Diploid Parthenogenetic Common Checkered Whiptail (Aspidoscelis tesselatus): Observations on the Species in Cimarron County in Extreme Western Oklahoma

Article · September 2024

CITATIONS

0

READS

148

7 authors, including:

Mark Paulissen

Northeastern State University

67 PUBLICATIONS **677** CITATIONS

SEE PROFILE

James Cordes

Louisiana State University at Eunice

SEE PROFILE

Greg Sievert

Emporia State University

23 PUBLICATIONS **109** CITATIONS

SEE PROFILE

Lynnette M. Sievert

Emporia State University

32 PUBLICATIONS **521** CITATIONS

SEE PROFILE

66 PUBLICATIONS **711** CITATIONS

Diploid Parthenogenetic Common Checkered Whiptail (*Aspidoscelis tesselatus*): Observations on the Species in Cimarron County in Extreme Western Oklahoma

Gavin H. Caldwell, Department of Natural Sciences, Northeastern State University, 611 North Grand Avenue, Tahlequah, OK; *caldwelg@nsuok.edu*

Billy E. Cantrell, Jr., Department of Natural Sciences, Northeastern State University, 611 North Grand Avenue, Tahlequah, OK; *cantre16@nsuok.edu*

Mark A. Paulissen, Department of Natural Sciences, Northeastern State University, 611 North Grand Avenue, Tahlequah, OK; *paulissen@nsuok.edu*

James E. Cordes, Division of Arts and Sciences, Louisiana State University Eunice, Eunice, LA; *jcordes@lsue.edu*

Greg Sievert, Emporia, KS; *gsievert@g.emporia.edu*

Lynnette Sievert, School of Science and Mathematics, Emporia State University, Emporia, KS; *desmoglover@gmail.com*

James M. Walker, Department of Biological Sciences, University of Arkansas, Fayetteville, AR; *jmwalker@uark.edu*

Introduction

The Common Checkered Whiptail (*Aspidoscelis tesselatus*; Say, 1823) has the most extensive natural geographic distribution among the eight diploid parthenogenetic species recognized in that genus [i.e., *A. cozumela* (Gadow, 1906), *A. maslini* (Fritts, 1969), and *A. rodecki* (McCoy and Maslin, 1962) in the *A. cozumela* species group; *A. laredoensis* (McKinney et al., 1973) and *A. preopatae* (Barley et al., 2021) in the *A. sexlineatus* group; *A. dixoni* (Scudday, 1973), *A. neomexicanus* (Lowe and Zweifel, 1952), and *A. tesselatus* (Say *in* James, 1823) in the *A. tesselatus* group]. The adaptability of *A. tesselatus* will become even more apparent in a forthcoming report by other scientists on its introduction to and establishment in habitats in California a great distance west of its natural geographic distribution area. Although Zweifel (1965) categorized the extensive color pattern variation in *Cnemidophorus* = *Aspidoscelis tesselatus* by recognition of informal pattern classes A, B, C, D, E, and F, subsequent studies have recognized A and B as belonging to the triploid parthenogenetic species *Cnemidophorus* = *Aspidoscelis neotesselatus* (Walker, Cordes, and Taylor, 1997) described by Walker et al. (1997) from southeastern Colorado and F as belonging to the diploid parthenogenetic species *Cnemidophorus* = *Aspidoscelis dixoni* (Scudday, 1973) described by Scudday (1973) from Hidalgo County, New Mexico, and arrays in Presidio County, Texas. These taxonomic reallocations of some of the pattern classes recognized by Zweifel (1965) to different species reduced the known distribution area of what we currently recognize as *A. tesselatus* by relatively small areas in Colorado, New Mexico, and Texas, USA. Walker et al. (1994), Walker et al. (1997), Cordes and Walker (2006), and Cole et al. (2007) recognized the arrays (we reserve the term population for species with males and females) of lizards in a small area of Hidalgo County, New Mexico, USA, as pattern class C of *A. dixoni*, and restricted pattern classes A and B of that species to relatively small areas in Presidio County, Texas. Two of us (JEC and JMW) have found one or more arrays of pattern classes C, D, and E of diploid *A. tesselatus* to be easily located, abundant, and readily observable at close range in a variety of habitats in parts of Colorado, New Mexico, and Texas, and Chihuahua state, México, as also indicated by Zweifel (1965), Taylor et al. (1996, 2005), Walker et al. (1997), and Taylor (2021). The only exception to the preceding statement pertains to the small geographic area of occurrence of *A. tesselatus* in Oklahoma, specifically in Cimarron County, which is the westernmost extension of the panhandle of the state. In fact, all the whiptail lizard specialists coauthoring this report (i.e., MAP, JEC, and JMW) have felt the sting of disappointment during repeated attempts to locate and study this species in the state! The total number of *A. tesselatus* pattern class C lizards observed during the many individual visits to Cimarron County by members of that group was one adult by JEC on 31 July 2015. The purpose of this report is to review what little is known about *A. tesselatus* in the state of Oklahoma and to document its current presence in the state through a series of recent observations made of this species in Cimarron County, Oklahoma.

Taxonomic Comments

We identified the pattern class of the Cimarron County, Oklahoma, all-female lizards based on videos, still images of lizards in the field, images of a lizard in hand, and previous examination of four preserved specimens from the Carnegie Museum with dates of collection (i.e., CM 48859-48860 collected on 10-11 June 1968, CM 93821-93822 collected on 4 August 1983). The Oklahoma array of *A. tesselatus* belongs to pattern class C of that species (*sensu* Zweifel 1965), which also naturally occurs in parts of the Texas panhandle, adjacent New Mexico, and southeastern of *Cnemidophorus* to partially correct paraphyly in the latter genus. Reeder et al. (2002) and Reeder and Cole (2005) considered the generic name *Aspidoscelis* to be of feminine grammatical gender. Thus, they reassigned and emended *Cnemidophorus neotesselatus to Aspidoscelis neotesselata*, *C. sexlineatus* to *A. sexlineata*, *C. tesselatus* to *A. tesselata*, *C. tigris marmoratus* to *A. tigris marmorata*, and *C. gularis septemvittatus* to *A. gularis septemvittata*. However, Tucker et al. (2016) reiterated the interpretation by Steyskal (1971) that the name *Aspidoscelis* must be treated as being of masculine grammatical gender. To quote Tucker et al. (2016):

The Common Checkered Whiptail (*Aspidoscelis tesselatus*; Say, 1823) has the most extensive natural geographic distribution among the eight diploid parthenogenetic species recognized in that genus...

"According to ICZN (1999) Article 30.1.4.2. '…a genus-group name that is or ends in a word of

Fig. 1. A rocky, sparsely vegetated, and sun-drenched site resulting from human disturbances where a large (>90 mm SVL) third- or fourth-year adult of diploid parthenogenetic *Aspidoscelis tesselatus* pattern class C was observed along with three additional individuals of the species by GHC and BEC in Cimarron County, Oklahoma, on 29 July 2023. Note the camouflage effect of the dorsal pattern of the lizard.

Colorado (Zweifel 1965, Walker et al. 1997). The dorsal color pattern characteristics of individuals of *A. tesselatus* in Oklahoma includes a black dorsal ground color, retention of evidence of six cream, yellow-tan or gray primary stripes, a zig-zag cream, yellow-tan, or gray configuration in the vertebral field between the paravertebral stripes, which some scientists refer to as a vertebral or middorsal stripe, and extensive pale-hued bars connecting the irregular stripes as described by Zweifel (1965), Walker et al (1997), and shown in Figs. 1-2. Although the lizard in Fig. 1 has fragmented lateral stripes that are partly incorporated into lateral bars, the lizard in Fig. 2 has intact lateral stripes coalesced with lateral bars.

A possible source of confusion for the reader pertains to the nomenclature of the *A. tesselatus* complex, its evolutionary progenitors, and sympatric congeners. Reeder et al. (2002) accepted that *A. tesselatus* was derived from one or more hybrids between gonochoristic *A. tigris marmoratus* = *A. marmoratus marmoratus* and *A. gularis septemvittatus*. They resurrected the name *Aspidoscelis* from the synonymy common or variable gender (masculine or feminine) is to be treated as masculine unless its author, when establishing the name, stated that it is feminine or treated it as feminine in combination with an adjectival species-group name.'" "Because Fitzinger (1843: 20) did not state the gender of either name, and did not combine either name with its type species name (or any species-group name) to indicate gender, these genera must be treated as masculine." Thus, based on Tucker et al. (2016), the appropriate names are returned to *A. neotesselatus*, *A. sexlineatus*, *A. tesselatus*, *A. marmoratus marmoratus* (based on Hendricks and Dixon 1986), and *A. gularis septemvittatus* (based on Walker 1981a, b) for the taxa referenced herein.

Methods

An extensive literature search was conducted using standard search engines (primarily Google Scholar) and the Literature Cited sections of relevant articles. In addition, three separate searches for museum specimens of *A. tesselatus* in Oklahoma were conducted using VertNet. The first query used search term *Cnemidophorus tesselatus* Oklahoma, the second query used the search term *Aspidoscelis tesselata* Oklahoma, and the third query used the search term *Aspidoscelis tesselatus* Oklahoma. All three located museum specimens (see Results).

An extensive literature search was conducted using standard search engines (primarily Google Scholar) and the Literature Cited sections of relevant articles. In addition, three separate searches for museum specimens of *A. tesselatus* in Oklahoma were

Field observations of *A. tesselatus* in Oklahoma were made by GHC and BEC who (inspired by completion of a herpetology course in the summer of 2023 taught by MAP) embarked on two field trips to search for amphibians and reptiles in Cimarron County during the summer of 2023. The focus of this report is an area in the immediate vicinity of Black Mesa State Park and Nature Preserve Visitor Center. Subsequently, we became aware of additional observations of *A. tesselatus* from within the small town of Kenton, Oklahoma. These are also included in this report.

Results

The first reports of *A. tesselatus* in Oklahoma were provided by Blair (1950) and Glass and Dundee (1950). The former author only mentioned collection of *Cnemidophorus grahamii* (Baird and Girard, 1852), now treated as a synonym of *A. tesselatus*, in Cimarron County. The more substantive latter reported was based on a single specimen of Common Checkered Whiptail collected on 10 August 1949, which was many years before Maslin (1962) reported that it is an all-female species. The single lizard of the species reported by Glass and Dundee (1950) was found in a pinon-juniper association in a canyon at an elevation of ca. 1341.1 m on the north side of legendary Black Mesa. Even at that time, the scarcity of the species in Cimarron County had become apparent as is indicated by the fact that it was the only individual of *A. tesselatus* observed in the area during a two-week period. However, numerous individuals of the smaller gonochoristic specimens in the Carnegie Museum, the museum numbers for which were previously listed herein, of which two were collected in 1968 and two in 1983, the second query (*Aspidoscelis tesselata* Oklahoma) located three specimens all in the Texas Natural History Museum collected in 1958, and the third query (*Aspidoscelis tesselatus* Oklahoma) located five specimens in the Oklahoma Museum of Natural History collected in each of four years (with museum numbers) 1957 (29331), 1966 (32600), 1976 (35126-35127) and 1977 (29350). We are also aware of several additional specimens of the species in several teaching collections in Oklahoma; however, there are no substantial samples of *A. tesselatus* from Oklahoma in existence to our knowledge. Several general herpetological guides are available that include Oklahoma reptiles and briefly mention the species. The most recent of these is Sievert and Sievert (2021) who importantly reminds readers that the scarcity status of *A. tesselatus* locally is such that "This species has a closed season in Oklahoma and cannot be collected."

This report provides the first detailed observations on the biology of rarely observed diploid parthenogenetic *A. tesselatus*, identifiable as pattern class C (*sensu* Zweifel 1965). On 29 July 2023 at ca. 0940 h GHC and BEC observed the first of four adult individuals of *A. tesselatus* C that morning, all only a short distance from a cove of Lake Carl Etling (elev. ca. 1337.5 m; Fig. 4). The lizards observed *in situ* in Cimarron County on that date were active in largely unshaded patches of parched grassland habitat with

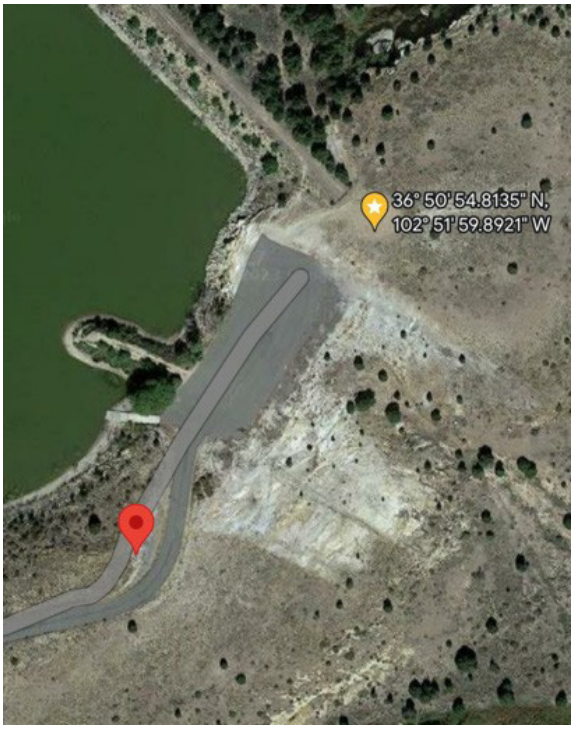
conducted using VertNet.

The first reports of *A. tesselatus* in Oklahoma were provided by Blair (1950) and Glass and Dundee (1950). The former author only mentioned collection of *Cnemidopho-*

Fig. 2. Image of an unusually large (>90 mm SVL) and regal fourth- or fifth-year adult of diploid parthenogenetic *Aspidoscelis tesselatus* pattern class C photographed by anonymous as it was basking on a cement surface in downtown Kenton, Cimarron County, Oklahoma.

species *A. sexlineatus* (Baird and Girard, 1852), were observed in that area over the same two-week period. a now treated as synonym of *A. tesselatus*, Knowledge of the status of *A. tesselatus* in Cimarron Oklahoma, as well as the significance of this County. report, can be further understood by the following results from VertNet searches, which are universally available to internet users. The first query (*Cnemidophorus* Oklahoma) *tesselatus* located four

Fig. 3. A sandy, sparsely vegetated, and sun-drenched site resulting from human disturbances where a moderately large (ca. 80 mm SVL) second-year individual of diploid parthenogenetic pattern class C was captured and released by GHC and BEC in Cimarron County, Oklahoma, on 19 August 2023.



on 19 August 2023. Near the dam of Lake Carl Etling and the parking lot on the side of road closest to the lake (elev. ca. 1316.4 m) one individual of *A. tesselatus* was observed at ca. 1304 h under the blistering air temperature of 99 °F. The apparent non-reproductive lizard, in its second year of life, was captured by noosing in a grass-scrubland area of habitat with a sandy substrate and rocky outcroppings (Fig. 3). This female, which was 80 mm in snout vent length (SVL) with a mass of 17.0 g, was stalked within a meter and noosed. When released within a few minutes it retreated at an incredible speed! Park rangers informed BEC and GHC that during the activity season of the species several individuals of *A. tesselatus* per day were usually observed in various parts of Black Mesa State Park and Nature Preserve Visitor Center; however, it is likely that late August was near the end of the summer activity season for adults of the species as reported for southeastern Colorado by Maslin (1966) and Taylor et al. (1999a).

Park rangers informed BEC and

Another observation on the adaptability of *A. tesselatus* C to areas dominated by humans in

Fig. 4. Image copied from Google Earth with pins showing the geographical relationship between the sites where *Aspidoscelis tesselatus* pattern class C was observed on 29 July 2023 (lower left) and 19 August 2023 (upper right) near Lake Carl Etling, Black Mesa State Park and Nature Preserve Visitor Center, Cimarron County, Oklahoma.

scattered junipers (Fig. 1). Also notable were scattered ant mounds, large numbers of grasshoppers, and ample evidence of burrowing likely in part by individuals of *A. tesselatus* C. Potential cover available for use by the lizards was scattered about the mostly barren locale and included some large rocks, several brush piles, numerous clumps of cacti, and scattered yucca plants. Behaviorally, the animals were not flighty from mere human presence, which permitted the acquisition of a video and several still images at close range (e.g., Fig. 1). We estimated that the snout vent length (SVL) of the large reproductively mature lizard in Fig. 1 to be >90 mm SVL, which would place the individual in the third or fourth summer of life with an expected seasonal fecundity of two clutches of 3-5 eggs per clutch (Taylor et al. 1999a, b). The lizard in the image would have been easily collected were that an objective, as it jerkily moved about ca. 2.5 m from the human observers, occasionally stopping to press body and limbs against the essentially barren landscape for thermoregulation by basking (Fig. 1). The last two adults of *A. tesselatus* C observed on that date had an intriguing spatial relationship of one closely following the other in and out of clumps of yucca. These observations provided further evidence that *A. tesselatus* C is tolerant of, and even prospers, in disturbed habitats maintained by human activities (Walker et al. 1995, 1997).

A second visit to the general area at a site ca. 150 m from that on the first visit (Figs. 2-3), was undertaken extreme western Oklahoma was provided by a resident of Kenton, Oklahoma, who sent images of adults *A. tesselatus* to GS and LS of Sievert and Sievert (2021). The images were accompanied by the note that three of these lizards were living in a yard in downtown Kenton. Existence of this species in human modified habitats has also been frequently observed by JEC and JMW in Colorado, New Mexico, and Texas in the USA and Chihuahua state in México (Walker et al. 1997). We have been notified that an introduced array of the species has also been discovered in such habitat in California far west of the natural distribution area of the species in New Mexico. We hypothesize that some of the advantages for the presence of *A. tesselatus* in such altered areas dominated by humans is that they provide an essentially predator free zone with open spaces for basking, retreat, and food gathering, conditions commonly exploited by this species (Walker et al. 1995, Taylor et al 1996, 1999b). There is also considerable anecdotal evidence that humans in an urban setting do not fear this lizard, and that they regard it as a regal addition to their environment. Its status is further enhanced by knowledge that it is among the small number of allfemale vertebrate species in the world (see Vrijenhoek et al. 1989).

The basis for the historical lack of attention to the biology of *A. tesselatus* in Oklahoma compared to research on the species in Colorado, New Mexico, and Texas in the USA and Chihuahua state in México is a result of the scarcity of the species in Cimarron County. However, the underlying ecological basis for the dearth of specimens of *A. tesselatus* from the state in research collections and the scarcity of reports on the biology of *A. tesselatus* C in Cimarron County remains a perplexing enigma!

GHC that during the activity season of the species several individuals of *A. tesselatus* per day were usually observed in various parts of Black Mesa State Park and Nature Preserve Visitor Center...

Acknowledgments—Personnel of the Black Mesa State Park and Nature Preserve Visitor Center were kindly disposed and cooperative as to our interest in diploid parthenogenetic *Aspidoscelis tesselatus* pattern class C in Cimarron County, Oklahoma. In the distant past, curators at the Carnegie Museum kindly provided JMW with a loan of the several specimens listed of Common Checkered Whiptail from Oklahoma. Financial support for the second visit to Cimarron County by BEC, GHC, and Benjamin Woolen was provided by the Walker Family Trust administered by JMW. We are grateful to an anonymous contributor for Figure 2, based on an unspecified address in Kenton, Cimarron County, Oklahoma, to maintain privacy.

Literature Cited

Baird, S.F., and C. Girard. 1852. Characteristics of some new reptiles in the museum of the Smithsonian Institution. Proceedings of the Academy of Natural Sciences of Philadelphia 6:125-129.

Barley, A.J., T.W. Reeder, A. Nieto-Montes de Oca, C.J. Cole, and R.C. Thomson. 2021. A new diploid parthenogenetic whiptail lizard from Sonora, Mexico, is the "missing link" in the evolutionary transition to polyploidy. American Naturalist 198:295-309.

Blair, A.P. 1950. Some cold-blooded vertebrates of the Oklahoma panhandle. Copeia 1950:234.

Cole, C.J., C.W. Painter, H.C. Dessauer, and H.L. Taylor. 2007. Hybridization between the endangered unisexual gray-checkered whiptail lizard (*Aspidoscelis dixoni*) and the bisexual western whiptail lizard (*Aspidoscelis tigris*) in southwestern New Mexico. American Museum Novitates 3555:1-31.

Cordes, J.E., and J.M. Walker. 2006. Evolutionary and systematic implications of skin histocompatibility among parthenogenetic teiid lizards: three color pattern classes of *Aspidoscelis dixoni* and one of *Aspidoscelis tesselata*. Copeia 2006:14-26.

Fitzinger, L. 1843. Systema Reptilium. Fasciculus primus: Amblyglossae. Vindobonae: Braumüller und Seidel. 106 pp.
Fritts, T.H. 1969. The systematics of the parthenogenetic lizards of the *Cnemidophorus cozumela* complex. Copeia 1969:519-535.
Gadow, H. 1906. A contribution to the study of evolution based upon the Mexican species of *Cnemidophorus*. Proceedings of the Zoological Society of London 76:277-375.
Glass, B.P., and H.A. Dundee. 1950. *Cnemidophorus tesselatus* (Say) in Oklahoma. Herpetologica 6:30.
Hendricks, F.S., and J.R. Dixon. 1986. Systematics and biogeography of *Cnemidophorus marmoratus* (Sauria: Teiidae). Texas Journal of Science 38:327-402.
James, E. 1823. Account of an expedition from Pittsburgh to the Rocky Mountains, performed in the years 1819 and 1820. Volume II. Longman, Hurst, Rees, Orme, and Brown, London. 356 pp. + vii.
Lowe, C.H., Jr., and R.G. Zweifel. 1952. A new species of whiptailed lizard (genus *Cnemidophorus*) from New Mexico. Bulletin Chicago Academy Science 9:229-247.
Maslin, T.P. 1962. All-female species of the lizard genus *Cnemidophorus*, Teiidae. Science 135:212213.
Maslin, T.P. 1966. The sex of hatchlings of five apparently unisexual species of whiptail lizards (*Cnemidophorus*, Teiidae). American Midland Naturalist 76:369-378.
McCoy, C.J., Jr., and T.P. Maslin. 1962. A review of teiid lizard *Cnemidophorus cozumelus* and the recognition of a new race, *Cnemidophorus cozumelus rodecki*. Copeia 1962:620-627.
McKinney, C.O., F.R. Kay, and R.A. Anderson. 1973. A new all-female species of the genus *Cnemidophorus*. Herpetologica 29:361-366.
Reeder, T.W., and C.J. Cole. 2005. *Aspidoscelis* versus *Cnemidophorus* as a genus of whiptail lizards in North America. Herpetological Review 36:233234.
Reeder, T.W., C.J. Cole, and H.C. Dessauer. 2002. Phylogenetic relationships of whiptail lizards of the genus *Cnemidophorus* (Squamata: Teiidae): a test of monophyly, reevaluation of karyotypic evolution, and review of hybrid origins. American Museum Novitates 3365:1-61.
Scudday, J.F. 1973. A new species of lizard of the *Cnemidophorus tesselatus* group from Texas. Journal of Herpetology 7:363-371.
Sievert, G., and L. Sievert. 2021. A field guide to Oklahoma's amphibians and reptiles. 4th edition. Oklahoma Department of Wildlife Conservation. Oklahoma City, OK. 231 pp.
Steyskal, G.C. 1971. On the grammar of names formed with –*scelus*, -*sceles*, -*scelis*, etc. Proceedings of the Biological Society of Washington 84:7-12.
Taylor, H.L. 2021. A latitudinal pattern of multivariate meristic variation in the parthenogenetic teiid lizard *Aspidoscelis tesselatus* (Common Checkered Whiptail) from the perspective of color-pattern classes C and E. Herpetological Review 52:747-759.
Taylor, H.L., J.M. Walker, and J.E. Cordes. 1996. Systematic implications of morphologically distinct populations of parthenogenetic whiptail lizards, *Cnemidophorus tesselatus* pattern class D. Herpetologica 52:254-262.
Taylor, H.L., J.M. Walker, and J.E. Cordes. 1999a. Monthly distributions of size classes and reproductive status in *Cnemidophorus tesselatus* (Sauria: Teiidae) from southeastern Colorado.

Herpetological Review 30:205-207.
Taylor, H.L., J.M. Walker, and J.E. Cordes. 1999b. Possible phylogenetic constraint on clutch size in the parthenogenetic teiid lizard *Cnemidophorus neotesselatus*. Journal of Herpetology 33:319-323.
Taylor, H.L., J.M. Walker, J.E. Cordes, and G.J. Manning. 2005. Application of the evolutionary species concept to parthenogenetic entities: comparison of postformational divergence in two clones of *Aspidoscelis tesselata* and between *Aspidoscelis cozumela* and *Aspidoscelis maslini* (Squamata: Teiidae). Journal of Herpetology 39:266-277.
Tucker, D.B., G.R. Colli, L.G. Giugliano, S.B. Hedges, C.R. Hendry, E.M. Lemmon, A.R. Lemmon, J.W. Sites, Jr., and R.A. Pyron. 2016. Methodological congruence in phylogenomic analyses with morphological support for teiid lizards (Sauria: Teiidae). Molecular Phylogenetics and Evolution 103:75-84.
Vrijenhoek, R.C., R.M. Dawley, C.J. Cole, and J.P. Bogart.1989. A list of the known unisexual vertebrates. *In* R.M. Dawley and J.P. Bogart (editors). Evolution and ecology of unisexual vertebrates. New York State Museum Bulletin 466:19-23.
Walker, J.M. 1981a. Systematics of *Cnemidophorus gularis*. I. Reallocation of populations currently allocated to *Cnemdophorus gularus* and *Cnemdophorus scalaris* in Coahuila, Mexico. Copeia 1981:826-849.
Walker, J.M. 1981b. Systematics of *Cnemidophorus gularis*. II. Specific and subspecific identity of the Zacatecas whiptail (*Cnemidophorus gularis semiannulatus*). Copeia 1981:850-868.
Walker, J.M., J.E. Cordes, C.C. Cobb, H.L. Taylor, R.V. Kilambi, and R.L. Meyer. 1994. Life history characteristic of triploid morphotypes in the parthenogenetic *Cnemidophorus inornatus* complex (Sauria: Teiidae) in Texas and New Mexico. Texas Journal of Science 46:27-39.
Walker, J.M., H.L. Taylor, and J.M. Cordes. 1993. Parthenogenetic *Cnemidophorus tesselatus* complex at Higbee, Colorado: Resolution of 30 years of controversy. Copeia 1993:658-668.
Walker, J.M., J.E. Cordes, and H.L. Taylor. 1997. Parthenogenetic *Cnemidophorus tesselatus* complex (Sauria: Teiidae): a neotype for diploid *C. tesselatus* (Say, 1823), redescription of the taxon, and description of a new triploid species. Herpetologica 53:233-259.
Zweifel, R.G. 1965. Variation in and distribution of the unisexual lizard, *Cnemidophorus tesselatus*. American Museum Novitates 2235:1-49.

NATURALHISTORYNOTE

Mexican Spadefoot Toad, *Spea multiplicata*, in an Urban Habitat within Central Mexico

Oswaldo Hernández-Gallegos, Laboratorio de Herpetología, Facultad de Ciencias, Universidad Autónoma del Estado de México, Instituto Literario No. 100, Colonia Centro, Toluca, Estado de México, México, C. P. 50000; *ohg@uaemex.mx*

Gisela Granados-González, Laboratorio de Morfofisiología de la Reproducción, Facultad de Ciencias, Universidad Autónoma del Estado de México, Instituto Literario No. 100, Colonia Centro, Toluca, Estado de México, México, C. P. 50000

Aldo Gómez-Benitez, Departamento de Ciencias Ambientales, División de Ciencias Biológicas y de la Salud, Universidad Autónoma Metropolitana, Unidad Lerma, Avenida de las Garzas No. 10, El Panteón, Lerma de Villada, Estado de México, México, C. P. 52005

Spea multiplicata, commonly known as the Mexican Spadefoot Toad, is a small to medium-sized burrowing toad, ranging from the southern United States to southern Mexico (Lemos Espinal and Dixon 2016). The Mexican Spadefoot Toad can be found at various elevations (from near sea level to around 2743 m a.s.l.), and in diverse habitats, including desert grassland, shortgrass plains, creosote bush and sagebrush desert, mixed grassland and chaparral, pinе-oak woodlands, and open pine forests (Stebbins 2003).

According to vulnerability established through the Environmental Vulnerability Score (EVS), *S. multiplicata* is classified as a species with low vulnerability (Wilson et al. 2013). Furthermore, in accordance with Mexican law, *S. multiplicata* is not included in the NOM

On 30 August 30
individuals of *S. mult*
male with 51 mm SV
mm SVL. Both indiv
Metepec (population
Estado de México, w
(19° 17’ 0.69” N, 99°
2). The property is ap
surrounded by house
I. Madero Street). Th
composed of grass, a
and fruit trees.

Apparently, *S. mu*
settlements when suf
Individuals

Spea multiplicata, commonly known as the Mexican Spadefoot Toad, is a small to medium-sized burrowing toad, ranging from the southern United States to southern Mexico (Lemos Espinal and Dixon 2016).

