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Intestinal Helminths of the Granite Spiny Lizard (*Sceloporus orcutti*)

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ABSTRACT: Examination of the intestinal tracts of 74 granite spiny lizards (*Sceloporus orcutti*) from Riverside County, California (USA) revealed infection with one cestode species *Oochoristica scelopori* (Anoplocephalidae) and one nematode species *Spauligodon giganticus* (Pharyngodonidae). Helminth prevalence was 24%. The presence of *Oochoristica scelopori* represents a new host record.

Key words: Cestoda, *Oochoristica scelopori*, Nematoda, *Spauligodon giganticus*, survey, prevalence, intensity, *Sceloporus orcutti*.

The granite spiny lizard (*Sceloporus orcutti*, Iguanidae) ranges from the lower slopes of the Peninsular Ranges of southern California and the northern side of San Gorgonio Pass southward to the tip of Baja California (USA); it occurs from sea level to 2,130 m (Stebbins, 1985). To our knowledge, there is a single report of helminth parasitism in *Sceloporus orcutti orcutti*, the subspecies in our investigation. Telford (1970) found the nematodes *Physaloptera retusa*, *Thubunaea iguanae*, *Atractis* (=*Cyrtosomum*) *penneri*, *Spauligodon* (=*Pharyngodon*) *giganticus* and *Parapharyngodon* (=*Thelandros*) *iguanae* in the gastrointestinal tract of *S. orcutti orcutti* collected between March 1962 and May 1964 in Riverside County, California. The purpose of this paper is to report the intestinal helminths from a second collection of *S. orcutti orcutti* from Riverside County made during the 2 yr following Telford's collection.

Seventy-four *S. orcutti orcutti* (mean snout–vent length, SVL = 76 mm ± 22 mm SD; range 38 to 120 mm) collected in the Box Springs Mountains near the University of California at Riverside (33°58′N, 117°30′W, elevation 778–867 m) during 1965 and 1966 were examined for parasites. The lizards had been preserved in 10% neutral buffered formalin. The stomachs had been removed and were not available for this study. The abdomen was opened and the small and large intestines were removed by cutting across the rectum. Each organ was slit longitudinally and examined with the aid of a dissecting microscope. Nematodes were identified using a glycerol wet mount; cestode proglottids were stained with hematoxylin. Representative specimens are deposited in the United States National Museum Helminthological Collection, Beltsville, Maryland 20705, USA. Accession numbers are 801209 for *Oochoristica scelopori* and 801210 for *Spauligodon giganticus*.

Helminths were observed in 18 of the 74 (prevalence 24%) *S. orcutti orcutti* examined. If stomachs had been available, prevalence might have been higher. One species of cestode *Oochoristica scelopori* (Anoplocephalidae) and one species of nematode *Spauligodon giganticus* (Pharyngodonidae) were collected. Forty-one *O. scelopori* were found in the small intestines of 16 lizards (prevalence 22%, mean intensity 2.6, range 1 to 7). There was no difference in the mean intensities of infection observed in male and female lizards (Kruskal-Wallis statistic = 1.12, 1 df, $P > 0.05$). Twenty-three *S. giganticus* were recovered from the large intestines of three female lizards (prevalence 4%, mean intensity 7.7, range 1 to 17). Statistical analysis for *S. giganticus* was not possible due to the low number of infected hosts.

Oochoristica scelopori was described originally from the northwestern fence lizard (*Sceloporus occidentalis occidentalis*) collected in Alameda County, California (USA) by Voge and Fox (1950). This tapeworm is commonly distributed across some

TABLE 1. Host and locality records for *Oochoristica scelopori* in North America.

Host	Locality	Prevalence	Reference
Iguanidae			
Crotaphytus collaris	California	100% (1/1)	Telford, 1970
Gambelia wislizeni	California	40% (2/5)	Telford, 1970
Sceloporus graciosus	California	not given	Voge and Fox, 1950
	California	10% (7/71)	Telford, 1970
	Idaho	22% (2/9)	Waitz, 1961
	Idaho	1% (1/118)	Lyon, 1986
	Utah	5% (1/22)	Pearce and Tanner, 1973
S. jarrovii jarrovii	Arizona	10% (47/489)	Goldberg and Bursey, 1990
S. magister	Arizona	not given	Walker and Matthias, 1973
S. occidentalis	California	20% (13/65)	Voge and Fox, 1950
	California	23% (27/116)	Telford, 1970
	Idaho	11% (2/19)	Lyon, 1986
	Oregon	33% (20/60)	White and Knapp, 1979
	Utah	9% (1/11)	Pearce and Tanner, 1973
S. orcutti	California	22% (16/74)	this paper
Uma notata	California	42% (10/24)	Telford, 1970
U. inornata	California	7% (1/15)	Telford, 1970
Urosaurus graciosus	California	6% (2/34)	Telford, 1970
Xantusiidae			
Xantusia henshawi	California	22% (11/51)	Telford, 1970
X. riversiana	California	15% (12/78)	Telford, 1970
X. vigilis	California	6% (1/18)	Telford, 1970

of the western United States (Table 1) and is considered by Telford (1970) to be specific to the families Xantusiidae and Iguanidae. Finding this parasite in *S. orcutti* represents a new host record and is the tenth iguanid species in which it has been collected. The prevalence of 22% for *O. scelopori* recorded here is much higher than the mean prevalence rate of 14% (177 infections in 1,280 hosts) as reported in the literature (Table 1). Insects and mites are intermediate hosts (Schmidt, 1986). The differential prevalences seen in Table 1 may reflect the abundance and distribution of suitable intermediate hosts or subtle differences in the diets of these lizard species.

Spauligodon (=Pharyngodon) giganti-

TABLE 2. Host and locality records for *Spauligodon giganticus* in North America.

Host	Locality	Prevalence	Reference
Callisaurus draconoides	California	5% (1/19)	Telford, 1970
Sceloporus graciosus	California	34% (24/71)	Telford, 1970
	Oregon	5% (2/40)	White and Knapp, 1979
S. jarrovii jarrovii	Arizona	94% (459/489)	Goldberg and Bursey, 1990
S. occidentalis	California	21% (24/116)	Telford, 1970
	Idaho	11% (2/19)	Lyon, 1986
	Oregon	67% (40/60)	White and Knapp, 1979
	Utah	27% (3/11)	Pearce and Tanner, 1973
S. orcutti	California	14% (3/23)	Telford, 1970
	California	4% (3/74)	this paper
S. undulatus	Utah	18% (2/11)	Pearce and Tanner, 1973
Uta stansburiana[•]	California	25% (13/51)	Telford, 1970

[•] San Clemente Island.

cus was originally described from the southern sagebrush lizard (*Sceloporus graciosus vandenburgianus*) from San Bernardino County, California (USA) by Read and Amrein (1953). Like *O. scelopori*, it also is widely distributed across the western United States but has been reported only from iguanid lizards (Table 2).

Pearce and Tanner (1973) suggested that *O. scelopori* and *S. giganticus* were mutually exclusive. Our evidence is to the contrary; one of three of the lizards in this study with infections of *S. giganticus* were concurrently infected with *O. scelopori*. Moreover, Goldberg and Bursey (1990) reported 94% of *Sceloporus jarrovii jarrovii* infected with *O. scelopori* had large intestinal infections with *S. giganticus*. Similarly, White and Knapp (1979) reported 23% of the sceloporine lizards in their study with concurrent infections.

The prevalence of 4% for *S. giganticus* appears to be very low when compared to a mean prevalence of 59% (576 infections in 984 hosts) reported in Table 2. Telford (1970) had found a prevalence of 14% for *S. giganticus* in *S. orcutti*.

Spauligodon giganticus has a direct life cycle and infection is gained by fecal contamination (see Telford, 1971). *Sceloporus jarrovii jarrovii* of all ages lick the substrate (Goldberg and Bursey, 1990), a behavior which may facilitate infection by *S. giganticus*. It has been suggested that *S. jarrovii* obtains environmental cues by substrate licking (DeFazio et al., 1977). This may in part by responsible for the *S. giganticus* prevalence of 94% (Table 2) in *S. jarrovii jarrovii* reported by Goldberg and Bursey (1990). Subsequent investigations of different species will be needed to determine the association between substrate licking and infection by *S. giganticus*.

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