FIRST RECORD OF PLAGIORCHUS MICRACANTHOS (TREMATODA: PLAGIORCHIIDAE) FROM THE WESTERN SMALL-FOOTED MYOTIS, MYOTIS CILIOLABRUM (CHIROPTERA: VESPERTILIONIDAE)

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FIRST RECORD OF PLAGIORCHUS MICRACANTHOS (TREMATODA:PLAGIORCHIIDAE) FROM THE WESTERN SMALL-FOOTED MYOTIS, MYOTIS CILIOLABRUM (CHIROPTERA: VESPERTILIONIDAE)

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ABSTRACT

A western small-footed myotis (Myotis ciliolabrum) from South Dakota harbored 2 plagorchiid trematodes in its small intestine. Both trematodes were identified as Plagiorchis micracanthos Macy, 1931. This is the first report of P. micracanthos from M. ciliolabrum, and the first time this parasite has been reported in a bat from South Dakota. At least 10 other parasites are known to infect and/or infest M. ciliolabrum in North America.

† † †

The western small-footed myotis, Myotis ciliolabrum (Merriam 1886), is a small vespertilionid that occurs over much of western North America from central British Columbia, southern Alberta, and southwestern Saskatchewan, Canada, southward to Chihuahua, Coahuila, and Zacatecas, Mexico (Holloway and Barclay 2001). Two subspecies are recognized, M. c. ciliolabrum in the east and M. c. melanorhinus in the western part of the range (Hall 1981; van Zyll de Jong 1984).

Previous reports of parasites from this host include coccidia (Scott and Duszynski 1997; Scott et al. 1999), chiggers and mites (Krutzsch 1955; Bradshaw and Ross 1961; Jones et al. 1973), and nematodes (Measures 1994; Table 1). Herein, we document a new host and a new distributional record for a trematode parasite that is known to infect bats in North America.

METHODS

On 13 September 2006, an adult female M. ciliolabrum was collected by hand from the Prairie Wind Casino, located 16.1 km E Oglala in the Pine Ridge Indian Reservation, Shannon County, South Dakota (43°11.1'N, 102°59.3'W). We euthanized the bat by cervical dislocation and examined it for helminths by opening the gastrointestinal tract from the esophagus to anus. We then placed the GI tract in a Petri dish containing a 0.9% saline solution. We also examined feces for coccidial parasites following previously published methods (McAllister et al. 2004). The GI tract plus the liver, heart, reproductive tract, and urinary tract were examined using a stereomicroscope. Two trematodes were recovered in the small intestine, placed briefly in distilled water for egg ejection, and preserved in 70% ethanol. Trematodes were stained with Semichon's acetocarmine, dehydrated through a series of graded ethanols, cleared with xylene, and mounted in Canada Balsam.
A voucher specimen of the trematode was deposited in the United States National Parasite Collection (USNPC), Beltsville, Maryland (USNPC 99004). The M. ciliolabrum (skin and skull) was deposited in the Angelo State Natural History Collection (ASNHC), San Angelo, Texas (ASNHC 13038).

Table 1. Parasites reported from M. ciliolabrum.

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Location</th>
<th>Prevalence a</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apicomplexa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eimeria pilarensis</td>
<td>NM</td>
<td>1/12 (8%)</td>
<td>Scott and Duszenski, 1997</td>
</tr>
<tr>
<td>Eimeria rioarribaensis</td>
<td>NM</td>
<td>4/22 (18%)</td>
<td>Scott et al., 1999</td>
</tr>
<tr>
<td></td>
<td>MXb</td>
<td>1/21 (5%)</td>
<td>Scott et al., 1999</td>
</tr>
<tr>
<td>Trematoda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plagiorchis micracanthos</td>
<td>SD</td>
<td>1/1 (100%)</td>
<td>This study</td>
</tr>
<tr>
<td>Nematoda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Longibucca lastiura</td>
<td>CANd</td>
<td>1/10 (10%)</td>
<td>Measures, 1994</td>
</tr>
<tr>
<td>Acari</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leptotrombidium myotis</td>
<td>SD</td>
<td>not stated</td>
<td>Turner and Jones, 1968</td>
</tr>
<tr>
<td></td>
<td>MT</td>
<td>1/6 (17%)</td>
<td>Jones et al., 1973</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td>not stated</td>
<td>Whitaker et al., 1983</td>
</tr>
<tr>
<td>Macronyssidae (nymphs)</td>
<td>CA</td>
<td>1/1 (100%)c</td>
<td>Krutzsch, 1955</td>
</tr>
<tr>
<td>Macronyssus crostyi</td>
<td>NM</td>
<td>1/1 (100%)</td>
<td>Ritzi et al., 2002</td>
</tr>
<tr>
<td>Ornithodoros sp.</td>
<td>AZ</td>
<td>not stated</td>
<td>Bradshaw and Ross, 1961</td>
</tr>
<tr>
<td>Spinturnix americanus</td>
<td>AZ</td>
<td>not stated</td>
<td>Bradshaw and Ross, 1961</td>
</tr>
<tr>
<td>Spinturnix carloshoffmanni</td>
<td>AZ</td>
<td>not stated</td>
<td>Bradshaw and Ross, 1961</td>
</tr>
<tr>
<td>Trombicula myotis</td>
<td>AZ</td>
<td>not stated</td>
<td>Bradshaw and Ross, 1961</td>
</tr>
<tr>
<td>Insecta</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cimex pilosellus</td>
<td>SD</td>
<td>not stated</td>
<td>Turner, 1974</td>
</tr>
</tbody>
</table>

*Prevalence = number infected/number examined (%).

bBaja California Norte and Sonora.

cOther M. ciliolabrum taken from near San Diego, California were uninfected; number not given.
dAlberta, Canada.

**RESULTS AND DISCUSSION**

No coccidia were found in the feces; however, the two trematodes found in the small intestine of M. ciliolabrum belonged to the family Plagorchiidae and were identified as Plagiorchis micracanthos Macy, 1931. This bat parasite has been previously reported from other vespertilionids including the little brown myotis (Myotis lucifugus) in New Mexico (Cain and Studier 1974) and Minnesota (Macy 1931), big brown bat (Eptesicus fuscus) in Minnesota (Macy 1931), gray myotis (Myotis grisescens) in Kansas (Ubelaker 1966), western pipistrelle (Pipistrellus hesperus) in Nevada, and eastern pipistrelle (Pipistrellus [=Perimyotis] subflavus) in Nebraska (Nickel and Hansen 1967). Interestingly, Manter and Debus (1945) reported this species of trematode from the California myotis (Myotis californicus) in Louisville, Cass County, Nebraska. However, the range of Myotis californicus is > 1,000 km to the west, so their host must be considered a misidentification (see Fig. 3 in Simpson 1993). Unfortunately, the identity of this bat will remain an enigma because a voucher specimen is not available.

A variety of parasites has been reported to infect/infest Myotis californicus, including 2 species of coccidia, 6 species of Acari, one insect, and a single species each of trematode and nematode in North America (Table 1). We have provided a new host and distributional record for P. micracanthos. Additional studies on helminths of bats of the northern Great Plains are warranted to further advance our knowledge of chiropteran parasites and their geographic distribution.
We thank members of the Oglala Sioux Nation, Prairie Wind Casino for donating the bat to the senior author and the South Dakota Game, Fish and Parks for issuing our scientific collecting permit (No. 42). We also thank Drs. Loren Ammerman and Robert Dowler (ASNHC) for verifying the identity of the bat and Dale W. Sparks (Indiana St. University) and an anonymous reviewer for improving the ms.

LITERATURE CITED


