

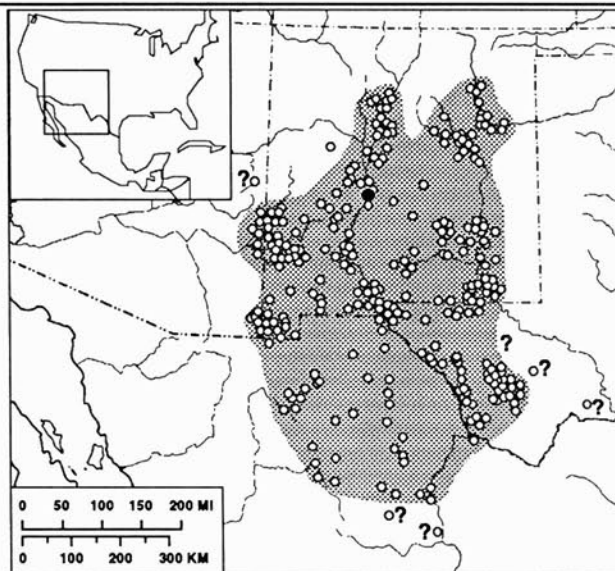
Catalogue of American Amphibians and Reptiles.

Stuart, J.N. 1991. *Cnemidophorus exsanguis*.

***Cnemidophorus exsanguis* Lowe**
Chihuahuan Spotted Whiptail lizard

- Cnemidophorus gularis*: Ruthven, 1907:556 (part).
Cnemidophorus sexlineatus gularis: Burt, 1931:97 (part).
Cnemidophorus sexlineatus perplexus: Burt, 1931:122 (part).
Cnemidophorus sexlineatus sackii: Mosauer, 1932:9.
Cnemidophorus gularis octolineatus: Smith, 1946:409 (part).
Cnemidophorus sackii stictogrammus: Burger, 1950:5 (part).
Cnemidophorus sackii strictogrammus: Stebbins, 1954:324 (part).
 Emendation and lapsus.
Cnemidophorus sackii stictogrammus: Chrapliwy and Fugler, 1955:126 (part). Emendation.
Cnemidophorus sackii exsanguis Lowe, 1956:138. Type-locality, "Socorro, Socorro County, New Mexico." Holotype, University of Arizona (UAZ) 16188 (formerly University of California, Los Angeles, Dept. of Zoology 3737), collected by Richard G. Zweifel and Kenneth S. Norris, 10 August 1948 (not examined by author).
Cnemidophorus costatus exsanguis: Maslin, 1962:212 (part). See Remarks.
Cnemidophorus exsanguis: Duellman and Zweifel, 1962:184 (part). First use of combination.
Cnemidophorus exsanguis: Morafka, 1977:73. Lapsus.
Cnemidophorus exsanguis: McCranie and Wilson, 1987:16. Lapsus.
Cnemidophorus exsanguis exsanguis: Smith, 1987:126. See Comment.

• **Content.** No subspecies have been formally described (but see Comment).



Map. The solid circle indicates the type-locality, open circles other records. Open circles outside the range boundary are extralimital. Question marks indicate uncertain records or range boundaries.

• **Definition and Diagnosis.** *Cnemidophorus exsanguis* is a parthenogenetic, allotriploid *Cnemidophorus* of hybrid origin (or origins) within the *sexlineatus* species group (*sensu* Duellman and Zweifel, 1962; Lowe et al., 1970a), distinguished by the following combination of characters: maximum SVL 100 mm; 6 (rarely 7) complete longitudinal light stripes on dorsum (vertebral stripe usu-



Figure. Adult *Cnemidophorus exsanguis* from Albuquerque, Bernalillo County, New Mexico (Museum of Southwestern Biology, University of New Mexico (MSB) 51576, skeleton). Photograph by Charles W. Painter.

ally broken or lacking; paravertebrals may be undulant but rarely broken; light stripes separated by black, dark brown, or reddish brown interspaces on torso; numerous light spots overlapping stripes and dark interspaces and on hindlimbs; venter immaculate; mesopterygial scales abruptly enlarged; postantibrachial scales distinctly enlarged.

The hatchling and juvenile dorsal color pattern differs from the adult pattern by the restriction of spots to the dark interspaces, low color intensity of spots versus stripes or absence of spots on body, and high intensity of vermiculate pattern on limbs (equivalent to that of stripes). Stripes and limb pattern both fade with maturity, whereas dorsal spots on body and hindlimbs usually become more distinct, typically surpassing the intensity of stripes at approximately 80 mm SVL.

Cnemidophorus exsanguis is closely allied morphologically (if not ancestrally) with *C. flagellicaudus* and *C. sonora* (all together constituting the *exsanguis* species subgroup, *sensu* Lowe and Wright, 1964), and may be distinguished from these similar forms at points of sympatry by a relatively high count of dorsal light spots in adults, the presence of dorsal spots on the light stripes and between the paravertebral stripes, a greater tendency for distinct dorsal spots on the neck (often extending anteriorly to the occiput), a marked reduction in color intensity of stripes with maturity (particularly on the neck), and the presence of a few dorsal spots in some hatchlings.

• **Descriptions.** Stebbins (1985) and Conant and Collins (1991) provided descriptions of the taxon as currently understood. Meristic and mensural data for various populations are in Lowe and Zweifel (1952), Lowe (1955, 1956), Zweifel (1959, in part), Duellman and Zweifel (1962, in part), Lowe and Wright (1964), Taylor et al. (1967), Christiansen and Degenhardt (1969), and Case (1983). Pennock (1965) and Cole (1979) described the karyotypes (allotriploid, $3n = 69$; and modified allotriploid, $3n = 70-71$).

• **Illustrations.** Black-and-white photographs are in Smith (1946), Lowe and Zweifel (1952), Lowe (1956), Maslin (1959), Cole and Townsend (1977), Townsend (1979), Hardy and Cole (1981), and Dessauer and Cole (1989). Color photographs are in Lowe and Wright (1964), Behler and King (1979), Garrett and Barker (1987), Obst et al. (1988), and Conant and Collins (1991). Line and color drawings are in Stebbins (1954) and (1985), respectively. Neaves (1971) illustrated an apparent *C. exsanguis* × *C. inornatus* hybrid and its tetraploid karyotype, and courtship between these species. Taylor et al. (1967) illustrated a possible male. Line drawings of head scutellation are available in Lowe and Zweifel (1952) and Lowe (1956) and of infralingual plicae in Harris (1985). Hardy and Cole (1981) provided photographs of serial histological sections and line drawings of the urogenital system and associated structures. Townsend and Cole (1985) provided X-ray photographs of the skeleton. Cole (1979) illustrated the karyotype, and Moritz and Brown (1986) provided electron micrographs of mitochondrial DNA.

• **Distribution.** *Cnemidophorus exsanguis* ranges from the upper Rio Grande, Pecos River, and Canadian River valleys of New Mexico (from approximately 36°N latitude) southward through western Texas to central Chihuahua (Rio Conchos and Rio Papigochic drainage basins), and westward to extreme eastern Arizona and northeastern Sonora. The species occurs primarily in Madrean evergreen woodlands (oak-juniper, juniper, and juniper-piñon associations) on mountain bajadas and valley sides, ranging upslope into Great Basin conifer and lower Madrean montane forests, and descending into semi-desert grassland, Chihuahuan desert scrub, and (locally) riparian floodplain communities. The known elevational range is from 760 to 2440 m.

Distributional information and locality records are provided by Axtell and Webb (1963), Smith et al. (1963), Tanner (1975), Van Devender and Lowe (1977), Dixon (1987), Tanner (1987), and Dessauer and Cole (1989). The maps provided by Lowe (1956) and Duellman and Zweifel (1962) include localities for *C. sonora* and *C. flagellicaudus*.

• **Fossil Record.** No fossil material has been unequivocally referred to *C. exsanguis*. Gehlbach and Holman (1974) reported possible recent remains from the Guadalupe Mountains, Culberson County, Texas.

• **Pertinent Literature.** The most comprehensive life history

studies were by Milstead (1957a, 1957b, 1958, 1961) for "*Cnemidophorus sacki*" (including *C. exsanguis*), and Medina (1967). Information on biogeography and habitat use is in Wright and Lowe (1968), Morafka (1977), Whitford and Creusere (1977), Gehlbach (1979), and McCranie and Wilson (1987). Diet and aspects of foraging behavior were studied by Scudday and Dixon (1973), Bissinger and Simon (1979), and Smith (1989). Maslin (1966), Parker (1973), Smith (1974), and Schall (1978) reported on reproduction, and Cole and Townsend (1977), Townsend (1979), and Townsend and Cole (1985) discussed captive care and husbandry. Aberrant specimens have been reported, including apparent hybrids (Zweifel, 1959; Axtell and Webb, 1963; Maslin, 1971; Neaves, 1971) and males (Taylor et al., 1967, 1989), which also may be hybrids (Lowe et al., 1970b). A reference to males by Maslin (1959) is apparently erroneous. Sexual behavior was noted by Neaves (1971), Cole and Townsend (1983), and Crews et al. (1983). Cuellar (1979) discussed sympatry with other congeneric species, and Clark et al. (1982) noted use of prairie dog burrows. Schall (1977) and Schall and Pianka (1980) studied thermal ecology and escape behavior, respectively. Other studies have considered isozyme characteristics (Neaves and Gerald, 1968; Dessauer and Cole, 1984, 1986; Good and Wright, 1984), blood chemistry (Punzo, 1976), parasitism (Ayala and Schall, 1977; McAllister, 1990), genetic similarity to *C. sonora* (Lucchino, 1973; Dessauer and Cole, 1989), anaerobic metabolism (Pough and Andrews, 1985), nucleolar dominance and ribosomal gene suppression (Ward and Cole, 1986), and variability in mitochondrial DNA (Moritz and Brown, 1986; Moritz et al., 1989b). Price (1983) reviewed the available literature.

• **Remarks.** Prior to formal recognition of this form as a distinct taxon, populations of *C. exsanguis* were variously included within other species of the *sexdentatus* species group (see synonymies in Duellman and Zweifel, 1962; and Maslin and Secoy, 1986). The combination *C. sacki exsanguis* first appeared in Lowe (1955: Table 1), antedating the formal description. Maslin (1962) placed the form in *C. costatus*, apparently following the substitution of *costatus* for *sacki* by Zweifel (1961:98). Lowe and Wright (1964) restricted the application of the name to the taxon as currently understood. Duellman and Zweifel (1962) and Maslin (1962) reported the unisexual status of *C. exsanguis*, and studies involving histology (Cuellar, 1968; Hardy and Cole, 1981), protein electrophoresis (Dessauer and Cole, 1984; 1986), captive breeding (Maslin, 1966; Cole and Townsend, 1977), and karyology (Cole, 1979) have since corroborated parthenogenetic reproduction and clonal inheritance in this species. Neaves (1969) first attempted to elucidate the hybrid nature of *C. exsanguis* via enzyme analysis. Subsequent studies involving allozyme electrophoresis (Good and Wright, 1984; Dessauer and Cole, 1989) and mitochondrial DNA analysis (Moritz et al., 1989a, 1989b) have indicated *C. exsanguis* probably arose by the hybridization of *C. septemvittatus* or *C. scalaris* with an allopolyploid intermediate form (or forms) created by one or more earlier hybridization event(s) involving a male *C. inornatus* and a female *C. costatus* or *C. burti*.

• **Etymology.** The name *exsanguis* (L., "without blood") refers to the distinct difference between this species and *C. burti stictogrammus*, with which it was formerly included.

• **Comment.** The taxonomy of *Cnemidophorus exsanguis* and its parthenogenetic congeners has been a subject of some controversy. Maslin (1966, 1968) questioned the recognition by Lowe and Wright (1964) of multiple species within the *exsanguis* subgroup. Walker (1986) proposed an informal taxonomy for *Cnemidophorus* parthenoforms and classified the three formally recognized taxa within the *exsanguis* subgroup as phenotypic variants; *C. exsanguis* was designated as *C. 'exsanguis'-A* or EXSAN-A. Smith (1987) informally proposed that Walker's variants within the subgroup be recognized as subspecies of *C. exsanguis*. Frost and Wright (1988) reviewed the taxonomic treatment of parthenoforms in the genus and noted that the taxon *C. exsanguis* (as currently applied) represents a distinct entity in the subgroup based upon available biochemical evidence and inferred ancestry, a conclusion supported by Dessauer and Cole (1989; see also Cole, 1990; Frost and Hillis, 1990). Without a consensus for the classification of *Cnemidophorus* parthenoforms, retention of the current nomenclatural arrangement in the *exsanguis* subgroup is recommended pending further clarification of relationships within and between formally recognized taxa.

Literature Cited

- Axtell, R.W. and R.G. Webb. 1963. New records for reptiles from Chihuahua, Mexico, with comments on sympatry between two species of *Cnemidophorus*. Southwest. Nat. 8:50-51.
- Ayala, S.C. and J.J. Schall. 1977. Apparent absence of blood parasites in southwestern Texas *Cnemidophorus*. Southwest. Nat. 22: 134-135.
- Behler, J.L. and F.W. King. 1979. The Audubon Society field guide to North American reptiles and amphibians. Alfred A. Knopf, New York.
- Bissinger, B.E. and C.A. Simon. 1979. Comparison of tongue extrusions in representatives of six families of lizards. J. Herpetol. 13: 133-139.
- Burger, W.L. 1950. New, revived, and reallocated names for North American whiptailed lizards, genus *Cnemidophorus*. Nat. Hist. Misc. (65):1-9.
- Burt, C.E. 1931. A study of the teiid lizards of the genus *Cnemidophorus* with special reference to their phylogenetic relationships. Bull. U.S. Natl. Mus. (154):viii + 286 p.
- Case, T.J. 1983. Sympatry and size similarity in *Cnemidophorus*, p. 297-325. In R.B. Huey, E.R. Pianka, and T.W. Schoener (eds.), Lizard ecology: studies of a model organism. Harvard Univ. Press, Cambridge, Massachusetts.
- Chrapliwy, P.S. and C.M. Fugler. 1955. Amphibians and reptiles collected in Mexico in the summer of 1953. Herpetologica 11:121-128.
- Christiansen, J.L. and W.G. Degenhardt. 1969. An unusual variant of the whiptail lizard *Cnemidophorus gularis* (Sauria: Teiidae), from New Mexico. Texas J. Sci. 21:95-97.
- Clark, T.W., T.M. Campbell, III, D.G. Socha, and D.E. Casey. 1982. Prairie dog colony attributes and associated vertebrate species. Great Basin Nat. 42:572-582.
- Cole, C.J. 1979. Chromosome inheritance in parthenogenetic lizards and evolution of allopolyploidy in reptiles. J. Heredity 70:95-102.
- . 1990. When is an individual not a species? Herpetologica 46: 104-108.
- and C.R. Townsend. 1977. Parthenogenetic reptiles: new subjects for laboratory research. Experientia 33:285-289.
- and —. 1983. Sexual behavior in unisexual lizards. Anim. Behav. 31:724-728.
- Conant, R. and J.T. Collins. 1991. A field guide to reptiles and amphibians, eastern and central North America. 3rd ed. Houghton Mifflin Co., Boston.
- Crews, D., J.E. Gustafson, and R.R. Tokarz. 1983. Psychobiology of parthenogenesis, p. 205-231. In R.B. Huey, E.R. Pianka, and T.W. Schoener (eds.), Lizard ecology: studies of a model organism. Harvard Univ. Press, Cambridge, Massachusetts.
- Cuellar, O. 1968. Additional evidence for true parthenogenesis in lizards of the genus *Cnemidophorus*. Herpetologica 24:146-150.
- . 1979. On the ecology of coexistence in parthenogenetic and bisexual lizards of the genus *Cnemidophorus*. Amer. Zool. 19:773-786.
- Dessauer, H.C. and C.J. Cole. 1984. Influence of gene dosage on electrophoretic phenotypes of proteins from lizards of the genus *Cnemidophorus*. Comp. Biochem. Physiol. 77B:181-189.
- and —. 1986. Clonal inheritance in parthenogenetic whiptail lizards: biochemical evidence. J. Heredity 77:8-12.
- and —. 1989. Diversity between and within nominal forms of unisexual teiid lizards, p. 49-71. In R.M. Dawley and J.P. Bogart (eds.), Evolution and ecology of unisexual vertebrates. Bull. New York State Mus. (466).
- Dixon, J.R. 1987. Amphibians and reptiles of Texas, with keys, taxonomic synopses, bibliography, and distribution maps. Texas A&M Univ. Press, College Station.
- Duellman, W.E. and R.G. Zweifel. 1962. A synopsis of the lizards of the *sedineatus* group (genus *Cnemidophorus*). Bull. Amer. Mus. Nat. Hist. 123:155-210.
- Frost, D.R. and D.M. Hillis. 1990. Species in concept and practice: herpetological applications. Herpetologica 46:87-104.
- and J.W. Wright. 1988. The taxonomy of uniparental species, with special reference to parthenogenetic *Cnemidophorus* (Squamata: Teiidae). Syst. Zool. 37:202-209.
- Garrett, J.M. and D.G. Barker. 1987. A field guide to reptiles and amphibians of Texas. Texas Monthly Press, Inc., Austin.
- Gehlbach, F.R. 1979. Biomes of the Guadalupe Escarpment: vegetation, lizards, and human impact, p. 427-439. In H.H. Genoways and R.J. Baker (eds.), Biological investigations in the Guadalupe Mountains National Park, Texas. Nat. Park Serv. Proc. Trans. Ser. (4).
- and J.A. Holman. 1974. Paleogeology of amphibians and reptiles from Pratt Cave, Guadalupe Mountains National Park, Texas. Southwest. Nat. 19:191-197.
- Good, D.A. and J.W. Wright. 1984. Allozymes and the hybrid origin of the parthenogenetic lizard *Cnemidophorus exsanguis*. Experientia 40:1012-1014.
- Hardy, L.M. and C.J. Cole. 1981. Parthenogenetic reproduction in lizards: histological evidence. J. Morphol. 170:215-237.
- Harris, D.M. 1985. Infralingual plicae: support for Boulenger's Teiidae (Sauria). Copeia 1985:560-565.
- Lowe, C.H., Jr. 1955. A new species of whiptailed lizard (genus *Cnemidophorus*) from the Colorado Plateau of Arizona, New Mexico, Colorado, and Utah. Breviora (47):1-7.
- . 1956. A new species and a new subspecies of whiptailed lizards (genus *Cnemidophorus*) of the inland southwest. Bull. Chicago Acad. Sci. 10:137-150.
- and J.W. Wright. 1964. Species of the *Cnemidophorus exsanguis* subgroup of whiptail lizards. J. Arizona Acad. Sci. 3:78-80.
- , —, C.J. Cole, and R.L. Bezy. 1970a. Chromosomes and evolution of the species groups of *Cnemidophorus* (Reptilia, Teiidae). Syst. Zool. 19:128-141.
- , —, —, and —. 1970b. Natural hybridization between the teiid lizards *Cnemidophorus sonoriensis* (parthenogenetic) and *Cnemidophorus tigris* (bisexual). Syst. Zool. 19:114-127.
- and R.G. Zweifel. 1952. A new species of whiptailed lizard (genus *Cnemidophorus*) from New Mexico. Bull. Chicago Acad. Sci. 9:229-247.
- Lucchino, R.V. 1973. Biochemical comparison of two sibling species: *Cnemidophorus exsanguis* and *Cnemidophorus sonoriensis* (Sauria: Teiidae). J. Herpetol. 7:379-380.
- Maslin, T.P. 1959. The nature of amphibian and reptilian species. J. Arizona Acad. Sci. 1:8-17.
- . 1962. All-female species of the lizard genus *Cnemidophorus*, Teiidae. Science 135:212-213.
- . 1966. The sex of hatchlings of five apparently unisexual species of whiptail lizards (*Cnemidophorus*, Teiidae). Amer. Midl. Nat. 76:369-378.
- . 1968. Taxonomic problems in parthenogenetic vertebrates. Syst. Zool. 17:219-231.
- . 1971. Parthenogenesis in reptiles. Amer. Zool. 11:361-380.
- and D.M. Secoy. 1986. A checklist of the lizard genus *Cnemidophorus* (Teiidae). Univ. Colorado Mus., Contrib. Zool. (1):1-60.
- McAllister, C.T. 1990. Helminth parasites of unisexual and bisexual whiptail lizards (Teiidae) in North America. III. The Chihuahuan Spotted Whiptail (*Cnemidophorus exsanguis*). J. Wildl. Dis. 26: 544-546.
- McCranie, J.R. and L.D. Wilson. 1987. The biogeography of the herpetofauna of the pine-oak woodlands of the Sierra Madre Occidental of Mexico. Milwaukee Pub. Mus. Contrib. Biol. Geol. (72):1-30.
- Medica, P.A. 1967. Food habits, habitat preference, reproduction, and diurnal activity in four sympatric species of whiptail lizards (*Cnemidophorus*) in south central New Mexico. Bull. So. California Acad. Sci. 66:251-276.
- Milstead, W.W. 1957a. Observations on the natural history of four species of whiptail lizard, *Cnemidophorus* (Sauria, Teiidae) in Trans-Pecos Texas. Southwest. Nat. 2:105-121.
- . 1957b. Some aspects of competition in natural populations of whiptail lizards (genus *Cnemidophorus*). Texas J. Sci. 9:410-447.
- . 1958. A list of the arthropods found in the stomachs of whiptail lizards from four stations in southwestern Texas. Texas J. Sci. 10: 443-446.
- . 1961. Observations of the activities of small animals (Reptilia and Mammalia) on a quadrat in southwest Texas. Amer. Midl. Nat. 65:127-138.
- Morafka, D.J. 1977. A biogeographical analysis of the Chihuahuan Desert through its herpetofauna. Biogeographica, Vol. 9. W. Junk, The Hague.
- Moritz, C. and W.M. Brown. 1986. Tandem duplication of D-loop and ribosomal RNA sequences in lizard mitochondrial DNA. Science 233:1425-1427.

- , L.D. Densmore, J.W. Wright, D. Vyas, S. Donnellan, M. Adams, and P. Baverstock. 1989a. Genetic diversity and the dynamics of hybrid parthenogenesis in *Cnemidophorus* (Teiidae) and *Heteronotia* (Gekkonidae), p. 87-112. In R.M. Dawley and J.P. Bogart (eds.), *Evolution and ecology of unisexual vertebrates*. Bull. New York State Mus. (466).
- , J.W. Wright, and W.M. Brown. 1989b. Mitochondrial-DNA analyses and the origin and relative age of parthenogenetic lizards (genus *Cnemidophorus*). III. *C. velox* and *C. exsanguis*. *Evolution* 43:958-968.
- Mosauer, W. 1932. The amphibians and reptiles of the Guadalupe Mountains of New Mexico and Texas. Occ. Pap. Mus. Zool. Univ. Michigan (246):1-18.
- Neaves, W.B. 1969. Adenosine deaminase phenotypes among sexual and parthenogenetic lizards in the genus *Cnemidophorus* (Teiidae). *J. Exp. Zool.* 171:175-183.
- . 1971. Tetraploidy in a hybrid lizard of the genus *Cnemidophorus* (Teiidae). *Breviora* (381):1-25.
- and P.S. Gerald. 1968. Lactate dehydrogenase isozymes in parthenogenetic teiid lizards (*Cnemidophorus*). *Science* 160:1004-1005.
- Obst, F.J., K. Richter, and U. Jacob. 1988. The completely illustrated atlas of reptiles and amphibians for the terrarium. T.F.H. Publ., Inc., Neptune City, New Jersey.
- Parker, W.S. 1973. Notes on reproduction of some lizards from Arizona, New Mexico, Texas, and Utah. *Herpetologica* 29:258-264.
- Pennock, L.A. 1965. Triploidy in parthenogenetic species of the teiid lizard, genus *Cnemidophorus*. *Science* 149:539-540.
- Pough, F.H. and R.M. Andrews. 1985. Use of anaerobic metabolism by free-ranging lizards. *Physiol. Zool.* 58:205-213.
- Price, A.H. 1983. Annotated bibliography of the genus *Cnemidophorus* in New Mexico. *Smithson. Herp. Info. Serv.* (58):1-92.
- Punzo, F. 1976. Analysis of the pH and electrolyte components found in the blood plasma of several species of west Texas reptiles. *J. Herpetol.* 10:49-52.
- Ruthven, A.G. 1907. A collection of reptiles and amphibians from southern New Mexico and Arizona. *Bull. Amer. Mus. Nat. Hist.* 23:483-603.
- Schall, J.J. 1977. Thermal ecology of five sympatric species of *Cnemidophorus* (Sauria: Teiidae). *Herpetologica* 33:261-272.
- . 1978. Reproductive strategies in sympatric whiptail lizards (*Cnemidophorus*): two parthenogenetic and three bisexual species. *Copeia* 1978:108-116.
- and E.R. Pianka. 1980. Evolution of escape behavior diversity. *Amer. Nat.* 115:551-566.
- Scudday, J.F. and J.R. Dixon. 1973. Diet and feeding behavior of teiid lizards from Trans-Pecos, Texas. *Southwest. Nat.* 18:279-289.
- Smith, D.D. 1974. Population structure, growth and reproduction of two species of *Cnemidophorus*; one unisexual and one bisexual (abstract). *Herpetol. Rev.* 5:77-78.
- . 1989. A comparison of food habits of sympatric *Cnemidophorus exsanguis* and *Cnemidophorus gularis* (Lacertilia, Teiidae). *Southwest. Nat.* 34:418-420.
- Smith, H.M. 1946. *Handbook of lizards: lizards of the United States and of Canada*. Comstock Publ. Co., Inc., Ithaca, New York.
- . 1987. The concepts of species and subspecies in uniparental populations, reflected in the nomenclature of *Cnemidophorus* (Reptilia: Lacertilia). *Bull. Maryland Herpetol. Soc.* 23:125-127.
- , K.L. Williams, and E.O. Moll. 1963. Herpetological explorations on the Rio Conchos, Chihuahua, México. *Herpetologica* 19:205-215.
- Stebbins, R.C. 1954. *Amphibians and reptiles of western North America*. McGraw-Hill Book Co., New York.
- . 1985. *A field guide to western reptiles and amphibians*. 2nd ed. Houghton Mifflin Co., Boston.
- Tanner, D.L. 1975. Lizards of the New Mexican Llano Estacado and its adjacent river valleys. *Eastern New Mexico Univ. Stud. Nat. Sci.* 2:1-39.
- Tanner, W.W. 1987. Lizards and turtles of western Chihuahua. *Great Basin Nat.* 47:383-421.
- Taylor, H.L., C. Currie, and J.J. Baker. 1989. The mode of origin for males collected from natural clones of parthenogenetic lizards (*Cnemidophorus*): cytological evidence. *J. Herpetol.* 23:202-205.
- , J.M. Walker, and P.A. Medica. 1967. Males of three normally parthenogenetic species of teiid lizards (genus *Cnemidophorus*). *Copeia* 1967:737-743.
- Townsend, C.R. 1979. Establishment and maintenance of colonies of parthenogenetic whiptail lizards. *Intl. Zoo Yearbook* 19:80-86.
- and C.J. Cole. 1985. Additional notes on requirements of captive whiptail lizards (*Cnemidophorus*), with emphasis on ultraviolet radiation. *Zoo Biol.* 4:49-55.
- Van Devender, T.R. and C.H. Lowe, Jr. 1977. Amphibians and reptiles of Yepomé, Chihuahua, Mexico. *J. Herpetol.* 11:41-50.
- Walker, J.M. 1986. The taxonomy of parthenogenetic species of hybrid origin: cloned hybrid populations of *Cnemidophorus* (Sauria: Teiidae). *Syst. Zool.* 35:427-440.
- Ward, O.G. and C.J. Cole. 1986. Nucleolar dominance in diploid and triploid parthenogenetic lizards of hybrid origin. *Cytogenet. Cell Genet.* 42:177-182.
- Whitford, W.G. and F.M. Creusere. 1977. Seasonal and yearly fluctuations in Chihuahuan Desert lizard communities. *Herpetologica* 33:54-65.
- Wright, J.W. and C.H. Lowe. 1968. Weeds, polyploids, parthenogenesis, and the geographical and ecological distribution of all-female species of *Cnemidophorus*. *Copeia* 1968:128-138.
- Zweifel, R.G. 1959. Variation in and distribution of lizards of western Mexico related to *Cnemidophorus sacki*. *Bull. Amer. Mus. Nat. Hist.* 117:57-116.
- . 1961. Relationship of two whiptail lizards (genus *Cnemidophorus*) in western Mexico. *Copeia* 1961:98-103.

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