544**: FMNH 121010.



Map 43. Distribution of *Scincopus fasciatus* in Libya.

Comments.— Schleich et al. (1996) reported no records of *Scincopus* from Libya. The first record was reported from Tripoli by Sindaco (1995). Most of the area occupied by the species, including Libya, is associated with the nominate form. *Scincopus f. melanocephalus* Lanza and Corsi, 1981 is the only other recognized subspecies and is endemic to the Red Sea coast. The species is noted for it disjunct distribution across North Africa (Sindaco 1995).

IUCN Threat Status.— Data Deficient.

Scincus scincus (Linnaeus, 17585)

Scincus scincus scincus (Linnaeus, 1758:205).

1758 *Lacerta stincus* [*sic*] Linnaeus, Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio decima, reformata. Laurentii Salvii, Holmiæ [Stockholm], Sweden. (4) + 823 + (I) pp.

Lectotypes:— NRHM 141a, "in montosis Lybiæ, Ægypti, Arabæ petreæ" designated by Arnold and Leviton (1977). Paralectotypes include specimens depicted by Seba (1734) in plate 105, figure 3, Besler and Besler (1716) in figure 1, Olearius (1694) in plate 8, figure 1, and described by Hasselquist (1750b) and by Gronovius (1756) (see Comments below).

Scincus scincus [part], Le Berre 1989:226.

Scincus scincus scincus, Schleich, Kästle, and Kabisch 1996:362.

Scincus scincus scincus, Sindaco and Jeremčenko 2008:200.

Scincus scincus scincus, Trape, Trape, and Chirio 2012:386.

Scincus scincus cucullatus Werner 1914:343, pl., fig. 2.

1914 *Scincus officinalis* var. *cucullata* Werner, Ergebnisse einer von Prof. F. Werner im Sommer 1910 mit Unterstützung aus dem Legate Wedl ausgeführten zoologsichen Forschungsreise nach Algerien. II. Vertebrata. Sitzungsberichte der Akademie der Wissenschaften mathematisch-naturwissenschaftliche Klasse, 123:331–361, 1 pl.

Holotype.— NHMW 10386:3, "Tripolis." The original publication does not mention the locality of the type, but refers to the variety as "der ostalgerisch-tunesisch-tripolitanischen" race.

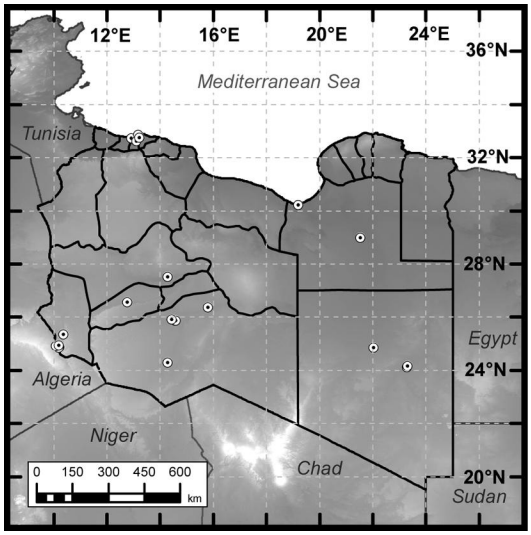
Scincus scincus [part], Le Berre 1989:226.

Scinsus scincus cucullatus, Schleich, Kästle, and Kabisch 1996:362.

Scincus scincus cucullatus, Sindaco and Jeremčenko 2008:200.

Scincsus scincus cucullatus, Trape, Trape, and Chirio 2012:386.

Distribution.— Algeria, Niger and northwestern Nigeria and east through Libya, Sudan, and Egypt to Sinai, Israel, Jordan, Syria, Iraq, Kuwait, southwestern Iran and the majority of the Arabian Peninsula (Sindaco and Jeremčenko 2008). In Libya records are scattered patchily across the country. Although subspecific boundaries are unclear, northwest Tripolitanian specimens are usually allocated to *S. s. cucullatus*, whereas other areas of Libya harbor the nominotypical form. Kufrah is a special case as specimens from this areas have variously been allocated to *S. s. scincus* or *S. albifasciatus* (see Comments).



Map 44. Distribution of *Scincus scincus* in Libya.

Libyan Records (Map 44): TRIPOLITANIA: Zawiyah: **19**: BMNH 1955.1.8.70–73; Arnold and Leviton 1977. Jafara: **27**: Sayers 1964. Tripoli: **39**: FMNH 82969; MCZ R 22352, R 22354; Arnold and Leviton 1977. **45**: CAS 12751; MNHN 1976.371; MZUT R1995; NHMW 10386; NMP 6300–09; ZMB 15288–95, 15318–19, 19563; Boettger 1893; Condorelli-Francaviglia 1896; Werner 1909; Ghigi 1913; Zavattari 1930, 1934; Arnold and Leviton 1977. FEZZAN: Wadi al Shatii: **210**: Essghaier et al. 2015. Ghat: **239**: Scortecci 1937a. **249**: MCSN 2275, 2291–92, 2304–05, 2312, 2510, 3033; Zavattari 1934, 1937; Scortecci 1937a. **252**: Scortecci 1937a. **253:** Scortecci 1937a. **255**: Scortecci 1937a. Wadi al Hayaa: **269**: Essghaier et al. 2015. Murzuq: **303**: Essghaier et al. 2015. **306**: ZCT 2006.35; Ibrahim 2008a. **307**: ZCT 2006.50–52; Ibrahim 2008a. **318**: ZCT 2006.42, 2006.60; Ibrahim 2008a. **324**: MCSN 2300. "**Sahara tripolitain**": Angel and Lhote 1938. CYRENAICA: Al Wahat: **544**: UUMZ 56615. **564**: BMNH 1932.3.6.18; MCSN 2276; MCSN 2458; MSNG 31578; Peters 1880, 1881; Werner 1909; Arnold and Leviton 1977; Zavattari 1929, 1930, 1934, 1937; Vinciguerra 1931. Kufrah: **568**: MZUF 00863; Scortecci 1935b, 1937. **573**: Vinciguerra 1931; Zavattari 1934, 1937; Scortecci 1935c. **575**: MF 863; MSNG 31577; Vinciguerra 1931; Arnold and Leviton 1977. **Kufrah**: BMNH 1987.1026. LIBYA: MCSN 2290; MZUF 20621–22.

Comments.— Arnold and Leviton (1977) referred to a single Linnean "type" of *Lacerta scincus*, implicitly designating this specimen as the lectotype. This action should restrict the type locality to that associated with the lectotype, but Linnaeus (1749) did not provide a specific locality for the specimen. Šmíd et al. (2014) listed this specimen as the holotype, however, the original description provides indications to seven works (Gronovius, Seba, Besler, Olearius, Ray [see Bauer 2012 for full citations], and Hasselquist (1750b, 1757) in addition to Linnaeus' (1749) own description in the *Amoenitates*. Specific individuals described or depicted in all of these works form part of the original syntype series.

Arnold and Leviton (1977), Griffiths et al. (2000) and Carranza et al. (2008) have outlined a number of intrageneric taxonomic problems in *Scincus*. Arnold and Leviton (1977), based on color pattern, considered material from northwest Tripolitania assignable to *Scincus s. cucullatus*, material from Cyrenaica to intermediates between *S. s. cucullatus* and *S. s. scincus*, and that from Kufrah to *Scincus albifasciatus*. Schleich et al. (1996) indicated that the nominotypical form occurred from eastern Libya eastwards, whereas *S. s. cucullatus* occupied western Libya, Eastern Algeria, and southern Tunisia. They considered *Scincus s. laterimaculatus* (now treated as a sub-

species of *S. albifasciatus* by most authors) as occurring in southern Morocco and parts of western Algeria. Sindaco and Jeremčenko (2008) questionably regarded *S. albifasciatus* as a species separate from *S. scincus*, with *S. a. laterimaculatus* as a northwestern subspecies. Within *S. scincus* they recognized four subspecies, *S. s. scincus*, *S. s. cucullatus*, *S .s. conirostris* Blanford, 1881 (eastern Arabia to Iran) and *S. s. meccensis* Wiegmann, 1837 (southern Jordan and into Arabia). Although they mapped records from Kufrah as *S. scincus* (presumably the nominate subspecies) they cited Kufrah as being within the range of *S. a. albifasciatus*, although they did not map this locality for that species. Trape et al. (2012) assigned Kufrah *Scincus* records to *S. s. scincus* and plotted no *S. albifasciatus* records east of eastern Niger. However, they did plot records in extreme southeastern Algeria, adjacent to the Libyan border near Ghat. As the nearest locality of *S. albifasciatus* is more than 2000 km away from Kufrah, we agree with recent authors that southeast Libyan specimens bearing the *albifasciatus* markings are convergent in this pattern with *S. albifasciatus sensu stricto* (type locality "Dakar," Senegal). However, if the interpretation of Trape et al. (2012) is correct, it is likely that *S. a. albifasciatus* does enter Libya in the southwest. Unfortunately, the only molecular study to date did not include specimens from Libya, so confirmation of this hypothesis awaits further study. As the taxonomy of *Scincus scincus* in Libya remains unsettled we have not differentially plotted locality records by subspecies.

IUCN Threat Status.— Not assessed, but assumed to be Least Concern.

Family Varanidae

Varanus griseus (Daudin, 1803:352) (Fig. 29)

An XI [1803] *Tupinambis griseus* 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 huitième. F. Dufart, Paris. 439 pp., pls. xciii–c.

Holotype.— MNHN lost *fide* Brygoo (1987), "Egypte."

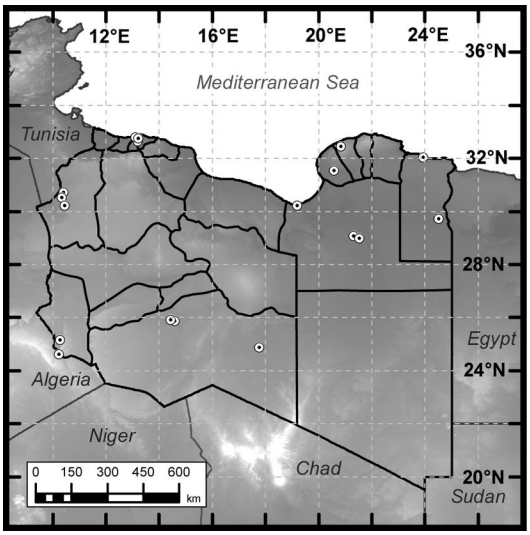
Varanus griseus, Le Berre 1989:236.
Varanus griseus, Schleich, Kästle, and Kabisch 1996:458.
Varanus griseus, Sindaco and Jeremčenko 2008:206.
Varanus griseus, Trape, Trape, and Chirio 2012:412.

Distribution.— Western Sahara east to Sinai and Sudan, as far south as Niger and northern Chad. In Asia from Israel, Jordan, probably Syria and southeastern Turkey and Iraq to the majority of the Arabian Peninsula and eastwards to Iran, Afghanistan, Pakistan and Middle Asia as far north as southern Kazakhstan. Also in northern India and portions of the Deccan Plateau. In Libya they are found across the country.

Figure 29. *Varanus griseus* from Az-Zytouna, Murzuq, Fezzan, Libya, 2006. Photo © Adel Ibrahim.

Libyan Records (Map 45): TRIPOLITANIA: Zawiyah: **25** Andreucci 1913; Zavattari 1934. Tripoli: **45**: König 1888; Condorelli-Francaviglia 1896; Werner 1909; Andreucci 1913; Ghigi 1913; Zavattari 1934. **47**: BMNH 1954.1.1.14. Nalut: **113**: Sindaco, pers. obs. 5/2/2008. **114**: Sindaco, pers. obs. 5/2/2008. **117**: Sindaco, pers. obs. 4/30/2008. "**Tripolitania settentrionale**": Zavattari 1937. "**Sirtica**": Zavattari 1937. FEZZAN: Ghat: **245**: Scortecci 1937a. **256**: Scortecci

1937a. MURZUQ: **303**: Zavattari 1937. **308**: ZCT 2006.46; Ibrahim 2008a. **332**: Scortecci 1935b. CYRENAICA: BENGHAZI: **379**: Zavattari 1922. MARJ: **385**: Zavattari 1922, 1929, 1930, 1934, 1937; Calabresi 1923. BUTNAN: **490**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **521**: MSNG 28220; Vinciguerra 1927; Zavattari 1929, 1930, 1934, 1937. AL WAHAT: **544**: Vinciguerra 1931; Zavattari 1934. **545**: Vinciguerra 1931; Sindaco and Jeremčenko 2008. **562**: Vinciguerra 1931; Zavattari 1934. **564**: Zavattari 1929, 1930, 1934, 1937; Vinciguerra 1931.



MAP 45. Distribution of *Varanus griseus* in Libya.

COMMENTS.— Three subspecies: *V. g. griseus, V. g. caspius*, and *V. g. koniecznyi* (Sindaco and Jeremčenko 2008) are recognized. All African records are attributable to the nominate subspecies. Le Berre (1989) indicated that this species was absent from Ghat, but there are several records from the region (Scortecci 1937a). Ibrahim and Ineich (2005) reported conspicuous tracks of this species at Badr, Nalut, but no specimens were collected during their surveys.

IUCN THREAT STATUS.— Not assessed.

Family Leptotyphlopidae

***Myriopholis lanzai* Broadley, Wade and Wallach 2014: 353, fig. 1**

2014 Myriopholis lanzai Broadley, Wade and Wallach, A new species of *Myriopholis* from Ghat Oasis, South-western Libya (Squamata: Leptotyphlopidae). Arnoldia (Zimbabwe) 10(30):351–359.

HOLOTYPE.— MZUF 36519 (ex NHCL 1543), "Ghat Oasis, south-west Fezzan, Libya (24°59′N: 10°11′E) at 700 m a.s.l."

Leptotyphlops macrorhynchus [part], Kramer and Schnurrenberger 1963:477.
Leptotyphlops macrorhynchus [part], Le Berre 1989:246.
Leptotyphlops macrorhynchus [part], Sindaco, Venchi, and Grieco 2013:70.

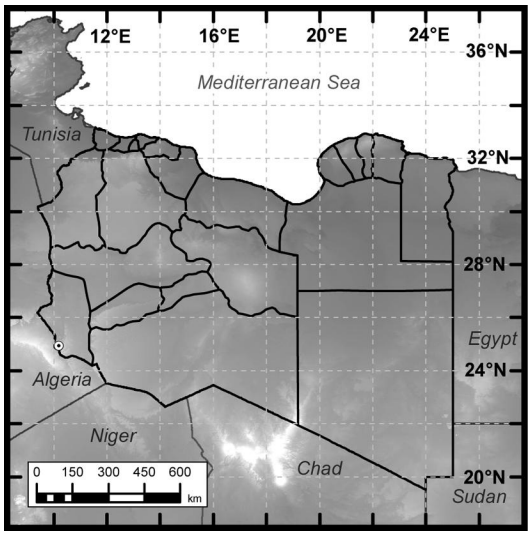
DISTRIBUTION.— *Myriopholis lanzai* is a Libyan endemic, known only from the oasis of Ghat in southwestern Fezzan. Its proximity to the Algerian border, however, suggests that it may eventually be found there in the Tassili n'Ajjer.

Libyan Records (Map 46): FEZZAN: GHAT: **249**: MCSN 2894; MSNM 2882, MZUF 36519, 36520, 39097–98; Scortecci 1934b, 1937a,b; Zavattari 1937; Scortecci 1939; Kramer and Schnurrenberger 1963; Broadley et al. 2014.

Comments.— Adelsteinsson et al. (2009) conducted a phylogenetic analysis of leptotyphlopids globally and established the genus *Myriopholis* for a group including the North African worm snakes. Leptotyphlopid records from the Sahara are very scattered (Sindaco et al. 2013) and the group has long been in desperate need of revision (Trape 2002). All pre-2014 references to Fezzan leptotyphlopids are to *Leptotyphlops machrorhynchus* (now *Myriopholis macrorhyncha*) (Jan, 1860). Ghigi (1913) mentioned the species in his biogeographic remarks but omitted it from his list of Libyan reptiles. Le Berre (1989) indicated that the Libyan range of *L. macrorhynchus* included

the area near Ghat, but also northwestern Tripolitania, whereas Schleich et al. (1996) did not indicate any Libyan records. Sindaco et al. (2013) used Scortecci's (1934b, 1935b) references to Ghat material as the basis for their inclusion of Libya in the distribution of *L. macrorhynchus*.

Broadley et al. (2014) briefly reviewed the history of the scattered records of North African leptotyphlopids and described this new species from Ghat on the basis of a series of specimens. The holotype and one of the paratypes (MZUF 39097) were collected in 1934 by G. Garganese, another three paratypes were collected by G. Scortecci, one on March 16, 1934 (MZUF 39098) and two on 13 October 1936 (MZUF 36520 and MSNM 2882). The last two were noted by Scortecci (1937) whereas the earlier one may be that noted by Scortecci (1934b). Scortecci (1939) also referred to the presence of a leptotyphlopid species at Ghat, but did not explicitly mention a taxon by name.



MAP 46. Distribution of *Myriopholis lanzai* in Libya.

UCN Threat Status: Not assessed, but assumed to be Data Deficient.

Family Typhlopidae

***Indotyphlops braminus* (Daudin, 1803:279)**

1803 [An XI] *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. lxxi–xcii.

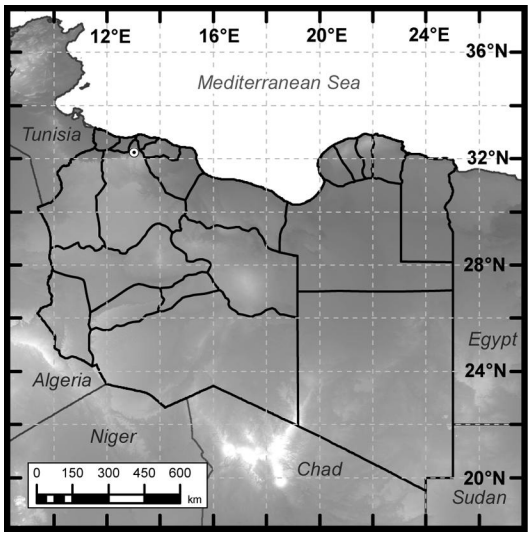
HOLOTYPE.— Type specimen lost but imaged in Russell (1796, pl. 43) from "Vizagapatam [Visakhapatnam, Andhra Pradesh, India]" (see Bauer 2015).

Ramphotyphlops braminus, Sindaco, Venchi, and Grieco 2013:74.

DISTRIBUTION.— This species is native to India and adjacent regions of tropical Asia, but has spread widely around the world through human agency, including to Australia and islands of the Pacific, North and Central America, portions of southwest Asia, and scattered localities across Africa, including in Egypt (Baha El Din 2006a; Wallach 2009). Known from a single locality in Libya.

Libyan Records (Map 47): TRIPOLITANIA: JABAL AL GHARBI: **149**: SNHM BS N 40292–93. LIBYA: SNHM BS N 55786.

COMMENTS.— The only record of this



MAP 47. Distribution of introduced *Indotyphlops braminus* in Libya.

parthenogenetic species, which has achieved a global distribution through human agency (Wallach 2009) is based on two specimens from Bu Gheilan reported by Joger et al. (2008). Although most for Libya is inhospitable for mesic-adapted blind snakes, it may be expected that *I. braminus* may be found elsewhere where appropriately moist microclimates can sustain them and the long distance movement of potted plants and similar means of transport provides a mechanism for their introduction.

UCN Threat Status: Not assessed, but assumed to be Least Concern.

Family Boidae

Eryx jaculus (Linnaeus, 1758:228)

1758 *Anguis Jaculus* Linnaeus, Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio decima, reformata. Laurentii Salvii, Holmiæ [Stockholm], Sweden. (4) + 823 + (I) pp.

HOLOTYPE.— NRM Lin-12 (see Comments below), considered lost by Andersson (1899) and Stimson (1969), "Ægypto" [= Egypt].

Eryx jaculus jaculus, Kramer and Schnurrenberger 1963:481.

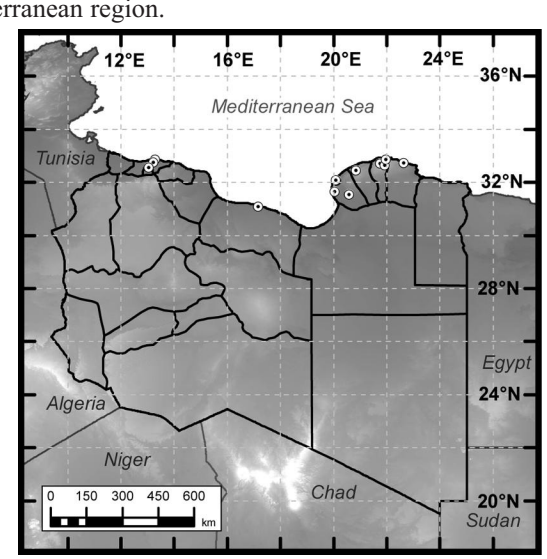
Eryx jaculus, Le Berre 1989:250.

Eryx jaculus, Schleich, Kästle, and Kabisch 1996:273.

Eryx jaculus, Sindaco, Venchi, and Grieco 2013:80.

DISTRIBUTION.— The species as a whole is distributed across North Africa from Morocco to the Suez in Egypt. The Eurasian subspecies occurs from the Middle East to Iran and north to the Caucasus and into Europe, through Greece and the Balkans to Romania (Krecsák and Iftime, 2006; Werner 2016). Records from Cyprus are considered questionable (Baier et al. 2009; see Sindaco et al. 2013). In Libya they are found in the Mediterranean region.

Libyan Records (Map 48): TRIPOLITANIA: JAFARA: **28**: Andreucci 1913. TRIPOLI: **43**: MCSN 2634. **45**: ZMB 15357; Andreucci 1913; Zavattari 1934. SIRTE: **178**: MCSN 2635. "**Tripolitania settentrionale**" Zavattari 1937. CYRENAICA: BENGHAZI: **357**: Umani 1922, 1923; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **358**: MZUF 12019. **367**: Calabresi 1923; Zavattari 1929, 1930, 1934. **379**: SK 597; Kramer and Schnurrenberger 1963. MARJ: **385**: Calabresi 1923; Zavattari 1929, 1930, 1934, 1937. JABAL AL AKHDAR: **417**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **457bs**: KNP 1981/[no specific number given]; Schleich 1987. **457c**l: KNP 1981/ [no specific number given]; Schleich 1987. DARNAH: **466**: SMF 36489.



MAP Distribution of *Eryx jaculus* in Libya.

COMMENTS.— Anderson (1898) provided a detailed consideration of the potential type specimens present in Stockholm and argued for a specimen figured on his plate XXXA as the true type, based on its correspondence to the single specimen mentioned by Hasselquist (1757) and cited by Linnaeus (1758). It is unclear if this spec-

imen disappeared in the short time before Andersson's (1899) statement that the type was missing or if Andersson did not accept the specimen as the type. Two subspecies are recognized by Sindaco et al. (2013), with the nominate form occurring in North Africa and *E. j. turcicus* (Olivier, 1801) in Eurasia. A record from Sirte was represented with a question mark by Schleich et al. (1996) and not acknowledged by Sindaco and Jeremčenko (2008), however we have examined MCSN 2635 and its associated data and verify this record.

IUCN Threat Status.— Not assessed.

Family Colubridae

Hemorrhois algirus (Jan, 1863:60)

1863 *P*[*eriops*]. *Algira* Jan, Elenco sistematico degli Ofidi descritti e disegnati per l'Iconografia generale. A. Lombardi, Milano, Italy. Pp. i–viii, 9–143, i–iii.

Syntypes.— MNHN 3575, 7464, MSNM (two specimens, destroyed in 1943 *fide* Wallach et al. (2014); MNHNP**,** "Algeri" (MSNM) "Sphax d'Algeria" [sic, Sfax, Tunisia] (MNHN). Kramer and Schnurrenberger (1963) referred to MNHN 3575 as the "Typus."

*Coluber florulentus algirus,*Kramer and Schnurrenberger 1963:484.

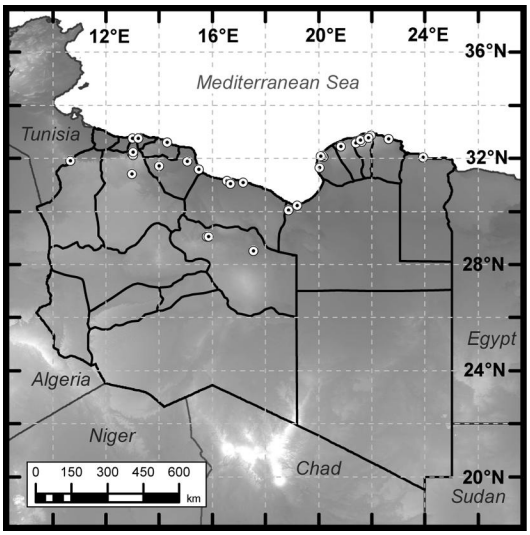
Coluber florulentus, Le Berre 1989:282.

Coluber algirus, Schleich, Kästle, and Kabisch 1996:479.

Hemorrhois algirus, Sindaco, Venchi, and Grieco 2013:109.

Distribution.— The species as a whole extends from northern Mauritania through northern Egypt west of the Nile (Marsa Matruh; Baha El Din 2000, 2006a), and has been introduced in Malta (Schleich et al. 1996; Joger 1997; Sindaco et al. 2013). There is an isolated population in the Ahaggar, Algeria. The nominate form occurs from northwestern Algeria to the east, whereas *H. a. intermedius* Werner, 1929 ranges from Monts des Ksour, Algeria, westward to Western Sahara, northern Mauritania, and southern Morocco (Sindaco et al. 2013). In Libya their range is broad in the northern parts of the country.

Libyan Records (Map 49): TRIPOLITANIA: Zawiyah: **22**: MCSN 4221. Tripoli: **45**: MNHN 1893.587. Murqub: **69**: SK 321; Kramer and Schnurrenberger 1959, 1963; Schätti 1986. Misratah: **73**: MCSN 4212, 4217; MHNG 1357.37; ZSM 153/1983; SK 200; Schätti 1986; Kramer and Schnurrenberger 1959, 1963; Schätti 1986. **84**: MCSN 4214. Nalut: **99**: MNHN 2004.0079; Ibrahim and Ineich 2005. Jabal al Gharbi: **148**: NMBE 52/1958; SK 325–326; Kramer and Schnurrenberger 1959, 1963; Schätti 1986. **149**: SK 204; Kramer and Schnurrenberger 1959, 1963; Schätti 1986. **154**: MNHG 1357.38, 1357.40–41; ZSM 154/1983; Schätti 1986. **158**: BMNH 1958.1.2.35; Schätti 1986. Sirt: **174**: MCSN 2877; MSNM [no specific number given]; Kramer and Schnurrenberger 1963; Schätti 1986. **176**: MSNM [no specific number given]; Kramer and Schnurrenberger 1963; Schätti



Map 49. Distribution of *Hemorrhois algirus* in Libya.

1986. **178**: MCSN 3003. "**Tripolitania**": BMNH 1955.1.8.97; Kramer and Schnurrenberger 1963; Schätti 1986. FEZZAN: Jufra: **216**: ZMB 19365; Peters 1880, 1881; Werner 1909; Zavattari 1934. **217**: Zavattari 1937. **221**: MCSN 2920. "**Sahara tripolitain**": Angel and Lhote 1938. CYRENAICA: Benghazi: **353**: Werner 1909. **357**: FMNH 214917; MCSN 1944, 2673 (5 specimens); IZUM 20192; Ghigi 1913; Umani 1922; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. Kramer and Schnurrenberger 1963; Schätti 1986; Resetar 1981. **367**: Calabresi 1923; Zavattari 1929, 1930, 1934. Marj: **385**: Zavattari 1937. Jabal al Akhdar: **417**: FMNH 214916; MSNG 29516; Calabresi 1923; Zavattari 1922, 1929, 1930, 1934; Resetar 1981. **419**: CUP R 065; Frynta et al. 2000. **421**: MSNM [no specific number given]; Zavattari 1929, 1930, 1934; Kramer and Schnurrenberger 1963; Schätti 1986. **447**: Frynta et al. 2000. **457**: KNP 1981/272, 311, 354, 509; Schleich 1987. **457au**: ZSM 1983/151; Schleich 1987; Schätti 2004. **457cw**: Schleich 1987. Darnah: **466**: MSNM [no specific number given]; SK 3935; SMF 34573; Calabresi 1923; Zavattari 1929, 1930, 1934; Kramer and Schnurrenberger 1963; Schätti 1986. Butnan: **490**: IZUM 20189, 20193, 20196, 20199, 20201; Kramer and Schnurrenberger 1963; Schätti 1986. Al Wahat: **537**: BMNH 1960.1.5.90; Kramer and Schnerrenberger 1963; Schätti 1986. **544**: SMF 56496; Schätti 1986. **547**: SK 60, 89; Kramer and Schnurrenberger 1958, 1959, 1963; Schätti 1986. LIBYA**:** HUJR 3214; Sochurek 1979.

Comments.— Earlier records of *Hemorrhois algirus* were sometimes attributed to *Coluber florulentus*, of which *algirus* has sometimes been considered a subspecies (e.g., Kramer and Schnurrenberger 1959, 1963). Werner (1909) reexamined older records and clarified that the Sokna record of *Zamenis florulentus* of Peters (1880, 1881) was referable to this species. He also identified the "Benghasi" record of von Martens (1883) (now ZMB 10506) as *Zamenis gemonensis* (now *Hierophis gemonensis*), perhaps collected in Europe en route to Libya and subsequently confused with the Cyrenaican collections made on the same trip. Schätti (2004) reidentified the single *Platyceps rogersi* recorded by Schleich (1987) from Kouf National Park as *H. algirus*. [Note that Schleich (1987) listed specimens KNP 1981/272, 311, 354, and 509 as both *Coluber algirus* and *Naja haje*. We have assumed that the associated localities are correct for both species and that specimen numbers were inadvertently duplicated].

IUCN Threat Status.— Least Concern.

Lytorhynchus diadema (Duméril, Bibron and Duméril, 1854:779) (Fig. 30)

1854 *Heterodon Diadema* Duméril, Bibron and Duméril, *Erpétologie Générale ou Histoire Naturelle Complète des Reptiles*. Tome septième.— Première partie. Comprenant l'Histoire des Serpents Non Venimeux. Librairie Encyclopédique de Roret, Paris.vii + [4] + xvi + 780 pp., 1 folding table, pls. 59. 63, 70, 72, 75–82.

Holotype.— MNHN 7560, "Algérie et du desert de l'ouest de l'Afrique Septentrionale" [= Algeria and the desert of western North Africa].

Lytorhynchus diadema diadema, Kramer and Schnurrenberger 1963:504.

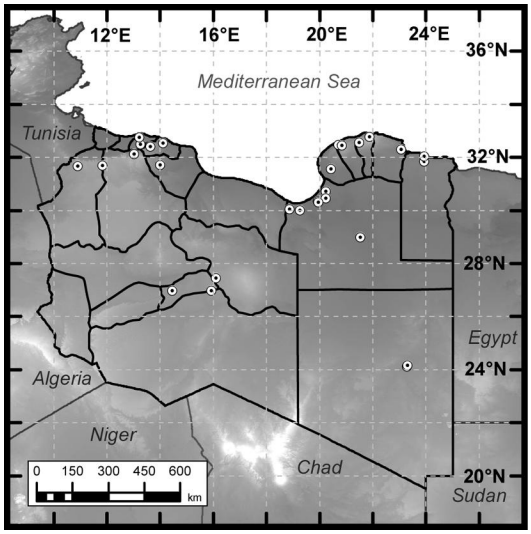
Lytorhynchus diadema, Le Berre 1989:270.

Lytorhynchus diadema, Schleich, Kästle, and Kabisch 1996:496.

Lytorhynchus diadema, Sindaco, Venchi, and Grieco 2013:133.

Distribution.— From Morocco eastwards across North Africa to southern Israel and Jordan, into northern Saudi Arabia, Iraq, Kuwait and southwestern Iran, with isolated records in Niger and Sudan (Sindaco et al. 2013). In Libya *L. diadema* is found widely, if patchily, throughout the country.

FIGURE 30. *Lytorhynchus diadema* from 37 km south of Gadamis, Nalut, Tripolitania, Libya, 2008. Photo © Roberto Sindaco.



MAP 50. Distribution of *Lytorhynchus diadema* in Libya.

Libyan Records (Map 50): TRIPOLITANIA: TRIPOLI: **45**: NHMW 23637; ZMB 15337–39, 15342–43, 15356, 85217; Condorelli-Francaviglia 1896; Werner 1909; Ghigi 1913; Zavattari 1934; Sayers 1964; Leviton and Anderson 1970. **49**: BMNH 1955.1.8.98; Kramer and Schnurrenberger 1963. MURQUB: **60**: Ghigi 1913. **64**: SMNS 3198. MISRATAH: **73**: MCSN 4210; Calabresi 1923. NALUT: **103**: Sindaco, pers. obs. 4/30/2008. JABAL AL GHARBI: **133**: NHMC 80.3.12.1. **154**: SMNS 3197. "**Tripolitania settentrionale**": Zavattari 1937. FEZZAN: JUFRA: **222**: SK 1747; Kramer and Schnurrenberger 1963. **224**: Schnurrenberger 1962. SABHA: **291**: SK 924; Kramer and Schnurrenberger 1963. CYRENAICA: BENGHAZI: **378**: SK 573-74; SK 583. MARJ: **384**: CAS 135744. **385**: Zavattari 1937. JABAL AL AKHDAR: **421**: MCSN 2983; Zavattari 1929, 1930, 1934; Kramer and Schnurrenberger 1963. **448**: SMF 55405. DARNAH: **475**: ANSP 28055. BUTNAN: **490**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **495**: Kramer and Schnurrenberger 1958; Leviton and Anderson 1970. AL WAHAT: **529**: NMP 34936; NMP 34936; Moravec 1995. **531**: SK 85; Kramer and Schnurrenberger 1963. **536**: SK 176–78, SK 584; Kramer and Schnurrenberger 1963. **537**: SMF 55756. **547**: SK 92; Kramer and Schnurrenberger 1958, 1963; Leviton and Anderson 1970. **548**: SK 196, SK 982–83; Kramer and Schnurrenberger 1963. **564**: MCSN 2676–77; Kramer and Schnurrenberger 1963. KUFRAH: **573**: Vinciguerra 1931; Zavattari 1934, 1937; Le Berre 1989. **575**: BMNH 1955.1.1.48; Vinciguerra 1931. "**Cyrenaica**": BMNH 1955.1.8.48; Kramer and Schnurrenberger 1963. "**Marmarica**": Zavattari 1937.

COMMENTS.— As noted in the species description, Duméril (1852) first referred to this species as *Lycognathus diadema*, although this was a *nonem nudum*. There are competing taxonomic inter-

pretations within *L. diadema.* Arnold (1980a), Gasperetti (1988) and Sindaco et al. (2013) accepted *L. gaddi* Nikolsky, 1907, *L. d. arabicus* Haas, 1957, and *L. d. mesopotamicus* Haas, 1952 as strict synonyms of *L diadema,* whereas Uetz and Hošek (2016) considered them as valid subspecies. *Lytorhynchus kennedyi* Schmidt, 1939 has variously been considered as a full species (Leviton and Anderson 1970; Gasperetti 1988; Martens 1993; Sindaco et al. 2006b, 2013) or as a pattern morph of *L. diadema* (Moravec 1995; Disi et al. 2001; Amr and Disi 2011) that is largely restricted to the Syrian Desert. However, Moravec (1995) noted a single specimen from Libya that exhibits the typical *L. kennedyi* pattern. Regardless of the taxonomic status of *L. kennedyi* in southwest Asia, we here regard Moravec's (1995) record from Libya as an aberrantly patterned *L. diadema*.

IUCN Threat Status.— Least Concern.

Macroprotodon cucullatus (I. Geoffroy Saint-Hilaire 1827:151, pl. 8, figs. 3, 3') (Fig. 31)

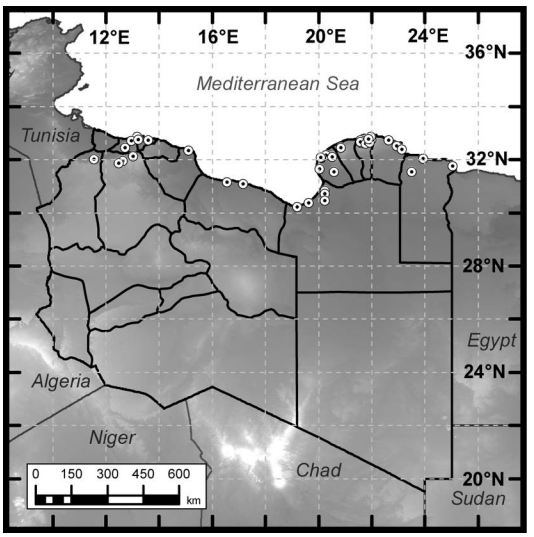
1827 *Coluber cucullatus* Geoffroy Saint-Hilaire, Description des reptiles qui se trouvent en Égypte, pp. 121–160 *in* M.J.-C.L. de Savigny, (ed.), Description de l'Égypte, ou Recueil des Observations et des Recherches qui ont été Faites en Égypte Pendant l'Expédition de l'Armée Française. Histoire Naturelle. Tome premier. Partie premier. Imprimerie Impériale, Paris, France.

Holotype.— Specimen illustrated on fig. 3 of pl. 8 of the Atlas accompanying the "Description de l'Égypte," lost *fide* Busack and McCoy (1990), 'Égypte" ("Unterägypten" [Lower Egypt] *fide* Mertens and Müller 1928:50).

Macroprotodon cucullatus cucullatus, Kramer and Schnurrenberger 1963:506.
Macroprotodon cucullatus, Le Berre 1989:264.
Macroprotodon cucullatus, Schleich, Kästle, and Kabisch 1996:496.
Macroprotodon cucullatus, Sindaco, Venchi, and Grieco 2013:122.

Figure 31. *Macroprotodon cucullatus* from 5 km east of Al Beida, Jabal al Akhdar, Cyrenaica, Libya (32.7826, 21.8276), 1998. Photo courtesy of Natural History Museum of Crete © A. Trichas.

Distribution.— Western Sahara eastwards through North Africa to Israel, primarily in Mediterranean areas, with isolated records in southern Algeria and Libya. Also on Lampedusa and introduced in the Balearic Islands (Eisentraut 1950; Salvador 1985). In Libya they are found chiefly within one hundred kilometers of the Mediterranean coastline (Schleich 1996).



Map 51. Distribution of *Macroprotodon cucullatus* in Libya.

Libyan Records (Map 51): TRIPOLITANIA: Zawiyah: **14**: BMNH 1960.1.6.7; Kramer and Schnurrenberger 1963; Busack and McCoy 1990. **18**: ZSM 78/1938. Tripoli: **38**: FMNH 82942; Busack and McCoy 1990. **45**: BMNH 58.4.20.53–55; NHMW 19193; ZMB 15346–47, 15351, 15355, 77705; Günther 1858; Werner 1909; Ghigi 1913; Zavattari 1934; Busack and McCoy 1990. **52**: SK 194, 332; Kramer and Schnurrenberger 1963; Busack and McCoy 1990. Misratah: **80**: Boulenger 1914; Scortecci 1934b; Zavattari 1934; Busack and McCoy 1990. Nalut: **105**: Ibrahim and Ineich 2005. Jabal al Gharbi: **139**: Zavattari 1937; Busack and McCoy 1990. **144**: BMNH 1955.1.8.99; Condorelli-Francaviglia 1896; Busack and McCoy 1990. **154**: ZSM 692/1979; Busack and McCoy 1990. Sirte: **174**: MSNM [no specific number given]; Kramer and Schnurrenberger 1963; Busack and McCoy 1990. **178**: MSNM [no specific number given]; SK 44; Kramer and Schnurrenberger 1963; Busack and McCoy 1990. "**Tripolitania**": Werner 1909; Ghigi 1913. "**Tripolitania settentrionale**": Zavattari 1937. "**Sirtica**": Zavattari 1937; Busack and McCoy 1990. CYRENAICA: Benghazi: **343**: ZSM 10/1963. **345**: Cornalia 1882, 1886; Werner 1909; Ghigi 1913; Calabresi 1923; Scortecci 1934b; Zavattari 1934; Busack and McCoy 1990. **357**: MZUF 20176–77; MSNM [no specific number given]; von Martens 1883; Werner 1909; Ghigi 1913; Calabresi 1923; Umani 1922; Zavattari 1922, 1929, 1930, 1934; Scortecci 1934b; Kramer and Schnurrenberger 1963; Busack and McCoy 1990. **358**: Calabresi 1923; Zavattari 1929, 1930; Busack and McCoy 1990. **367**: CAS 135734; Calabresi 1923; Zavattari 1929, 1930, 1934; Busack and McCoy 1990. **379**: Kramer and Schnurrenberger 1958; Busack and McCoy 1990. Marj: **383**: Scortecci 1934b; Busack and McCoy 1990. **385**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Scortecci 1934b; Busack and McCoy 1990. Jabal al Akhdar: **417**: MCSN 3150; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Busack and McCoy 1990. **419**: FMNH 214918; Resetar 1981. **421**: MSNG 50623; Vinciguerra 1927; Zavattari 1929, 1930, 1934; Scortecci 1934b; Busack and McCoy 1990. **422**: KNP 1981/17; Schleich 1987. **425**: KNP 198/21; ZSM 146/1983; Cornalia in Haimann 1882, 1886; Werner 1909; Ghigi 1913. **426**: NHMC 80.3.39.1. **429**: KNP 1981/31; Schleich 1987. **442**: KNP 1981/42; Schleich 1987. **457**: FMNH 83057; KNP 1981/38; ZSM 562/1997; Busack and McCoy 1990. **457at**: KNP 1981/26–27; Schleich 1987; **457bs**: KNP 1981/41; Schleich 1987. **457cg**: ZSM 1983/146; Schleich 1987. Darnah: **466**: ZSM 152/1983; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Busack and McCoy 1990. **472**: NHMC 80.3.39.2. **474** Vinciguerra 1927; Zavattari 1929, 1930, 1934. Butnan: **490**: MZUF 20187; Kramer and Schnurrenberger 1963; Busack and McCoy 1990. **503**: Vinciguerra 1927; Zavattari 1929, 1930; Scortecci 1934b; Busack and McCoy 1990. **513**: SK 183; Kramer and Schnurrenberger 1963; Busack and McCoy 1990. Al Wahat: **528**: BMNH 1960.1.6.6; Kramer and Schnurrenberger 1963; Busack and

McCoy 1990. **529**: NMP 34937; Busack and McCoy 1990. **531**: SK 76, 184–85; Kramer and Schnurrenberger 1963; Busack and McCoy 1990. **540**: BMNH 1960.1.6.5; Kramer and Schnurrenberger 1963; Busack and McCoy 1990. **544**: BMNH 1960.1.6.4; MSNG 31587; Vinciguerra 1931; Scortecci 1934b; Zavattari 1934; Kramer and Schnurrenberger 1963; Busack and McCoy 1990; Carranza et al. 2004. "**Cyrenaica**": ZMB 10504, 51653; Condorelli-Francaviglia 1896; Werner 1909; Ghigi 1913. "**Marmarica**": Zavattari 1937; Busack and McCoy 1990. LIBYA: ZMB 57092. "**Kussahsat**" [unlocated]: MCSN 4222.

Comments.— The complicated dating of the natural history portions of *Description de l'Égypte* has been elucidated by Sherborn (1897) and Tollitt (1986). Both specific and intraspecific taxonomy have been controversial within *Macroprotodon* (see Sindaco et al. 2013 for a brief overview of the taxonomic confusion). Wade (2001) revised the genus and recognized four species. Carranza et al. (2004) recognized three monophyletic species, and a paraphyletic *M. cucullatus*. Werner (2016) accepted four subspecies within *M. cucullatus*, *M. c. brevis* (Günther, 1862) from Morocco, *M. c. mauritanicus* Guichenot, 1850 from Morocco to Tunisia, *M.c. ibericus* Busack and McCoy, 1990 from the Iberian Peninsula, and the nominotypical form from southern Tunisia and western Libya east to the edge of the species' distribution in the western Negev of Israel. Another nominal taxon, *M. c. textilis* (Duméril, Bibron and Duméril, 1854) was previously recognized (e.g., Wade 2001; Geniez et al. 2004) from central Tunisia, the northwestern Sahara, the Hoggar (Ahaggar), and Lampedusa Island (Italy), but genetic data (Carranza et al. 2004) place morphologically identified *M. c. textilis* into two different clades.

IUCN Threat Status.— Least Concern.

Natrix maura (Linnaeus, 1758:219)

1758 *Coluber maurus* Linnaeus, Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio decima, reformata. Laurentii Salvii, Holmiæ [Stockholm], Sweden, (4) + 823 + (I) pp.

Lectotype.— NRM Lin-214, designated by Wallach et al. (2014), lost *fide* Kramer and Schnurrenberger (1963), "Algeriae."

Natrix maura, Kramer and Schnurrenberger 1963:513.

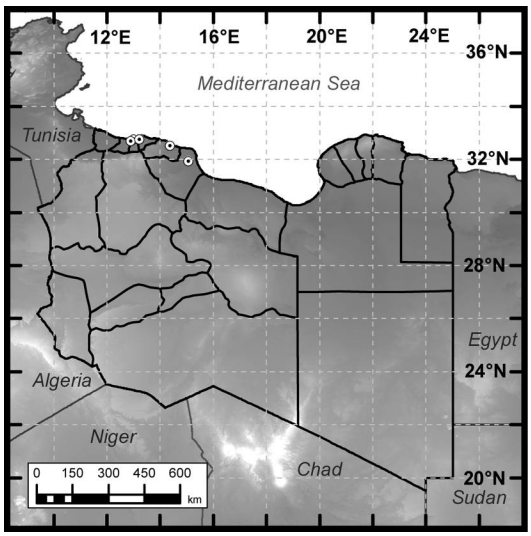
Natrix maura, Le Berre 1989:276.

Natrix maura, Schleich, Kästle, and Kabisch 1996:505.

Natrix maura, Sindaco, Venchi, and Grieco 2013:153.

Distribution.— Western Europe, from the Iberian Peninsula through France and northwestern Italy and North Africa from southern Morocco to northern Tripolitania, Libya. Introduced in the Balearic Islands (Guicking et. al. 2006, 2008) and Sardinia (Schätti 1999).

Libyan Records (Map 52): TRIPOLITANIA: Zawiyah: **17**: BMNH 1955.1.8.94–96; Kramer and Schnurrenberger 1963. **23**: BMNH 1954.1.7.26; Kramer and Schnurrenberger 1963. Tripoli: **45**: Scortecci 1938, 1939.



Map 52. Distribution of *Natrix maura* in Libya.

Murqub: **70**: Scortecci 1938, 1939. Misratah: **83**: MSNM [no specific number given]; SK 2777; Kramer and Schnurrenberger 1963.

Comments.— Recent molecular work on *N. maura* has shown multiple independent migrations from Europe into northern Africa (Barata et al. 2007). The status of this species in Libya is poorly known and confirmation of its distribution and conservation status should be priorities.

IUCN Threat Status.— Least Concern.

***Platyceps rogersi* (Anderson, 1893:439)**

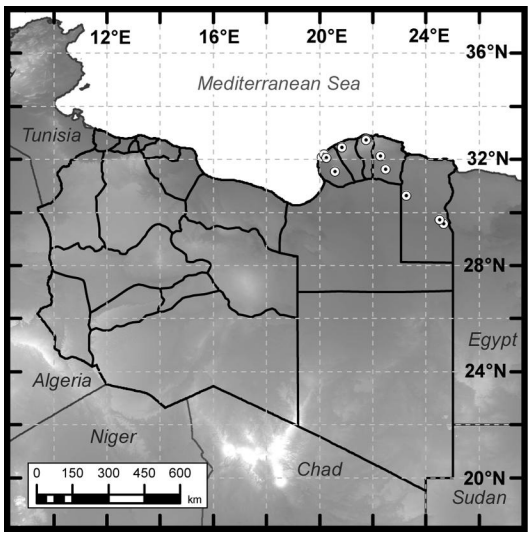
1893 *Zamenis Rogersi* Anderson, 1893. On a new species of *Zamenis* and a new species of *Bufo* from Egypt. Annals and Magazine of Natural History, series 6, 12:439–440.

Lectotype.— BMNH 1946.1.14.71, "desert to the east of Helwan" [Egypt] designated by Flower (1933), [= "Above Wadi Hoaf, near Heluan" [Egypt] *fide* Anderson (1898) [= "Wadi Hawf near Hulwan at approximately 29°52′N 31°19′E" *fide* Schätti 2004]. The original type series included four additional specimens: 1946.1.11.43 from "Beltim, between Rosetta and Damietta" and BMNH 1946.1.11.41 from "Shaloof, near Suez" and two unlocated specimens, including one from "Marsa Matruh (31°21′N 27°14′E)" [Egypt] *fide* Schätti (2004).

Coluber rogersi, Kramer and Schnurrenberger 1963:503.
Coluber rogersi, Le Berre 1989:288.
Coluber rogersi, Schleich, Kästle, and Kabisch 1996:486.
Platyceps "chesneii", Sindaco, Venchi, and Grieco 2013:133.

Distribution.— From Cyrenaica, Libya east to Syria, Iraq, and northern Saudi Arabia into Kazakhstan. In Libya the species is limited to Cyrenaica.

Libyan Records (Map 53): CYRENAICA: Benghazi: **341**: SK 2720 [= MHNG 1359.4]; Kramer and Schnurrenberger 1958, 1963; Schätti 2004. **350**: Cornalia in Haimann 1882, 1886; Werner 1909. **357**: SMF 52888; Ghigi 1913; Calabresi 1923; Schätti 2004. **379**: Kramer and Schnurrenberger 1958. Marj: **385**: Zavattari 1937. Darnah: **484**: MZUT 644 [= MZUT 4005]; Calabresi 1923; Zavattari 1929, 1930, 1934; Schätti 2004. **485**: Kramer and Schnurrenberger 1958. Butnan: **519**: Kramer and Schnurrenberger 1958. **521**: Zavattari 1937. **523**: MSNG 29532 [= MG 701]; Kramer and Schnurrenberger 1958; Schätti 2004; Vinciguerra 1927; Zavattari 1929, 1930, 1934. "**Cyrenaica**": Condorelli-Francaviglia 1896; Werner 1909. "**Eastern Libya**"**:** Sochurek 1979. LIBYA: "**between Tripoli and Kilki**" [unlocated]: BMNH 1886.9.21.102–103.



Map 53. Distribution of *Platyceps rogersi* in Libya.

Comments.— Boulenger (1996) reported that three of the five syntypes were present in the BMNH collection. Flower's (1933) reference to one of these as "the type" constituted an implied lectotype designation, as recognized by Kramer and Schnurrenberger (1963) and Schätti (2004). The taxonomic history of this species has been confusing. Some earlier Libyan records (e.g., Condorelli-Francaviglia 1896) were recorded as *Zamenis florulentus* (Geoffroy St.-Hilaire, 1827), a

species now regarded as primarily East African in distribution and extending northwards to the Nile Delta region (Schätti, 1988), with disjunct forms in Nigeria and Cameroon (Sindaco et al. 2013), and according to Schätti (2004) Schleich (1987) confused one specimen of *Hemorrhois algirus* for *P. rogersi* (ZSM 1983/151) (see Werner 1909 for a discussion of early records of *Zamenis* [or *Coluber*] *algirus*). Schätti (2006) regarded *P. rogersi* as conspecific with *P. ventromaculatus* (Gray, 1834) and Schätti and Schmitz (2006) suggested that *P. chesneii* (Martin, 1838) might be the correct name for the northeast African and Middle Eastern snakes related to this taxon. Schätti et al. (2012), however, referred populations of *P*. cf. *ventromaculatus* occurring from Libya to southern Syria and Jordan to *P. karelini rogersi*, which they regarded as distinguished only by subtle color pattern differences from the nominate form occurring in Asia. Schätti et al. (2013) have since confirmed that the name *P. chesneii* applies to another species from Iran and Pakistan. However, Sindaco et al. (2013), based on Schätti's earlier interpretation, used *Platyceps* "*chesneii*" for the North African and Middle Eastern forms and suggested that records from Iran, Pakistan, Afghanistan and Middle Asia are referable to other, unnamed, members of the *P. karelini* group. Most recently Schätti et al. (2014) considered the distribution of *C. karelini* to extend from Libya to Lake Balqash (Kazakhstan) and Pakistan. Ibrahim (2013) and Werner (2016), however, have subsequently treated *P. rogersi* as a full species. The sister-taxon relationship between *P. karelini* and *P. rogersi* had earlier demonstrated by Nagy et al. (2004).

IUCN Threat Status.— Least Concern.

Platyceps saharicus Schätti and McCarthy 2004:693, fig. 1

Playceps saharicus Schätti and McCarthy 2004. Saharo-Arabian racers of the *Platyceps rhodorachis* complex – description of a new species (Reptilia: Squamata: Colubrinae). Revue Suisse de Zoologie, 111: 691–705.

Holotype.— FMNH 72108, "Egypt: St. Catherine's Monastery area, Wadi el Sheikh" [Sinai].

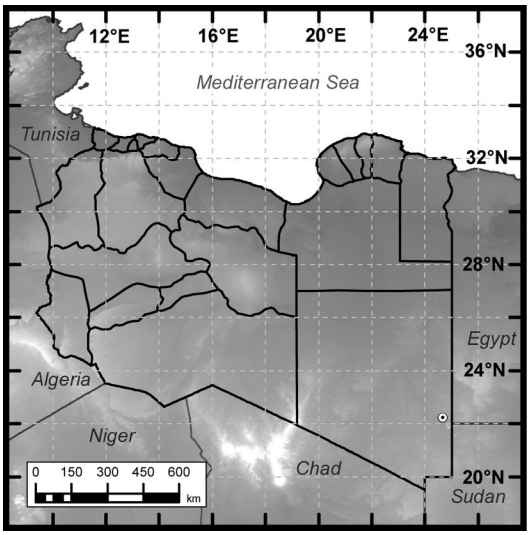
Coluber rhodorachis rhodorachis, Kramer and Schnurrenberger 1963:501.
Coluber rhodorachis, Le Berre 1989:286.
Coluber rhodorachis, Schleich, Kästle, and Kabisch 1996:484.
Platyceps saharicus, Sindaco, Venchi, and Grieco 2013:131

Distribution.— Southern Israel, Palestinian Authority (West Bank), southern Jordan and northwestern Saudi Arabia, through Sinai and Egypt (and far northern Sudan) east of the Nile. Scattered western records in southeastern Algeria, southern Libya, and northern Chad (Schätti and McCarthy 2004; Geniez and Gauthier 2008). Material cited from Eritrea and Ethiopia by Largen and Spawls (2010) as *P. rhodorachis* has been provisionally assigned to *P. tessellatus* by Perry (2012) [= *P. saharicus* sensu Schätti et al. 2014, see Comments below], but retained in *P. rhodorachis* by Sindaco et al. (2013). Records supposedly attributable to this taxon, regardless of the name applied to it, from as far east as Afghanistan (Baha El Din 2006a) have been called into question (see Werner 2016). Perry's (2012) mention of record(s) from Oman appears to be in error and Omani records in the *P. rhodorachis* group have been considered of uncertain taxonomic status by Sindaco et al. (2013). The sole specific Libyan record is based on MZUF 00659 from Ayn Murr (Scortecci 1935c) (see Comments).

Libyan Records (Map 54): CYRENAICA: Kufrah: **580**: MZUF 00659 [a paratype of *Platyceps saharicus* Schätti and McCarthy, 2004]; Scortecci 1935c; Zavattari 1937; Schätti and McCarthy 2004; Perry 2012. "**Cyrenaica**"**:** Sochurek 1979.

Comments.— Schätti and McCarthy (2004) distinguished *P. saharicus* from true *P. rhodorachis*, now considered restricted to Iran and northeastern Iraq, and through Middle Asia to south-

ern Kazakhstan and possibly as far as western Nepal (Schätti et al. 2014), and "*P*. sp. *incertae sedis*" from Egypt through Israel and Jordan (the latter subsequently considered by Perry (2012) to be *P. ladacensis* (Anderson, 1871)). Schätti et al. (2014), on the other hand, considered *P. ladacensis* as a subspecies of *P. rhodorachis* and applied the name entirely differently than did Perry (2012). Perry (2012) identified *Platyceps tessellata* [sic] (Werner, 1909) as a senior synonym of *P. saharicus* and assigned North African specimens formerly allocated to *P. rhodorachis* to this taxon, as did Geniez (2015) and Werner (2016). Schätti et al. (2014) revised the *Platyceps* east of the Tigris River and provided extensive information relative to the convoluted history and interpretation of the *P. rhodorachis* complex. They argue that Perry's (2012) interpretation of *P. tessellatus* is misguided and provide a discussion of the possible allocation of the name, while making it clear that it does not, in their opinion, apply to the African taxa to which Schätti and McCarthy (2004) had applied the name *P. saharicus*.



MAP 54. Distribution of *Platyceps saharicus* in Libya.

In Egypt, Baha El Din (2006a) reported only one record west of the Nile Valley (Gebel Uweinat = Jabal Al Uwaynat). According to Baha El Din (2006a) MZUF 00659 from Ayn Murr is from Sudan, not Libya (contra Scortecci 1935c, Kramer and Schnurrenberger 1963, and Schätti and McCarthy 2004). Kramer and Schnurrenberger (1963) noted that some maps place Ayn Murr in Sudan and others depict it in Libyan territory. Confusion arises from the fact that there is an Ain Murr on Jabal Arkenu, just northwest of the Jabal Al Uwaynat and another on the base of the southeastern slope of Jabal Al Uwaynat, the former in Libya and the latter in Sudan. Schleich et al. (1996) indicated a single locality for this taxon to the northwest of Jabal Al Uwaynat, and unambiguously inside Libya, presumably corresponding to Ayn Murr on Jabal Arkenu. In addition, Sochurek (1979) indicated that this species (as *Coluber rhodorachis*) occurs in Cyrenaica. We consider this species as a member of the Libyan fauna. Certainly its occurrence anywhere in Jabal Al Uwaynat area suggests that it should be present in Egypt, Libya and Sudan. We here plot the Jabal Arkenu locality, although the specimen may well originate from the Sudanese site (21.8833°N, 25.1000°E).

IUCN THREAT STATUS.— Not assessed.

Spalerosophis diadema cliffordii (Schlegel, 1837:163, pl. VI, figs. 13–14) (FIG. 32)

1837 *Coluber cliffordii* Schlegel, Schlegel, H. Essai sur la Physionomie des Serpens. Partie Descriptive: H.M. Schonekat, Amsterdam, The Netherlands. 606 + xvi pp. / Essai sur la Physionomie des Serpents. Planches, Cartes et Tableaux. J. Kips, J. Hz. et W. P. van Stockum, La Haye, The Netherlands. [iv] pp. 21 pls., 3 folding maps, 2 folding tables.

LECTOTYPE:— Specimen figured by Schlegel (1837b), pl. VI, figs. 13–14 (designated by Mertens, 1940), "États barbaresques" [Tripoli, Libya *fide* Mertens, 1940; Marx, 1959)], subsequently identified as RMNH 467 by Brongersma in Kramer and Schnurrenberger (1963:524).

Spalerosophis diadema cliffordi, Kramer and Schnurrenberger 1963:524.
Spalerosophis diadema, Le Berre 1989:290.

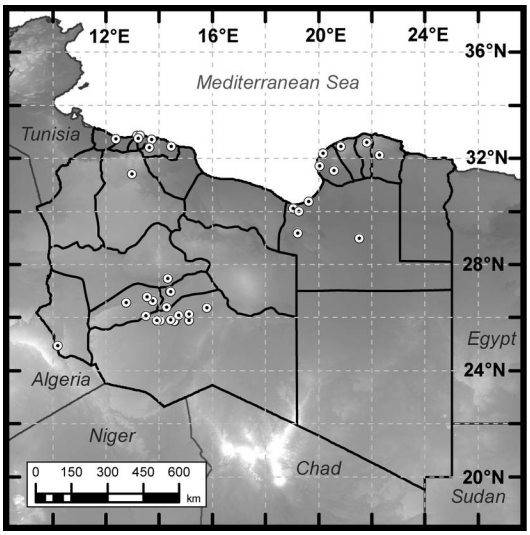
Spalerosophis diadema, Schleich, Kästle, and Kabisch 1996:520.
Spalerosophis cliffordi, Trape and Mané 2006:160.
Spalerosophis diadema cliffordii, Sindaco, Venchi, and Grieco 2013:139.

Distribution.— Mauritania eastwards through Mali, Niger, northern Nigeria, and North Africa to Egypt, including Sinai, Israel, Jordan, and Syria and from southeastern Turkey, Iraq, south through the Arabian Peninsula and east through Iran, Pakistan and northwest India. Widely distributed across Libya, though with no records from Kufrah and the southeast of the country.

Figure 32. *Spalerosophis diadema cliffordii* from 9 km east of Ben Joad, Jabal al Akhdar, Cyrenaica, Libya (32.8239, 21.8519), 2007. Photo courtesy of Natural History Museum of Crete © V. Paravas.

Libyan Records (Map 55): TRIPOLITANIA: Nuqat al Khams: **8**: BMNH 1960.1.5.92; Kramer and Schnurrenberger 1963. Tripoli: **39**: FMNH 82964, 83056; Marx 1959. **43**: MCSN 4209. **45**: RMNH RENA 467A,B; ZMB 15345, 15349, 15352–53, 15358, 18093; Günther 1858; Boulenger 1893; Werner 1909; Schätti et al. 2010. **56**: BMNH 1960.1.5.93; Kramer and Schnurrenberger 1963. Murqub: **60**: ZMB 18093; Peters 1880, 1881; Ghigi 1913; Zavattari 1934. **71**: MCSN 4207. Jabal al Gharbi: **158**: MCSN 4208. "**Tripolitania settentrionale**": Zavattari 1937. FEZZAN: Wadi al Shatii: **211**: Zavattari 1937. Ghat: **249**: Domergue 1953. Wadi al Hayaa: **277**: Frynta et al. 2000. **279**: MSNM [no specific number given]; Kramer and Schnurrenberger 1963. **269**: Zavattari 1934. Sabha: **281**: AIC 2006.1546; Ibrahim 2008a. **284**: SK 1064, 1726; Kramer and Schnurrenberger 1963. **285**: Schnurrenberger 1963. **286**: Ghigi 1913. Murzuq: **296**: ZCT 2005.36; Ibrahim 2008a. **298**: MCSN 2874. MSNM [no specific number given]; ZCT 2005.44; Zavattari 1934; Kramer and Schnurrenberger 1963; Ibrahim 2008a. **300**: ZCT 2005.13; Ibrahim 2008a. **303**: ZCT 2006.34; Zavattari 1937; Ibrahim 2008a. **306**: ZCT 2005.10; Ibrahim 2008a. **308**: AIC 2005.1540; Ibrahim 2008a. **310**: ZCT 2006.61; Ibrahim 2008a. **313**: AIC 2006.1545; Ibrahim 2008a. **316**: ZCT 2005.18, 2006.08; Ibrahim 2008a. **318**: SK 826; ZCT 2006.36; Kramer and Schnurrenberger 1963; Schnurrenberger 1963; Ibrahim 2008a. CYRENAICA: Benghazi: **341**: SK 36; Kramer and Schnurrenberger 1958, 1963. **366**: NHMC 80.3.7.1. **379**: Kramer and Schnurrenberger 1958. Marj: **385**: Werner 1909; Zavattari 1937. Jabal al Akhdar: **423**: CAS 135743. Darnah: **484**: Calabresi 1923; Zavattari 1929, 1930, 1934. Al Wahat: **540**: BMNH 1960.1.5.91; Kramer and Schnurrenberger 1963. **545a**: SK 596; Kramer and

Schnurrenberger 1963. **548**: SK 981; Kramer and Schnurrenberger 1963. **553**: MCSN 4206. **564**: MSNM [no specific number given]; Vinciguerra 1931; Zavattari 1934, 1937; Kramer and Schnurrenberger 1963. LIBYA: NHMW 26662; NHMW 28595. "**Bir Terrhim/Tezzhim (?)**" [unlocated]: MCSN 4205.



MAP 55. Distribution of *Spalerosophis diadema cliffordii* in Libya.

COMMENTS.— *Spalerosophis* was mostly treated as a synonym of *Coluber* until resurrected by Gasperetti (1988). The taxonomy of the *Spalerosophis diadema* complex is highly confused (Sindaco et al. 2013). Schätti et al. (2009b, 2010) recognized three subspecies, with *S. d. schirasianus* [sic, *schirazianus*] (Jan, 1863) [sic, Jan *in* de Filippi, 1865] from Turkmenistan, Uzbekistan, Pakistan, and the Zagros mountains of Iran, *S. d. cliffordii* (Schlegel, 1837) from North Africa and Arabia, and the nominate form, *S. d. diadema* (Schlegel, 1837) (see below). Schätti et al. (2009a) identified *Coluber cahirinus* Gmelin, 1789 (a *nomen novum* for *Coluber guttatus* Forskål, 1775) and *Coluber geoffroyii* Gray, 1831 as senior subjective synonyms, (although *nomina oblita*) of *Coluber cliffordii* Schlegel, which they declared a *nomen protectum*. Schätti et al. (2010) raised the possibility that the presumed Iranian type locality of the nominate form of *S. diadema* may be incorrect and that the type of *S. d. diadema* may, in fact, be referable to the North African form now known as *S. d. cliffordii*. Pending further resolution of this issue we retain the current usage and apply the latter name to Libyan *Spalerosophis*. These authors regard the Indian form, assigned to the nominotypical race by Sindaco et al. (2013), as yet to be properly named. Wallach et al. (2014) treated *S. cliffordii* as a full species. Kramer and Schnurrenberger's (1963) designation of a surviving RMNH syntype as a lectotype is invalid (see Schätti et al. 2010).

IUCN THREAT STATUS.— Not assessed.

Telescopus tripolitanus (Werner, 1909:619)

1909 *Leptodira tripolitana* Werner, Reptilien, Batrachier und Fische von Tripolis und Barka. Zoologische Jahrbücher Abteilung für Systematik, Geographie und Biologie der Tiere 27:595–646, pl. 30.

HOLOTYPE.— NHMW, lost *fide* Kramer and Schnurrenberger (1963), "Tripolis" [from animal dealer R. Storch via W. Schlüter in Halle] "probably … southern Tunisia or north-western Libya" (Crochet et al. 2008).

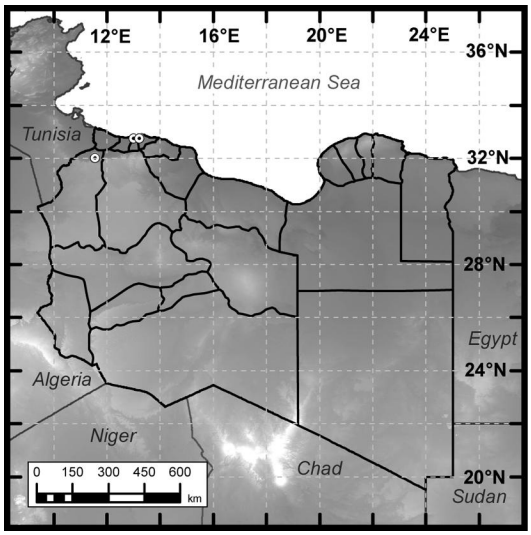
Telescopus tripolitanus, Kramer and Schnurrenberger 1963:529.
Telescopus obtusus, Le Berre 1989:272.
Telescopus obtusus, Schleich, Kästle, and Kabisch 1996:524.
Telescopus tripolitanus, Sindaco, Venchi, and Grieco 2013:144.

DISTRIBUTION.— The species is distributed from Tripolitania west to Morocco and south to Senegal and thence east through the Sahel to Sudan, and is absent from the Sahara proper (see Crochet et al. 2008 for details).

Libyan Records (Map 56): ZAWIYAH: **22**: Scortecci 1939. TRIPOLI: **45**: ZMB 51636; Werner 1909; Ghigi 1913; Zavattari 1934; Kramer and Schnurrenberger 1963. NALUT: **105**: MNHN 2004.0080; Ibrahim and Ineich 2005; Crochet et al. 2008. "**Tripolitania settentrionale**" Zavattari 1937. "**W-Libyen**": Sochurek 1979.

Comments.— Early *Telescopus* records from North Africa were typically referred to *T. dhara* (Forskål, 1775) and subsequently to *T. guidimakaensis* (Chabanaud, 1916) (e.g., Geniez et al. 2004) or *T. obtusus* (Reuss, 1834) (e.g., Bons and Geniez 1996), the later now considered as occurring in Egypt (Sindaco et al. 2013). *Telescopus tripolitanus* was treated as a *nomen dubium* (*fide* Crochet et al. 2008) before Crochet et al. (2008) verified that this is the name applicable to western *T. dhara* complex. Kramer and Schnurrenberger (1963) considered the type locality of Tripoli as questionable, but a specimen from Nalut (Ibrahim and Ineich 2005) confirms the occurrence of the species in northwestern Tripolitania.

IUCN Threat Status.— Not assessed, but assumed to be Least Concern.



Map 56. Distribution of *Telescopus tripolitanus* in Libya.

Family Lamprophiidae

Malpolon insignitus (I. Geoffroy Saint-Hilaire 1827:151, pl. 7, fig. 6)

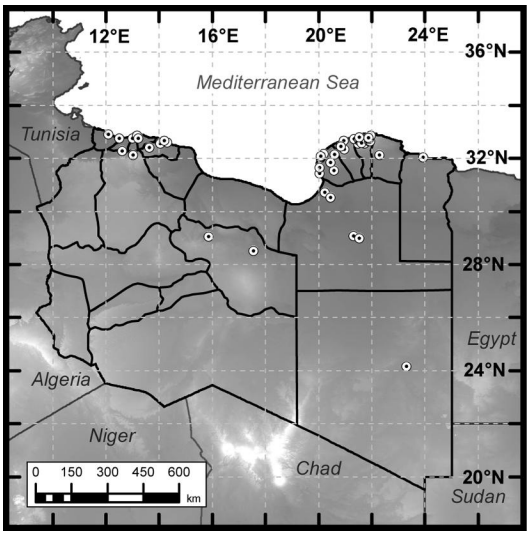
1827 *Coluber insignitus* Geoffroy Saint-Hilaire, Description des reptiles qui se trouvent en Égypte, pp. 121–160 *in* M.J.-C.L. de Savigny, (ed.), Description de l'Égypte, ou Recueil des Observations et des Recherches qui ont été Faites en Égypte Pendant l'Expédition de l'Armée Française. Histoire Naturelle. Tome premier. Partie premier. Imprimerie Impériale, Paris, France.

Holotype.— Specimen illustrated on fig. 6 of pl. 7 of the Atlas accompanying the "Description de l'Égypte," location unknown, "Égypte" [= Egypt] ("Unterägypten" [Lower Egypt] *fide* Mertens and Müller 1928:51).

Malpolon monspessulanus insignitus, Kramer and Schnurrenberger 1963:509.
Malpolon monspessulanus, Le Berre 1989:280.
Malpolon monspessulanus insignitus, Schleich, Kästle, and Kabisch 1996:502.
Malpolon insignitus, Sindaco, Venchi, and Grieco 2013:165.

Distribution.— From northeastern Morocco and western Algeria across North Africa to the Middle East, western Iran, the Caucusus and southern Russia and from Turkey and Cyprus westwards to the Adriatic coast. The subspecies *M. i. fuscus* (Fleischmann, 1831) is present in the Balkans. Within Libya the species is represented by the nominate form, predominately in the Mediterranean region.

Libyan Records (Map 57): TRIPOLITANIA: Nuqat al Khams: **5**: BMNH 1960.1.5.94; Kramer and Schnurrenberger 1963. Zawiyah: **11**: Frynta et al. 2000. **15**: BMNH 1960.1.5.99; Kramer and Schnurrenberger 1963. **22**: MCSN 4213. Tripoli: **36**: BMNH 1954.1.7.27, 1954.1.7.29 Kramer and Schnurrenberger 1963. **38**: Sayers 1964. **39**: FMNH 82953. **40**: BMNH 1960.1.5.95; Kramer and Schnurrenberger 1963. **45**: ZMB 15341, 15344, 15348, 15354; Günther 1858; Condorelli-Francaviglia 1896; Werner 1909; Ghigi 1913; Zavattari 1934; Sayers 1964. Murqub: **60**: MSNM [no specific number given]; SK 2095; Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1934.; Kramer and Schnurrenberger 1963. **62**: Frynta et al. 2000. **67**: Sinda-



MAP 57. Distribution of *Malpolon insignitus* in Libya.

co obs. 4/29/2008. **69**: SK 257; Kramer and Schnurrenberger 1963. JABAL AL GHARBI: **154**: FMNH 82954–55. "**Tripolitania**": Scortecci 1939. "**Tripolitania settentrionale**": Zavattari 1937. "**Sirtica**": Zavattari 1937. FEZZAN: JUFRA: **217**: Zavattari 1937; **221**: Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1934; Scortecci 1939. CYRENAICA: BENGHAZI: **342**: Cornalia in Haimann 1882, 1886; Werner 1909; Ghigi 1913; Calabresi 1923; Zavattari 1929, 1930, 1934. **344**: Cornalia in Haimann 1882, 1886; Werner 1909; Ghigi 1913; Zavattari 1929, 1930, 1934. **357**: MCSN 2791; MZUF 00814; Werner 1909; Ghigi 1913; Umani 1922; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **358**: Calabresi 1923; Zavattari 1929, 1930. **360**: BMNH 1954.1.7.28; Kramer and Schnurrenberger 1963. **364**: Cornalia in Haimann 1882, 1886; Werner 1909; Ghigi 1913; Zavattari 1929, 1930, 1934. **367**: BMNH 1960.1.5.96–97; Calabresi 1923; Zavattari 1929, 1930, 1934; Kramer and Schnurrenberger 1963. **379**: Werner 1909; Ghigi 1913. **372**: CUP R 127; Frynta et al. 2000. MARJ: **385**: Calabresi 1923; Zavattari 1929, 1930, 1934, 1937. **389**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **405**: Frynta et al. 2000. **457a**: Schleich 1987. JABAL AL AKHDAR: **417**: FMNH 214911–13; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Resetar 1981. **421**: Zavattari 1929, 1930, 1934. **435**: FMNH 82952. **448**: KNP 1981/205; SMF 55404; Schleich 1987. **451**: CUP R 128; Frynta et al. 2000. **457**: KNP 1981/291, 1981/435, 1981/449, 1981/458, 1981/496, 1981/498, 1981/506, 1981/514; ZSM [5 specimens under 2 numbers] 1983/147, 1983/149; Schleich 1987. **457at**: Schleich 1987. **457ba**: Schleich 1987. **457bb**: Schleich 1987. **457bc**: Schleich 1987. **457bf**: Schleich 1987. **457bj**: Schleich 1987. **457bk**: Schleich 1987. **457bl**: Schleich 1987. **457bm**: Schleich 1987. **457ce**: Schleich 1987. **457co**: Schleich 1987. **457cp**: Schleich 1987. **457cs**: Schleich 1987. **457cw**: Schleich 1987. **457n**: Schleich 1987. DARNAH: **484**: Calabresi 1923; Zavattari 1929, 1930, 1934. BUTNAN: **490**: MSNG 27765; Vinciguerra 1927; Zavattari 1929, 1930, 1934. AL WAHAT: **529**: Vinciguerra 1931; Zavattari 1934. **530**: Peters 1880, 1881; Werner 1909; Calabresi 1923; Zavattari 1929, 1930, 1934. **562**: Werner 1909; Ghigi 1913. **564**: Zavattari 1937. KUFRAH: **573**: Zavattari 1937. "**Cyrenaica**": Condorelli-Francaviglia 1896; Scortecci 1939. "**Marmarica**": Zavattari 1937.

COMMENTS.— The complicated dating of the natural history portions of *Description de l'Égypte* has been elucidated by Sherborn (1897) and Tollitt (1986). Carranza et al. (2006) resurrected *M. insignitus* from the synonymy of *M. monspessulanus* based on the deep genetic divergence between the two, and recognized the nominotypical form and the subspecies *M. i. fuscus* (Fleischmann, 1831). Sindaco et al. (2013) considered the Balkan taxon, *M. i. fuscus*, to be ill-defined. Records from the southeast of Libya (see map in Geniez 2015), based on the locality "El Giof" reported by Zavattari (1937) are likely in error.

IUCN THREAT STATUS.— Not assessed, but assumed to be Least Concern.

***Psammophis aegyptius* Marx, 1958:194, figs. 30C, 31C**

1958 *Psammophis aegyptius* Marx, Egyptian snakes of the genus *Psammophis*. Fieldiana: Zoology 39(18):191–200.

HOLOTYPE.— FMNH 75092, "date grove near the government house at Siwa, Siwa Oasis, Western Desert Governorate, Egypt."

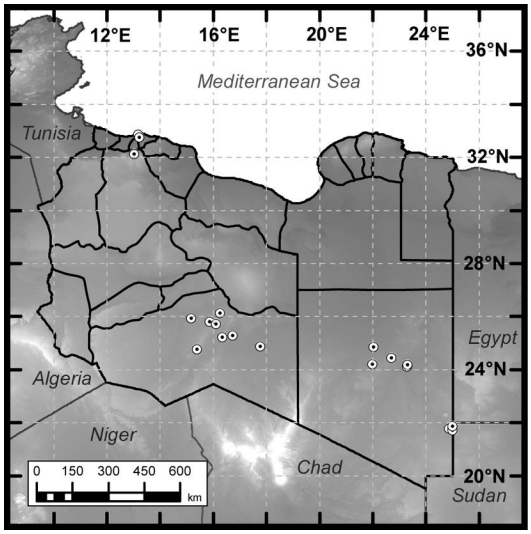
Psammophis schokari aegyptius, Kramer and Schnurrenberger 1963:519.

Psammophis aegyptius, Schleich, Kästle, and Kabisch 1996:513.

Psammophis aegyptius, Trape and Mané 2006:146.

Psammophis aegyptius, Sindaco, Venchi, and Grieco 2013:167.

DISTRIBUTION.— Southern Algeria through Niger, southern Libya, and most of Egypt (including southern Sinai) to extreme southern Israel, a single record in southwestern Chad (Sindaco et al. 2013). In Libya they have been recorded around Tripoli (based on three FMNH specimens) and in the southern half of the country (Schleich et al. 1996). See Figure 56.



MAP 58. Distribution of *Psammophis aegyptius* in Libya. Records from near-coastal northwestern Libya need further confirmation.

Libyan Records (Map 58): TRIPOLITANIA: TRIPOLI: **39**: FMNH 83054. **45**: FMNH 83055. JABAL AL GHARBI: **154**: FMNH 82957. FEZZAN: MURZUQ: **314**: SK 1482; Kramer and Schnurrenberger 1963. **320**: SK 1483; Kramer and Schnurrenberger 1963; Schnurrenberger 1962. **322**: SK 1412; Kramer and Schnurrenberger 1963. **323**: SK 1744–46, 1891–96, 2424–25, 2427; Kramer and Schnurrenberger 1963. **326**: MCSN 2999; Kramer and Schnurrenberger 1963. **328**: SK 1143; Kramer and Schnurrenberger 1963. **331**: MCSN 2753; SK 1140–41; Kramer and Schnurrenberger 1963. Scortecci 1935b; Loveridge 1940; Kramer and Schnurrenberger 1963. **332**: SK 1090; Kramer and Schnurrenberger 1963. CYRENAICA: KUFRAH: **568**: MZUF 971, 20197; Scortecci 1935c; Loveridge 1940; Kramer and Schnurrenberger 1963. **569**: MCSN 2752; Scortecci 1935b; Zavattari 1937; Loveridge 1940. **570**: Scortecci 1935c; Loveridge 1940. **571**: Scortecci 1935b; Zavattari 1937; Loveridge 1940. **573**: Loveridge 1940. **575**: MCSN 3206; MG 31605; MSNG 31585*; ZMB 18160–61; Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1929, 1930, 1934; Vinciguerra 1931; Scortecci 1939; Loveridge 1940; Kramer and Schnurrenberger 1963. **578**: MCSN 2755. **580a**: MCSN 2759; Scortecci 1935b. **584**: MCSN 3208; MZUF 962, 2497, 20194; Scortecci 1935c; Loveridge 1940; Zavattari 1937; Kramer and Schnurrenberger 1963. **585**: MZUF 964; Scortecci 1937c; Loveridge 1940. "**Eastern Libya**"**:** Sochurek 1979.

COMMENTS.— Older records from Libya were mostly referred to *P. schokari.* Records in neighboring Egypt are mostly south of 30° (Baha El Din 2006a) so northern records in Libya, which have not been accepted by some authors (e.g., Geniez 2015) need confirmation. However, the Tripoli records are relatively recent and are unlikely to be erroneous, although they may reflect the over generalization of locality. We follow Kramer and Schnurrenberger (1963) in assigning whipsnake records from Kufrah by Peters (1880, 1881) to this species.

IUCN Threat Status: Not assessed, but assumed to be Least Concern.

***Psammophis schokari* (Forskål 1775:14) (Fig. 33)**

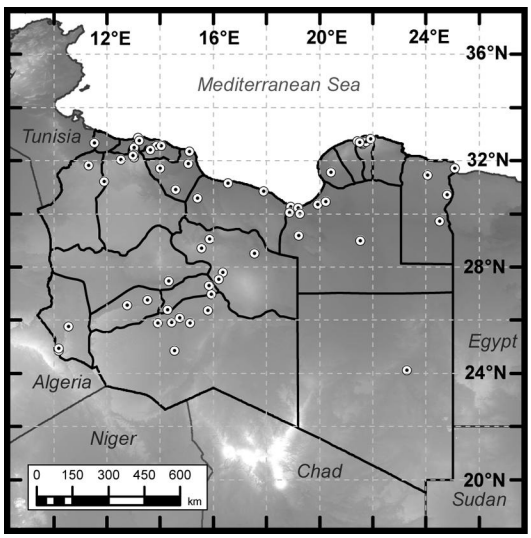
1775 *Coluber schokari* Forskål, Descriptiones animalium, avium, amphibiorum, piscium, insectorum, vermium; quae in itinere Orientali observavit Petrus Forskål. Mölleri, Hainiæ [Copenhagen], xxxiv + 164 pp.

Neotype.— FMNH 66153, designated by Marx (1958a), "Hodeida (= Al Hudaydah), Yemen" by neotype selection. The original description provides scale counts for two syntypes, both appertly lost, from "Yemen."

Psammophis schokari schokari, Kramer and Schnurrenberger 1963:517.
Psammophis shokari [sic], Le Berre 1989:270.
Psammophis sibilans [part], Le Berre 1989:266.
Psammophis schokari, Schleich, Kästle, and Kabisch 1996:515.
Psammophis sibilans [part], Schleich, Kästle, and Kabisch 1996:515.
Psammophis schokari, Trape and Mané 2006:152.
Psammophis schokari, Sindaco, Venchi, and Grieco 2013:133.

Distribution.— Widely distributed across North Africa from Senegal to Morocco and across the continent to Sinai and south to Ethiopia and Somalia, with scattered records from Mali and possibly Niger (but see Trape and Mané 2015). In Asia from Israel, Jordan, Syria, and the Arabian Peninsula to Iran, Turkmenistan, Afghanistan, Pakistan, and northwestern India. Libyan records are from across the entire country except Kufrah.

Figure 33. *Psammophis schokari* from Murzuq, Fezzan, Libya. Photo © Adel Ibrahim.



Map 59. Distribution of *Psammophis schokari* in Libya.

Libyan Records (Map 59): Nuqat al Khams: **9**: MCSN 4203. Jafara: **29**: MCSN 4220. Tripoli: **39**: USNM 56019. **45**: NHMW 25747; Werner 1909; Ghigi 1913; Zavattari 1934; Scortecci 1939; Loveridge 1940. Murqub: **60**: Peters 1880, 1881; Werner 1909; Gighi 1913; Zavattari 1934. **61**: BMNH 1901.10.28.9. **62**: CUP R 068; Frynta et al. 2000. Misratah: **73**: SK 338; Kramer and Schnurrenberger 1963. **77**: MCSN 4200. **80**: NMBE 29534; MSNG 29534; Boulenger 1914; Zavattari 1934; Scortecci 1939; Loveridge 1940; Kramer and Schnurrenberger 1963. **84**: MCSN 4202. Nalut: **104**: BMNH 1960.1.6.3; Kramer and Schnurrenberger 1963. Jabal al Gharbi: **131**: SK 2445; Kramer and Schnurrenberger 1963. **141**: MCSN 4199. **148**: SK 198, 330; Kramer and Schnurrenberger 1963. **149**: SK 237; Kramer and Schnurrenberger 1963. **154**: FMNH 82956. Sirte: **174**: MSNM [no specific number given]; Kramer and Schnurrenberger 1963. **85**: MCSN 4201. "**Bir Milrha to Giofra**": Loveridge 1940. "**Tripolitania settentrionale**": Zavattari 1937. FEZZAN: Wadi al Shatii: **211**:

Scortecci 1937; Zavattari 1937a; Loveridge 1940. JUFRA: **213**: NMBE 29535; MSNG 56909, 57811; Kramer and Schnurrenberger 1963. **217**: Zavattari 1937. **221**: MCSN 2778; Kramer and Schnurrenberger 1963. **224**: SK 2710; Kramer and Schnurrenberger 1963. **226**: MCSN 2748; Scortecci 1935b; Loveridge 1940; Kramer and Schnurrenberger 1963. GHAT: **234**: MCSN 2757; Schnurrenberger 1958b. **249**: MCSN 2745, 2747, 2762, 2781; Scortecci 1939. **253**: MCSN 3244. WADI AL HAYAA: **269**: MCSN 2744; Zavattari 1934; Essghaier et al. 2015. **276**: Sindaco, pers. obs. 4/25/2008. SABHA: **281**: AIC 2006.1543; Ibrahim 2008a. **290**: Schnurrenberger 1962. **291**: SK 1099–100, 1835; Kramer and Schnurrenberger 1963. MURZUQ: **298**: ZCT 2005.20; Ibrahim 2008a. **303**: Zavattari 1937; Loveridge 1940; Essghaier et al. 2015. **310**: ZCT 2006.07; Ibrahim 2008a. **313**: ZCT 2006.22; Ibrahim 2008a. **318**: SK 2700–01; Kramer and Schnurrenberger 1963; Schnurrenberger 1963; Ibrahim 2008a. **325**: ZCT 2006.44; Ibrahim 2008a. CYRENAICA: BENGHAZI: **378**: SK 26-27. JABAL AL AKHDAR: **434**: CM 91614; FMNH 214915; Resetar 1981. **457**: KNP 1981/3664 [2 specimens]; ZSM 1983/148; Schleich 1987. **457bg**: Schleich 1987. **457bh**: Schleich 1987. **457bs**: Schleich 1987. **457cx**: Schleich 1987. **457r**: Schleich 1987. **457t**: Schleich 1987. BUTNAN: **505**: NMBE 29536; Kramer and Schnurrenberger 1963. **511**: ZSM 150/1983; Loveridge 1940. **517**: Vinciguerra 1927**;** Zavattari 1929, 1930. **521**: Vinciguerra 1927; Zavattari 1930, 1934, 1937; Scortecci 1939; Loveridge 1940. AL WAHAT: **531**: SK 86, 181, 626, 2711; Kramer and Schnurrenberger 1963. **536**: SK 197, 236; Kramer and Schnurrenberger 1963. **544**: MCSN 4219; BMNH 1960.1.6.1–2; Kramer and Schnurrenberger 1963. **546**: MCSN 3004. **547**: SK 79, 169–70; Kramer and Schnurrenberger 1963. **548**: SK 199, 390, 543; Kramer and Schnurrenberger 1963. **553**: MCSN 3207. **564**: NMBE 29585, NMBE [no specific number given]; MCSN 3205; MSNG 31585*; Zavattari 1929, 1930, 1934, 1937; Vinciguerra 1931; Scortecci 1939; Loveridge 1940; Kramer and Schnurrenberger 1963. "**Cyrenaica**": MCSN 4218; NHMW 19238; Condorelli-Francaviglia 1896; Werner 1909; Ghigi 1913; Calabresi 1923.

COMMENTS.— Some earlier references to *P. sibilans* in Libya are likely attributable to *P. schokari,* whereas some pre-1958 records of *P. schokari* may actually refer to *P. aegyptius* (Sindaco et al. 2013). A molecular phylogeny by Rato et al. (2007) did not include Libyan samples.

UCN Threat Status: Not assessed, but assumed to be Least Concern.

***Psammophis tanganicus* Loveridge, 1940:57.**

1940 *Psammophis biseriatus tanganicus* Loveridge, Revision of the African snakes of the genera *Dromophis* and *Psammophis*. Bulletin of the Museum of Comparative Zoology at Harvard College, 87: 1–69.

HOLOTYPE.— MCZ R30380 "Mangasini, Usandawi, central Tanganyika Territory." [= Mangasini, Northwest Singida Region, Tanzania].

Psammophis biseriatus tanganicus, Kramer and Schnurrenberger 1963:515.

Psammophis tanganicus, Sindaco, Venchi, and Grieco 2013:170.

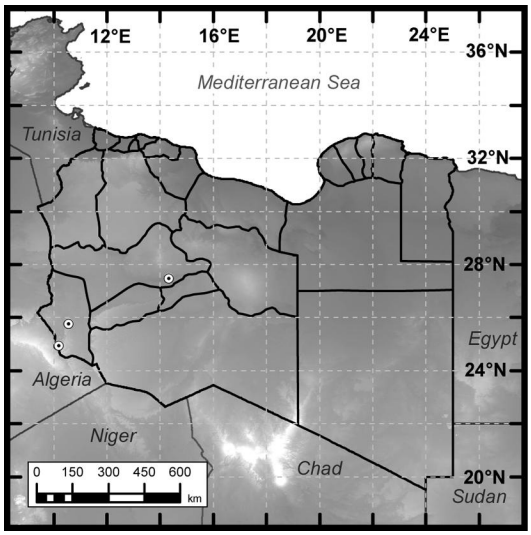
DISTRIBUTION.— This species is distributed from the Horn of Africa south to Tanzania. Fezzan records in Libya are widely disjunct. Its occurrence in Libya was treated as questionable by Sindaco et al. (2013) and it was not considered by Geniez (2015).

Libyan Records (Map 60): FEZZAN: WADI AL SHATII: **211**: Scortecci 1937a. GHAT: **234**: Scortecci 1937a. **249**: SK 1619; Scortecci 1937a,b, 1939; Zavattari 1937; Loveridge 1940; Kramer and Schnurrenberger 1963.

COMMENTS.— Scortecci (1937) and Zavattari (1937) reported this species from the Fezzan area as *Psammophis biseriatus*. Loveridge (1940) acknowledged that his acceptance of the species' occurrence in Libya rested on the authority of these earlier authors. Scortecci's material was sup-

posedly destroyed in World War II (Scortecci in Kramer and Schnurrenberger 1963). Kramer and Schnurrenberger (1963) examined a male specimen from Ghat (collection Kramer), having 15 scales at midbody and 3 supralabials touching the eye, which is consistent with *P. tanganicus* but not its Libyan or northeast African congeners (see Chippaux 1999). Although some recent authors cite this species for Libya (Schleich et al. 1996) or for the Sahel of Chad (Le Berre 1989), Spawls et al. (2002), Venchi and Sindaco (2006) and Sindaco et al. (2013) have called into question the occurrence of this species so far from its primary range.

UCN Threat Status: Not assessed.



MAP 60. Distribution of *Psammophis tanganicus* in Libya.

***Rhagerhis moilensis* (Reuss, 1834:142, pl. 7, fig. 1a–1b)**

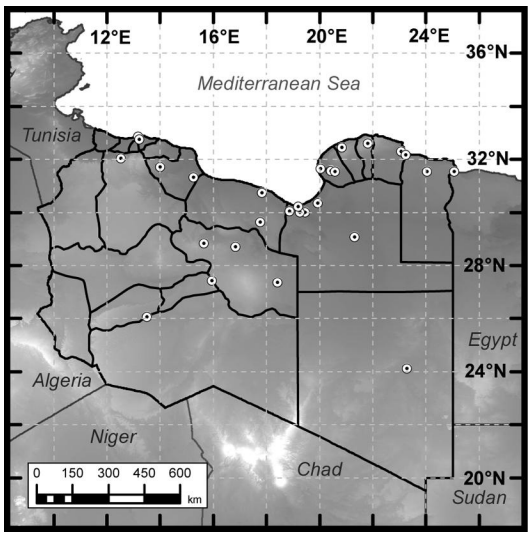
1834 *Coluber moilensis* Reuss, Zoologische Miscellen. Reptilien. Ophidier. Museum Senckenbergianum 1:127–162, pls. 7–9.

HOLOTYPE.— SMF 20017 (formerly SMF-R III.R.1.a and SMF-B-9143c) fide Boettger (1898) and Mertens (1922, 1967), "Arabien, Gegend von Moilah" [Arabia, vicinity of Al Muwaylah, Al Muqata'ah Ash Shamaliyah Province, Saudi Arabia].

Malpolon moilensis, Kramer and Schnurrenberger 1963:511.
Malpolon moïlensis, Le Berre 1989:278.
Malpolon moilensis, Schleich, Kästle, and Kabisch 1996:499.
Rhagerhis moilensis, Sindaco, Venchi, and Grieco 2013:171.

DISTRIBUTION.— Widely distributed across North Africa from Mauritania to Morocco and across the continent to the east from Sinai to Sudan and Eritrea. In Asia from Israel to Syria to western Iran and throughout the Arabian Peninsula. Distributed widely across Libya.

Libyan Records (Map 61): TRIPOLITANIA: TRIPOLI: **39**: FMNH 82961–63. **45**: Werner 1909; Ghigi 1913. MISRATAH: **73**: ZSM 159/1983. **88**: MCSN 4211. JABAL AL GHARBI: **141**: SK 1481; Kramer and Schnurrenberger 1963. SIRTE: **185**: MCSN 2797; Kramer and Schnurrenberger 1963. **195**: MCSN 2792. "**Tripolitania**": Anderson 1898; Zavattari 1934; Scortecci 1939. "**360 km S. of Tripoli**": BMNH 1987.2200. FEZZAN: JUFRA: **214**:



MAP 61. Distribution of *Rhagerhis moilensis* in Libya.

MSNG 29517. **220**: MCSN 2790; Kramer and Schnurrenberger 1963. **229**: SK 1897–98; Kramer and Schnurrenberger 1963. Sabha: **289**: SK 1445; Kramer and Schnurrenberger 1963. Murzuq: **296**: ZCT 2005.30; Ibrahim 2008a. CYRENAICA: Benghazi: **367**: CAS 135739. **377**: SK 48; Kramer and Schnurrenberger 1963. **378**: SK 381, 571, 752. **379**: Kramer and Schnurrenberger 1958. Marj: **385**: Werner 1909. Jabal al Akhdar: **423**: CM 91594. Darnah: **475**: ANSP 28051. **477**: NHMC 80.3.23.2. Butnan: **508**: NHMC 80.3.23.1. **512**: ZSM 158/1983. Al Wahat: **536**: SK 329; Kramer and Schnurrenberger 1963. **544**: SMF 62312. **547**: SK 66–67; Kramer and Schnurrenberger 1958, 1963. **548**: AMNH R109610; SK 977–78; Kramer and Schnurrenberger 1963. **549**: SK 401–04; Kramer and Schnurrenberger 1963. **562**: MSNG 31586; Vinciguerra 1931; Zavattari 1934; Scortecci 1939. Kufrah: **575**: Peters 1880, 1881; Werner 1909; Ghigi 1913, Zavattari 1929, 1930, 1934; Scortecci 1939. LIBYA: NHMW-25664.

Comments.— Böhme and de Pury (2011) discussed the allocation of this species to different genera and presented evidence for its inclusion in *Rhagerhis.* Most recently, however, Figueroa et al. (2016) presented evidence that *R. moilensis* was nested within *Malpolon* and transferred the species back to this genus. Pending further study we here retain it in *Rhagerhis*.

UCN Threat Status: Not assessed, but assumed to be Least Concern.

Family Elapidae

Naja haje (Linnaeus, 1758:225)

1758 *Coluber Haje* Linnaeus, Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio decima, reformata. Laurentii Salvii, Holmiæ [Stockholm], Sweden. (4) + 823 + (I) pp.

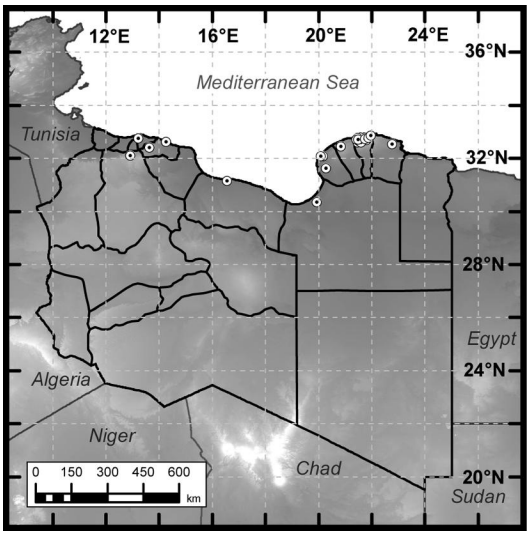
Syntypes.— NRM and Hasselquist collection (see Comments), lost *fide* Andersson (1899) and Kramer and Schnurrenberger (1963), "Ægypto inferiore" [= Lower Egypt].

Naja haje, Kramer and Schnurrenberger 1963:536.
Naja haje, Le Berre 1989:256.
Naja haje, Schleich, Kästle, and Kabisch 1996:526.
Naja haje, Sindaco, Venchi and Grieco 2013:176.

Distribution.— Across northern Africa exclusive of the Sahara proper, from Senegal to Western Sahara and Morocco to the Nile Valley and Delta (Baha El Din 2006a). In the Sahel crossing eastwards through northern Nigeria, southern Chad and the Central African Republic into Sudan and the Horn of Africa and as far south as Tanzania in East Africa. Libyan records are chiefly in coastal or near-coastal regions across the country.

Libyan Records (Map 62): TRIPOLITANIA: Tripoli: **45**: Werner 1909; Scortecci 1939. Murqub: **60**: Werner 1909; Ghigi 1913; Zavattari 1934; Scortecci 1939. **68**: SK 448; Kramer and Schnurrenberger 1963. Jabal al Gharbi: **147**: FMNH 83058. "**Tripolitania settentrionale**" Zavattari 1937. Sirte: **174**: MCSN 2688. CYRENAICA: Benghazi: **354**: Umani 1922. **357**: von Martens 1883; Werner 1909; Umani 1922; Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Ribolla 1923; Scortecci 1939. **376**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Scortecci 1939. Marj: **385**: Zavattari 1929, 1937. Jabal al Akhdar: **411**: FMNH 214914; Resetar 1981. **414**: Resetar 1981. **417**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923; Scortecci 1939. **421**: Ghigi 1920; Calabresi 1923; Zavattari 1929, 1930. **427**: Scortecci 1939. **457**: KNP 1981/272, 354, 509; ZSM 145/1983; Resetar 1981; Schleich 1987. **457aj**: Schleich 1987. **457an**: Schleich 1987. **457ao**: Schleich 1987. **457at**: Schleich 1987. **457au**: Schleich 1987. **457bp**: Schleich 1987. **457br**: Schleich 1987. **457bs**: **179**: KNP 1919/13; Schleich 1987. **457bu**: Schleich 1987. **457ca**: Schleich

1987. **457cc**: Schleich 1987. **457cv**: Schleich 1987. **163**: KNP 1981/311; Schleich 1987. **457i**: Schleich 1987. **457r**: Schleich 1987. **457u**: Schleich 1987. **457w**: Schleich 1987. DARNAH: **469**: Kramer and Schnurrenberger 1958, 1963. AL WAHAT: **536**: Kramer and Schnurrenberger 1963. "**Cyrenaica**": IZUM 20178, IZUM 20179; ZMB 10507; Condorelli-Francaviglia 1896; Kramer and Schnurrenberger 1963. LIBYA: "**Libysche Wüste**": ZMB 64824.



MAP 62. Distribution of *Naja haje* in Libya.

COMMENTS.— Wüster et al. (2008) have clarified and confirmed the position of the genus *Naja* within Elapidae. Trape et al. (2009) revised the *N. haje* complex. Wallach et al. (2009) placed the species in the subgenus *Uraeus* Wagler, 1830 which Wallach et al. (2014) regarded as a valid genus. Linnaeus (1758) noted only Hasselquist (1757) as an earlier source for *Coluber Haje* but as noted by Andersson (1899), he provided scale counts which differ from those in Hasselquist, suggesting that his concept was based on two different specimens. The second set of ventral and subcaudal counts are identical to those of a specimen from the Adolphi Friderici collection published in volume two of the Museum Adolphi Friderici (Linnaeus 1764). Although not published until after the Systema Naturae, this work had been completed a decade earlier and so Linnaeus used some of the material in 1758. Andersson (1899) noted that neither the specimen from the Museum Adolphi Friderici nor Hasselquist's specimen appear to be extant. [Note that Schleich (1987) listed specimens KNP 1981/272, 311, 354, and 509 as both *Coluber algirus* and *Naja haje*. We have assumed that the associated localities are correct for both species and that specimen numbers were inadvertently duplicated].

UCN Threat Status: Not assessed, but assumed to be Least Concern. However, regardless of the status of the species as a whole, this taxon is certainly threatened in portions of its North African range.

Family Viperidae

Cerastes cerastes (Linnaeus, 1758:217) (FIG. 34)

1758 *Coluber Cerastes* Linnaeus, Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio decima, reformata. Laurentii Salvii, Holmiæ [Stockholm], Sweden. (4) + 823 + (I) pp.

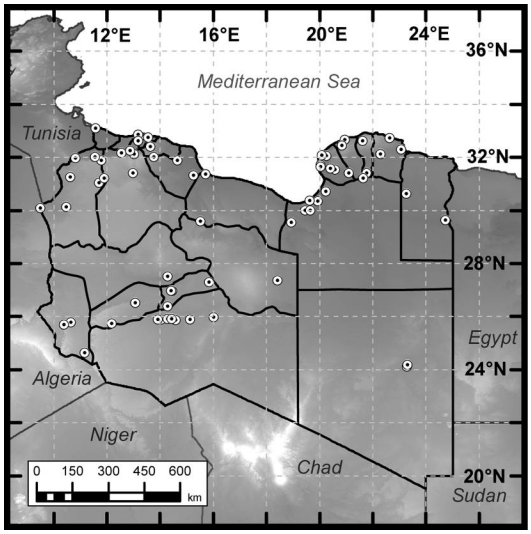
HOLOTYPE.— NRM Lin-98, "Oriente" [= Rashid, Nile Delta, Egypt] *fide* Hasselquist 1762:70-72, 315-322], restricted to "Egypt" by Flower (1933:830) and to "southern Judaea" by Schmidt (1939:88).

Cerastes cerastes, Kramer and Schnurrenberger 1963:539.
Cerastes cerastes, Le Berre 1989:294.
Cerastes cerastes, Schleich, Kästle, and Kabisch 1996:534.
Cerastes cerastes, Trape and Mané 2006:208.
Cerastes cerastes, Sindaco, Venchi, and Grieco 2013:192.

DISTRIBUTION.— Mauritania through southern Israel and south to Sudan, although absent from Morocco north of the Atlas Mountains and coastal Algeria (nominate form), also in south-

western Arabia (*C. c. hoofieni*). In Libya it occurs countrywide.

FIGURE 34. *Cerastes cerastes* from Ghodwa, Murzuq, Fezzan, Libya. Photo © Adel Ibrahim.



MAP 63. Distribution of *Cerstes cerastes* in Libya.

Libyan Records (Map 63): TRIPOLITANIA: NUQAT AL KHAMS: **1**: Frynta et al. 2000. JAFARA: **34**: Werner 1909; Ghigi 1913; Zavattari 1934. TRIPOLI: **39**: Kramer and Schnurrenberger 1959. **45**: MNHN 1893.614; NMP 35389. **48**: Sayers 1964. **51**: Schnurrenberger 1959. MURQUB **60**: ZMB 18090; Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1934. MISRATAH: **72**: SMF 89435–40. **78**: MCSN 2971. **88**: MCSN 2942. NALUT: **100**: Frynta et al. 2000. **105**: AIC no number provided; MNHN 2004.0078; Ibrahim and Ineich 2005. **108**: MCSN 2957; Kramer and Schnurrenberger 1963. **109**: BMNH 1960.1.6.9; Kramer and Schnurrenberger 1963. **115**: Brito et al. 2008. **121**: BMNH 1960.1.6.10, 1960.1.6.40; MZUF 39090; MZUF 39091; Kramer and Schnurrenberger 1963. **127**: Zavattari 1937. JABAL AL GHARBI: **131**: SK 1751; Kramer and Schnurrenberger 1963. **142**: BMNH 1960.1.6.8; Kramer and Schnurrenberger 1963. **154**: ZSM 10/1979. **158**: MCSN 2926. SIRTE: **166**: MCSN 2914; Kramer and Schnurrenberger 1963. **197**: MCSN 4197. "**Tripolitania settentrionale**": Zavattari 1937. "**Wadi Guerias**": BMNH 1901.10.28.10. FEZZAN: WADI AL SHATII: **210**: Essghaier et al. 2015. JUFRA: **229**: SK 3567; Kramer and Schnurrenberger 1963. GHAT: **233**: Kramer and Schnurrenberger 1959. **235**: Frynta et al. 2000. **264**: MSNM [no specific number given]; Kramer and Schnurrenberger 1963. WADI AL HAYAA: **265**: ZFMK.63668; Wagner and Wilms 2010. **271**: ZMB 37943. SABHA: **281**: ZCT 2005.46; Ibrahim 2008a. **284**: Kramer and Schnurrenberger 1963; Schnurrenberger 1963. **286**: Essghaier et al. 2015. **290**: SK 1311; Schnurrenberger 1962; Kramer and Schnurrenberger 1963. MURZUQ: **298**: Essghaier et al. 2015. **300**: ZCT 2005.03; Ibrahim 2008a. **302**: ZCT 2005.17, 2005.19; Ibrahim 2008a. **303**: Essghaier et al. 2015; Zavattari 1937; Scortecci 1939. **308**: ZCT 2005.18, 2005.33; Ibrahim 2008a. **313**: ZCT 2005.34–35, 2006.53; Ibrahim 2008a. **321**: MCSN 2964; Scortecci 1935b. "**Fezzan**": Scortecci 1939. "**Sahara tripolitain**" Angel and Lhote 1938. CYRENAICA: BENGHAZI: **351**: BMNH 1974.5300. **357**: BMNH 1945.11.9.1; Ghigi 1920; Umani 1922; Calabresi 1923; Zavattari 1929, 1930, 1934. **366**: NHMC 80.3.5.1. **367**: Calabresi 1923; Zavattari 1929, 1930, 1934. **377**: Kramer and Schnurrenberger 1959. **379**: SK 422, 456, 986; Kramer and Schnurrenberger 1958, 1963. **381**: Kramer and Schnurrenberger 1959. MARJ: **385**: Zavattari 1937. **389**: Zavattari 1922, 1929, 1930, 1934; Calabresi 1923. **409**: Kramer and Schnurrenberger 1959. JABAL AL AKHDAR: **455**: SMF 54174. **457**: Schleich 1987. DARNAH: **466**: USNM 146794; ZSM 8/1979. **475**: MCZ R 46849. **484**: Zavattari 1929, 1930, 1934. BUTNAN: **519**: SK 98, 149–151, 377; Schnurrenberger 1958a; Kramer and Schnurrenberger 1959, 1963; SMF 55436. AL WAHAT: **529**: NMP 34938. **536**: SK 324, 556; Kramer and Schnur-

renberger 1963. **540**: Schnurrenberger 1959. **549**: SK 336, 369, 421, 425–26; Kramer and Schnurrenberger 1963. **550**: SK 457; SMF 54733; Schnurrenberger 1958a; Kramer and Schnurrenberger 1963. **554**: Schnurrenberger 1958a. KUFRAH: **571**: Zavattari 1937. **575**: Peters 1880, 1881; Werner 1909; Ghigi 1913; Zavattari 1929, 1930, 1934. "**Cyrenaica**": SMF 54732; Werner 1909. LIBYA: RMNH RENA 13928.

COMMENTS.— Two subspecies of *C. cerastes* are currently recognized, *C. c. cerastes* from North Africa and into Sinai and southwestern Israel and *C. c. hoofienii* Werner and Sivan in Werner, Sivan, Kushnir and Motro, 1999 which is found in the southwestern Arabian Peninsula (Wagner and Wilms 2010). The original description cites Hasselquist (1750a, 1757) and Bellonius (1553).

Schnurrenberger (1963) and Kramer and Schnurrenberger (1963) noted that the localities provided for the two species of *Cerastes* by Schnurrenberger (1959) were reversed. Schleich (1987) noted a sight record of what was presumably this species near the northwest corner of watershed area in Kouf (El Kouf) National Park. Zavattari (1934) credited Brezzi (1930) with a Kufrah area record of this species, but we were unable to locate this in Brezzi's book.

UCN Threat Status: Not assessed, but assumed to be Least Concern.

Cerastes vipera (Linnaeus, 1758:216) (FIG. 35)

1758 *Coluber vipera* Linnaeus, Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio decima, reformata. Laurentii Salvii, Holmiæ [Stockholm], Sweden. (4) + 823 + (I) pp.

HOLOTYPE.— NRM Lin-99, "Aegypto" [= Egypt], [= Rashid, Nile Delta, Egypt *fide* Hasselquist 1762: 70-72, 315-322].

1842 *Cerastes Richiei* Gray, Monographic synopsis of the vipers, or the Family Viperidae, pp. 68–71 *in* The Zoological Miscellany, part 2. Treuttel, Wurtz and Co., London, United Kingdom.

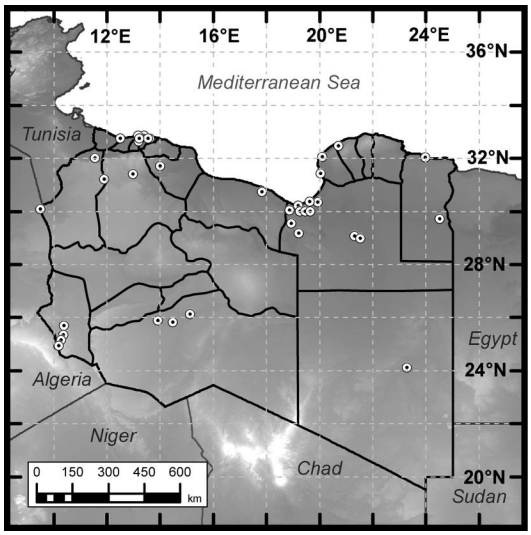
Syntypes: BMNH 1946.1.20.85, 1946.1.20.89, 1946.1.20.94 (formerly BMNH iii.3.2a–c), "Tripoli" [Libya].

Cerastes vipera, Kramer and Schnurrenberger 1963:541.
Cerastes vipera, Le Berre 1989:296.
Cerastes vipera, Trape and Mané 2006:210.
Cerastes vipera, Schleich, Kästle, and Kabisch 1996:537.
Cerastes vipera, Sindaco, Venchi, and Grieco 2013:193.

DISTRIBUTION.— Mauritania east to the Negev of Israel, including northern Mali and Niger, but absent from the Mediterranean of Morocco, Algeria and Tunisia. Widespread across Libya.

FIGURE 35. *Cerastes vipera* from Ma'fan, Murzuq, Fezzan, Libya. Photo © Adel Ibrahim.

Libyan Records (Map 64): TRIPOLITANIA: ZAWIYAH: **11**: MNHN 1979.3841. TRIPOLI: **39**: Schnurrenberger 1959. **44**: USNM 56237. **45**: BMNH 1946.1.20.85, 1946.1.20.89, 1946.1.20.94; NHMW 28696; ZFMK 32489; ZMB 15332–36, 15350; Gray 1842, 1849; Boulenger 1896; Condorelli-Francaviglia 1896; Werner 1909; Ghigi 1913; Zavattari 1934; Marx 1958b; Wagner and Wilms 2010. **47**: BMNH 1955.1.9.1; Kramer and Schnurrenberger 1963. **51**: Kramer and Schnurrenberger 1959. **52**: SK 195, 288–94, 538–41; Kramer and Schnurrenberger 1963. **53**: SMF 55446. MISRATAH: **73**: SMF 55753–54. NALUT: **105**: MNHN 2004.0086; Ibrahim and Ineich 2005. **127**: MCSN 2934.



MAP 64. Distribution of *Cerestes vipera* in Libya.

JABAL AL GHARBI: **131**: SK 1750, 2458; Kramer and Schnurrenberger 1963. **158**: MCSN 2927. SIRTE: **185**: MCSN 2929; Kramer and Schnurrenberger 1963. "**Tripolitania**": Scortecci 1939. "**Tripolitania settentrionale**" Zavattari 1937. FEZZAN: GHAT: **233**: Schnurrenberger 1959. **239**: Scortecci 1937a. **245**: Scortecci 1937a. **249**: Scortecci 1939. MURZUQ: **298**: MCSN 2946, 2958. **305**: ZCT 2005.36; Ibrahim 2008a. **316**: ZCT 2006.06; Ibrahim 2008a. "**Ghat-Murzuq-Mesak-Mellet-Uadi Tilemsin**": MCSN 2933. CYRENAICA: BENGHAZI: **358**: MZUF 989. **372**: Frynta et al. 2000; Kratochvíl et al. 2002. MARJ: **384**: CM 91617. BUTNAN: **491**: MZUF 992. **521**: MSNG 37503; Zavattari 1929, 1930, 1934, 1937. AL WAHAT: **536**: SK 323, 423–24, 287; Kramer and Schnurrenberger 1963. **540**: Schnurrenberger 1959. **544**: BMNH 1960.1.6.11–12; CM S7209; Kramer and Schnurrenberger 1963; BMNH 1985.1181. **547**: Kramer and Schnurrenberger 1958. **548**: SK 301–05; Kramer and Schnurrenberger 1963. **549**: SK 405–08, 630; Kramer and Schnurrenberger 1963. **550**: Schnurrenberger 1958a. **553**: MCSN 4198, Zavattari 1937. **554**: MCSN 2965; Scortecci 1935b; Kramer and Schnurrenberger 1963. **562**: MSNG 31581*; Vinciguerra 1931; Zavattari 1934. **564**: MSNG 31581*; Vinciguerra 1931; Zavattari 1934, 1937. KUFRAH: **575**: SMF 32710; ZMB 18091; Scortecci 1939. "**Cyrenaica**": MCSN 2959; MZUF 12153–54; Gestro and Vinciguerra 1931; Scortecci 1939. "**Soluch to Hatiet el Rtém**": Schnurrenberger 1959.

COMMENTS.— Wagner and Wilms (2010) commented on the conflicting reports of sympatry and syntopy in the literature regarding the spatial relationships between *C. cerastes* and *C. vipera.* Our records support that the two occur in sympatry, although *C. vipera* tends to occupy more xeric environments than *C. cerastes*, as was concluded by Wagner and Wilms (2010). Schnurrenberger (1963) and Kramer and Schnurrenberger (1963) noted that the localities provided for the two species of *Cerastes* by Schnurrenberger (1959) were reversed. Scortecci (1937a) listed several localities from near Ghat including Tafilellelt, Uadi Iseien near Tin Caraden, Uadi Inelegghi, and Uadi Iseien near Tin Alcun. Kramer and Schnuerrenberger (1963) treated the first two of these as being in Algerian territory, but considered the other two to be Libyan. However, all four of these localities are actually in the Tassili n'Ajjer of Algeria. Likewise, Scortecci's (1939) mention of a specimen from the Tassili certainly refers to an Algerian snake.

IUCN Threat Status: Least Concern.

Echis pyramidum (I. Geoffroy Saint-Hilaire, 1827:151, pl. 8, fig. 1) (FIG. 36)

1827 *Scythale pyramidum* Geoffroy Saint-Hilaire, Description des reptiles qui se trouvent en Égypte, pp. 121–160 *in* M.J.-C.L. de Savigny, (ed.), *Description de l'Égypte, ou Recueil des Observations et des Recherches qui ont été Faites en Égypte Pendant l'Expédition de l'Armée Française. Histoire Naturelle*. Tome premier. Partie premier. Imprimerie Impériale, Paris, France.

LECTOTYPE.— MNHN 4031, designated by Stemmler and Sochurek (1969:90), "Kaire, Egypte" [= Cairo, Egypt].

1972 *Echis carinatus leucogaster* Roman, Deux sous-especes de la vipere *Echis carinatus* (Schneider)

dans les territoires de Haute-Volta et du Niger: *Echis carinatus ocellatus* Stemmler — *Echis carinatus leucogaster* n. ssp. *Notes et Documents Voltaïques*, 5(4):1–11, 2 maps, 1 pl. [6, pl. figs. 3–8].

HOLOTYPE.— RN 191, "Boubon, à 20 km au Nord de Niamey" [Niger].

1990 *Echis pyramidum lucidus* Cherlin, Taxonomic revision of the snake genus *Echis* (Viperidae). II. An analysis of taxonomy and description of new forms [in Russian]. *Trudy Zoologicheskogo Instituta Akademii Nauk SSSR*, 207:193–223, pls. IV–VI. [206, pl. V, fig. 3].

HOLOTYPE.— USNM 134975, "Египет, Фаюм, Синнурис" [Egypt, Faiyum, Sinnuris].

Echis carinatus pyramidum, Kramer and Schnurrenberger 1963:544.

Echis leucogaster, Le Berre 1989:298.

Echis pyramidum, Le Berre 1989:300.

Echis pyramidum lucidus, Schleich, Kästle, and Kabisch 1996:542.

Echis arenicola leucogaster, Schleich, Kästle, and Kabisch 1996:540.

Echis pyramidum leucogaster, Sindaco, Venchi, and Grieco 2013:200.

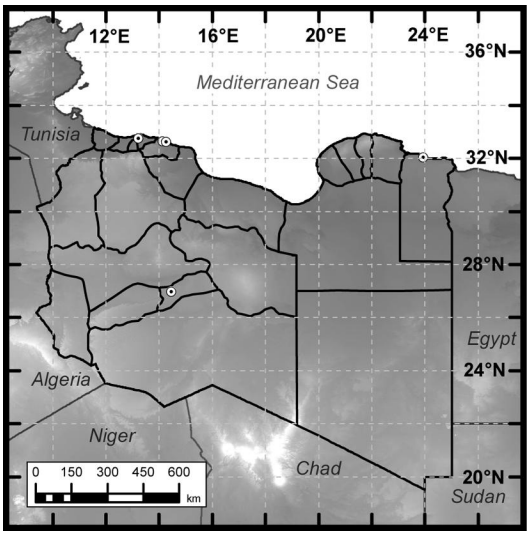
FIGURE 36. *Echis pyramidum* from between Al Khums and Tripoli, Tripolitania, Libya (32.6694, 14.1242), 2007. Photo courtesy of Natural History Museum of Crete © V. Paravas.

DISTRIBUTION.— From Senegal and Guinea-Bissau across North Africa to Egypt and south to Kenya and the Horn of Africa. In both Egypt and Libya there are scattered localities, none from Kufrah and the southeastern portion of the country, nor from the Egyptian border region.

Libyan Records (Map 65): TRIPOLITANIA: TRIPOLI: **45**: BMNH 1960.1.6.13; Kramer and Schnurrenberger 1963. MURQUB: **65**: NHMC 80.3.4.1. **68**: Boulenger 1914; Zavattari 1934; Scortecci 1939. **"Tripolitania settentrionale"**: Zavattari 1937. FEZZAN: SABHA: **286**: NMBA-REPT 18127. CYRENAICA: BUTNAN: **490**: Ribolla 1923; Zavattari 1934; Scortecci 1939. "**Cyrenaica**": Condorelli-Francaviglia 1896; Schleich et al. 1996; Sindaco et al. 2013; Werner 1909; Calabresi 1923. "**Marmarica**": Zavattari 1937.

COMMENTS.— The complicated dating of the natural history portions of *Description de*

l'Égypte has been elucidated by Sherborn (1897) and Tollitt (1986). Cherlin (1990) and Cherlin and Borkin (1990) recognized a large number of species and subspecies in the *E. pyramidum* complex, including *E. arenicola leucogaster* Roman, 1972 (type locality: Boubon, Niger) reaching its easternmost extent in west central Libya and *E. pyramidum lucidus* Cherlin, 1990 (type locality: Faiyum, Egypt), which they considered to be distributed across northern Libya and Egypt west of the Nile. Golay et al. (1993) synonymized *E. arenicola* with *E. pyramidum*. Despite obvious color differences (Hughes 1976), *Echis leucogaster* was found to be minimally genetically distinct from *E. pyramidum* (Arnold et al. 2009) and has not subsequently been recognized at the specific level by some authors (e.g., Sindaco et al. 2013), although it has by others (e.g. Wallach et al. 2014). Following Hughes (1976) and Sindaco et al. (2013), the nominotypical form is regarded as extending from Egypt southwards to Kenya, whereas *E. p. leucogaster* occupies the western portion of the species distribution. These authors did not explicitly indicate into which subspecies Libyan populations should be placed. Alternative interpretations have been reached by McDiarmid et al. (1999), David and Ineich (1999), Pook et al. (2009), and Wallach et al. (2014). Pending further study of the group we consider all Libyan populations as assignable to *E. pyramidum pyramidum*.



MAP 65. Distribution of *Eryx pyramidum* in Libya.

UCN Threat Status: Least Concern.

Daboia deserti (Anderson, 1892:20, pl. 1, figs. 6–7)

1892 *Vipera lebetina* var. *deserti* Anderson, On a small collection of mammals, reptiles, and batrachians from Barbary. Proceedings of the Zoological Society of London, 1892:3–24, pl.1.

HOLOTYPE.— BMNH 1946.1.18.28 (formerly BMNH 1891.5.4.150), "Duirat, Tunisia" [= Douirat, Ghomrassen Governate, Tunisia].

Vipera mauritanica deserti, Kramer and Schnurrenberger 1963:547.
Vipera lebetina, Le Berre 1989:302.
Macrovipera deserti, Schleich, Kästle, and Kabisch 1996:546.
Daboia mauritanica deserti, Sindaco, Venchi, and Grieco 2013:194.

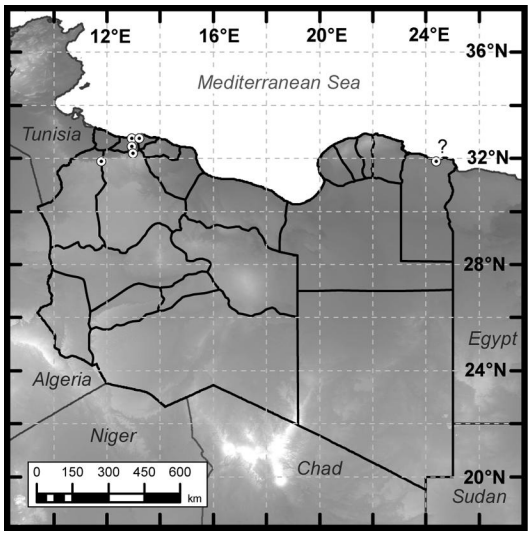
DISTRIBUTION.— Western Sahara eastwards into Libya. In Libya they are found in western Tripolitania with two questionable records from Cyrenaica (see Comments).

Libyan Records (Map 66): TRIPOLITANIA: ZAWIYAH: **20**: Joger and Bshaenia 2010; Bshaena and Joger 2013. JAFARA: **31**: Joger and Bshaenia 2010; Bshaena and Joger 2013. TRIPOLI: **45**: Werner 1909; Ghigi 1913; Zavattari 1930, 1934; Schwarz 1936; Scortecci 1939. NALUT: **108**: NHMW 25235; GNM-2005-3117; Schleich et al. 1996. JABAL AL GHARBI: **148**: SK 421; Kramer 1959; Kramer and Schnurrenberger 1959, 1963. "**Tripolitania settentrionale**": Zavattari 1937. CYRENAICA: BUTNAN: **499**: Sochurek 1979. "**Cyrenaica**": Ribolla 1923; Zavattari 1930, 1934.

COMMENTS.— Kramer and Schnurrenberger (1959) provided morphological evidence for the recognition of *deserti* as a distinct form from *Vipera* (now *Daboia*) *mauritanica* (Duméril and

Bibron in Guichenot, 1848). Schleich et al. (1996) considered the two forms only weakly differentiated as did Joger (in McDiarmid et al. 1999), and Sindaco et al. (2013) and Geniez (2015) treated *deserti* as a subspecies. Sindaco et al. (2013) traced the single Cyrenaican record plotted by Schleich et al. (1996) and earlier authors to a paper by Ribolla (1923 [incorrectly cited as 1930 by Schwarz 1936]), which was considered unreliable by Zavattari (1930). Kramer and Schnurrenberg (1959) also considered this record to be erroneous and regarded Tripoli as the easternmost edge of the species' distribution. However, there is a Cyrenaican photographic record referred to by Sochurek (1979). On this basis we consider eastern Libyan records as at least potentially valid.

UCN Threat Status: Near Threatened.



MAP 66. Distribution of *Daboia deserti* in Libya. The plotted Cyrenaican record is supposedly supported by a photographic voucher (Sochurek 1979) but appears biogeographically unlikely.

Unconfirmed or Erroneous Taxon Records from Libya

A number of species have been erroneously reported from the territory of Libya. In some cases such records reflect changing taxonomy and these are noted in Comments under the relevant species accounts. Other records reflecting misidentifications, incorrect localities, and unsubstantiated claims of Libyan occurrence are listed below, along with taxa likely to occur in Libya, but not yet verified for the country. Full bibliographic records for the taxon authorities for these species are provided in the literature cited section of this paper.

Testudinidae

***Testudo hermanni* Gmelin, 1789:1041**

Reported by Luiselli et al. (2012) from Libya, but without specific data. Although introduced individuals may exist, there are no documented records of this species outside of southern Europe and its associated islands (Sindaco and Jeremčenko 2008).

***Testudo marginata* Schoepff, 1793:58, pl. XI, pl. XII, fig. 1. [German edition]/Schoepff, 1793:52, pl. XI, pl. XII, fig. 1.**

Reported by Luiselli et al. (2012) from Libya, but without specific data. Peters (1880, 1881) reported *T. campanulata* [= *T. marginata*] from Bir-Milrha. However, Schneider and Schneider (2008) argued that the likely species intended was *T. kleinmanni*, based on the similarity of plastron pattern between adult *T. kleinmanni* and juvenile *T. marginata.*

***Testudo flavominimaralis* Highfield and Martin, 1990 "1989":[9]**

The nominal taxon *T. flavominimaralis* was described from "North Africa. Precise range and biotype not known. Believed to include Libya." According to van der Kuyl et al. (2002) this name belongs in the synonymy of *Testudo graeca ibera* Pallas, 1814, a subspecies distributed from the

Balkans east to Iran. The date of description of this form is uncertain. We have interpreted it as 1990, although the publication bears a 1989 date.

Gekkonidae

***Tropiocolotes nattereri* Steindachner, 1901:326**

Schleich et al. (1996) included a single record of this species from Libya from "Graret Seccar at the Oued es Sceberma, east of Fezzan, 16°E, 25°30′N" as their only North African site for this species, which is otherwise distributed from Sinai through southern Jordan and Israel and the Palestinian Authority (West Bank) and into Saudi Arabia (Baha El Din 2006a; Sindaco and Jeremčenko 2008). This was based on Schnurrenberger's (1962) earlier record (actually from N'el Mehershema) and certainly refers to *T. steudneri*.

Phyllodactylidae

***Tarentola ephippiata hoggarensis* Werner, 1937:33**

Le Berre (1989) plotted this taxon in southwestern Libya, although Libya is not mentioned in his list of distributions by country. According to Sindaco and Jeremčenko (2008), this species has been recorded from the Ahaggar in Algeria, Aïr Mountains in Niger, Adjar des Ifhoras in Mali, and Tibesti in Chad, among other parts of North Africa. Although it might be expected to occur in the Akakus Mountains near Ghat or in the Tibesti region on southeastern Murzuq, there are no verified records from the territory of Libya (Joger 1984).

Lacertidae

***Acanthodactylus erythrurus* (Schinz, 1833:102, pl. 38, bottom figure)**

A single specimen, MCSN 2116, from Tripoli, is the basis for the Libyan occurrence of this taxon, which is otherwise known from the Iberian Peninsula and western North Africa, as far east as western Tunisia (Salvador 1982; Sindaco and Jeremčenko 2008). The specimen could not be located during visits to the Milan collection, so the possibility of a range extension into Libya exists, but we believe that the identification is in error and that the specimen represents some other congener.

***Acanthodactylus savignyi* (Audouin, 1827:172, Suppl. pl. 1, fig. 8)**

This species is supposedly represented by two specimens, MNHN 0.2760 from Tripoli, and SMNS 788 (Tripolitania). Western Libya is well outside of documented range of this species, in coastal Algeria (Salvador 1982; Sindaco and Jeremčenko 2008). These specimens need to be reexamined, as they certainly represent some other species of *Acanthodactylus*, most likely *A. pardalis*.

***Mesalina pasteuri* (Bons, 1960:69)**

Baha El Din (1995, 2006a) reported *Mesalina pasteuri* from Egypt for the first time from the Siwa Oasis in the Western Desert and also assigned several older specimens previously attributed to *M. guttulata* to this form (e.g., Marx 1968; Farid 1979; FMNH 66078, BMNH 1938.8.4.38). Despite the huge disjunction in the range of *M. pasteuri* (types from the Ahaggar, Algeria and no intervening records, Sindaco and Jermcenko (2008) accepted these records. There are no confirmed Libyan records, but the nearest Western Desert localities are only 5 km from the border (Baha El Din 2006a), making it almost a certainty that this species, whether *M. pasteuri sensu stricto* or something else, occurs in inland Cyrenaica.

***Podarcis muralis* (Laurenti, 1768:61)**

This species was first listed for the Libyan fauna by von Martens (1883), based on an identification made by Reichenow. The record was repeated by Ghigi (1913). Calabresi (1923) also mentioned this species from Benghazi, but did not believe the record to be "sufficiently validated." It is widely distributed across southern and parts of central Europe and into Anatolia. The only *Podarcis* with a natural distributional range approaching Libya is *P. vaucheri* (Boulenger, 1905), which ranges from Morocco to northern Tunisia. There is also a record of *Podarcis sicula* from Tripoli (BMNH 1965.1132). We assume that all records of *Podarcis* from Libya represent introduced individuals. As only a few scattered records exist, there is no evidence that these wall lizards have established viable populations in the country.

***Psammodromus algirus* (Linnaeus, 1766:203)**

This species was depicted on a map by Le Berre (1989) as just entering far northwestern Tripolitania but no specific localities or specimens were mentioned. It reaches as far east as Tunisia north of the Gulf of Gabes, and Lampedusa Island (Italy).

Scincidae

***Chalcides delislei* (Lataste and Tremeau de Rochbrune *in* Lataste, 1876:238, pl. 10, figs. 1–13).**

Schleich et al. (1996) suggested on their map (p. 367) that this species might occur in southern Libya, although a question mark indicated a lack of data for the region, and these authors suggested that central Saharan records needed to be verified. Sindaco and Jeremčenko (2008) indicated no records nearer to the Libyan border than 900 km away in west central Niger.

***Scincus albifasciatus albifasciatus* Boulenger, 1890:85, pl. 11, fig. 5**

Specimens of *Scincus* from Kufrah have been assigned to *S. albofasciatus* (type locality "Dakar, Senegambia" [Senegal]).by Arnold and Leviton (1977), and although Sindaco and Jeremčenko (2008) mapped records from Kufrah as *S. scincus* (presumably the nominate subspecies) they cited Kufrah as being within the range of *S. a. albifasciatus.* Trape et al. (2012) assigned Kufrah *Scincus* records to *S. s. scincus* and plotted no *S. albifasciatus* records east of eastern Niger. However, they did plot records in extreme southeastern Algeria, adjacent to the Libyan border near Ghat. Given the more than 2000 km separating Kufrah from the nearest confirmed *S. albofasciatus* localities, we suggest that southeast Libyan specimens are likely convergent with this species. However, if the interpretation of Trape et al. (2012) is correct, it is likely that *S. a. albifasciatus* does enter Libya in the southwest. Unfortunately, the only molecular study to date did not include specimens from Libya, so confirmation of this hypothesis awaits further study. As the taxonomy of *Scincus scincus* in Libya remains unsettled we have not differentially plotted locality records by subspecies.

***Trachylepis quinquetaeniata* (Lichtenstein, 1823:103).**

Mapped by LeBerre (1989) as *Mabuia* [*sic*] *quinquetaeniata* for "Cyrénaïque". This was on the basis of Condorelli-Francaviglia's (1896) record of *Euprepes savignii*, a synonym of *T. quinquetaeniata*. The collection reported on in that publication was that of Prof. Panceri, which was made in Egypt as well as Libya, so it is likely that the specimen came from Egypt, where this species does occur. Ghigi (1913) repeated the Libyan record, but Werner (1909) questioned its validity. The species is chiefly distributed in sub-Saharan Africa and reaches North Africa only

along the course of the Nile (Broadley and Bauer 1998). There is a single record from the Tassilin-Ennedi, Chad (Sindaco and Jeremčenko 2008). We examined several additional museum specimens of *Heremites vittatus* that had also been incorrectly identified as *T. quinquetaeniata*.

Leptotyphlopidae

***Myriopholis cairi* (Duméril and Bibron, 1844:323)**

Reported questionably form eastern Libya, without specific locality by Sochurek (1979). Although it is conceivable that *L. cairi* occurs in Libya, most records are no closer than the Nile Valley of Egypt or central Niger (Sindaco et al. 2013). However, Broadley et al. (2014) reported it from the Siwa Oasis of Egypt (BMNH 1938.8.4.50–51), only about 50 km from the Libyan border, although other authors have assigned snakes from this region to *M. macrorhyncha* (e.g., Geniez 2015).

***Myriopholis macrorhyncha* (Jan, 1860:pl. V, fig. 12)**

Leptotyphlopid records from Ghat, Fezzan (Scortecci 1934b, 1937, 1939; Kramer and Snurrenberger 1963) were formerly attributed to this species, although Broadley et al. (2014) recently described these specimens as a new, endemic form, *M. lanzai*. *Myriopholis macrorhyncha* has been reported from scattered records in northeastern Africa from the Nile Delta and southern Sinai south to northern Tanzania and in Asia from Israel and southeastern Turkey east to Iran, Pakistan, and doubtfully in Rajasthan, India (Sindaco et al. 2013). Although other West African records are sometimes attributed to this species (e.g., Werner 2016), records from Senegal are doubtful and those from other countries in northwestern Africa have chiefly been assigned to *M. algeriensis* (Trape 2002). Specimens form the Siwa Oasis in the Western Desert of Egypt (Baha El Din 2006a) have been referred to *M. macrorhyncha* (Geniez 2015), but Broadley et al. (2014) considered these to be *M. cairi*.

Pythonidae

***Python sebae* (Gmelin, 1789:1118)**

Angel and Lhote (1938) cited an earlier mention by Largeau (1881) of a "énorme python" (presumably *P. sebae*, the only large python occurring in North Africa) he had seen in January 1875, 12 km east of Rhadamès (Ghadames) in the "Ouest du Sahara tripolitain." There are, however, no vouchered records from Libya and the nearest confirmed modern occurrences of pythons are south of the Sahara. However, there are historical records of what have been interpreted by some as large *Python* in North Africa, most noteworthy being that of a giant snake at the River Bagradas (the modern Medjerda River in Tunisia) reported in 256 B.C. (Stothers 2004). If Largeau actually witnessed a python in 1875 if would certainly be the only modern record from north of the Sahara. As there are no other candidate species that might be interpreted as "enormous," the only other option is that he was mistaken as to the site of his own observation.

Colubridae

***Spalerosophis dolichospilus* (Werner, 1923:166)**

Sochurek (1979) reported this species (as *S. dolichospila*), without specific locality, from northwest Tripolitania. Confirmed localities extend from southern Morocco to northern Tunisia. The occurrence of *S. dolichospilus* in Tripolitania is possible but unconfirmed.

***Platyceps florulentus* (Geoffroy Saint-Hilaire, 1827:151, pl. 8, figs. 2, 2')**

Le Berre (1989) indicated a more or less continuous distribution of this species across coastal Libya, but was, in fact, referring to the species today known as *Hemorrhois algirus*. At least some other references to *P. florulentus* from Cyrenaica may refer to *P. rogersi* (Anderson, 1893), which itself has a complex taxonomic history that is intertwined with several other species, including *P. florulentus* (see *P. rogersi* species account). No *Platyceps* species are known to occur in Tripolitania. *Platyceps florulentus* is primarily East African in distribution and extends northwards to the Nile Delta region (Schätti, 1988), with a disjunct subspecies, *P. f. perreti* Schätti, 1988 from Nigeria and Cameroon (Sindaco et al. 2013).

Lamprophiidae

***Psammophis sibilans sibilans* (Linnaeus, 1758:222)**

This species was listed questionably from eastern Libya by Sochurek (1979), without specific locality. It was likewise indicated to occur in Libya by Le Berre (1989) and Schleich et al. (1996). These records are likely attributable to *P. schokari* (Sindaco et al. 2013). The name *P. sibilans* has been applied in a variety of different ways to a number of completely different lineages of African whip snakes (e.g., Brandstätter 1995, 1996; Kelly et al. 2008), chiefly in sub-Saharan Africa. In North Africa, *P. sibilans*, as currently construed, is limited to the Nile Valley of Egypt (Baha El Din 2006a; Sindaco et al. 2013).

Elapidae

***Naja nubiae* Wüster and Broadley, 2003:348, figs. 1, 4**

Naja nubiae occurs along the Nile Valley of Egypt and Sudan, but is also known from the Tassili-n-Ennedi region of Chad. This distribution suggests that it might occur in southeastern Libya, particularly in areas with localized mesic habitats, as perhaps near Al Uwaynat.

***Walterinnesia aegyptia* Lataste, 1887:411**

This species was incorrectly reported from Cyrenaica by Ribolla (1923) and the record was repeated by Grixoni (1926) and Franchini and Giordano (1929). Zavattari (1930) considered Ribolla's work as a whole to be unreliable and Scortecci (1939) noted that Ribolla's record needed confirmation. There are no confirmed records of *Walterinnesia* west of the Nile Valley (Baha El Din 2006a).

Discussion

Ghigi (1913) listed the number of terrestrial reptile species then known from Libya as 38 and Zavattari (1937) noted 56 species and subspecies. Eight of the taxa listed by the latter author have since been synonymized or determined to have been erroneously recorded for Libya and today the total number of reptiles stands at 66 (including three marine turtles), three of which are represented in the country by two named subspecies, and one of which is recognized as a complex of numerous, yet to be described, taxa. Many recent changes in the faunal list of the country have been the result of the taxonomic revision of groups long known to be represented in the fauna. For example, *Pseudotrapelus chlodnickii*, described in 2015 (Melnikov et al. 2015) had long been recorded from Libya as *P. sinaitus*, and the leptotyphlopid *Myriopholis lanzai* Broadley et al., 2014 had previously been treated as *Leptotyphlops macrorhynchus*. Similar examples include *Agama tassiliensis* (formerly *A. impalearis*) and *Ptyodactylus togoensis* (formerly *P. ragazzii* and before that *P. hasselquistii*). Other additions represent range extensions into Libya from adjacent regions, such as *Tarentola mindiae*, which enters Libya from the Western Desert of Egypt, and *Scincopus fasciatus*, which, though widely distributed in North Africa, was not recorded in Libya until 1995 (Sindaco 1995). Newly described taxa include *Uromastyx alfredschmidti*, with its type from the Tassili n'Ajjer of Algeria, but also noted from the Libyan Tadrart Akakus in its description (Wilms and Böhme 2001), and *Tarentola neglecta lanzai*, thus far the only strictly Libyan endemic reptile (Bshaena and Joger 2013), although several other putative new species in Libya have been signaled in the *Tarentola fascicularis* group (including *T. deserti sensu lato*) (Bshaena 2011). Another recent addition to the fauna has been *Indotyphlops braminus* (Joger et al. 2008), the only known established invasive species (although several extralimital taxa are known from one or more encounters (see **Unconfirmed or Erroneous Taxon Records from Libya, pp. 265–269**).

Naturally, the reptile fauna of Libya shares similarities with that of all of its neighbors (Table 2). However, Sudan, Chad and Niger have large areas that lie in the Sahel, which supports a richer and fundamentally different fauna of sub-Saharan taxa with mostly southern affinities (Trape et al. 2012). Although all three countries have a more diverse fauna than Libya, that of Chad is particularly poorly documented. Only about a third or les of the Libyan fauna occurs in any of these countries. Similarities between Egypt and Cyrenaica are strong and a number of taxa, such as *Tarentola mindiae*, *Acanthodactylus pardalis*, and *Platyceps rogersi*, show this connection well. In total, Egypt harbors 43 of the 65 terrestrial reptile taxa known from Libya. However, Egypt has a much more species rich reptile fauna (at least 110 species, Baha El Din 2006 and subsequent taxonomic revisions) as the Nile Valley provides a corridor that allows penetration of Sub-Saharan taxa, like *Trachylepis quinquetaenita*, and the Sinai acts as a bridge to the Middle East, allowing numerous species to extend at least as far as the Nile. Tunisia and Algeria share the largest number of taxa with Libya, with 71% and 77% of the Libyan fauna. Indeed, the vast majority of species in Tripolitania, the richest region of Libya, also occur in Tunisia and/or Algeria. Further, species limited to the Ghat area of Fezzan are mostly also found in the Tassili n'Ajjer of southeastern Algeria (e.g., *Uromastyx alfredschmidti*, *Ptyodactylus togoensis*).

Although sampling is highly inconsistent across Libya and actual distributions may, in some cases, be masked by over generalization of older records or their incorrect attribution to "Tripoli" or "Benghazi, the Libyan reptile fauna nonetheless clearly exhibits several major biogeographic patterns. Tripolitania has the richest reptile fauna, with 48 native non-marine species, whereas Cyrenaica, at more than three times the area, has only 45, and Fezzan has only 39. There is a clear distinction between Mediterranean and Saharan forms. *Ophisops occidentalis*, *Stenodactylus mauritanicus* and *Eryx jaculus* are all limited to near coastal localities, whereas *Agama tassiliensis*,

Pseudotrapelus chlodnickii, and *Psammophis aegyptius* are chiefly restricted to desert areas. At least some of the Mediterranean forms also occur in the more xeric inland, but often in association with mesic pockets such as oases (e.g., *Mauremys leprosa saharica*, *Chamaeleo chamaeleon*, *Acanthodactylus dumerilii, Chalcides sepsoides*, *Lytorhynchus diadema*). Some such distributions may reflect ancient patterns of distribution achieved via mesic corridors along paleodrainage systems, although some may reflect intentional or accidental introductions via the movement of goods. Other taxa appear to be present both in Mediterranean climate zones and in the Sahara proper, even away from oases. These include *Mesalina guttulata*, *Psammophis schokari*, and both species of *Cerastes* among many others. Such species may be highly tolerant of diverse conditions, may seek out common microhabitats across broad habitat zones, or may be selecting a common substrate rather than a common climate. Or, alternatively, at least some widespread taxa may in reality be complexes of several more stenoecious cryptic species masquerading under a single name.

In the Mediterranean area there is also a distinct East-West pattern of distribution. Four species are largely restricted to the area east of the Gulf of Sirte, whereas ten species occur only to the west. Twelve species occur on both sides of the Gulf, but *Testudo graeca* is represented by a different subspecies on either side and some other species, like *Eumeces schneiderii* and *Heremites vittatus* appear to be absent from Sirte but occur both east and west of it. This pattern is explained by the fact that the desert extends to the sea in the Gulf of Sirte, excluding primarily Mediterranean taxa with more mesic habitat requirements. This disjunction is especially stark in Cyrenaica, as the poverty of the Gulf of Sirte contrasts so strongly with the high reptile diversity associated with the Jabal al Akhdar (Hegazy et al. 2011), which also supports approximately 50% of the endemic floral species (Boulos, 1972, 1997; Qaiser and El-Gadi 1984), a wide range of mammals (Masseti, 2010), and high avian diversity (Isenmann et al. 2016).

A few species have enigmatic distributions. *Philochortus zolii* is known from two Libyan localities at opposite corners of the country, and is otherwise represented by only a few scattered localities across North Africa. *Psammophis tanganicus* is represented by two Libyan localities, one in Ghat and the other in Wadi al Shatii, whereas the main body of its distribution is form the Horn of Africa to Tanzania. Other taxa with puzzling patterns include several apparently more xeric adapted forms with one or more localities on the coast, particularly at or near Tripoli. For example, *Trapelus mutabilis popekki*'s two localities are in Fezzan and at Tripoli and *Scincus scincus* is widespread in the desert, but also has been recorded from Tripoli. Likewise, there are records of *Uromastyx acanthinura* from Benghazi (although we have rejected these; see species account). In some cases, e.g., *Tarentola neglecta* and *Trapelus mutabilis*, suspect distributions may be the result of either incorrect locality data or inadequate sampling, or both.

In considering the distribution patterns of Libyan reptiles artifact must be taken into account. The areas around the major Mediterranean population centers have by far the greatest number of collecting localities (Figs. 2, 3, 5). In Cyrenaica, this is further supplemented by the huge number of localities in El-Kouf National Park in Marj and Jabal Akhdar (Fig. 6), which is one of the only parts of the country to have been the focus of extended surveys (Resetar 1981; Schleich 1987). In Fezzan collections have been made along the major roads to Sabha, Murzuq and Ghat (Fig. 4) as well as at or near most of the other major oases, such as Jufra. The most poorly collected area of the country is the Kufrah district (Figs. 5, 6), which occupies nearly a quarter of the total area of Libya. In this vast region only the Oasis of Kufrah (Al Jawf and surrounding areas) and the isolated Jabal Al Uwaynat on the Sudanese border have multiple collecting sites. Although the Libyan road system appears quite extensive (Fig.2), it must be remembered that very few of these roads are tarred and most are mere tracks in the sand, as can be visualized on Google Earth. Some areas, particularly along the southern and eastern borders of the country have absolutely no reptile records

TABLE 2. Distribution of the reptile species and subspecies recorded in Libya. The first three columns show occurrence in the three regions of Libya: Tripolitania (TRP), Fezzan (FEZ), and Cyrenaica (CYR); the remaining columns shows their distribution in the six countries sharing borders with Libya: Egypt (EGY), Sudan (SUD), Chad (CHA), Niger (NIG), Algeria (ALG), and Tunisia (TUN). Data for Libya from the present study, that for other North African countries from Sindaco and Jeremčenko (2008), Trape et al. (2012), and Sindaco et al. (2013) with updates from the relevant taxonomic literature. I = introduced, M = marine species, N/A = not applicable, X = species occurrence confirmed, ?: species questionably or possibly present (see corresponding species account). Note that Chad, in particular, remains very poorly sampled, thus absence of confirmation does not necessarily imply a lack of actual occurrence.

	LIBYA			Neighboring Countries					
Taxon	TRP	FEZ	CYR	EGY	SUD	CHA	NIG	ALG	TUN
CHELONIA									
CHELONIIDAE									
Caretta caretta	M	N/A	M	M		N/A	N/A	M	M
Chelonia mydas		N/A	M	M	M	N/A	N/A	M	M
DERMOCHELYIDAE									
Dermochelys coriacea	M	N/A	M	M		N/A	N/A	M	M
GEOMYDIDAE									
Mauremys leprosa saharica	X							X	X
TESTUDINIDAE									
Testudo graeca nabeulensis	X								X
Testudo graeca cyrenaica ENDEMIC			X						
Testudo kleinmanni	X		X	X					
SQUAMATA									
AGAMIDAE									
Agama tassiliensis		X				X	X	X	
Pseudotrapelus chlodnickii			X	X	X	?			
Trapelus mutabilis mutabilis	X	X	X	X	X			X	X
Trapelus mutabilis poppeki ENDEMIC	X	X							
UROMASTYCIDAE									
Uromastyx acanthinura	X	X	X					X	X
Uromastyx alfredschmidti		X						X	
Chamaeleonidae									
Chamaeleo chamaeleon	X	X	X	X				X	X
GEKKONIDAE									
Hemidactylus turcicus	X		X	X	X			X	X
Stenodactylus mauritanicus	X		X	X				X	X
Stenodactylus petrii	X	X	X	X	X		X	X	X
Stenodactylus stenurus	X							X	X
Stenodactylus sthenodactylus	X	X	X	X	X	X	X	X	X
Tropiocolotes steudneri		X	X	X	X			X	
Tropiocolotes tripolitanus	X	X	X	X				X	X
PHYLLODACTYLIDAE									
Ptyodactylus togoensis		X				X	X	X	
Tarentola annularis		X	X	X	X	X	X		
Tarentola deserti	X							X	X
Tarentola fascicularis Complex	X	X	X	X				X	X
Tarentola mindiae			X	X					
Tarentola neglecta neglecta	X	X						X	X
Tarentola neglecta lanzai ENDEMIC		X							
LACERTIDAE									
Acanthodactylus boskianus asper	X	X	X	X	X	X	X	X	X
Acanthodactylus dumerilii	X	X						X	X
Acanthodactylus longipes	X	X	?	X		X	X	X	X
Acanthodactylus maculatus	X							X	X
Acanthodactylus pardalis			X	X					
Acanthodactylus scutellatus audouini	X	X	X	X	X	X	X	X	X
Mesalina guttulata	X	X	X	X	X		X	X	X

TABLE 2 (continued). Distribution of the reptile species and subspecies recorded in Libya. The first three columns show occurrence in the three regions of Libya: Tripolitania (TRP), Fezzan (FEZ), and Cyrenaica (CYR); the remaining columns shows their distribution in the six countries sharing borders with Libya: Egypt (EGY), Sudan (SUD), Chad (CHA), Niger (NIG), Algeria (ALG), and Tunisia (TUN). Data for Libya from the present study, that for other North African countries from Sindaco and Jeremčenko (2008), Trape et al. (2012), and Sindaco et al. (2013) with updates from the relevant taxonomic literature. I = introduced, M = marine species, N/A = not applicable, X = species occurrence confirmed, ?: species questionably or possibly present (see corresponding species account). Note that Chad, in particular, remains very poorly sampled, thus absence of confirmation does not necessarily imply a lack of actual occurrence.

	LIBYA			Neighboring Countries					
Taxon	TRP	FEZ	CYR	EGY	SUD	CHA	NIG	ALG	TUN
Mesalina olivieri	X		X	X				X	X
Mesalina rubropunctata	X	X	X	X	X		X	X	X
Ophisops occidentalis	X		X	X				X	X
Philochortis zolii		X	X	X					
SCINCIDAE									
Chalcides boulengeri	X	X						X	X
Chalcides chalcides vittatus	X								X
Chalcides ocellatus	X	X	X	X	X		X	X	X
Chalcides sepsoides		X	X	X					
Eumeces schneideri	X		X	X				X	X
Heremites vittatus	X		X	X				X	X
Scincopus fasciatus	X		X		X	X	X	X	X
Scincus scincus	X	X	X	X	X		X	X	X
VARANIDAE									
Varanus griseus	X	X	X	X	X	X	X	X	X
LEPTOTYPHLOPIDAE									
Myriopholis lanzai ENDEMIC		X							
TYPHLOPIDAE									
Indotyphlops braminus	I			I					
BOIDE									
Eryx jaculus	X		X	X				X	X
COLUBRIDAE									
Hemorrhois algirus	X	X	X	X				X	X
Lytorhynchus diadema	X	X	X	X	X		X	X	X
Macroprotodon cucullatus	X		X	X				X	X
Natrix maura	X							X	X
Platyceps rogersi			X	X					
Platyceps saharicus			X	X	?	X		X	
Spalerosophis diadema cliffordii	X	X	X	X	X		X	X	X
Telescopus tripolitanus	X				X	X	X	X	X
LAMPROPHIIDAE									
Malpolon insignitus	X	X	X	X				X	X
Psammophis aegyptius	?	X	X	X		X	X	X	
Psammophis schokari	X	X	X	X	X		X	X	X
Psammophis tanganicus		X							
Rhagerhis moilensis	X	X	X	X	X		X	X	X
ELAPIDAE									
Naja haje	X		X	X	X	X	X	X	X
VIPERIDAE									
Cerastes cerastes	X	X	X	X	X	X	X	X	X
Cerastes vipera	X	X	X	X			X	X	X
Echis pyramidum	X	X	X	X	X	X	X	X	X
Daboia deserti	X		?					X	X
Total confirmed taxa/native terrestrial	51/48	39/39	48/45						
Confirmed native terrestrial reptile taxa shared with Libya				43	23	15	24	50	46

and there is a contiguous record-free area in eastern Kufrah and adjacent districts that is the size of Germany (approximately 350,000 km^2). Although collections in these vast unsampled areas would be desirable, the highest priorities for future intensive sampling are the less well sampled oases, which are under tremendous pressure from human encroachment (White et al. 2004) and the areas of higher elevation, such as the Libyan Tibesti, which has not been herpetologically sampled since the 1930s, and the Tadrart Akakus, which, by virtue of its proximity to the Tassili n'Ajjer, may share with it additional taxa that have yet to be collected in Libya.

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Appendix

Gazetteer of Libyan Reptile Localities

Localities associated with specimen and literature records of reptiles in Libya arranged by *shibayah* (district) within the three regions of the country: Tripolitania, Fezzan, and Cyrenaica. Locality numbers correspond to those plotted on the index maps provided (Figs. 3–6). Additions to the gazetteer after the establishment of the numbering system have been intercalated and indicated with a suffix "a." Some entries were also deleted at a late stage and in these cases an asterisk preceding the following locality signals that there is a gap in the numerical sequence. See Materials and Methods for information about georeferencing of localities, duplicate localities and sources of error. A large series of localities numbered 457 (the locality number for unspecified localities within El-Kouf National Park) and followed by a suffix (e.g., a–z, then aa–az, etc.) are listed in an indented position after the main entries for the *shibayat* of Marj and Jabal Akhdar. These are localities from within El-Kouf National Park (Figs. 3, 3a) based on Schleich (1987), who plotted collection sites on his maps but did not provide coordinates or link individual specimens, when listed, to particular localities. In order to capture these spatial data, we overlaid his maps of El-Kouf on a map of northern Cyrenaica and georeferenced each point, assigning it a letter designation. Locality names include a preferred romanization followed, in square brackets, by alternative versions or older names, particularly those used in the herpetological literature or found in museum records associated with Libyan specimens.

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
TRIPOLITANIA			
NUQAT AL KHAMS			
1	33.12522	11.57059	Ra's Ajdir, 3 km W [Ras Jdayr]
2	33.07000	11.74000	Pisida
3	33.10083	11.76190	Farwa
4	32.95000	11.86000	Bir Zaltan (Marada Formation)
5	32.93133	12.08853	Zuwarah [Zuara, Suara]
5a	32.85000	12.05000	Sha'abeyyat Al-Jomayyel
6	32.92674	12.08779	Zuwarah, near, close to Tunisian border
7	32.89687	12.15360	Jadi Resort (7 km E of Zuwarah)
8	32.75611	12.37611	Agelat
9	32.70005	11.52959	Al Jifarah [Gefara]
10	32.56879	11.98414	Itwellia
ZAWIYAH			
11	32.78865	12.48935	Sabratah [Sabratha, Sabrata, Safata, Sahata]
12	32.75000	12.72000	Zawiyah [Zauia, Sawia, Zavia, Zawiya]
*14	32.48750	12.72567	Zawiyah (20 mi S)
15	32.30000	12.60000	Bir Gnehm
16	32.68000	12.87000	az-Zahrā [Ain Zara, Ain Zarag]
17	32.71667	12.88333	Maamura [Maromura]
18	32.74440	12.94250	Qabilat as Sahla [El Sahla, Ain Zalah]
19	32.76667	12.91667	Hascian
20	32.78106	12.92723	az-Zawiyah
21	32.77694	12.94111	between Tripoli and Zawiyah
22	32.78455	13.00088	Oasis of Tripoli
23	32.77789	13.00163	Janzour [Zansur, Zanzur]
24	32.77034	13.02408	Janzour (5 km S) [Endschila]
25	32.83333	13.10000	Fortino Mamura (near Gargaresch) [Gargaresch]
JAFARA			
26	32.71750	13.07640	Suani Beni Adem [Bin Yadim; Suani Beni Aden]
27	32.65697	13.11183	between Al Azizia and Tripoli
28	32.58333	13.05000	Fonduk el Maguz
29	32.52996	13.01000	Al-Aziziyah [El Azizia; Oase Azizia]
*31	32.47500	12.92389	Ra's al Lifa' [Ras el Lifa]
32	32.41160	13.10260	Qaser [Ben Gascr, Ben Ghashir]
33	32.35800	13.11100	Tripolis (50 km S)
34	32.28813	12.86429	Jabal Montrus (E)
TRIPOLI			
35	32.88333	13.10000	Tripoli (verbatim coordinates #1) [Tripolis; Triplis; Tarabulus]
36	32.86667	13.11667	Gargaese [Gargaresc]
37	32.87968	13.15986	Hammangi, Christian Cemetery of
38	32.88944	13.16222	Tripoli coast
39	32.89250	13.18000	Tripoli (verbatim coordinates #2) [Tripolis; Triplis; Tarabulus]
40	32.86667	13.20000	Sidi Mesri
41	32.86951	13.20774	Sghedeida
42	32.86721	13.22951	Sciara-Sciat [Sciati,Sciara Sciatudi, Sciarasciat, Sciara Zahiz]
43	32.89500	13.28028	Mellaha
44	32.89550	13.38300	Tajura [Tadschura, Tagiura]
45	32.78455	13.21437	Tripoli (general) [Tripolis; Triplis; Tarabulus]
46	32.68870	13.19383	Tripoli (13 mi S)
47	32.68587	13.19527	Qasr Bin Ghashir [Ben Gascr, Ben Ghashir, Castel Benito]
48	32.66014	13.17317	Tripoli (16 mi S)
48a	32.53504	13.16229	between Tripoli and Garyān
49	32.51667	13.26667	Formolga [Formolgha]
50	32.38333	13.26667	Tripolis (40 km E)

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
51	32.78455	13.53461	Wadi Sharghi (30 mi E of Tripoli) [Wadi Shergi]
52	32.76802	13.58944	Tripoli (40 km E)
53	32.79028	13.59583	Wadi Sidi Bennur [Wadi Turghut, Sidi Benour, Bennu]
54	32.78917	13.61359	Mediterranean coast (30-50 km S of Tripoli)
55	32.79135	13.71220	Mediterranean coast (50-60 km S of Tripoli)
56	32.75000	13.71667	Qasr al Qarabulli [Gasr Garabulli, El Garbulli, Garabulli, Castelverde]
MURQUB			
57	32.23300	13.36670	Ayn Uif [Ain Uif]
58	32.28333	13.61667	Wadi Tessuia [Wadi Tessina]
59	32.40000	13.50000	Sharshara [Uadi Sharshara, Tarhuna]
60	32.43389	13.63440	Jabal Tarrhona [Bir Milrha, Uadi Milrha; Wadi Milrha, Tarhuna, Tarunah, Tarhuni' Gebel Tarrhona]
61	32.58333	13.86667	Sidi Al Farjani [Sidi Faradje]
62	32.58500	14.03790	Al Qusbat (20 km N)
63	32.58249	14.03948	Msallata [Mselata]
64	32.57140	14.10810	between Tripoli and Misratah
65	32.66940	14.12410	Al Khums to Tripoli
66	32.70853	14.14761	Al Khums (5 km W Villa Selin)
67	32.70931	14.17744	Al Khums (env. Villa Selin)
68	32.65028	14.26178	Al Khums [Khoms, Homs, Uadi Bu Naadscha]
69	32.63846	14.29194	Leptis Magna [Leptis]
70	32.55369	14.35643	between Wadi Càam and Al Khums
71	32.48400	14.44121	Wadi Càam
MISRATAH			
72	32.04938	13.74638	between Tarhuna and Bani Walid
73	31.75000	14.00000	Bani Walid [Bani Waled, Beni Ulid, Beni Ouled, Beni Uhled]
74	31.56157	13.97389	Bani Walid (20 km S)
75	31.39031	14.07500	Bani Walid (40 km S)
76	31.13333	14.40000	Biraiad
77	30.94999	14.56666	Qirdah [Ghersa, Gerisa, Ghirza]
78	31.91845	14.64020	Bi'r Dūfān [Bir Dufan]
79	32.41100	15.09270	Misratah (55 km S)
80	32.37700	15.09200	Misratah [Misrata; Misurata; Misratha]
81	32.35521	15.10758	Oasis of Misratah
82	32.11390	15.06670	Sirte to Misratah (250 km from Sirte)
83	31.97194	15.05194	Tawergha [Tauorga]
84	31.92957	15.05501	Sofeggin [Uadi Sofeggin]
85	31.84183	15.03731	road to Bani Walid from Misratah
86	31.66700	15.05000	Wadi Muballum [Wadi M'bellem, Uadi M'bellum]
87	31.49620	15.19600	Sirte to Misratah (150 km from Sirte)
88	31.36000	15.24000	al-Qaddāḥīyah [Bir Gheddahia, Bir Gheddaia]
89	32.26546	15.29611	Ar Arar
90	32.20406	15.31712	Ogla
91	32.18175	15.33772	Elmahbula
92	32.11178	15.33135	Semeda
93	32.05083	15.34603	Marzuga
94	31.95694	15.35577	Al Malfa
95	31.87076	15.38529	Al Gwezat
96	31.75393	15.43293	Almjarin
97	31.60900	15.48100	between Buerat and Misratah
98	31.56091	15.56061	El Merkeb [Mengar el Merkeb]
NALUT			
99	31.94227	10.66244	Wazin
100	32.00000	10.81667	Al Ghazaya

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
101	31.86670	10.98330	Nalut [Nalut Air Strip]
102	31.78953	10.95580	Nalut (10 km S)
103	31.70189	10.89853	(verbatim locality)
104	31.85000	11.30000	Cabao
105	32.04083	11.54389	Badr [Al-Bedair]
106	31.99250	11.67111	Al Jawsh [Giose]
107	32.00388	11.72277	Al Jawsh (5 km E)
108	31.91500	11.79300	Jabal Nafusa
109	31.08333	11.70000	Bir Allaq [Bir Alag]
110	30.70544	11.41394	Gabr Saleh [In Salah, Gabr Salah, Hamada]
111	31.18832	10.59784	Gadamis (235 km N)
112	31.03220	10.59890	Sinoun oasis (200 km N of Garamesh)
113	30.75499	10.39656	Dirj (N)
114	30.58797	10.33056	Dirj (50 km N)
115	31.29957	10.62465	Nalut (72 km S)
116	30.31310	10.44952	Dirj (15 km N)
117	30.25274	10.44037	Dirj (10 km N)
118	30.21980	10.34440	Dirj Oasis (20 km W)
119	30.19583	10.25750	Gadamis (80 km E)
120	30.18640	10.45190	Dirj Oasis
121	30.16000	10.46000	Dirj [Darg, Derg, Derj]
122	30.07658	10.66568	Dirj (22 km SE)
123	29.88000	10.75667	Dirj (45 km SE towards Adiri)
124	29.98250	10.96940	Hamadat al Hamrah
125	30.17615	9.44107	Gadamis (7 km NW)
126	30.14610	9.45472	Gadamis, just before
127	30.13330	9.50000	Gadamis [Gadames, Gadames Oasis, Gadamesh, Ghadames]
128	30.13333	9.48333	Gadamis (3 km W, village)
129	30.11442	9.49189	Gadamis (hotel Dar Gadames)
130	30.09046	9.48668	Gadamis (5 km S)
JABAL AL GHARBI			
131	31.25000	11.90000	Bir Tlacsin [Bir Telasin]
132	31.61667	11.88333	Wadi Harana
133	31.72910	11.81960	Al Haraba
*135	32.04611	12.16778	Qsar Al Hajj [Gasr el Hag]
136	31.91667	12.21667	Ayn el Amenia [Ain el Amenia]
137	31.99900	12.33100	Qabilat Awlad 'Amir [Abmir]
138	31.92640	12.45280	Jadu South
139	31.90000	12.48330	Barca [Barq 'Arram]
140	32.01755	12.51935	Rumia
141	32.06278	12.52667	Yafran [Djebel Jefran, Sefren, Jefren, Tefren]
142	32.20000	12.53333	Rugenban [Rugeban, Rugebar]
143	31.97560	12.67240	Algwalish
144	31.97922	12.62838	Garyān (30 mi SW) [Djebel Nefusa]
145	32.06010	12.72270	Kikla
146	32.12450	12.80680	Ayn Tagnit
147	32.13056	12.91130	Henscir El [near Vertice]
148	32.23120	12.96462	Garyān (8 km N)
149	32.27278	13.02556	Bu Gheilan [Bugheilan, Bu Gheilan, Aboghidan]
150	32.27220	13.02810	Bu Gheilan (Aboghidan protected area)
151	32.26350	13.03500	Al Kowsin
152	32.21243	13.03000	Al Qabil
153	32.21222	13.03944	between Garyān and Bu Gheilan
154	32.16000	13.02000	Garyān [Gharian, Gharyan, Garian, Djebel Garian, Garian Hills, Garian Mountains

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
155	32.12754	12.98957	Jabal Taghrinnah [Tegrinna, Djebel Teghrinna]
156	32.11476	13.03489	Garyān (desert S of)
*158	31.44500	12.98306	Mizda
159	31.35000	13.15000	Gasr El-Chafagi [Chatagi Aamer, Chafagi Aamer]
160	30.38362	13.58635	Qaryat [Gheriat es Schergia, Gheriat]
161	30.21667	13.71667	Wadi Ash Shwayrif (30 km SE)
162	29.97870	14.25993	Ash Shwayrif [El Shwayrif]
163	29.12872	11.78515	Hamadath al Hamrah (172 km SE of Dirj)
164	29.06055	11.95448	Hamadath al Hamrah (190 km SE of Dirj)
SIRTE			
165	31.43051	15.67899	Buretma
166	31.40440	15.70860	Bwayrat Al Hasun [Buerát el Hsun, Buerat]
167	31.38730	15.73965	Ramel Khaieb
168	31.33464	15.86531	Surrah
169	31.31984	15.90778	El Khowada
170	31.23667	16.11727	Al Arbaeen
171	31.21850	16.31798	Al Thalateen
172	31.21856	16.36212	West Camp
173	31.21939	16.38675	Al Gbeba [Al Gbiba]
174	31.19000	16.53720	Wadi Tlal [Wadi el Talha, Uadi el Talha, Uadi Umm el Talha]
175	31.20531	16.58894	Sirte [Sirt, Surt, Syrte]
176	31.06667	16.68333	Ksar bou Hadi
177	31.19250	16.82639	East Sirte
178	31.11770	17.14750	As Sultan [Es Sultan, Esc Soultane]
179	31.11944	17.15750	Mrsa as Sultan [Marsa es Sultan]
180	31.02056	17.47806	Wadi el Ahmar
181	30.93810	17.62750	Ajdabiya towards Sirte (100 km from Ajdabiya)
182	30.94306	17.63333	Sirte (106 km E)
183	30.92111	17.85222	Ras el Aweja
*185	30.78300	17.83300	Aw Nawfaliyah [Nofilia, Nufilia, Gifa-Nufila]
186	30.80000	18.05000	Bin Jawwad [Ben Guaid, Ben Joad]
187	30.80000	18.06667	Ben Jawwad (32 km towards Sirte)
188	30.76480	18.16410	Ben Jawwad (9 km E, 120 km W of Sirte)
189	30.75861	18.18283	Sirte (160 km E)
190	30.58606	18.41163	Ras Lanuf
191	30.53469	18.49815	Al Aqaylah (W, 360 km SW Benghazi)
192	30.39202	18.64000	Benghazi (330 km W)
193	30.37833	18.78583	Um Gbaraniq
194	30.38333	18.23333	Demara
195	29.66667	17.76670	Loleb El-Gifa [Gifa]
196	29.79111	15.96844	Hun (50 mi N)
197	29.61660	15.49970	Wadi ez-Zmam
198	29.95420	15.62520	Bu Ngem (80 km S)
199	30.61416	15.40051	Bu Njem [Bou Ngem, Bondgim, Bu Ngem]
FEZZAN			
WADI AL SHATII			
200	28.51173	12.81298	Adiri [Idri] (120 km N)
201	28.44330	12.78000	Military checkpoint (300 km SE of Dirj)
202	28.37808	12.83227	Adiri (105 km N)
203	28.27665	12.88275	Adiri (95 km N)
*205	28.66700	13.90995	Jabal Fezzan
206	28.24472	14.32750	Jabal al Hasawinah [Jebel Fezzan]
207	28.21667	14.53333	Gargaf
208	28.11667	15.25000	Serir Ben-Afien
209	27.49300	13.22762	Adiri (17 km E)

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
210	27.55091	14.27435	Al Biraq [Brak, Oase Brak]
211	27.49567	14.30665	Wadi As Sayl Agial [Uadi Agial]
JUFRA			
212	28.23250	15.34694	Bir el Gaf
213	28.73750	15.54972	Jabal as-Sawda [Jabal as-Soda, Djebel Es Soda, Jebel Soda, Gebel Soda, Gebel es Soda]
214	28.86000	15.63000	valle Zigar (Jabal as-Soda)
215	29.16670	15.75000	Wadi Bu Dindin [Wadi Bundindin]
216	29.07860	15.78420	Sawknah [Socna, Sokna]
217	29.08333	15.85000	Jufra Oasis [Giofra, Jouhfrah Oasis]
218	29.10168	15.95650	Hun [Hon, Uadi Bu Etal (Hon)]
219	29.16111	16.14361	Waddan [Uaddan]
220	28.73333	16.83333	Wadi Huefria (verbatim coordinates)
221	28.54705	17.53641	Zillah [Zella, Sella]
222	27.48333	16.10000	Graret el Heira
*224	27.56667	16.20000	Graret Sceccar (verbatim coordinates)
225	27.58333	16.25000	near Graret Sceccar
226	27.83343	16.35010	El Fogaha [El Fogha]
227	27.81670	17.30000	Khanquat Al Ma'rak [Marak]
228	27.13948	17.47205	Haruj Al Aswad
229	27.40000	18.40000	Wadi el Abd
GHAT			
230	25.51000	9.94000	Erg Titersine (40–80 km NNW)
231	25.81640	9.97040	Wadi de Maghidet
232	25.94946	10.08004	Tan Afella
233	25.72222	10.38500	Wadi Ilachlachan
234	25.79000	10.55000	Sardalas [Serdeles]
235	25.81667	10.63330	Oasis of Al-Awaynat (2 km E) [Auenat]
236	25.86907	11.15670	Sardalas (62 km E)
237	25.51619	10.57039	Akakus (Adadh area 1, verbatim coordinates)
238	25.52189	10.59964	Akakus (Adadh area 2, verbatim coordinates)
239	25.38300	10.36670	Bir Tahala [Uadi Tanezruft near Bir Tahala]
240	25.32700	10.53297	Akakus [loc. 3]
241	25.27317	10.55250	Akakus [loc. 4]
242	25.31667	10.61667	Akakus Mountains, Adadh area
243	25.20839	10.90936	Wan Kassa [Uadi Uatkassa (Tasili)]
244	25.26100	10.27675	Wadi Tanezruft near Idinen
245	25.19026	10.27148	Wadi Tanezruft
246	25.09758	10.41239	Akakus region, southern [Akkakus, Accacus, Acacus]
*248	24.98611	10.16806	Ghat [Gat] (2 km N)
249	24.96163	10.18135	Giardini di Mustafà [Ghat Oasis]
*251	24.93300	10.18300	Ghat (1 km S)
252	24.91627	10.19415	Tin Geráben
253	24.88796	10.18654	Al Birkah [El Barcat, Elbarkat, El Perkat, Oasi di Elbarkat, Tunin]
254	24.87236	10.17479	Ghat (8 km S)
255	24.94986	10.08291	Fueuat [Feuat]
256	24.65167	10.23346	Wadi Houfia [Uadi Iseien]
257	24.86942	10.51270	Akakus (Awiss area, [L05])
258	24.81667	10.65000	Akakus Mountains
259	24.77985	10.64592	Akakus (Wadi Imlal)
260	24.69667	10.62981	Akakus (Awiss area, [L08])
261	24.68450	10.63269	Akakus (Afozedzhar Arch) [Fozzigiaren Arch]
*263	24.68333	10.63300	Akakus Mountains
264	24.66667	11.16667	Wadi Titermsime
WADI AL HAYAA			

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
265	25.75572	12.16444	Wadi Mathendous [Wadi Mathkendush, Wadi Matendus, Wadi Mathendous]
266	26.15800	12.48580	Wadi Tekniwen on the Messak Sattafet Plateau
267	25.98758	12.66742	Wadi Mathendous (desert around)
268	25.99238	12.69312	Tesawa (95 km W)
269	26.59000	12.76000	Awbārī [Ubari Iban]
270	26.29211	13.05589	Wadi Bargiug [Messak Mallet, 95km W of Tesawa]
271	26.54400	13.06400	Germa [Djerma]
272	26.56540	13.25583	Tcarkiba [Techertiba]
*274	26.54219	13.31702	Al'Fjayj
275	26.76131	13.42712	Mandria Oasis
276	26.78761	13.50897	Mafu Lake
277	26.80224	13.53592	Gaberoun [Lake Gabrun, Gaber Aown Oasis, Gabroon Lake, Qabr' Oan, Rawla Dawada]
278	26.89437	13.51025	Umm El Ma Oasis [Om Elma Oasis]
279	26.66667	13.75000	Gasr Berruru [Glifa]
SABHA			
280	26.34568	14.11297	Murzuq (50 km toward Sabhā)
281	26.43061	14.26733	Ghadduwah [Goddua, Ghodwah, Ghodwa]
282	26.84686	14.42104	Sabhā (20 km S)
283	27.01633	14.37499	Sabhā (5 km W)
284	27.01633	14.39514	Ayn ed-Dalaam [Aïn ed-Dalaam]
285	27.00000	14.41667	Sabhā (verbatim coordinates)
286	27.01633	14.44553	Sabhā [Oasi di Sebha, Sebha Oase, Sebha]
287	27.16670	14.55000	Oasis of Sabhā (23 km N)
288	27.19472	14.62301	Temenhint [Tamanhint]
289	27.45000	15.93333	Ramlet el Heira
290	27.33333	15.83333	Dor el Gani
291	27.00000	15.91667	Esc Sciala [Esc Sciuaila, Esc Sciaila, Esc Sciaila (Serir el-Gattusa)]
MURZUQ			
292	25.50000	11.50000	Wadi Meseknan on the Messak Settafet Plateau
293	25.22342	11.66208	between Erg Ouan Kasa and Erg Murzuq 2
294	25.35231	11.98333	between Erg Ouan Kasa and Erg Murzuq 1
295	25.51475	12.13356	Erg Murzuq
296	26.08883	13.50511	Tsawah
297	26.11706	13.67921	Dujal [Dougal]
298	25.93338	13.90995	Murzuq [Murzuch, Morzoq, Mourzouk, Murzuk]
299	25.85944	13.91194	Murzuq (5 km S)
300	25.91949	14.04546	Heg' Hagel [Haj Hjeel]
301	25.88710	14.15038	Jizaw
302	25.93736	14.27243	Fonqol
303	25.93960	14.42664	Taraghin [Taraghen, Traghen, Trsghan, Hofra]
304	25.85806	14.43056	Taraghin (10 km S)
305	25.85809	14.47007	Ma'fan (10 km S of Taraghin) [Ma'afan, Maafen]
306	25.90833	14.56056	Al Jabbar
307	25.90111	14.58056	Ash-Showaish
308	25.91200	14.57470	Az-Zytouna [Zaytouna]
309	26.27417	14.70972	Umm Al Aranib (16 km N)
310	26.11708	14.72791	Umm Al Aranib [Um el Araneb, Om Al-Araneb]
311	26.16222	14.84204	Meseguin [Mosequeen]
312	26.13333	14.88330	El Bder [Crossroad to Al Katrun]
313	25.92869	15.10785	Magedul [Majdoul]
314	25.96667	15.16667	Umm es Suer
315	25.96660	15.15740	Tarbu (E)
316	26.16484	15.12412	Zawilah [Zuila, Zowailah]

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
317	26.38750	15.59389	Tmassah (20 km W)
318	26.39998	15.78018	Tmassah [Tmesa, Tmessa; Tmessah]
319	26.52762	15.92192	Tmassah (20 km NE)
320	26.16667	16.25000	Sagberg
321	26.00000	16.00000	Wadi Blota [Uadi Blota]
322	25.83333	15.85000	Wadi Ben Gnema
323	25.75000	16.08333	Guerat el Bgar [Uadi esc Sceberma]
324	24.33250	14.26694	Tajarhi [Tegerhi]
325	24.89550	14.52321	Al Quatrun [Gatrun, Al Qatroun]
326	24.79000	15.37000	Jabal Ben Ghnema [Jebel Ben Guenema; Gebel Ben Ghnema]
327	24.80750	16.31972	Tarbu (East)
328	25.25000	16.33333	el Meherscema [el Mehershema]
329	25.48333	16.48333	el Meherscema, near
*331	25.31365	16.72553	Waw Al Kabir [Uadi el-Abiad, Uau el-Chebir, Uau el Kebir]
332	24.91552	17.75936	Waw an-Namus [Wau en-Namus, Uau en Namus]
333	25.75000	17.92000	Dor el Talha (Evaporite)
334	25.71500	18.18190	Dor el Talha (Idam)
CYRENAICA			
BENGHAZI			
335	32.40370	20.41100	Al Mabne
336	32.46667	20.50000	Bersis
337	32.38330	20.38330	Daryanah (5 km NE)
*339	32.29333	20.22183	Daryanah [Deriana, Darnah]
340	32.21667	20.16667	Ayn Zeyanah [Aen Alzeana, Ain Alzenna]
341	32.21563	20.15405	Bir Duema [Bir Duema]
342	32.20637	20.17688	Al Kuwayfiyah [Coefia, Zeinana, Zejana]
343	32.19297	20.27980	Benghazi (30 km NE)
344	32.18216	20.59041	Al Abyar [Negal, El Abiar]
345	32.14458	20.50753	Bu Maryam [Bu Mariam, Bu Marian]
346	32.06667	20.55000	Dirham
347	32.09667	20.38841	Ar Rajmah Pass [Er Regima Pass]
348	32.07092	20.34891	Ar Rajmah [Er-Regima, Regima]
349	32.05780	20.31600	Ar Rajmah [Arajma] (verbatim)
350	32.08333	20.25000	Gioh 7km E. of Benghazi
351	32.09111	20.24694	Baninah [Benina]
352	32.09900	20.23700	Benghazi (18 km E)
353	32.08426	20.18295	Benghazi (5 km E)
354	32.10372	20.16134	Goik Kebir [Gilf Kebir]
355	32.11000	20.14306	Benghazi (7 km E)
356	32.13837	20.12999	Benghazi (6 km N), Mongar
357	32.11670	20.06670	Benghazi [Benghasi, Fortina Giuliana, Forte Castelaccio, Benghazi Beach]
358	32.08189	20.10661	Fwayhat [Fuehat, Guehat]
*360	32.04450	20.06411	Benghazi (4 km S)
361	32.03126	20.06130	Al Qawarishah [Qanfutta, Oasi di Guarscia, Ganfooda, El Guarascia]
362	31.98194	20.03667	Benghazi (15 km S)
363	31.95604	20.14389	Abu Fakra
364	31.86670	20.43300	Uàdi el- Ahmar
365	31.76700	20.01500	See el Moamen
366	31.74950	20.02220	Qaminis (10 km N)
367	31.67192	20.02072	Qaminis [Ghemines, Gheminez, Qamenis]
*369	31.67231	19.95809	Errgeta
370	31.58522	19.96909	Al Metefla
371	31.47806	19.99525	Shat habib
372	31.46627	20.04009	Sabkhat Karkurah

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
373	31.42541	20.02341	Bagasa
374	31.43333	20.15000	El Magrun
375	31.23333	20.16667	El Badine
376	31.66464	20.26147	Soluq [Soluk, Solluch, Soluch, See el Ucamen]
377	31.62252	20.39763	Soluq to Ash Shulaydimah
378	31.59548	20.41546	between Soluq and Ash Shulaydimah
379	31.56667	20.56667	Furti ash Shulaydimah [Esc Sceleidima]
*381	31.43333	21.08333	Bir Hag Hamed
MARJ			
382	32.53333	20.56670	Al Aquriah
383	32.53123	20.58043	Tocra [Tokra]
384	32.50333	20.69472	Al Marj (12 km W)
385	32.49000	20.83000	al-Marj [Barca, Barka, Berca, Barce, Wadi Tuega, Merg, El Marj, Gasr Chauabi]
386	32.61556	20.74389	North Benghazi coast
387	32.65194	20.85417	Tulmaythah (10 km W)
388	32.67800	20.92090	Tulmaythah [Tolmette, Tolmais, Tolmetta; Tolmeta]
389	32.70020	20.93286	Ad Dirsiyah [Addirsiah, Tulmaythah ruins]
390	32.76995	21.22453	Elogla
391	32.77042	21.25008	Wadi Jarjaroma (8.5–10.4 km W) [Wadi Jarjarouma, Wadi Jajaruma], El-Kouf National Park
392	32.77362	21.29504	Wadi Jarjaroma (2 km W) El-Kouf National Park
393	32.77371	21.34090	Jarjaroma Beach, Jarjaroma, El-Kouf National Park
394	32.77263	21.35082	Wadi Buzangug
395	32.77670	21.36996	Al Hasi
396	32.78114	21.38810	Wadi Jarjaroma (5.3–5.6 km E)
397	32.78178	21.39004	Banans
398	32.77880	21.40820	Limnothalassa
399	32.65333	21.40106	Igdeida semidesert loc. 1
400	32.58432	21.33081	Qasr (8 km SW)
401	32.60540	21.12406	Maquis
402	32.48054	21.12406	Taknis [Tecnis, Technis]
403	32.39120	21.24040	Igdeida semidesert loc. 2
404	32.38000	21.24000	Gasr el Ebia [Rass El Lifa, Kasr Ras el Leben]
405	32.38330	20.96667	Al Awayliah ash Sharkiah (5 km W)
406	32.30377	20.98941	Jardas Al Abid [El Abid]
407	32.26667	21.18333	Uàdi el- Hasànna
408	32.18333	21.20000	Carruba
409	31.25164	21.63611	Bir Ben Ganía
El-Kouf National Park (KNP) localities from Schleich (1987)			
457a	32.77100	21.33500	KNP: NW boundary near the beach
457b	32.77000	21.35000	KNP: Beach #1
457q	32.76500	21.39300	KNP: S of beach near Jarjuma #1
457s	32.74500	21.36300	KNP: S of beach near Jarjuma #3
457v	32.73700	21.38000	KNP: Jarjuma area #3
457y	32.72000	21.42100	KNP: Jarjuma area #6
457z	32.69200	21.44600	KNP: Jarjuma area #7
457aa	32.67500	21.37800	KNP: N of the road N from Qasr
457ab	32.63800	21.37800	KNP: NW of Qasr
457ac	32.63900	21.39600	KNP: N of Qasr
457ad	32.63600	21.41200	KNP: NE of Qasr
457ae	32.62900	21.39700	KNP: Qasr
457af	32.63200	21.41100	KNP: E of Qsar
457ag	32.62800	21.44200	KNP: Road from Qasr to Massah #1
457ah	32.62400	21.45300	KNP: Road from Qasr to Massah #2

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
457ai	32.64400	21.44200	KNP: Road from Qasr to Massah #3
JABAL AL AKHDAR			
410	32.80833	21.45000	Beach 5–6 dunes, El-Kouf National Park
411	32.80000	21.46613	Ayn Shaqiqah, El-Kouf National Park
412	32.81701	21.48945	Al Haniyah (4 km W), El-Kouf National Park
413	32.82525	21.49789	Haniyah (3 km W)
414	32.83562	21.51042	Haniyah (0–2 mi S) on road to Massah
415	32.83667	21.52000	Haniyah Beach Dunes (1 mi W)
416	32.90190	21.96850	Ancient Apollonia (on the beach)
417	32.89577	21.96124	Susah Apollonia [Marsa Susa]
418	32.86040	21.92030	between ruins of Cyrene and ruins of Apollonia
419	32.82780	21.86220	Cyrene ruins [Shahhat, Shahat-Cyrene, Cyrene archeological site]
420	32.82400	21.85200	Archaia Kyrrini [Ancient Cyrene]
421	32.80696	21.86674	Shahhat [Cirene, Cyrrini, Kyrrini]
422	32.78375	21.98586	Egfanta (20 km E of Al Bayda)
423	32.63953	21.80960	Faydiyah (10 Km SW)
424	32.69060	21.91179	Faydiyah (0.25 mi E)
425	32.68761	21.90550	Faydiyah [El Faidia, El Feydiyah]
426	32.71880	21.80840	Al Bayda (5 km SE)
427	32.75642	21.73762	Littoria
428	32.76639	21.74167	Al Bayda [El Beida]
429	32.76077	21.68620	Al Bayda (4 km W)
430	32.70233	21.65933	Wadi El-Kouf [Wadi Kuf, Wadi Kouf, Uadi el Cuf, Uadi el Kouf, el Cuf]
431	32.75167	21.62639	Massah [Messa, Messah, Sidi Massod]
432	32.73000	21.60000	Wadi El-Kouf (side wadi below staff houses) El-Kouf National Park
433	32.71667	21.60000	Wadi el Gereib
434	32.70833	21.58333	Wadi Sudan , near Wadi El-Kouf National Park headquarters
435	32.71174	21.57259	Al Bayda (15 km W)
436	32.70330	21.56430	El-Kouf National Park (verbatim coordinates)
437	32.69655	21.56561	Wadi El-Kouf
438	32.68750	21.57500	El-Kouf National Park, behind headquarters
439	32.75190	21.57518	Massah (3 mi W)
440	32.75000	21.57083	El-Kouf National Park, eastern border
441	32.75039	21.56245	Aqfanta (1.5 mi W)
442	32.76667	21.56667	Aqfanta (2 km N)
443	32.77886	21.54238	Kufanta (2 mi NW), near El-Kouf National Park boundary
444	32.75833	21.54091	Kufanta (1.5 km W)
445	32.71959	21.47381	Wadi Jarjaroma
446	32.63833	21.40833	El-Kouf National Park, western end near fence track
447	32.61439	21.39970	Qasr [Kasr El Lebia, Gasr el Ebia]
448	32.59770	21.47278	Jabal Akhdar
449	32.56460	21.60380	between Gandula and Al Bayda
450	32.63014	21.67449	Omar al Mukhtar
451	32.60000	21.71667	Sluntah [Suluntah, Slonta]
452	32.48391	21.41002	Marawah [Maraua]
*454	32.12198	21.71992	Sluntah (50 km S)
455	31.43333	21.76667	Hagfed Ailet-el-Aquar
456	31.35050	21.96699	between Ajdabiya and Tubruq
457	32.65422	21.61917	El-Kouf National Park (general)
El-Kouf National Park (KNP) localities from Schleich (1987)			
457c	32.78500	21.41600	KNP: Beach #2
457d	32.78800	21.41500	KNP: Beach #3
457e	32.81000	21.47800	KNP: Beach #4
457f	32.78000	21.40300	KNP: Beach #5

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
457g	32.78700	21.42600	KNP: Beach #6
457h	32.79000	21.45500	KNP: Beach #7
457i	32.79900	21.45200	KNP: Beach #8
*457k	32.80000	21.46700	KNP: Beach #9
457l	32.81700	21.49100	KNP: Beach by road S and parallel to Haniyah #2
457m	32.81300	21.48500	KNP: Beach by the road S and parallel to Haniyah #3
457n	32.83600	21.52100	KNP: Haniyah beach #1
457o	32.83400	21.51900	KNP: Haniyah beach #2
457p	32.78300	21.50500	KNP: road S and parallel to Haniyah
457r	32.77300	21.41200	KNP: S of beach near Jarjuma #2
457t	32.73100	21.50300	KNP: Jarjuma area #1
457u	32.74700	21.42300	KNP: Jarjuma area #2
457w	32.73800	21.47200	KNP: Jarjuma area #4
457x	32.73600	21.42900	KNP: Jarjuma area #5
457aj	32.64000	21.46200	KNP: Road from Qasr to Massah #4
457ak	32.64600	21.48200	KNP: Road from Qasr to Massah #5
457al	32.65900	21.49700	KNP: Road from Qasr to Massah #6
457am	32.66000	21.51000	KNP: Road from Qasr to Massah #7
457an	32.67600	21.53600	KNP: Road from Qasr to Massah #8
457ao	32.68500	21.53200	KNP: Road from Qasr to Massah #9
457ap	32.68500	21.55300	KNP: Road from Qasr to Massah #10
457aq	32.69100	21.55000	KNP: Road from Qasr to Massah #11
457ar	32.67600	21.52200	KNP: N on the road W from station I to Qasr #1
457as	32.69200	21.51100	KNP: N on the road W from station I to Qasr #2
457at	32.70500	21.56100	KNP: Station I for Soil and Humidity #1, road W of Massah
457au	32.71100	21.56400	KNP: Station I for Soil and Humidity #2, road W of Massah
457av	32.69900	21.55700	KNP: Station I for Soil and Humidity #3, road W of Massah
457aw	32.70200	21.56200	KNP: Station I for Soil and Humidity #4, road W of Massah
457ax	32.71000	21.55700	KNP: Station I for Soil and Humidity #5, road W of Massah
457ay	32.72000	21.54500	KNP: N of Station I for Soil and Humidity
457az	32.71200	21.54700	KNP: road N from station I to station II (2) #1
457ba	32.70900	21.52600	KNP: road N from station I to station II (2) #2
457bb	32.74500	21.54500	KNP: Station II (1) for Soil and Humidity #1, road W of Massah
457bc	32.74600	21.55700	KNP: Station II (1) for Soil and Humidity #2, road W of Massah
457bd	32.75400	21.54200	KNP: Station II (1) for Soil and Humidity #3, road W of Massah
457be	32.74700	21.52700	KNP: Station II (1) for Soil and Humidity #4, road W of Massah
457bf	32.75700	21.50500	KNP: N of Station II (1) for Soil and Humidity
457bg	32.69700	21.57900	KNP: Station IV for Soil and Humidity #1, road W of Massah
457bh	32.70800	21.58900	KNP: Station IV for Soil and Humidity #2, road W of Massah
457bi	32.71600	21.59100	KNP: Station IV for Soil and Humidity #3, road W of Massah
457bj	32.71300	21.57700	KNP: road E from station I to Massah #1
457bk	32.72100	21.57900	KNP: road E from station I to Massah #2
457bl	32.72700	21.57500	KNP: road E from station I to Massah #3
457bm	32.72800	21.59200	KNP: road E from station I to Massah #4
457bn	32.76700	21.57700	KNP: N of the road between station II (1) and Massah
457bo	32.74600	21.62600	KNP: Massah
457bp	32.76100	21.61300	KNP: road N of Massah #1
457bq	32.79800	21.58300	KNP: road N of Massah #2
457br	32.82400	21.55400	KNP: road N of Massah #3
457bs	32.75100	21.73900	KNP: Al Bayda
457bt	32.74100	21.74400	KNP: S of Al Bayda
457bu	32.71200	21.79000	KNP: road S from Al Bayda #1
457bv	32.72700	21.81100	KNP: road S from Al Bayda #2
457bw	32.72900	21.78500	KNP: road S from Al Bayda #3
457bx	32.77700	21.80900	KNP: road E from Al Bayda to Shahat #1

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
457by	32.79000	21.84200	KNP: road E from Al Bayda to Shahat #2
457bz	32.68600	21.65000	KNP: Mountains #7
457ca	32.65900	21.55800	KNP: Mountains #5
457cb	32.63000	21.59500	KNP: Mountains #4
457cc	32.63300	21.58600	KNP: Mountains #3
457cd	32.62800	21.61100	KNP: Mountains #2
457ce	32.62000	21.60800	KNP: Mountains #1
457cf	32.60600	21.69200	KNP: NW of Suluntuh
457cg	32.63300	21.75900	KNP: road E from Suluntah to Gaygab (Al Qubah) #1
457ch	32.62600	21.80800	KNP: road E from Suluntah to Gaygab (Al Qubah) #2
457ci	32.62600	21.80800	KNP: road E from Suluntah to Gaygab (Al Qubah) #3
457cj	32.65300	21.80700	KNP: road E from Suluntah to Gaygab (Al Qubah) #4
457ck	32.68200	21.85400	KNP: road E from Suluntah to Gaygab (Al Qubah) #5
457cl	32.66800	21.90400	KNP: East boundary road #1
457cm	32.65400	21.93900	KNP: East boundary road #2
457cn	32.69000	21.96000	KNP: East boundary road #3
457co	32.66800	21.89100	KNP: East boundary road #4
457cp	32.66900	21.94300	KNP: East boundary road #5
457cq	32.70700	21.95600	KNP: East boundary road #6
457cr	32.76200	21.90000	KNP: road S from Shahat #3
457cs	32.75900	21.89400	KNP: road S from Shahat #2
457ct	32.77200	21.88500	KNP: road S from Shahat #1
457cu	32.82700	21.86200	KNP: Shahat #2
457cv	32.83400	21.85500	KNP: Shahat #1
457cw	32.89500	21.96400	KNP: road N of Shahat #2
457cx	32.86000	21.90800	KNP: road N of Shahat #1
DARNAH			
458	32.92640	22.10470	Ras al Hilal beach
459	32.88300	22.18067	Ras al Hilal [Ras al Helal]
460	32.86800	22.17610	Katarraktis
461	32.84580	22.16170	Senebat Lauela Gorge
462	32.76187	22.23509	Al Qubbah [el Gubba, el Guba, Gubba, Quubah]
463	32.84536	22.42295	Chersa [Kersa]
464	32.68000	22.40139	between Sidi el Garbaa and Al Qubbah
465	32.67500	22.53944	Sidi el Garbaa [Sidi Garbaa]
466	32.76156	22.63409	Darnah [Derna, Burnah, Derna, Derna-El Fetejah highlands, Dernah]
467	32.66623	22.79355	Mintaqat Al Fata'ih
468	32.61083	22.74611	Darnah (20 km SE)
469	32.57515	22.76006	Martuba
470	32.56203	22.91317	Darnah (35 km SE)
*472	32.55560	22.93590	Umm Ar Rizam (2 km W)
473	32.53626	23.00796	Umm Ar Rizam [Um Arrizam, Om Arazam, Um Erzan, Umm er Rzem]
474	32.41759	23.12467	Bombah [Bomba, Golfo di Bomba]
475	32.33330	23.06670	Tmimi [Tamimi]
476	32.26667	23.21667	Abu el Frais [Oum el Frais]
477	32.19560	23.24370	Tubruq (75 km W, near the lakes)
*479	32.60000	22.07000	between Sahabi and Wadi El Faregh
480	32.50683	22.28215	Al Qubbah (35 km S)
481	32.49000	22.48400	Darnah (35 km S)
482	32.24299	22.30656	Zawiyat al Mukhaylá (10 km N)
483	32.19694	22.31277	South Jabal Akhdar (verbatim coordinates)
484	32.16250	22.28381	Zawiyat al Mukhaylá [el Mechili, Mekhili, Zauia Mechili, Zaouia Mechili]
484a	31.88749	22.31323	Zawiyat al Mukhaylá (30 km S)

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
485	31.66667	22.46667	Bir Tengeder
BUTNAN			
487	32.20500	23.34500	Ayn el Ghazal (loc. 1) [Ayn al Ghazalah, Ain el Gazala]
488	32.20600	23.34267	Ayn el Ghazal (loc. 2)
489	32.11972	23.59944	West Tubruq
490	32.06763	23.93701	Tubruq [Tobruk, Tobruch, Forte Mdauar]
491	32.07611	23.96100	Tubruq (area of)
492	32.04000	24.02750	Ras Bayad
493	32.00100	23.96090	Tubruq (2 km S)
494	31.94785	23.93573	Tubruq (15 km S)
495	31.86667	23.93333	South of El Adem
496	31.98480	24.06650	El Adem (20 km SE of Tubruq)
497	32.00580	24.16620	Tubruq (20 km E)
498	32.00000	24.27167	El Agelia
499	31.90940	24.38247	Tubruq (40 km E)
*501	32.01138	24.76247	Marsa Luk [Màrsa Lucch, Marsa Lukk]
502	31.96667	24.98056	Ras Azzaz
503	31.79840	25.03769	Wadi Raheb [Uadi Raheb]
504	31.76034	25.04092	Wadi el-Gerfan [Uadi Gerfen, Uadi el Garfan]
505	31.75594	25.08309	Bardiyah [Bardia, Porto Bardia]
506	31.60000	25.05000	Musaid
507	31.58333	25.05000	Capuzzo Amsaad (Capuzzo)
508	31.57970	25.05410	Libya and Egypt Boarder
509	31.57060	25.03560	between Giarabub and Tobruq
510	31.42951	24.06872	Tubruq (75 km S) near Wadi Giarabub
511	31.47794	24.05275	Tubruq (71 km S)
512	31.56370	24.03192	Bir el-Gòbi
513	31.58333	23.48333	Bir Hacheim
514	31.26516	24.83411	between Scegga and Amseat
515	31.07790	24.87270	between Scegga and Scheferzen
516	31.03611	24.20528	Bir el-Gòbi (60 km S)
517	30.74778	24.79158	between Al Jaghbub and Bardiyah
518	30.46590	24.53660	Al Jaghbub Oasis [Giarabub] (verbatim coordinates)
519	30.66667	23.25000	Wadi el Mra [Uadi el Mra]
520	29.83325	24.66063	Hish as Sahabi [Es Sahabi, Gasr es Sahabi]
521	29.74481	24.51620	Al Jaghbub [Giarabub, Giarabuch]
522	29.75120	24.78180	Melfa Lake, near Bohiret
523	29.67750	24.71728	Al Jaghbub (21 km ESE) [Bahr El Tubat]
524	29.59977	24.67348	Qārat ash Shuhaybāt [Garet es Sceheibat, Garet ex Scheibat]
AL WAHAT			
525	31.03717	20.15417	Sultan
526	30.91667	20.08333	Zuwaytinah [Zuetina]
527	30.91456	20.18364	Ajdabiya (20 km N)
528	30.86919	20.21592	Ajdabiya (14 km N)
529	30.75015	20.21877	Ajdabiya [Agedabia, Ajdabia]
530	30.54930	20.44848	between Augila and Benghazi
531	30.48237	20.22522	Ajdabiya (30 km S)
*533	30.53122	20.01537	between Ajdabiya and Marsa al Brega
534	30.54099	20.00220	Ajdabiya (35 mi W, 10 km from coast)
*536	30.38333	19.91667	Maaten el Gefera
537	30.33333	19.95000	Marsa al Brega, outside of
538	30.35000	19.86667	Benghazi (S of)
539	30.46389	19.73722	Marsa al Brega (16 km NE)
540	30.40247	19.60989	Marsa al Brega [Marsa Brega, Marsa Breah, Marsa al Bregah]
541	30.33210	19.51680	Ajdabiya towards Sirte (300 km from Ajdabiya)

Locality #	Latitude N	Longitude E	Locality name [Alternative names]
542	30.32468	19.48953	Bishr (20 km SE)
543	30.31667	19.45000	Matten Bishr [Maaten Becher]
544	30.25700	19.19400	Bishr [Becher, Agheila, El Agheila]
545	30.26134	19.18889	Al' Aquaylah [Al' Uqaylah]
545a	32.02359	23.18220	Bishr (20 km SW) [Eluet el Heira]
546	30.29278	18.90667	Jabal al Khash
547	30.08333	18.86667	el Hameimat
548	30.03194	19.25278	Bishr (25 km S)
549	30.04583	19.45500	Maaten Giofer (20 km ENE)
550	30.02798	19.65119	Bishr (30 km SE)
551	29.80000	19.18330	Jahama
552	29.81278	19.27778	Bishr (50 km S)
553	29.21881	19.20585	Maradah [Marada, Mrada]
554	29.58333	18.91667	Dahabia
555	29.22806	18.75083	Maradah (50 km NW by road)
556	28.95983	18.60905	Wadi Hasan [Uadi Hassan]
557	28.25000	19.25000	Baltat ash Shuqaytah [Balat]
558	29.80479	20.21608	Ajdabiya (100 km S)
559	30.00044	20.77059	Haseiat
560	29.96667	20.80000	Sahabi [Gara el Beda (Sahabi)]
561	29.15673	21.29593	Al Sawani [El Sawani]
562	29.10997	21.31797	Awjilah [Angila, Augila, Audjila]
563	29.09583	21.25722	Wadi Gabr el-Faregh [Wadi el-Faregh]
564	29.02909	21.53473	Jalu [Gialo, Jialo, El Scerruf, Esc Scerruf]
564a	29.28333	21.63333	Jikharra [Gicherra, Gigherra]
565	28.85000	21.56667	South of Jalu
KUFRAH			
566	25.66430	21.09260	Tazerbo [Tazirbu]
567	25.65000	22.11667	Bir Zighen
568	24.89434	22.03147	Buzaymah [Bzema Oasis, Bzema, Ramla di Bzema (Cufra)]
569	24.22852	21.98104	Rabyanah [Rebiana]
570	24.46667	22.70000	Jabal Neri
571	24.21667	23.30000	Al Tāj [El Tag, Et Tag]
571a	24.21814	23.26667	Hauairi [Hannari]
572	24.20000	23.33333	Buma
573	24.18333	23.30000	Al Jawf [El Giof]
574	24.17800	23.25000	Ayn Zueja [Ain Zueia]
575	24.15174	23.28680	Al-Kufrah [Cufra, Cufra Oasis, Oase Kufra]
575a	24.14583	23.18611	El Mzienà
576	24.13330	23.30000	Es Zurgh
577	24.02000	23.17000	At Tallab [El Talab, El Telib]
578	24.20542	23.29391	between Al-Jawf and El Tag
579	22.93333	22.66667	Bisciara
580	22.27623	24.67186	Ayn Murr [Ain Murr]
580a	22.12139	24.78778	btw. Jabal Al'uwaynat and Jabal Arkenu [btw. Auenat and Àrchenu]
581	22.26667	24.66667	Jabal Arkenu [Jabal Archenu]
582	22.00000	24.00000	Kufrah (verbatim)
583	21.90083	25.04516	Karkur Murr (El-Auenàt) [in Sudan, but see *Pseudotrapelus chlodnickii* account]
584	21.88830	24.98130	Jabal Al Uwaynat [el Auenat, Jebel Uweinat, Al Airenat, Jabal Auenat]
585	21.80611	24.86250	Ayn el Ghazal [Auenat, Ain Ghazal, Ain el Ghazal, Ain el-Ghazàl]
586	21.74470	24.99110	Ayn el Ghazal (wadi 15 km E)
587	24.88830	24.98127	Wadi Abd el Malech
OFFSHORE LOCALITIES (sea turtles only)			
588	32.51667	15.86667	North Benghazi 1 - sea
589	32.13333	19.25000	North Benghazi 2 - sea
590	32.58333	19.60000	North Benghazi 3 - sea
591	32.85000	20.16667	North Benghazi 4 - sea
592	32.45000	19.85000	North Benghazi 5 - sea
593	31.48333	16.20000	South Misratah - sea
594	32.35000	15.66667	North Misratah - sea

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