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John E. Ubelaker  
*Southern Methodist University*, ubelaker@smu.edu

Roxanne Easter-Taylor  
*Southern Methodist University*

April Marshall  
*Southern Methodist University*

Donald W. Duszynski  
*University of New Mexico*, eimeria@unm.edu

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A NEW SPECIES OF SUBULURA (NEMATODA: SUBULUROIDEA) FROM GROUND SQUIRRELS, SPERMOPHILUS SPILOSOMA BENNETT, 1833, IN NEW MEXICO

John E. Ubelaker, Roxanne Easter-Taylor, April Marshall, and Donald W. Duszynski*

Department of Biological Sciences, Southern Methodist University, Dallas, Texas 75205. e-mail: ubelaker@smu.edu

ABSTRACT: A description is presented of a new species of Subulura Molin, 1860, Subulura novomexicanus, collected from the spotted ground squirrel, Spermophilus spilosoma Bennett, 1833, in New Mexico. The males are 24 to 29 mm long, precloacal sucker 1.7–2.0 mm from posterior end, spicules subequal 0.83–1.0 long, and gubernaculum Y-shaped 0.21–0.39 mm long. Females are 34–39 mm long, vulva near middle of body 14.06–22.00 mm from anterior end, and eggs 0.04–0.05 mm long by 0.03–0.04 mm wide. The new species is distinguished from Subulura unguulatus Erickson, 1938 in being longer and having spicules that are distinctively different in size and form. It also differs from Subulura nevadense Babero, 1973 in being longer and having a larger egg size and smaller spicules. The new species is most similar to Subulura anderssoni (Cobbolt, 1876) (Thwaites, 1927); however, the males of this species are smaller and they have broad cervical alae, and the adults occur in squirrels of India. Reexamination of S. unguulatus showed 11 pairs of caudal papillae, including 4 pairs of preanals, 1 pair adanal and lateral, and 6 pairs of postanal papillae located at the end of the tail. Spermophilus richardsoni (Sabine, 1822) is a new host record for S. nevadense, and Montana is a new distributional record for this nematode. Eimeria callospermophili Henry, 1932, is a new record for S. spilosoma.

MATERIALS AND METHODS

In total, 89 spotted ground squirrels were collected as part of The University of New Mexico's Long-Term Ecological Research (LTER) project on the Sevilleta National Wildlife Refuge, near Socorro, New Mexico. The only other mention of parasites from this species of ground squirrel is by Broda and Schmidt (1978), who reported the presence of Hymenolepis citelli McLeod, 1933, Citellina triradiata (Hall, 1916) Morgan, 1930, redescribed by Broda and Schmidt (1978), Physaloptera massino Schulz, 1926, and Trichuris sp. from Colorado. This is the first report of a species of Subulura from S. spilosoma.

Here, we describe a new species of Subulura Molin, 1860. It was discovered in spotted ground squirrels, Spermophilus spilosoma Bennett, 1833, collected on the Sevilleta National Wildlife Refuge, near Socorro, New Mexico. The only other mention of parasites from this species of ground squirrel is by Broda and Schmidt (1978), who reported the presence of Hymenolepis citelli McLeod, 1933, Citellina triradiata (Hall, 1916) Morgan, 1930, redescribed by Broda and Schmidt (1978), Physaloptera massino Schulz, 1926, and Trichuris sp. from Colorado. This is the first report of a species of Subulura from S. spilosoma.

DESCRIPTION

Subulura novomexicanus n. sp. (Figs. 1–5)

Description (based on 9 specimens): With the characteristics of the genus. Whitish nematodes tapering to both extremities, anterior end with rounded cephalic tips. Cephalic plate with 4 ovoid and striated papillae, 2 prominent submedian amphids, and a hexagonal mouth opening surrounded by 6 smaller papillae. Mouth surrounded by 6 labial lobes, separated by 6 interlabia, characteristic of the subgenus, Muri-subulura Quantin, 1969. Pharynx of 3 muscular portions, each composed of 3 lobes twisted to make the pharynx have a helicoidal structure. Two narrow lateral alae originate behind cephalic plate and terminate in region of the junction of muscular and glandular parts of esophagus; numerous and varied transversal striations present throughout alae. Esophagus dilated posteriorly with short neck followed by bulb.

Male (n = 6): 24–29 long by 0.49–0.59 wide. Buccal cavity 0.05–0.06 long by 0.04–0.048 wide. Nerve ring and excretory canal 0.11–0.12 and 0.34–0.35 from anterior end, respectively; precloacal sucker located 1.7–2.0 from posterior end. Tail with terminal spine. Eleven pairs of ventral caudal papillae with 4 pairs of preanals that begin at the level of the precloacal sucker, 1 pair adanal and lateral, and 6 pairs of postanal, 4 near the end of the tail. Anus to tip of tail, including terminal spine 0.24–0.38. Spicules alated, equal to subequal, 0.83–1.0 long, gubernaculum Y-shaped 0.21–0.39 long.

Female (n = 3): 34–39 long by 0.5–0.8 wide. Buccal cavity 0.04–0.07 long by 0.03–0.7 wide. Esophagus length with bulb 1.8–2.1 long. Nerve ring 0.41–0.43 and excretory pore 0.62–0.66 from anterior end. Vulva near middle of body, 14.06–22.58 from anterior end. Eggs 0.04–0.05 mm long by 0.03–0.04 wide. Tail 1.58–1.59 long.

Taxonomic summary

Type host: Spermophilus spilosoma Bennett, 1833.

Type locality: Sevilleta National Wildlife Refuge, Socorro Co., New Mexico.

Specimens deposited: Holotype male and allotype female and paratypes, USNPC 099587.00, 099588.00, and 099589.00, respectively. Symbiotype hosts: MSB 19049 captured in 1989 and MSB 26856 captured in 1993, both from Five Points Grassland.

Etymology: The specific name of this species refers to the state of New Mexico, where the specimens were collected.

DISCUSSION

The genus Subulura contains many species occurring in both birds and mammals. Two species of Subulura are known to occur in rodents in North America. Subulura unguulatus Erickson, 1938, from Zapus hudsonius (Zimmermann, 1780), collected in Minnesota, is a much smaller nematode (males 15–16 mm long vs. 24–29 mm), with males having spicules similar in length to our new species. Erickson (1938) did not record all the caudal papillae present in the male specimens. Examination of the type specimen revealed that there are 11 pairs of caudal
papillae, including 4 pairs of preanals, 1 pair adanal and lateral, and 6 pairs of postanal papillae, including 4 small papillae located at the tip of the tail. Thus, S. unguilatus is similar to most species of Subulura from rodents in the distribution of caudal papillae, including the new species described here.

A second species, Subulura nevadense Babero, 1973, occurs in Spermophilus tereticaudus Baird, 1858 and Ammospermophilus leucurus (Merriam, 1893), from Clark, Lincoln and Nye counties, Nevada (Babero, 1973). The males of S. nevadense are significantly shorter (9.9–13) than our new species. In addition, in males of S. nevadense, the anterior most caudal papillae are located much anterior to the adanal sucker, and in the females, the egg size is larger (0.08–0.09) than our new species (0.04–0.05). We also examined Subulura specimens deposited in the USNPC (042484.00, 042485.00, and 042490.00) collected from Spermophilus richardsoni (Sabine, 1822) in Beaverhead, Montana, by Jellison in 1936 and deposited in the USNM Helminthological Collections. These specimens are all similar to S. nevadense; thus, S. richardsoni represents a new host record, and Montana is a new distributional record for this parasite.

In all specimens of S. nevadense examined, the males from S. richardsoni were within the range reported by Babero (1973) and shorter than those of the new species we report here.

The new species is also morphologically similar to S. andersoni as redescribed by Thwaite, 1927, as presented by Baylis (1936). In S. andersoni, the males are smaller (13.5–14.9) than S. novomexicanus, have broad cervical alae, and the adults are only known to occur in squirrels of India.

In our study, a single host animal (both males) collected in spring 1989 contained 5 male and 1 female S. novomexicanus, a juvenile Physaloptera massino, and Eimeria callospermophili. Both ground squirrels occurred in a grassland habitat described by Decker et al. (2001). Broda and Schmidt (1978) surveyed the parasites of this squirrel species, and they did not find Subulura species in the 38 animals examined from northern Colorado. They did record the presence of Eimeria larimerensis, Hymenolepis citelli, Citiellina triradiata, Physaloptera massino, and Trichuris sp. in this host. The report here of E. callospermophili is a new host record for this ground squirrel.

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LITERATURE CITED


