5-2-2002

Gastrointestinal helminths of the blackneck garter snake, *Thamnophis cyrtopsis* (Colubridae)

Stephen R. Goldberg
*Whittier College, Whittier, California*

Charles R. Bursey
*Pennsylvania State University, Shenango Campus, Sharon, Pennsylvania*

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The blackneck garter snake, *Thamnophis cyrtopsis*, occurs from southeastern Utah through central New Mexico, central and southern Arizona, and central Texas to Guatemala (Rossman et al. 1996) at elevations from sea level to around 2700 m (Stebbins 1985). Three subspecies are recognized, *T. c. cyrtopsis*, *T. c. collaris*, and *T. c. ocellatus*; however, intergrades between *T. c. cyrtopsis* and *T. c. ocellatus* have been reported (Rossman et al. 1996). Our sample consisted of the subspecies *T. c. cyrtopsis*. There are, to our knowledge, no reports of helminths from this species. The purpose of this paper is to report host records for helminth parasites of *T. c. cyrtopsis* for the first time.

Twenty-three *T. c. cyrtopsis* (mean snout-vent length [SVL] = 490 mm ± 69 s, range = 366–653 mm) were borrowed from the herpetology collection of the University of Arizona, Tucson (UAZ): COCHISE COUNTY 42342, 42478, 44290; GREENLEE COUNTY 42711, 42712; PIMA COUNTY 26523, 26528, 26531, 26542, 26552, 26556, 26558, 26559, 26562, 26564, 26567, 26570, 42713, 44976, 47141; SANTA CRUZ COUNTY 26561, 26565. The snakes were initially fixed in 10% formalin, washed in water, and stored in 70% isopropanol. The body cavity was opened ventrally and the gastrointestinal tract removed by cutting across the anterior end of the esophagus and the posterior end of the large intestine. The gastrointestinal tract was then opened longitudinally and searched for helminths using a dissecting microscope. The body cavity and liver were also examined for helminths. Nematodes were cleared individually in a drop of concentrated glycerol on a glass slide and identified from these wet mounts. Selected trematodes were rehydrated in water, regressively stained in hematoxylin, dehydrated in ethanol, cleared in xylene, and mounted in Canada balsam on glass slides.

Two species of trematodes, *Ochetosoma ellipticum* (Pratt, 1903) and *Alaria* sp. (mesocercariae only), and 3 species of nematodes, *Ophidascaris labiatopapillosa* Walton, 1927, *Abbreviata terrapenis* (Hill, 1941), and *Physaloptera* sp. (larvae only), were found. Infection sites, total number of helminths, prevalence (number of infected snakes divided by sample examined), mean intensity ± 1 s (number of helminths divided by number of infected snakes), and range are given in Table 1. Voucher helminths were deposited in the United States National Parasite Collection (USNPC), Beltsville, Maryland: *Ochetosoma ellipticum* (90611), *Alaria* sp. (mesocercariae) (90612), *Ophidascaris labiatopapillosa* (90614), *Abbreviata terrapenis* (90613), *Physaloptera* sp. (larvae) (90615).

*Ochetosoma ellipticum* was originally described by Pratt (1903) from specimens found in the mouth of an eastern hognose snake, *Heterodon platirhinos* (locality of collection not given), as *Renifer ellipticus* which was reassigned to its current taxonomic position by Yamaguti (1958). It has been reported from other colubrid snakes of Central and North America (Yamaguti 1958). The life cycle of *O. ellipticum* has not been studied. However, Sogandaress-Bernal and Grenier (1971) studied the life cycles of *O. kansensis* and *O. laterotrema* and found metacercariae encysted in tadpoles of the leopard frog, *Rana pipiens*. Adult trematodes were recovered from the mouths of young cottonmouth snakes, *Agkistrodon piscivorus*. Because *T. cyrtopsis* feeds mainly on tadpoles and adult anurans in
aquatic habitats (Rossman et al. 1996), it likely acquires *O. ellipticum* by eating tadpoles infected with metacercariae. *Thamnophis cyrtopsis* is a new host record for *O. ellipticum*.

Likewise, mesocercariae of *Alaria* sp. develop in the muscles of ranid and bufonid tadpoles (Schell 1985). Garter snakes serve as paratenic (transport) hosts (Schell 1985). This is the first report of mesocercariae of *Alaria* sp. from *T. cyrtopsis*.

Abbreviata terrapenis was originally described from the ornate box turtle, *Terrapene ornata*, from Oklahoma (Hill 1945) and is the only species of its genus known from North America (Baker 1987). *Abbreviata ranae*, a larval form (considered a species inquirenda by Baker 1987), was described by Walton (1931) from cysts in the stomach and intestine of a bullfrog, *Rana catesbeiana*. However, the adult form of *A. ranae* has not been described. Larval *Abbreviata* in cysts have been reported by numerous authors (see Baker 1987) from North American frogs, which are considered paratenic hosts by McAllister and Freed (1992). Whether *A. ranae* is the larval form of *A. terrapenis* is yet to be resolved. We could find no morphological differences between our specimens and the description by Hill (1945), nor were differences found between our specimens and specimens of *A. terrapenis* accessioned in the United States Parasite Collection (USNPC 83537, 85038). This is the first report of *A. terrapenis* from a snake; *T. cyrtopsis* is a new host record.

*Ophidascaris labiatopapillosa* was first described from an eastern racer, *Coluber constrictor*, collected in Florida by Walton (1927) and is the only member of its genus known to occur in the United States (Baker 1987). It has been reported from 6 species of colubrids (but not *Thamnophis*) and 1 species of viperid snake (see Goldberg and Bursey 1999). Walton (1937) found larvae of *O. labiatopapillosa* encysted in the stomach wall, mesentery, and muscles of the amphibians *Amphiiuma tridactylum*, *Rana capito aescopus* (= *Rana aescopus*), *R. catesbeiana*, and *R. sphenocephala*. *Thamnophis cyrtopsis* may become infected with both *A. terrapenis* and *O. labiatopapillosa* by eating infected frogs. *Thamnophis cyrtopsis* is a new host record for *O. labiatopapillosa*.

Third stage larvae of *Physaloptera* sp. were found in the stomach and intestines of 4 *T. cyrtopsis* (Table 1). The majority of the 16 species of *Physaloptera* from North America listed by Morgan (1941) are mammalian parasites. All species of *Physaloptera* require an insect intermediate host (Anderson 2000), and larvae of *Physaloptera* sp. could be expected in any insectivore. Amphibians and reptiles harboring larvae of *Physaloptera* sp. but not adults are summarized in Goldberg et al. (1993). Because most of these larvae were found in the intestinal lumen of the snakes examined, we believe they are a byproduct of diet and will be passed in feces. Thus, they are not parasites of these snakes. This is the first report of physalopteran larvae in *T. cyrtopsis*.

In view of the extensive geographic distribution of *T. cyrtopsis* (Rossman et al. 1996), subsequent examination of different populations will be needed before the helminth diversity of this snake is known.

We thank Charles H. Lowe (University of Arizona) for permission to examine *T. cyrtopsis*.

**LITERATURE CITED**


Received 1 September 2000
Accepted 15 February 2001