

Helminth Parasites of Unisexual and Bisexual Whiptail Lizards (Teiidae) in North America. I. The Colorado Checkered Whiptail (*Cnemidophorus tesselatus*)

Author: McAllister, Chris T.

Source: Journal of Wildlife Diseases, 26(1) : 139-142

Published By: Wildlife Disease Association

URL: <https://doi.org/10.7589/0090-3558-26.1.139>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Helminth Parasites of Unisexual and Bisexual Whiptail Lizards (Teiidae) in North America. I. The Colorado Checkered Whiptail (*Cnemidophorus tesselatus*)

Chris T. McAllister, Renal-Metabolic Laboratory (151-G), Veterans Administration Medical Center, 4500 S. Lancaster Road, Dallas, Texas 75216, USA and Department of Biological Sciences, University of North Texas, Denton, Texas 76203, USA

ABSTRACT: Eleven of 27 (41%) parthenogenetic Colorado checkered whiptails (*Cnemidophorus tesselatus*) from four counties of western and southwestern Texas were infected with one or more helminths. These included a linstowiid cestode (*Oochoristica* sp.), a larval spirurid nematode (*Physaloptera* sp.) and two species of oxyurid nematodes (*Parathelandros texanus* and *Pharyngodon warneri*). This note, the first in a series of reports on helminths of *Cnemidophorus* spp., represents the first record of parasites from *C. tesselatus*.

Key words: Cestoidea, *Cnemidophorus tesselatus*, Cyclophyllidea, helminths, lizards, *Oochoristica* sp., Oxyurida, *Parathelandros texanus*, *Pharyngodon warneri*, *Physaloptera* sp., Spirurida, survey.

The Colorado checkered whiptail (*Cnemidophorus tesselatus*) is a parthenoform (all-female) lizard that ranges from Chihuahua, Mexico northward through the Trans-Pecos and Big Bend of Texas to the high plains of New Mexico and eastward into the western Panhandle of Texas and Oklahoma to central Colorado in the United States (Price, 1986; Dixon, 1987). The species inhabits various habitats ranging in elevation from 250 to 1,829 m on rocky, gravelly and sandy soils of plains, canyons and uplands to floodplains of the Rio Conchos and Rio Grande rivers (Conant, 1975; Stebbins, 1985; Price, 1986). This unisexual teiid is believed to have originated by hybridization between the bisexual marbled whiptail, *C. tigris* (= *marmoratus sensu* Hendricks and Dixon, 1986), and plateau spotted whiptail, *C. septemvittatus* (syn. *scalaris*) (Brown and Wright, 1979). Price (1986) summarized information on the natural history and ecology of *C. tesselatus*; however, nothing is known concerning the helminths of this multiclinal lizard. The purposes of this

note, the first in a series of reports on helminths of *Cnemidophorus* spp., is to provide prevalence data and identities of endoparasites infecting this lizard in Texas and to compare these results with previously published parasite information on its parental congeners.

Twenty-seven juvenile and adult female *C. tesselatus* with snout–vent lengths (SVL) ranging from 57 to 105 mm ($\bar{x} \pm \text{SE} = 82.7 \pm 2.8$ mm) and which had been fixed in formalin and stored in 70% ethanol were borrowed from the Sul Ross State University Museum (SRSU, Alpine, Texas 79830, USA). Lizards were collected during various months from 1975 to 1985 in Brewster (30°30'N, 103°20'W) ($n = 6$), Culberson (31°50'N, 104°20'W to 31°50'N, 104°50'W) ($n = 3$), and Presidio (30°00'N, 104°30'W to 30°20'N, 104°30'W) ($n = 13$) counties of the Big Bend and Oldham (35°30'N, 102°15'W) County ($n = 5$) in the western Panhandle region of Texas (USA). The gastrointestinal tract was removed from lizards, slit lengthwise, and examined for helminths with the aid of a dissecting microscope. The liver, ventral musculature and body cavity were examined for encapsulated, encysted or free parasites. Cestodes were stained with Mayer's hematoxylin and eosin counterstain, dehydrated in a series of alcohols, cleared in xylene, and mounted in Permount® mounting medium (Fisher Scientific, Pittsburgh, Pennsylvania 15219, USA). Nematodes were stored in glycerol and studied as temporary mounts. Representative helminth specimens are deposited in the United States National Museum Helminthological Collection (United States Department of Agriculture, Beltsville, Mary-

TABLE 1. Helminths found in *Cnemidophorus tesselatus*.

| Helminth | Prevalence | | Intensity | |
|-----------------------------------|-------------------------------------|----|------------------|---------|
| | Number examined/ number infected | % | $\bar{x} \pm SE$ | (Range) |
| Cestoidea | | | | |
| Cyclophyllidea | | | | |
| <i>Oochoristica</i> sp. (d)* | 3/27 | 11 | 2.0 ± 0.6 | (1–3) |
| Nematoda | | | | |
| Spirurida | | | | |
| <i>Physaloptera</i> sp. (s) | 5/27 | 19 | 7.2 ± 4.7 | (1–25) |
| Oxyurida | | | | |
| <i>Parathelandros texanus</i> (c) | 3/27 | 11 | 7.0 ± 4.2 | (1–15) |
| <i>Pharyngodon warneri</i> (r) | 4/27 | 15 | 65.3 ± 45.5 | (1–200) |

* Location of parasites: d, duodenum; s, stomach; c, colon; r, rectum.

land 20705, USA; accession numbers for *Oochoristica* sp. are 80701 to 80702, for *Physaloptera* sp. are 80703, for *Parathelandros texanus* are 80704, and for *Pharyngodon warneri* are 80705).

Eleven of 27 (41%) *C. tesselatus* (SVL 57 to 89 mm, 80.9 ± 2.9 mm) were infected with at least one of four helminths (Table 1). These included eight (73%) infected lizards with a single helminth, two (18%) with two, and one (9%) with three species, respectively. Infected whiptails came from Brewster (83%), Presidio (39%) and Culberson (33%) counties; none of the *C. tesselatus* from Oldham County were infected with helminths.

Larval specimens of *Physaloptera* sp. were collected from two adult lizards (88 to 89 mm SVL, SRSU accession numbers 3863 and 4636) in Brewster County and a juvenile (57 mm SVL, SRSU 5631) and two adult lizards (80 to 85 mm SVL, SRSU 3946, 4527) in Presidio County. These helminths have been reported from a variety of lizards in North America (Baker, 1987), including western whiptails (*C. tigris*) from Nevada (Babero and Matthias, 1967), prairie-lined racerunners (*C. sexlineatus viridis*) from South Dakota (Dyer, 1971), Laredo-striped whiptails (*C. laredoensis*) from Texas (McAllister et al., 1986) and giant spotted whiptails (*C. burti sticto-*

grammus) from Arizona (Goldberg and Bursey, 1989).

Specimens of *Pharyngodon warneri* occurred in two lizards from Brewster County (71, 87 mm SVL, SRSU 5082 and 5088), one lizard from Culberson County (89 mm SVL, SRSU 5690) and a single lizard from Presidio County (84 mm SVL, SRSU 3783). This latter host had a heavy infection of more than 200 helminths. *Pharyngodon warneri* was originally described by Harwood (1932) from *C. sexlineatus* in southeastern Texas and since has been reported from various cnemidophoriine taxa (McAllister et al., 1986).

Six linstowiid cestodes (*Oochoristica* sp.) were found in two adult lizards (SVL 76, 87 mm, SRSU 5082 and 5087) from 40 km northeast of Alpine in Brewster County and another adult (SVL 85 mm, SRSU 4527) from a site in extreme western Presidio County of the Big Bend region of Texas (USA). Because the cestodes had been killed in situ and in an unrelaxed state, species identification was not possible. However, they most closely resembled *O. bivittellata*, a common cestode previously reported from several *Cnemidophorus* spp. in the United States (see Benes, 1985; McAllister et al., 1985; Lyon, 1986; Goldberg and Bursey, 1989).

A rarely reported nematode, *Parathe-*

landros texanus was found in three adult lizards (SVL 80 to 85 mm, SRSU 3946, 4527 and 5571) from separate localities in Presidio County. The type locality of *P. texanus* (Stairway Mountain, Black Gap Management Area in Brewster County; Specian and Ubelaker, 1974) is located only 155 km southeast of the present localities. This nematode, originally reported erroneously as *Pharyngodon warneri* by Babero and Matthias (1967) also is known from *C. tigris* in Arizona (Specian and Ubelaker, 1974).

Read and Amrein (1953) described *Pharyngodon cnemidophori* from *C. tessellatus tessellatus* in San Bernardino County, California (USA). However, it is likely these investigators misidentified their host because *C. tessellatus* and *C. tigris* are somewhat similar in appearance. This is further supported by the fact that *C. tessellatus* has never been reported to range any further west than possibly extreme southwestern Arizona and even its current existence in this isolated locale is uncertain (Price, 1986). Further, the only whiptail that occurs in San Bernardino County, California is *C. tigris* (Stebbins, 1985).

In summary, this paper documents new host and distributional records for helminths reported from a parthenogenetic whiptail lizard in western Texas. Although *Pharyngodon warneri* occurs in *C. tessellatus*, it has not been found in either of its biparental ancestors. However, like *C. tessellatus*, both *C. tigris* and *C. septemvittatus* have been reported to serve as hosts for *Parathelandros texanus* (Specian and Ubelaker, 1974). In addition, *C. tessellatus* is similar to *C. tigris* in terms of habitat preference and they are often found in sympatry in southwestern Texas. It could be expected on the basis of similar ecological and inferred coevolutionary patterns that these two lizards should share more parasites and are more closely related. Surveys of additional whiptail lizard taxa could provide an alternative organismal approach of studying host phylogeny compared with molecular techniques. This may

aid in further delineating coevolutionary patterns among *Cnemidophorus* spp.

I thank J. F. Scudday, Sul Ross State University, for providing the lizards used in this study.

LITERATURE CITED

- BABERO, B. B., AND D. MATTHIAS. 1967. *Thuburnaea cnemidophorus* and other helminths from lizards, *Cnemidophorus tigris*, in Nevada and Arizona. Transactions of the American Microscopical Society 86: 173-177.
- BAKER, M. R. 1987. Synopsis of the nematoda parasitic in amphibians and reptiles. Memorial University of Newfoundland Occasional Papers in Biology 11: 1-325.
- BENES, E. S. 1985. Helminth parasitism in some central Arizona lizards. Southwestern Naturalist 30: 467-473.
- BROWN, W. M., AND J. W. WRIGHT. 1979. Mitochondrial DNA analysis and the origin and relative age of parthenogenetic lizards (genus *Cnemidophorus*). Science 203: 1247-1249.
- CONANT, R. 1975. A field guide to reptiles and amphibians of eastern and central North America, 2nd ed. Houghton-Mifflin Company, Boston, Massachusetts, 475 pp.
- DIXON, J. R. 1987. Amphibians and reptiles of Texas. Texas A&M University Press, College Station, Texas, 434 pp.
- DYER, W. G. 1971. Some helminths of the six-lined lizard, *Cnemidophorus sexlineatus*, in South Dakota. Proceedings of the Helminthological Society of Washington 38: 256.
- GOLDBERG, S. R., AND C. R. BURSEY. 1989. Helminths of the giant spotted whiptail, *Cnemidophorus burti stictogrammus* (Sauria: Teiidae). Proceedings of the Helminthological Society of Washington 56: 86-87.
- HARWOOD, P. D. 1932. The helminths parasitic in the amphibia and reptilia of Houston, Texas and vicinity. Proceedings of the United States National Museum 81: 1-71.
- HENDRICKS, F. S., AND J. R. DIXON. 1986. Systematics and biogeography of *Cnemidophorus marmoratus* (Sauria: Teiidae). Texas Journal of Science 38: 327-402.
- LYON, R. E. 1986. Helminth parasites of six lizard species from southern Idaho. Proceedings of the Helminthological Society of Washington 53: 291-293.
- MCALLISTER, C. T., S. E. TRAUTH, AND J. E. UBELAKER. 1985. *Oochoristica crotaphyti* n. sp. (Eucestoda: Linstowiidae) from *Crotaphytus collaris* (Lacertilia: Iguanidae) in northern Arkansas. The Journal of Parasitology 71: 803-807.
- , ———, AND ———. 1986. Nematode parasites of the parthenogenetic whiptail lizard, *Cnemidophorus laredoensis* (Sauria: Teiidae)

- from south Texas. Proceedings of the Helminthological Society of Washington 53: 138-139.
- PRICE, A. H. 1986. *Cnemidophorus tessellatus*. In Catalogue of American amphibians and reptiles, C. J. McCoy and Society for the Study of Amphibians and Reptiles (eds.). American Museum of Natural History, New York, New York, pp. 398.1-398.2.
- READ, C. P., AND Y. U. AMREIN. 1953. North American nematodes of the genus *Pharyngodon* Diesing (Oxyuridae). The Journal of Parasitology 39: 365-370.
- SPECIAN, R. D., AND J. E. UBELAKER. 1974. *Parathelandros texanus* n. sp. (Nematoda: Oxyuridae) from lizards in west Texas. Transactions of the American Microscopical Society 93: 413-415.
- STEBBINS, R. C. 1985. A field guide to western reptiles and amphibians, 2nd ed. Houghton-Mifflin Company, Boston, Massachusetts, 336 pp.

Received for publication 21 April 1989.