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**LEECHES (ANNELIDA: HIRUDINEA)
IN CENTRAL AND WESTERN NEBRASKA**

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Sixteen sites in western and central Nebraska were sampled for leeches. Of the ten species found, three are newly recorded in Nebraska: *Alboglossiphonia heteroclita*, *Dina dubia*, and *Theromyzon biannulatum*. The habitats and ecology of each species are described.

† † †

INTRODUCTION

There has been a revival of interest in the use of hematophagous (blood feeding) leeches for medicinal purposes (Claude, 1937; Bagdasarova, 1969; Gasic et al., 1983; Lent, 1986; Sawyer, 1986) and for veterinary medicine (Cooper, 1990; Hendrix and Shealy, 1991). However, only about half of the known leech species are hematophagous, while the others are scavengers and predators of invertebrates. Leeches can be used to control invertebrate vectors of harmful parasites (Cooper, 1990) and are regarded as indicators of water quality (Mann, 1955a, b).

Limited data are available on the distribution of leeches in North America. Three studies provide information on Nebraska leeches. The earliest was that of Verrill (1874) as part of a Yale University scientific expedition. The second was Ward's (1902) survey of leeches of the world, which included some from Nebraska. Dang and Curtin (1978) reported nine species in eastern Nebraska. Here I present a complementary survey from central and western Nebraska.

MATERIALS AND METHODS

From late May through early August, 1990, I collected leeches from lotic and lentic habitats in Arthur, Cherry, Custer, Garden, Keith, McPherson, and Wheeler counties (Fig. 1). They were hand-collected from submerged logs, rocks, sticks, vegetation, and turtles and taken to Cedar Point Biological Station in Keith County, where they were examined alive whenever possible. If their movements prevented identification, they were placed in 30% Nembutal for up to three hours to relax them for fixation. They were then identified and fixed in alcohol-formalin-acetic acid for 24 hours and stored in 40% glycerol in ethanol. Klemm's (1982) key was used to identify them, primarily on the basis of external morphology. In some cases, it was necessary to dissect the specimen to identify it using internal morphological characters.

RESULTS AND DISCUSSION

Ten species representing three families were found, of which three are new records for Nebraska (Fig. 1; Table I).

Family Glossiphoniidae

***Theromyzon biannulatum* Klemm**

This leech represents a new generic record for Nebraska. It was collected at two places—Swan Lake in Arthur County and Martin Bay pond in

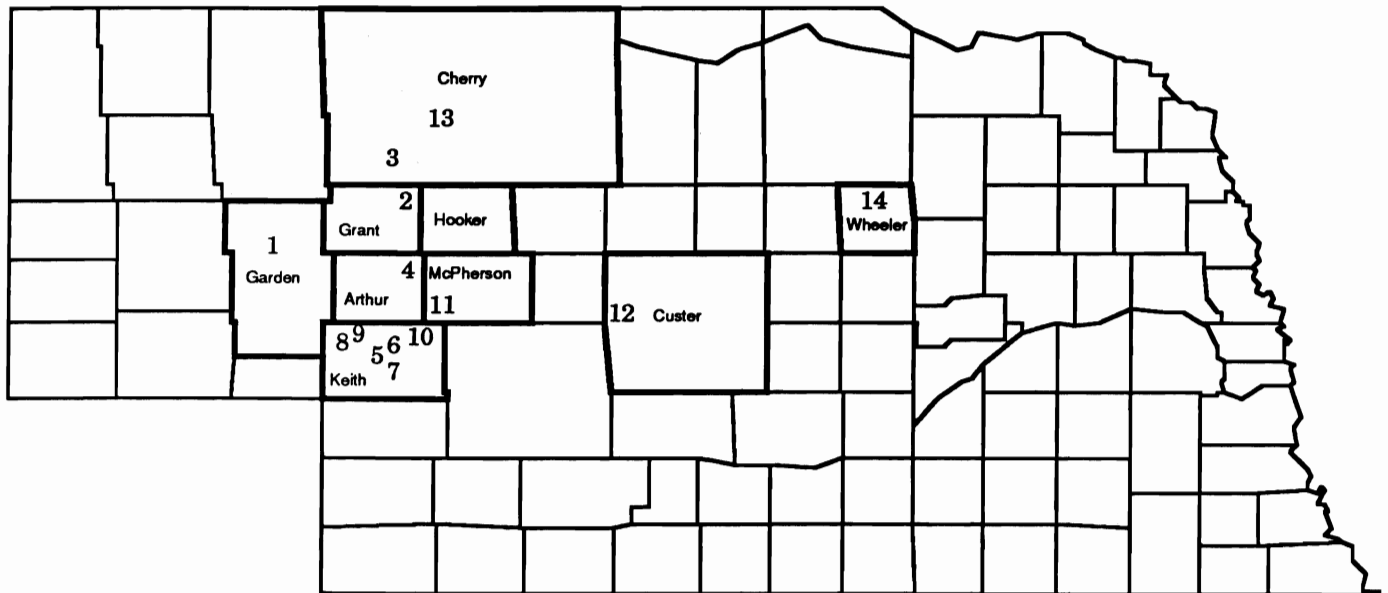


Figure 1. Location of collecting sites in Nebraska. 1. Hackberry Lake. 2. Drainage pond (1 mile west of Whitman). 3. Stream (10 miles north of Whitman). 4. Swan Lake. 5. Martin Bay pond. 6. Keystone/Ogallala Reservoir. 7. Beckius Pond. 8. Sand Creek. 9. Pond near Sand Creek. 10. Cedar Creek. 11. Diamond Bar Slough. 12. Arnold State Recreation Area. 13. Stream off Mud Lake. 14. Clearwater Creek.

Keith County—under lily pads (*Nymphaea*) and on arrowheads (*Sagittaria*). One brooding adult was collected from the underside of a lily pad, but most specimens were immature and in erect posture, with their anterior end pointing upward. Thus, they were positioned to attach to waterfowl to acquire a first or second meal of blood. They attach to the nasal mucous membranes of the bird, and they have been reported to feed on the blood from eyes of birds as well (Sawyer, 1972, 1986).

Its life history is probably similar to that of other members of the genus such as *T. rude* Baird and *T. tessulatum* Muller, both of which require three blood meals to reach maturity and do not feed after copulation (Davies and Wilkialis, 1980; Wilkialis and Davies, 1980). This leech exhibits a free-living breeding and brooding period similar to that of *Placobdella*. The adults search for a blood meal using chemoreception (response to preen-gland secretions) and thermoreception (Sawyer, 1972, 1986).

Glossiphonia complanata Linnaeus

Glossiphonia complanata is cosmopolitan. In Nebraska it is frequently encountered both in lentic

and lotic environments. Specimens were collected in Arthur County (Swan Lake) and Keith County (Keystone/Ogallala Lake, Cedar Creek, pond near Sand Creek, Sand Creek, and Martin Bay pond). They were collected from submerged logs and from between the leaves on reeds.

Glossiphonia complanata, commonly called the snail leech or mollusc leech, is nocturnal and feeds on the soft parts of gastropods (Moore, 1964; Mann, 1962; Sawyer, 1986). Gastropods are the majority of its diet, but it also consumes oligochaetes, larval chironomids, and amphipods (Wrona et al., 1979). Although it is an aggressive predator, it is quite lethargic compared to other glossiphoniids. An excellent, stereotypical account of the feeding mechanism of *G. complanata* was given by Gale (1973).

Placobdella ornata Verrill

Placobdella ornata was found in eight localities: Arthur County (Swan Lake); Keith County (Beckius Pond, Cedar Creek, Martin Bay pond, Sand Creek, and a pond near Sand Creek); McPherson County (Diamond Bar slough); and Cherry County (tributary of Mud Lake).

Table I. List of species and localities

Arthur County	
Swan Lake	<i>Alboglossiphonia heteroclita</i> <i>Erpobdella punctata</i> <i>Glossiphonia complanata</i> <i>Helobdella fusca</i> <i>Helobdella stagnalis</i> <i>Macrobodella decora</i> <i>Placobdella ornata</i> <i>Theromyzon biannulatum</i>
Cherry County	
Stream ten miles north of Whitman	<i>Dina dubia</i>
Tributary of Mud Lake	<i>Macrobodella decora</i> <i>Placobdella ornata</i>
Custer County	
Arnold Lake State Recreation Area	<i>Helobdella fusca</i>
Garden County	
Hackberry Lake	<i>Macrobodella decora</i>
Grant County	
Drainage pond one mile west of Whitman	<i>Erpobdella punctata</i>
Keith County	
Beckius Pond	<i>Placobdella ornata</i> <i>Placobdella parasitica</i>
Cedar Creek	<i>Erpobdella punctata</i> <i>Glossiphonia complanata</i> <i>Haemopsis marmorata</i> <i>Placobdella ornata</i>
Keystone/Ogallala Lake	<i>Erpobdella punctata</i> <i>Glossiphonia complanata</i> <i>Helobdella stagnalis</i>
Martin Bay pond	<i>Glossiphonia complanata</i> <i>Helobdella fusca</i> <i>Placobdella ornata</i> <i>Theromyzon biannulatum</i>
Pond near Sand Creek	<i>Erpobdella punctata</i> <i>Glossiphonia complanata</i> <i>Placobdella ornata</i>
Sand Creek	<i>Glossiphonia complanata</i> <i>Placobdella ornata</i>
McPherson County	
Diamond Bar Slough	<i>Macrobodella decora</i> <i>Placobdella ornata</i>
Wheeler County	
Clearwater Creek	<i>Erpobdella punctata</i> <i>Helobdella stagnalis</i>

It is a hematophagous leech that feeds primarily on turtles. It has also been found to feed on human blood. It has a free-living stage when it breeds and then broods its young, primarily in summer months. However, *P. ornata* has been found brooding as early as April and as late as October (Sawyer, 1972). During this time it is commonly found in shallow water, and I collected it under submerged logs and on sticks and rocks and occasionally on a turtle. The substrate at the breeding and brooding period is smooth submerged wood, usually stripped of bark and resting on the bottom.

Placobdella parasitica Say

Although *Placobdella parasitica* is widely distributed in the United States (Sawyer, 1972; Klemm, 1982), only four specimens were collected in Keith County (Beckius Pond) under a submerged log during the summer breeding and brooding period. This leech seasonally feeds on turtle blood, but it is not as likely to detach after a blood meal as *P. ornata* (Sawyer, 1986). As such, *P. parasitica* is not encountered as often as *P. ornata* in lotic and lentic debris.

Helobdella stagnalis Linnaeus

Helobdella stagnalis is on all continents except Australia (Sawyer, 1986). It was originally reported in Nebraska by Verrill (1874), under the name of *Clepsine modesta*. Ward (1902) collected it and called it *Glossiphonia stagnalis*. Dang and Curtin (1978) found it, and I collected it in Arthur County (Swan Lake), Keith County (Keystone/Ogallala Lake), and Wheeler County (Clearwater Creek); it usually was under submerged logs and on aquatic vegetation.

It consumes molluscs, small oligochaetes, and aquatic insects (Hilsenhoff, 1963; Thut, 1969; Sawyer, 1972). It is unique among North American leeches because it has a chitinous, horny, brown nuchal scute (Sawyer, 1972; Klemm, 1982) of unknown function.

Helobdella fusca Castle

I collected *Helobdella fusca* in Arthur County (Swan Lake), Custer County (Arnold Lake), and Keith County (Martin Bay pond) from under submerged logs and on aquatic vegetation.

This leech was originally described by Castle (1900). Dang and Curtin (1978) reported it at Chris

Lake in Sarpy County. Gastropods compose the majority of this leech's diet (Sawyer, 1972).

***Alboglossiphonia heteroclita* Linnaeus**

Alboglossiphonia heteroclita is newly collected in Nebraska. I collected it from Swan Lake in Arthur County from my wading boots while I walked through aquatic vegetation in late May.

It is found in Eurasia and North America, especially near the Great Lakes and in western Canada (Sawyer, 1972, 1986; Klemm, 1982). It may also be in the western states, but lack of surveys and difficulty of finding this leech explain its incompletely-known range. It feeds primarily upon molluscs (gastropods) (Mann, 1962; Sawyer, 1986).

Family Hirudinidae

***Haemopsis marmorata* Say**

Haemopsis marmorata is widely distributed throughout North America. I found this amphibious leech as it was foraging at night in a small, sandy, slow-moving part of Cedar Creek in Keith County.

It is a nocturnal feeder with three jaws and teeth like most members of the family. It feeds on small invertebrates—gastropods, insect larvae, and oligochaetes—near the shoreline (Sawyer, 1972).

***Macrobdella decora* Say**

I collected *Macrobdella decora* in Arthur County (Swan Lake), McPherson County (Diamond Bar Slough), Cherry County (tributary of Mud Lake), and Garden County (Hackberry Lake) using a dip net in vegetation, from below lily pads, and from my leg.

It is abundant in northern lotic and lentic environments and is encountered infrequently in the southern part of the United States (Klemm, 1982). It was first collected in Nebraska by Ward (1902), who claimed that some were a foot long. It is known as the American medicinal leech because of its use in medical bloodletting, and it was considered a New World counterpart of the European leech *Hirudo medicinalis* Linnaeus.

Family Erpobdellidae

***Erpobdella punctata* Leidy**

Erpobdella punctata was first documented in Nebraska by Verrill (1874), later by Ward (1902) and by Dang and Curtin (1978). I collected it in Arthur County (Swan Lake), Grant County (drainage pond on highway 163, one mile west of Whitman), Keith County (Keystone/Ogallala Lake; Cedar Creek; pond close to Sand Creek; Martin Bay pond), and Wheeler County (Clearwater Creek) using a dip net and from vegetation. Its brownish, seed-shaped cocoon was also present at these localities.

It is a scavenger and a predator of oligochaetes, aquatic insects, and gastropods (Sawyer, 1972, 1986).

***Dina dubia* Moore and Meyer**

Dina dubia is a species record for Nebraska. I collected it from a stream in the southwestern corner of Cherry County, about ten miles north of Whitman, with a dip net in the aquatic vegetation on the bank of the stream.

Little is known of the diet of this leech. Based on the structure of its mouth and muscular pharynx, one can speculate that it is probably a predator and scavenger like other erpobdellids, and thus it may have the typical diet of oligochaetes, gastropods, and aquatic insects.

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