

Catalogue of American Amphibians and Reptiles.

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Gambelia copeii.

***Gambelia copeii* (Yarrow)**
Cope's Leopard Lizard

Crotaphytus copeii Yarrow 1882a:441. Type-locality, "La Paz, Cal. [Baja California Sur, Mexico]". Holotype, United States National Museum (USNM) 12663, young adult female, collected by L. Belding in 1882 (not examined by authors).

Crotaphytus copii: Garman 1884:16. *Lapsus*.

Crotaphytus copei: Cope 1887:34.

Crotaphytus wislizenii: Cope 1900:255 (part).

Gambelia wislizenii wislizenii: Smith and Taylor 1950a:94 (part).

Crotaphytus wislizenii copei: Leviton and Banta 1964:153.

Crotaphytus wislizeni neseotes Banta and Tanner 1968:186. Type-locality, "Cedros Island, west coast of Baja California Norte, Mexico." Holotype, California Academy of Sciences (CAS) 79872, adult male, collected by J.R. Slevin between April 25th and May 30th 1940 (not examined by authors).

Gambelia copei: McGuire 1996:98.

Gambelia copeii: Grismer 2002:113.

• **CONTENT.** This species is monotypic.

• **DEFINITION.** The rostral is approximately four times wider than high, usually rectangular in shape, and bordered by 4–7 postrostrals. The remaining scales on the snout are irregularly arranged, and an enlarged middorsal series may be present. The nasals are separated by 6–7 internasals. The frontonasals are occasionally enlarged. Canthals number 4, the posterior one or two are wider than high, and 7–9 scales separate the canthals of the left and right sides. Supraorbital semicircles are absent. Supraoculars are smooth and small, flat or convex, and becoming progressively larger medially such that medial scales are two to four times larger than the lateral ones. Circumorbitals are absent. Superciliaries number 8–12, and an extremely elongate medial scale is present. Palpebrals are ovoid, slightly convex, and may be interspersed with numerous interstitial granules. Preoculars, suboculars, and postoculars form an arc of 4–7 rectangular scales, and the second, third, or fourth scale is elongate. Supralabials number 13–17 and are usually slightly longer than high, except for the anteriormost scale which is square. Lorilabials are in 2–4 rows, are ovoid to rectangular, juxtaposed, and separate the supralabials from the suboculars and nasals. The aperture of the external auditory meatus is rectangular or ovoid, often constricted at or above the midpoint, approximately two to four times higher than wide, and has small, strongly convex, somewhat conical auricular scales lining the anterior margin. The mental pentagonal, 1–1.5 times wider than high, is bordered laterally by anterior infralabials and posteriorly by a pair of



FIGURE 1. *Gambelia copeii* from Sierra de Vizcaino, Baja California Sur, Mexico (photograph by B. Hollingsworth).



FIGURE 2. *Gambelia copeii* from Isla de Cedros, Baja California, Mexico (photograph by B. Hollingsworth).



FIGURE 3. *Gambelia copeii* from 10 km south of Ojos Negros, Baja California, Mexico (photograph by C. Mahrtdt).

postmentals that may be enlarged. The postmentals are almost always separated from the infralabials by sublabials on at least one side. Chinshields are weakly differentiated or undifferentiated. Infralabials number 12–17, are square or wider than high, and the inferior border of each scale is convex. The gulars are usually flat, but can occasionally be convex and bead-like; each scale may be separated by numerous asymmetrically arranged interstitial granules. Dorsal scale rows number 160–200 midway between the



FIGURE 4. *Gambelia copeii* from Sierra de Vizcaino, Baja California Sur, Mexico (photograph by L. Grismer).



FIGURE 5. Gravid female *Gambelia copeii* from 2 km north of Cameron Corners, San Diego County, California (photograph by C. Brown).



FIGURE 6. Post-gravid female *Gambelia copeii* from Vizcaino Desert near Guerrero Negro, Baja California Sur, Mexico (photograph by B. Hollingsworth).

forelimb and hindlimb. The tail is long and cylindrical in both sexes and all age groups. There is a median row of paired subcaudals that are the same size or smaller than the adjacent subcaudals and lateral caudals. Enlarged postanal scales are present in males. A deep postfemoral dermal mite pocket is present at each hindlimb insertion. Femoral pores number 20–31, extend beyond the angle of the knee and are separated medially by 10–18 granular scales. The subdigital lamellae on each fourth toe number 20–24. Females attain a larger maximum size (SVL 126 mm) than do males (SVL 120 mm).

The dorsal ground coloration in individuals from southern San Diego County, Sierra de Juarez, Sierra San Pedro Martir, and cismontane northwestern Baja California is generally dark brown with a pair of large paravertebral spots that are separated by cream-colored transverse bars. Lateral flecking is present but lateral spots are absent. Spots are nearly always absent from the head. In southern (e.g. Vizcaíno Desert) populations, the dorsal ground coloration is a pale golden tan with dorsal spots fragmented or obscure; lateral spots may be present. Dorsal spotting may be nearly indistinguishable. The dorsum has fine pale speckling.

The coloration of gravid females consists of two rows of orange or red spots on each flank and the ventral surface of the tail. Spots are often present on the head or neck as well. The thighs may be suffused with red or orange. Males lack any form of breeding coloration.

• **DIAGNOSIS.** The genus *Gambelia* comprises 3 large-sized (maximum SVL = 146 mm in *G. wislizenii*) species occurring throughout the western United States, northern mainland Mexico, and Baja California: *G. sila*, *G. wislizenii*, and *G. copeii*. Adults of both sexes of *G. copeii* are distinguished from other members of the genus by the absence of spotting on the dorsal surface of the head, a pair of large paravertebral spots separated by cream-colored transverse bars, and a conspicuous dark brown or golden tan dorsal ground color. In some southern (e.g., Vizcaíno Desert and Isla de Cedros) individuals of *G. copeii*, the paravertebral spots are nearly indistinguishable. In adults of *G. copeii* and *G. wislizenii*, the snout is elongate, the gular pattern consists of longitudinally black or dark brown streaks, and females obtain larger adult size than males. Male breeding coloration is absent. *Gambelia sila* possess a truncated snout, black linearly arranged spots in the gular region, and males obtain larger adult size than females. Breeding coloration is present in males.

• **DESCRIPTIONS.** The original description of *Gambelia copeii* was published by Yarrow (1882a). A brief description of the species appeared in Boulenger (1885). Banta and Tanner (1968) published Yarrow's original description and provided a redescription and diagnosis of the species after examining the holotype (USNM 12663). McGuire (1996) analyzed morphological variation throughout the known range of the species and provided a detailed description of skeletal morphology, hemipenes, squamation, and coloration in life. Lappin and Swinney (1999) discussed sexual dimorphism in body and cranial size as it relates to the geographic distribution and natural history of the species. Additional descriptions were published by Behler and King (1979), Cope (1900), Grismer (2002), Grismer et al. (1994), Lemm (2006), Mahrtdt and Beaman (2009), Montanucci (1978), Stebbins (2003), and Samaniego Herrera et al. (2007).

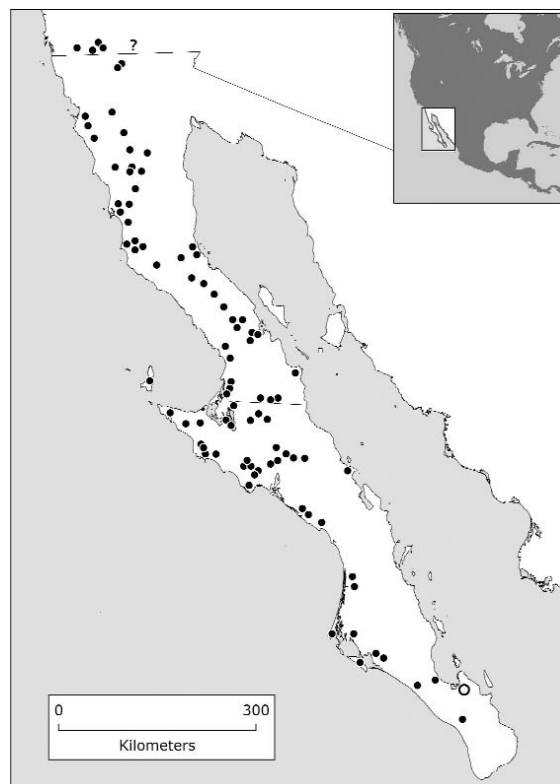
• **ILLUSTRATIONS.** Color photographs of adult

Gambelia copeii appeared in Zoonooz (1972), McGuire (1996), McPeak (2000), and Samaniego Herrera et al. (2007). A color photograph of an adult *G. copeii* in its natural habitat was published in Grismer (2002). Color photographs of adult and juvenile lizards appeared in Lemm (2006) and Mahrdt and Beaman (2009). A color illustration appeared in Stebbins (2003). A black-and-white photograph of the dorsal view of an adult appeared in Montanucci (1978). Black-and-white photographs of 3 adults from San Luis Gonzaga, Isla Cedros, Vizcaino Desert, and a juvenile from Isla Cedros were published in Grismer et al. (1994). A black-and-white photograph showing dorsal and ventral views of the holotype, a dorsal view of a juvenile, and dorsal and ventral views of an adult male from Isla Cedros were published in Banta and Tanner (1968). Line drawings depicting a dorsal view of the posterior portion of the right mandible and the hyoid skeleton appeared in McGuire (1996).

• **DISTRIBUTION.** *Gambelia copeii* occurs in extreme south-central San Diego County, California, USA and Baja California, Mexico southward to the Isthmus of La Paz and the north Cape Region. Elevations range from near sea level to 1480 m on the Pacific slope of the Sierra San Pedro Martir at Rancho Concepción, Baja California (Welsh 1988). The species occurs in a variety of habitats and plant communities including coastal dunes, sandy flats and arroyos with sparse vegetation, and on rocky mesas and hillsides with chaparral vegetation (Grismer 2002). See **Comment**.

In northern Baja California, the species occurs in the western foothills of the Sierra de Juarez and Sierra de San Pedro Mártir, and eastward to Paseo de San Matias where it meets and is narrowly syntopic with *G. wislizenii*. *Gambelia copeii* is presumed absent from the coastal valleys and mesas north of San Quintín (Grismer 2002), perhaps due to insufficient field work in the region. Southward, *G. copeii* reaches the Pacific coast at El Socorro, (lat. 30°20' N) and the Gulf of California at El Huerfanito, 50 km north of Bahía San Luis Gonzaga (lat. 30°05' N). It occurs in high densities throughout the central desert region and sandy plains of the Vizcaino Desert, and is distributed southward along the Pacific Coast of the Magdalena Plain to the north Cape Region. The southernmost locality is 1 km north of Rancho Tres (= Cuatro) Hermanos (lat. 23°45' N) and 36 km north of Todo Santos (McGuire 1996). Until recently, *Gambelia copeii* was thought to be absent from coastal areas of the Gulf of California between Punta San Francisquito in the north to La Paz in the south. However, discovery of a specimen near Punta Chivato (lat. 27°04' N), approximately 20 km north of Mulegé (Zepewski et al. 2003), suggests that *G. copeii* might occur in low densities throughout the coastal plain and mountain foothills of this area. The species occurs on the Pacific islands of Cedros, Magdalena, and Santa Margarita (Grismer 2002).

In San Diego County, the distribution of *G. copeii* is highly restricted and disjunct due, in part, to low population density and a lack of suitable habitat. Six mu-



MAP. Distribution of *Gambelia copeii*. The circle indicates the type-locality. Dots indicate other known localities; some dots represent two or more proximate localities. The question marks indicate two records of uncertain validity. All localities plotted are based on museum specimens, literature records, or photo vouchers.

seum specimens and 16 confirmed sightings exist, mainly in the vicinity of Campo Valley. Its known range in the county is approximately 70 km². The presence of a leopard lizard (*G. wislizenii*), based on a single record from Campo in cismontane San Diego County, was first noted by Van Denburgh (1922). Klauber (1928, 1934) and Shaw (1950) suggested that the species was “occasional” in the western foothills along the southern border of the county. Currently, *G. copeii* occurs from Dulzura (Klauber 1928 and unpub. field notes) (32°38'33" N, 116°46'45" W) east to 3.0 km northeast of Cameron Corners (32°38'33" N, 116°26'41" W) (Mahrdt 1973). The species has not been observed in the vicinity of Dulzura and Cottonwood Creek despite several years of extensive field work in southern San Diego County (R. Fisher pers. comm.). Based on locality and habitat, a hatchling *G. copeii* (CAS 119) from Cottonwood Canyon, SW of Mason Valley (western Borrego Desert) collected by E.W. Hyatt around 1892 is considered to be *G. wislizenii*. McGuire (1996) included this record on a distribution map for *G. wislizenii*. An observation from the desert foothills of Davies Valley (elev. 380 m), southwestern Imperial County (Fritts 1978) requires verification.

Range and distribution maps appeared in Banta and Tanner (1968), Grismer (1994a, 1994b, 2002), Lappin and Swinney (1999), Lemm (2006), Mahrdt and Beaman (2009), McGuire (1996), Stebbins

(2003), and Samaniego Herrera et al. (2007). A list of museum locality records appeared in Banta and Tanner (1968) and McGuire (1996).

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** Banta and Tanner (1968) and McGuire (1996) presented comprehensive reviews of *G. copeii* and its relationship with other members of the *Crotaphytidae*. McGuire (1996) elevated *G. copeii* to species status, a taxonomic arrangement that was subsequently followed by Collins (1997), Powell et al. (1998), Grismer (2002), Stebbins (2003) and Crother (2008). Aspects of the biology of *G. copeii* include: **behavior** (Grismer 2002; McGuire 1996), **biogeography and evolution** (Grismer 1990, 1994a-c; Grismer et al. 1994; Lovich and Grismer 2009; McGuire 1996; McGuire et al. 2007; Orange et al. 1999; Schulte and Moreno-Roark 2010; Welsh 1976, 1988), **conservation** (Conserv. Biol. Inst. 2003; Galina-Tessaro et al. 2002, 2003), **ecology** (Vincent and Herrel 2007), **parasites** (Goldberg et al. 2009), **habitat** (Bostic 1971; Fritts 1978; Grismer 2002; Welsh 1976, 1988), **systematics and taxonomy** (Banta and Tanner 1968; Cope 1900; Dickerson 1917; Grismer et al. 1994; Linsdale 1932; McGuire 1996; Mocquard 1889, 1903; Montanucci 1978; Schmidt 1922; Stejneger 1890; Tanner and Banta 1963, 1977; Van Denburgh 1895, 1905, 1922), **reproduction** (Grismer 2002; McGuire 1996, and **sexual dimorphism** (Lappin and Swinney 1999). *Gambelia copeii* has appeared in the following **checklists, taxonomic keys, and similar compendia** (Behler and King 1979; Belding 1887b; Beltz 1995; Cochran 1961; Collins 1990, 2001; Collins and Taggart 2002; Collins et al. 1978, 1982; Cope 1887; Crother 2000, 2008; Flores-Villela and Canseco-Márquez 2004; Frank and Ramus 1995; Garman 1884; Grismer 1993, 2001, 2002; Grismer et al. 1994; Jennings 1983, 1987, 2004; Lemm 2006; Leviton and Banta 1964; Limer 2007; Loomis et al. 1974; Lovich and Mahrtdt 2008; Mahrtdt and Beaman 2009; McPeak 2000; Mellink 2002; Mosauer 1936; Nelson 1921; Powell et al. 1998; Samaniego Herrera et al. 2007; Sanborn and Loomis 1976; Smith and Brodie 1982; Smith and Smith 1976, 1993; Sokolov 1988; Stebbins 2003; Stejneger and Barbour 1917; Van Denburgh 1895, 1905; Yarrow 1882b).

• **NOMENCLATURAL HISTORY.** Since the description of *Gambelia copeii* (Yarrow 1882a), several authors (Cope 1900, Ruthven 1907, Schmidt 1922, Linsdale 1932, Smith and Taylor 1950a,b, Van Denburgh 1895, 1905, 1922, and Van Denburgh and Slevin 1914) have questioned the validity of the species based on inadequate sample size and evident geographic variation, placing it in synonymy with *G. wislizenii* (Baird and Girard 1852). Dickerson (1917) agreed with Yarrow's designation after examining a specimen from Cedros Island and from Tiburon Island "[as] being a longer and relatively larger-headed form than any other species of the *Crotaphytus wislizenii* group known". Stejneger and Barbour (1917)

and Nelson (1921) also recognized the species by including it in their geographic checklists. Leviton and Banta (1964), without comment, used the subspecies designation *C. w. copeii* in a checklist of the herpetofauna of the Cape Region of Baja California. Banta and Tanner (1968) presented a re-description of the holotype and 50 additional specimens from peninsular Baja California, and retained the subspecific designation. In addition, they described a new subspecies, *Crotaphytus wislizeni neseotes*, from Cedros Island, Baja California, Mexico, which was subsequently rejected by Montanucci (1978) based on the high degree of pattern polymorphism and lack of "meristic comparisons between *copei* and *neseotes*." Later, Murphy (1983) recognized *G. wislizenii* without subspecies and as occurring in all faunal zones of Baja California. The concept of *Gambelia copeii* as a species went largely unaccepted until McGuire (1996), in the first comprehensive review of the *Crotaphytidae*, provided additional morphological and ecological data distinguishing *G. copeii* from *G. wislizenii*. More importantly, McGuire (1996) observed that *G. copeii* and *G. wislizenii* appear to occur in syntopy within a 1.6 km stretch of San Matias Pass in northeastern Baja California. Here, the lower Colorado Desert connects with the more mesic foothills and coastal regions of northwestern Baja California, and other reptile sister taxa can also be found in sympatry (i.e., *Sceloporus zosteromus* and *S. magister*; Grismer and McGuire 1996). Because *G. copeii* and *G. wislizenii* differ primarily in aspects of dorsal pattern and coloration, McGuire (1996) and McGuire et al. (2007) argued that a definitive assessment of species status for *G. copeii* would require genetic analysis of gene flow, an analysis which has yet to be undertaken. The current designation of *G. copeii* as a valid species has received wide acceptance since the revision of the *Crotaphytidae* by McGuire (1996) (see **Pertinent Literature**).

• **REMARKS.** The double-*i* suffix of *copeii* is the correct spelling as proposed in the original description of the species (Yarrow 1882a) with *copei* (suffix-*i*) an incorrect subsequent spelling (ICZN 1999, Art. 33.4). However, either spelling can be correct if proposed in the original spelling of the name of a species (ICZN 1999, Art. 31.1.3).

The recognized common name for this species is Cope's Leopard Lizard (Collins and Taggart 2002, Crother 2008, Lemm 2006, Stebbins 2003). It was first used by Collins et al. (1978) and Behler and King (1979) as the common name for the subspecies *G. w. copei*. Grismer (2002) introduced the name Baja California Leopard Lizard, in view of the fact that the species is almost entirely restricted to the Baja California peninsula. This name was later used by Samaniego Herrera et al. (2007).

The range map published by Banta and Tanner (1968) incorrectly showed the species occurring from the gulf coast between Punta Chivato and the southern terminus of the Sierra de la Giganta north of La Paz and throughout the Cape Region. There are no records of *G. copeii* from these regions in Baja Cali-

foria. In addition, the range map of Banta and Tanner (1968) showed *G. copeii* occurring in the lower Colorado Desert between San Felipe and Puertocitos, a region inhabited by *G. wislizenii*.

• **ETYMOLOGY.** The name *copeii* is a patronym honoring the distinguished American herpetologist and paleontologist Edward Drinker Cope.

• **COMMENT.** Unlike the arid Vizcaino Desert, Magdalena Plain, and Isthmus of La Paz populations of *G. copeii* in central and southern Baja California, northern populations in the California Phytogeographic Region occur at higher elevations in open, scattered patches of chaparral and inland sage scrub. In the southern foothills and mesas of San Diego County, *G. copeii* prefers mixed chaparral and sage scrub vegetation dominated by Great Basin Sagebrush (*Salvia tridentata*), Buckwheat (*Eriogonum fasciculatum*), Chamise (*Adenostoma fasciculatum*), oaks (*Quercus* sp.) and Sugar Bush (*Rhus ovata*). Soil type is characterized by medium- to coarse-grained granitic soil; granodiorite boulder outcroppings may be present (CRM unpubl. field notes).

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LITERATURE CITED

- Baird, S.F. and C. Girard. 1852. Appendix C. Reptiles, p. 336–365. In Howard Stansbury, An expedition to the valley of the Great Salt Lake of Utah. Lippincott, Grambo and Co., Philadelphia.
- Banta, B.H. and W.W. Tanner. 1968. The systematics of *Crotaphytus wislizenii*, the leopard lizards (Sauria: Iguanidae). Part II. A review of the status of the Baja California peninsular populations and a description of a new subspecies from Cedros Island. Great Basin Nat. 28:183–194.
- Behler, J.L. and F.W. King. 1979. The Audubon Society Field Guide to North American Reptiles and Amphibians. A.A. Knopf, New York.
- Belding, L. 1887a. Collecting in the cape region of Lower California. West. Amer. Sci. 3(24):93–97.
- . 1887b. Reptiles of the cape region of Lower California. West. Amer. Sci. 3(24):97–99.
- Beltz, E. 1995. Citations for the original descriptions of North American amphibians and reptiles. SSAR Herpetol. Circ. (24):1–44.
- Bostic, D.L. 1971. Herpetofauna of the Pacific coast of north central Baja California, Mexico, with a description of a new subspecies of *Phyllodactylus xanti*. Trans. San Diego Soc. Nat. Hist. 16:237–263.
- Boulenger, G.A. 1885. Catalogue of the Lizards in the British Museum (Natural History). 2nd ed., Vol. 2. Trustees of the British Museum (Natural History), London.
- Cochran, D.M. 1961. Type specimens of reptiles and amphibians in the U.S. National Museum. Bull. U.S. Natl. Mus. (220):xv + 291 p.
- Collins, J.T. 1990. Standard common and current scientific names for North American amphibians and reptiles. 3rd ed. SSAR Herpetol. Circ. (19):1–41.
- . 1997. Standard common and current scientific names for North American amphibians and reptiles. 4th ed., rev. SSAR Herpetol. Circ. (25):1–40.
- and T.W. Taggart. 2002. Standard common and current scientific names for North American amphibians, turtles, reptiles, and crocodylians. 5th ed. Publication of the Center for North American Herpetology, Lawrence, Kansas. 44 p.
- , J.E. Huheey, J.L. Knight, and H.M. Smith. 1978. Standard common and current scientific names for North American Amphibians and Reptiles. SSAR Herpetol. Circ. (7):1–36.
- , R. Conant, J.E. Huheey, J.L. Knight, E.M. Rundquist, and H.M. Smith. 1982. Standard common and current scientific names for North American amphibians and reptiles. 2nd ed. SSAR Herpetol. Circ. (12):1–28.
- Conservation Biology Institute. 2003. La Posta Linkage Portfolio, San Diego County, California. Unpubl. Report, 37 pp.
- Cope, E.D. 1887. Catalogue of batrachians and reptiles of Central America and Mexico. Bull. U.S. Natl. Mus. (32):1–98.
- . 1900. The Crocodylians, Lizards, and Snakes of North America. Ann. Rep. U.S. Natl. Mus. 1898: 153–1270 + 36 pl.
- Crother, B.I., J. Boundy, J.A. Campbell, K. de Queiroz, D.R. Frost, R. Highton, J.B. Iverson, P.A. Meylan, T.W. Reeder, M.E. Seidel, J.W. Sites, Jr., T.W. Taggart, S.G. Tilley, and D.B. Wake. 2000. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with comments regarding confidence in our understanding. SSAR Herpetol. Circ. (29):iii + 82 p.
- , –, F.T. Burbrink, J.A. Campbell, K. de Queiroz, D.R. Frost, R. Highton, J.B. Iverson, F. Kraus, R.W. McDiarmid, J.R. Mendelson III, P.A. Meylan, T.W. Reeder, M.E. Seidel, S.G. Tilley, and D.B. Wake. 2008. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with comments regarding confidence in our understanding. 6th ed. SSAR Herpetol. Circ. (37):1–90.
- Dickerson, M.C. 1917. Systematic note on Lower California lizards. Copeia (50):96–98.
- Flores-Villela, O. and L. Canseco-Márquez. 2004. Nuevas especies y cambios taxonómicos para la herpetofauna de México. Acta Zool. Mex. (n.s.) 20:115–144.
- Frank, N. and E. Ramus. 1995. A Complete Guide to Scientific and Common Names of Reptiles and Amphibians of the World. N G Publ., Inc., Pottsville, Pennsylvania.
- Fritts, T.H. 1978. Faunal studies of the reptiles and amphibians of southwestern Imperial County, Cal-

- ifornia. Report U.S. Dept. Interior, Bureau of Land Management, Contract No. CA-060-CT7-1437.
- Galina-Tessaro, P., A. Castellanos-Vera, E. Troyo D., G. Arnaud F., and A. Ortega-Rubio. 2003. Lizard assemblages in the Vizcaino Biosphere Reserve, Mexico. *Biodivers. Conserv.* 12:1321-1334.
- , L.L. Grismer, B.D. Hollingsworth, and A. Ortega-Rubio. 2002. Distribution and conservation of lizards in the Vizcaino Biosphere Reserve, Baja California Sur, México. *Southwest. Nat.* 47:40-55.
- Garman, S. 1884. The North American reptiles and batrachians. A list of the species occurring north of the Isthmus of Tehuantepec, with references. *Bull. Essex Inst.* 16:1-46.
- Goldberg, S.R., C.R. Bursley, K.R. Beaman, and C.R. Mahrtdt. 2009. Natural history notes. *Gambelia copei* (Cope's Leopard Lizard). *Endoparasites. Herpetol. Rev.* 40:85.
- Grismer, L.L. 1990. The reptiles and amphibians of Baja California. *Tucson Herpetol. Soc. Newsl.* 3: 2-6.
- . 1993. The insular herpetofauna of the Pacific Coast of Baja California, México. *Herpetol. Nat. Hist.* 1:1-10.
- . 1994a. The Evolutionary and Ecological Biogeography of the Herpetofauna of Baja California and the Sea of Cortés, México. Ph.D. Diss., Loma Linda Univ., Loma Linda, California.
- . 1994b. The origin and evolution of the peninsular herpetofauna of Baja California, México. *Herpetol. Nat. Hist.* 2:51-106.
- . 1994c. Ecogeography of the peninsular herpetofauna of Baja California, Mexico and its utility in historical biogeography, p. 89-125. *In* P.R. Brown and J.W. Wright (eds.), *Herpetology of North American Deserts: Proceedings of a Symposium.* Southwest. Herpetol. Soc. Spec. Publ. (5).
- . 2001. An evolutionary classification and checklist of amphibians and reptiles on the Pacific Islands of Baja California, Mexico. *Bull. So. California Acad. Sci.* 100:12-23.
- . 2002. *The Amphibians and Reptiles of Baja California, its Pacific Islands, and the Islands in the Sea of Cortés, México: Natural History, Distribution and Identification.* Univ. California Press, Berkeley.
- and J.A. McGuire. 1996. The systematics, classification, and biogeography of the *Sceloporus magister* complex. *Herpetologica* 52:416-427.
- , -, and B.D. Hollingsworth. 1994. A report on the herpetofauna of the Vizcaino Peninsula, Baja California, Mexico with a discussion of its biogeographic and taxonomic implications. *Bull. So. California Acad. Sci.* 93:45-80.
- International Commission on Zoological Nomenclature (ICZN). 1999. *International Code of Zoological Nomenclature.* Fourth Edition. International Trust for Zoological Nomenclature, c/o The Natural History Museum, London.
- Jennings, M.R. 1983. An annotated checklist of the amphibians and reptiles of California. *California Fish and Game* 69:151-171.
- . 1987. Annotated checklist of the amphibians and reptiles of California. 2nd ed. Southwest. Herpetol. Soc., Spec. Publ. (3):1-48.
- . 2004. An annotated checklist of the amphibians and reptiles of California and adjacent waters. 3rd rev. ed. *California Fish and Game* 90:161-213.
- Klauber, L.M. 1928. A list of the amphibians and reptiles of San Diego County, California. *Bull. Zool. Soc. San Diego* (4):1-8.
- . 1934. Annotated list of the amphibians and reptiles of the southern border of California. *Bull. Zool. Soc. San Diego* (11):1-28.
- Lappin, A.K. and E.J. Swinney. 1999. Sexual dimorphism as it relates to natural history of leopard lizards (*Crotaphytidae: Gambelia*). *Copeia* 1999: 649-660.
- Lemm, J.M. 2006. *Field Guide to Amphibians and Reptiles of the San Diego Region.* California Natural History Guides, Univ. California Press, Berkeley.
- Leviton, A.E. and B.H. Banta. 1964. Midwinter reconnaissance of the cape region of Baja California, Mexico. *Proc. California Acad. Sci., 4th Ser.,* 30: 127-156.
- , R.H. Gibbs, Jr., E. Heal, and C.E. Dawson. 1985. Standards in herpetology and ichthyology: Part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. *Copeia* 1985:802-821.
- Liner, E.A. 1994. Scientific and common names for the amphibians and reptiles of Mexico in English and Spanish. *Nombres científicos y comunes en Inglés y Español de los anfibios y reptiles de México.* SSAR Herpetol. Circ. (23):v + 113 p.
- . 2007. A checklist of amphibians and reptiles of México. *Occas. Pap. Mus. Nat. Sci., Louisiana St. Univ.* (80):1-60
- Linsdale, J.M. 1932. Amphibians and reptiles of Lower California. *Univ. California Publ. Zool.* 38: 345-386.
- Loomis, R.B., S.G. Bennett, S.R. Sanborn, C.H. Barbour, and H. Weiner. 1974. *A handlist of the herpetofauna of Baja California and adjacent islands.* Privately. printed. California State Univ., Long Beach.
- Lovich, R. and C.R. Mahrtdt. 2008. Herpetofauna terrestre, p. 495-521. *In* G. Danemann y E. Ezcurra (eds.), *Bahía de Los Angeles: recursos naturales y comunidad.* Línea base 2007. Pronatura Noroeste AC, Secretaría de Recursos Naturales y Medio Ambiente, Instituto Nacional de Ecología y Museo de Historia Natural de San Diego.
- and L.L. Grismer. 2009. Lizards of Baja California (Norte) and Baja California Sur, México, p. 503-507. *In* L.L.C. Jones and R.E. Lovich (eds.), *Lizards of the American Southwest: a Photographic Field Guide.* Rio Nuevo Publ., Tucson, Arizona.
- Mahrtdt, C.R. 1973. Geographic Distribution, *Sauria, Crotaphytus wislizenii copei* (leopard lizard). *HISS News J.* 1:98.
- and K.R. Beaman. 2009. Cope's Leopard Lizard *Gambelia copeii* (Yarrow, 1882), p. 116-119. *In* L.L.C. Jones and R.E. Lovich (eds.), *Lizards of the American Southwest: a Photographic Field*

- Guide. Rio Nuevo Publ., Tucson, Arizona.
- McGuire, J.A. 1996. Phylogenetic systematics of crotophytid lizards (Reptilia: Iguania: Crotophytidae). *Bull. Carnegie Mus. Nat. Hist.* (32):1–143.
- , C.W. Linkem, M.S. Koo, D.W. Hutchison, A.K. Lapin, D.I. Orange, J. Lemos-Espinal, B.R. Riddle, and J.R. Jaeger. 2007. Mitochondrial introgression and incomplete lineage sorting through space and time: phylogenetics of crotophytid lizards. *Evolution* 61:2879–2897.
- McPeak, R.H. 2000. Amphibians and Reptiles of Baja California. Sea Challengers, Monterey, California.
- Mellink, E. 2002. El limite sur de la region mediterranea de Baja California, con base en sus tetrapodos endemicos. *Acta Zool. Mex. (n.s.)* 85: 11–23.
- Mocquard, M.F. 1899. Contribution à la faune herpétologique de la Basse-Californie. *Nouv. Arch. Mus. d'Hist. Nat. Paris* (4)1:297–344.
- . 1903. Notes herpétologiques. *Bull. Mus. d'Hist. Nat. Paris* 1903(5):209–221.
- Montanucci, R.R. 1978. Dorsal pattern polymorphism and adaptation in *Gambelia wislizenii* (Reptilia, Lacertilia, Iguanidae). *J. Herpetol.* 12:73–81.
- Mosauer, W. 1936. The reptilian fauna of sand dune areas of the Vizcaino Desert and of northwestern Lower California. *Occas. Pap. Mus. Zool. Univ. Michigan* (329):1–21
- Murphy, R.W. 1983. Paleogeography and genetic differentiation of the Baja California herpetofauna. *Occas. Pap. California Acad. Sci.* (137):1–48.
- Nelson, E.W. 1921. Lower California and its natural resources. *Mem. Nat. Acad. Sci.* (16):1–194.
- Orange, D.I., B.R. Riddle, and D.C. Nickle. 1999. Phylogeography of a wide-ranging desert lizard, *Gambelia wislizenii* (Crotophytidae). *Copeia* 1999:267–273.
- Powell, R., J.T. Collins, and E.D. Hooper, Jr. 1998. A Key to the Amphibians and Reptiles of the Continental United States and Canada. Univ. Press Kansas, Lawrence.
- Ruthven, A.G. 1907. A collection of reptiles and amphibians from southern New Mexico and Arizona. *Bull. Amer. Mus. Nat. Hist.* 23:483–603.
- Samaniego Herrera, A., A. Peralta García, and A. Aguirre Muñoz. 2007. Vertebrados de las islas del Pacífico de Baja California: Guía de campo. Grupo de Ecología y Conservación de Islas, A.C., Ensenada, Baja California, México.
- Sanborn, S.R. and R.B. Loomis. 1976. Keys to the amphibians and reptiles of Baja California, Mexico, and the adjacent islands. Privately printed. California State Univ., Long Beach.
- Schmidt, K.P. 1922. The amphibians and reptiles of Lower California and the neighboring islands. *Bull. Amer. Mus. Nat. Hist.* 46:607–707.
- Schulte, J.A., II and F. Moreno-Roark. 2010. Live birth among iguanian lizards predates Pliocene-Pleistocene glaciations. *Biol. Lett.*, in press.
- Shaw, C.E. 1950. The lizards of San Diego County with descriptions and key. *Bull. Zool. Soc. San Diego* (25):1–63.
- Smith, H.M. and E.D. Brodie, Jr. 1982. A Guide to Field Identification: Reptiles of North America. Golden Press, New York.
- and R.B. Smith. 1976. Synopsis of the Herpetofauna of Mexico. Source Analysis and Index for Mexican Reptiles. Vol. III. John Johnson, North Bennington, Vermont.
- and –. 1993. Synopsis of the Herpetofauna of Mexico. Vol. VII. Bibliographic Addendum IV and Index, Bibliographic Addenda II–IV. Univ. Press of Colorado, Niwot.
- and E.H. Taylor. 1950a. An annotated checklist and key to the reptiles of Mexico exclusive of the snakes. *Bull. U.S. Natl. Mus.* (199): v + 253 p.
- and E.H. Taylor. 1950b. Type localities of Mexican reptiles and amphibians. *Univ. Kansas Sci. Bull.* 33:313–380.
- and –. 1966. Herpetology of Mexico. Annotated Checklists and Keys to the Amphibians and Reptiles. Eric Lundberg, Ashton, Maryland.
- Sokolov, V.E. 1988. Dictionary of Animal Names in Five Languages. Amphibians and Reptiles. Russky Yazyk, Moscow.
- Stebbins, R.C. 2003. A Field Guide to Western Reptiles and Amphibians. 3rd ed. Houghton Mifflin Co., Boston Massachusetts.
- Stejneger, L. 1890. Annotated list of reptiles and batrachians collected by Dr. C. Hart Merriam and Vernon Bailey on the San Francisco Mountain Plateau and desert of the Little Colorado, Arizona, with descriptions of new species. *North Amer. Fauna* (3):103–118.
- and T. Barbour. 1917. A checklist of North American Amphibians and Reptiles. Harvard Univ. Press, Cambridge, Massachusetts.
- Tanner, W.W. and B.H. Banta. 1963. The systematics of *Crotaphytus wislizeni*, the leopard lizards. Part I: a redescription of *Crotaphytus w. wislizeni* Baird and Girard and a description of a new subspecies from the upper Colorado River basin. *Great Basin Nat.* 23:129–148.
- and –. 1977. The systematics of *Crotaphytus wislizeni*, the leopard lizards. Part III. The leopard lizards of the Great Basin and adjoining areas, with a description of a new subspecies from the Lahontan Basin. *Great Basin Nat.* 37:225–240.
- Van Denburgh, J. 1895. A review of the herpetology of Lower California. Part I - Reptiles. *Proc. California Acad. Sci.*, 2nd Ser., 5:77–162.
- . 1905. The reptiles and amphibians of the islands of the Pacific Coast of North America from the Farallons to Cape San Lucas and the Revilla Gigedos. *Proc. California Acad. Sci.*, 3rd Ser. 4:1–41.
- . 1922. The reptiles of western North America Vol. I. Lizards. *Occas. Pap. California Acad. Sci.* (10): 1–611.
- Vincent, S.E. and A. Herrel. 2007. Functional and ecological correlates of ecologically-based dimorphisms in squamate reptiles. *Integr. Comp. Biol.* 47:172–188.
- Welsh, H.H., Jr. 1976. Ecogeographic Distribution of the Herpetofauna of the Sierra San Pedro Mártir Region, Baja California Norte, Mexico. M.S. Thesis, Humboldt State Univ., Arcata, California.

- . 1988. An ecogeographic analysis of the herpetofauna of the Sierra San Pedro Mártir Region, Baja California, with a contribution to the biogeography of the Baja California herpetofauna. Proc. California Acad. Sci. 46:1–72.
- Yarrow, H.C. 1882a. Descriptions of new species of reptiles and amphibians in the United States National Museum. Proc. U.S. Natl. Mus. 5:438–443
- . 1882b. Check list of North American Reptilia and Batrachia, with catalogue of specimens in U.S. National Museum. Bull. U.S. Natl. Mus. (24):v +[i] + 249 p.
- Zepenewski, E.D., C.A. Carreno, and A.K. Lappin. 2003. Geographic Distribution. *Gambelia copei*. Herpetol. Rev. 34:166.
- Zoonooz. 1972. [Photograph of *Gambelia copeii* from Cameron Corners, San Diego County, California], 45:19.

Clark R. Mahrtdt, Herpetology Department, San Diego Natural History Museum, P.O. Box 121390, San Diego, CA, 92112 (leopardlizard@cox.net), **Jimmy A. McGuire**, Museum of Vertebrate Zoology and Department of Integrative Biology, University of California, Berkeley, CA 94720, **Kent R. Beaman**, Ichthyology and Herpetology, Natural History Museum of Los Angeles County, 900 Exposition Blvd., Los Angeles, CA 90007 (heloderma@adelphia.net).

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