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HELMINTHS OF THE MADREAN ALLIGATOR LIZARD, *ELGARIA KINGII* (SAURIA: ANGUIDAE), FROM ARIZONA

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Key words: *Elgaria kingii*, *Anguidae*, *helminths*, *Arizona*.

The Madrean alligator lizard, *Elgaria kingii* Gray, 1838, occurs from the southern edge of the central plateau of Arizona southward in the Sierra Madre of México to Jalisco, México; it frequents chaparral, oak woodland, and pine-fir forests and occurs from 760 to 2070 m (Stebbins 1985). There are no accounts of helminths from this species. The purpose of our paper is twofold: to provide the first report of helminths from *E. kingii* collected in Arizona and to furnish a list of parasites known from the genus *Elgaria*.

We borrowed 31 *E. kingii* from Arizona from the herpetology collection of the University of Arizona (UAZ), Tucson (mean snout-vent length, 68 mm, 8.2 s, range 48–80 mm). The lizards were originally preserved in 10% formalin and stored in 70% isopropanol. Specimens examined are listed by county of collection in Appendix 1. The body cavity was opened and the gastrointestinal tract excised by cutting across the esophagus and rectum. The esophagus, stomach, and small and large intestines were slit longitudinally and examined separately under a dissecting microscope. The body cavity and liver surface were also examined. Each helminth was removed to a temporary glycerol mount for examination. Nematodes were identified from these temporary mounts. Cestodes were stained in hematoxylin and mounted in Canada balsam for identification. Voucher specimens were deposited in the U.S. National Parasite Collection (Appendix 2). Terminology usage is in accordance with Bush et al. (1997).

Elgaria kingii harbored 2 species of cestodes, *Mesocestoides* sp. (tetrathyridia) and *Oochoristica eumecis* Harwood, 1932, and 4 species of nematodes: *Cosmocercoides variabilis*

(Harwood, 1930) Travassos, 1931, *Spauligodon goldbergi* Bursey and McAllister, 1996, *Physaloptera* sp. (larvae), and *Skrjabinoptera* sp. (larvae). Prevalence, mean intensity, range and mean abundance are given in Table 1. *Elgaria kingii* is a new host record for each helminth species.

None of the helminths found in this study was unique to *Elgaria kingii*. Gravid individuals of the following 3 species were found. *Oochoristica eumecis* was originally described from the skink, *Eumeces fasciatus*, from Texas (Harwood 1932) and has been reported from *Ctenosaura pectinata* from México (Flores-Barroeta et al. 1958); *E. kingii* is the 3rd host record. *Cosmocercoides variabilis* is known from a variety of amphibians and reptiles from North America (Baker 1987); *E. kingii* represents the 26th host record. *Spauligodon goldbergi* was originally described from the ground snake, *Sonora semiannulata*, from central Texas by Bursey and McAllister (1996); *E. kingii* is the 2nd host record.

Three species of helminths were represented by immature forms. Tetrathyridia of *Mesocestoides* sp. occur commonly in the coelomic cavities of lizards and snakes which are considered to be paratenic hosts (Bolette 1997). Adults of *Physaloptera* and *Skrjabinoptera* are frequently seen gastric parasites of lizards (Baker 1987). Because only 3rd-stage larvae of these 2 genera were found, their importance to the helminth load of *E. kingii* cannot be assessed.

Parasite lists (Table 2) can now be developed for 3 of 4 species of *Elgaria* occurring in North America, namely, *E. coerulea*, *E. kingii*, and *E. multicaudata*; *E. panamintina* has not yet been examined. There is some overlap in

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TABLE 1. Helminths from *Elgaria kingii* (N = 31) from Arizona.

| Helminth | N | Prevalence (%) | Mean intensity $\pm s$ (range) | Mean abundance $\pm s$ | Site |
|--|----|----------------|--------------------------------|------------------------|----------------------------------|
| CESTODA | | | | | |
| <i>Mesocestoides</i> sp. (tetrathyridia) | 47 | 3 | 47.0 | 1.52 \pm 8.44 | coelom |
| <i>Oochoristica eumecis</i> | 1 | 3 | 1.0 | 0.03 \pm 0.18 | small intestine |
| NEMATODA | | | | | |
| <i>Cosmocercoides variabilis</i> | 8 | 13 | 2.0 \pm 2.0 (1-5) | 0.26 \pm 0.93 | large intestine |
| <i>Spauligodon goldbergi</i> | 40 | 10 | 13.3 \pm 10.2 (6-25) | 1.29 \pm 4.79 | small, large intestines |
| <i>Physaloptera</i> sp. (larvae) | 34 | 35 | 3.1 \pm 3.2 (1-11) | 1.10 \pm 2.39 | stomach, small, large intestines |
| <i>Skrjabinoptera</i> sp. (larvae) | 36 | 6 | 18.0 \pm 18.3 (5-31) | 1.16 \pm 5.61 | stomach |

TABLE 2. Prevalence of helminths in species of *Elgaria* from North America.

| Species of <i>Elgaria</i> Helminth | Location | Prevalence | Reference |
|--|--------------------------------|-------------|--------------------------|
| <i>E. coerulea</i> | | | |
| <i>Mesocestoides</i> sp. (tetrathyridia) | Contra Costa Co., CA | not given | Voge 1953 |
| <i>Cosmocercoides</i> sp. | Whatcom Co., WA | 2% (2/104) | Goldberg and Bursey 1991 |
| <i>Oswaldocruzia</i> sp. | Whatcom Co., WA | 1% (1/104) | Goldberg and Bursey 1991 |
| <i>E. kingii</i> | | | |
| <i>Mesocestoides</i> sp. (tetrathyridia) | Gila Co., AZ | 3% (1/31) | this study |
| <i>Oochoristica eumecis</i> | Santa Cruz Co., AZ | 3% (1/31) | this study |
| <i>Cosmocercoides variabilis</i> | Cochise, Pima cos., AZ | 13% (4/31) | this study |
| <i>Spauligodon goldbergi</i> | Cochise Co., AZ | 10% (3/31) | this study |
| <i>Physaloptera</i> sp. (larvae) | Cochise, Graham, Pima cos., AZ | 35% (11/31) | this study |
| <i>Skrjabinoptera</i> sp. (larvae) | Cochise Co., AZ | 6% (2/31) | this study |
| <i>E. multicaerinata</i> | | | |
| <i>Baerietta gerrhonoti</i> | Los Angeles Co., CA | 64% (16/25) | Telford 1970 |
| <i>Mesocestoides</i> sp. (tetrathyridia) | Riverside Co., CA | 7% (2/30) | Telford 1970 |
| <i>Oochoristica</i> sp. | Los Angeles Co., CA | 1% (1/96) | Goldberg and Bursey 1990 |
| <i>Physaloptera retusa</i> | Riverside Co., CA | 13% (4/30) | Telford 1970 |
| <i>Physaloptera</i> sp. (larvae) | Los Angeles Co., CA | 1% (1/96) | Goldberg and Bursey 1990 |
| <i>Oswaldocruzia pipiens</i> | Los Angeles Co., CA | 2% (2/96) | Goldberg and Bursey 1990 |

the helminth genera harbored (Table 2), but too few helminths have been found to evaluate the helminth community in species of *Elgaria*. Except for the 64% (16/25) prevalence of the cestode *Baerietta gerrhonoti* reported by Telford (1965), prevalences of helminth species of *Elgaria* are low.

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APPENDIX 1

Museum accession numbers for specimens of *Elgaria kingii* ($N = 31$) from the University of Arizona (UAZ) listed by Arizona County. **Cochise** (UAZ 15501, 15691, 36871, 37918-37920, 39487, 39711, 39715, 40032-40033, 40308, 40938-40939, 40941-40942, 40944, 40947, 46845, 47297, 48012); **Gila** (UAZ 36731, 40309); **Graham** (UAZ 36362, 39710, 43862); **Pima** (UAZ 11248, 19773-19774) **Santa Cruz** (UAZ 11990, 49171).

APPENDIX 2

Accession numbers for helminths of *Elgaria kingii* deposited in the U.S. National Parasite Collection. *Mesocestoides* sp. (87667), *Oochoristica eumecis* (87664), *Cosmocercoides variabilis* (87665), *Spauligodon goldbergi* (87666), *Physaloptera* sp. (87668), *Skrjabinoptera* sp. (87669).

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