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# INSECTS

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## COLLECTION RECORDS OF THREE AQUATIC BUGS (HETEROPTERA); PYGMY BACKSWIMMER (PLEIDAE), WATER SCORPION (NEPIDAE) AND MARSH TREADER (HYDROMETRIDAE) FOR SASKATCHEWAN, CANADA

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Aquatic sampling in Saskatchewan by the authors has collected specimens of pygmy backswimmers, *Neoplea striola*, water scorpions, *Ranatra fusca*, and marsh treaders, *Hydrometra martini*. According to Mau et. al., *Checklist of the Hemiptera of Canada and Alaska*, published in 2000, there are no previous records for the

province. There appears to be some confusion regarding the distribution of the latter two bugs in Saskatchewan however; an article published in 1994 reported *R. fusca* as occurring in southern parts of all Canadian provinces<sup>13</sup> and in 1987 another paper reported *H. martini* as occurring in Manitoba, Saskatchewan and Alberta.<sup>12</sup>



Figure 1: Side view of pygmy backswimmer (*Neoplea striola*) showing beak.

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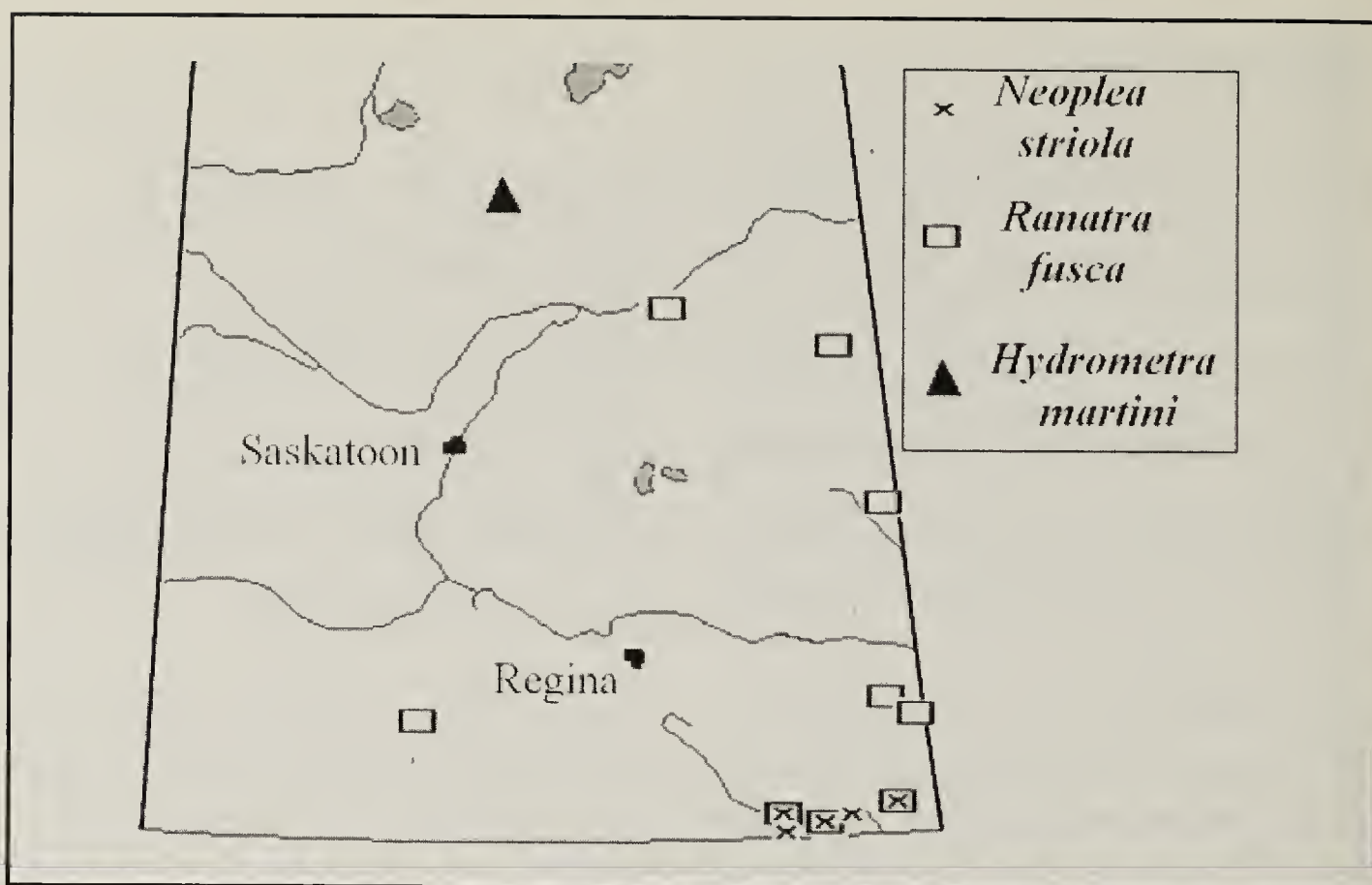


Figure 2: Map of southern Saskatchewan showing collection sites.

These two earlier papers did not provide a basis for the reported presence of these bugs in Saskatchewan. Our collection results confirm the presence of all three bugs in Saskatchewan.

**Pygmy backswimmer (*Neoplea striola* (Fieber): Pleidae)**

Pygmy backswimmers are easily overlooked, as they are only about 2 mm in length (Figure 1). The body is flattened ventrally and rounded dorsally. The legs are all relatively short as is the beak (mouthparts). The hind legs have sparse swimming hairs but pygmy backswimmers are weak swimmers, preferring to crawl through the submersed vegetation.<sup>5</sup> The body as a whole has no obvious markings, but under the microscope the first pair of wings and most of the body are coarsely punctate (pock-marked). All stages are predaceous on small invertebrates, including seed shrimp and insect larvae.<sup>1,5</sup> The short beak is used to pierce the bodies of the prey and the internal fluids are sucked out.<sup>10</sup> Eggs are laid into submersed aquatic

plants.<sup>1,11</sup> The life cycle has five larval instars (growth stages) and takes about 60 to 70 days to complete.<sup>11</sup> There appears to be only one generation a year, with the adult being the overwintering stage.<sup>1,11</sup>

Specimens were collected in southeastern Saskatchewan in 2006 from Lightning Creek at Carnduff (49° 12' 17" N; 101° 43' 03"W), Long Creek (49° 03' 47"N; 103° 29' 54"W) and three sites associated with the Souris River: Rafferty Dam (49° 07' 27"N; 103° 01' 59"W), Roche Percée (49° 04' 43"N; 102° 45' 12"W) and at Highway 9 (49° 04' 28"N; 102° 17' 51"W) (Figure 2). Collection locations ranged from slow-moving streams associated with cultivated agricultural land (Long Creek) to larger rivers with Manitoba Maple (*Acer negundo*) groves along the banks (Souris River at Highway 9).

It appears that this is a new record for *N. striola* and the family, Pleidae, in Saskatchewan. This is the only species of the family reported from Canada.<sup>8</sup> *N. striola* has previously been recorded

from Manitoba, Ontario, and Quebec.<sup>8</sup> In the United States, it has been reported throughout New England and in North Dakota, Montana, Florida, Kansas, Texas, Colorado and California.<sup>2,3,4,6,7,8,15</sup>

The waterways from which pygmy backswimmers were collected in Saskatchewan—Souris River, Long Creek and Lightning Creek—all flow into North Dakota and ultimately into Manitoba. As of yet, there are no collections from other waterways that flow directly into Manitoba, such as the Qu'Appelle River and Pipestone Creek, even though Pipestone Creek does connect with the Souris River system in Manitoba. At present, the immigration route for this species appears to be from the southeast through North Dakota, rather than straight east from Manitoba.

**Water scorpion** (*Ranatra fusca* Uhler: Nepidae)

Adult water scorpions, identified by completely developed wings, have a long slender appearance, with a body 35 to 45 mm long but only 8 mm, or less, wide (Figure 3). The slender

appearance is accentuated by two long breathing tubes at the end of the abdomen, which add 40% to the total length. The overall body colour is brown. The forelegs are modified for grasping prey. The other two pairs of walking legs are long and slender for clinging onto submersed vegetation and other substrates. The head is short in proportion to the body, with large eyes and a pointed beak. Adults overwinter in submersed vegetation and debris.<sup>12</sup> Egg to adult requires about 47 days and includes five larval instars.<sup>9,12</sup> Water scorpions are predaceous in all stages.<sup>13</sup> They use their modified grasping forelegs to capture other insects, crustaceans and even small fish and tadpoles.<sup>13</sup> The prey is held by the forelegs while the pointed beak pierces the prey and sucks out body fluids.<sup>10</sup>

In east-central Saskatchewan, water scorpions were collected from the Red Deer River at Rendek Elm Forest (52° 54' 38" N; 102° 01' 49" W) in 2002 and 2003. Sampling in 2006 collected specimens from additional sites in east-central Saskatchewan; fish rearing ponds near the Highway 6

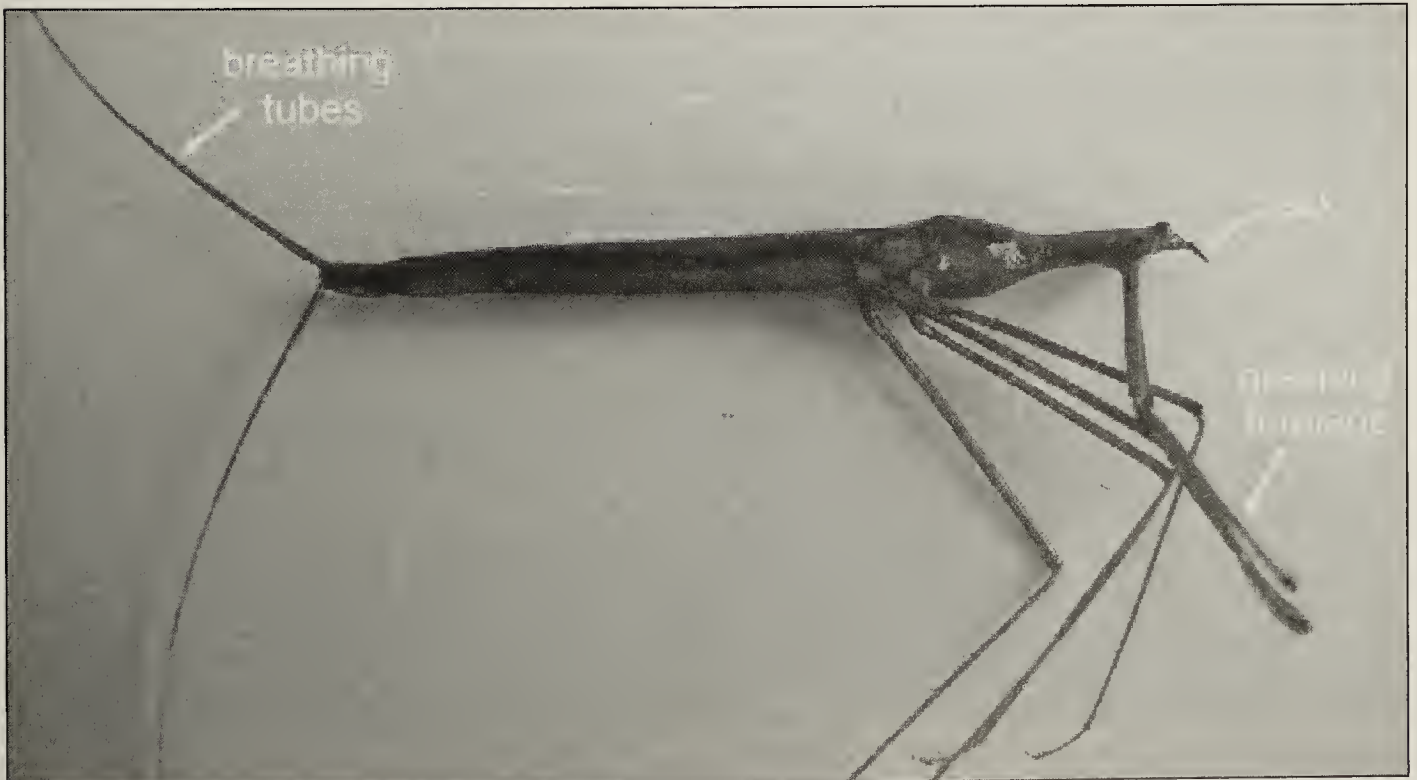


Figure 3: Side view of water scorpion (*Ranatra fusca*) showing breathing tubes, beak and grasping forelegs  
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crossing of the Saskatchewan River (53° 15' 09" N; 104° 29' 07" W) and from Little Boggy Creek at Runnymede (51° 28' 25" N; 101° 41' 54" W). Specimens also were collected from southeastern Saskatchewan in 2006 : Little Pipestone Creek at Moosomin Lake Reservoir (50° 02' 02" N; 101° 41' 41" W), Pipestone Creek before it enters Manitoba (49° 53' 11" N; 101° 26' 57" W), Lightning Creek near Carnduff, (49° 12' 17" N; 101° 43' 03" W) and from two sites on the Souris River—one associated with Rafferty Dam (49° 07' 27" N; 103° 01' 59" W) and the other at Roche Percée (49° 04' 43" N; 102° 45' 12" W). Farther west, they were collected from the Wood River near Gravelbourg (49° 54' 07" N; 106° 29' 48" W) in 2006 (Figure 2).

Water scorpions are known to inhabit all types of aquatic habitats.<sup>9,12</sup> The specimens collected were associated with submersed vegetation, trailing fibrous roots or stick entanglements in slower reaches of the creeks and rivers. They were also collected in artificial fishponds.

*R. fusca* is one of three species of water scorpion collected in Canada.<sup>8</sup>

*R. fusca* has been reported from British Columbia, Ontario, Quebec, New Brunswick, Prince Edward Island and Nova Scotia.<sup>8</sup> In the United States, it is found throughout the northern states south to North Carolina and Texas, west to Kansas and California.<sup>13</sup>

Water scorpions appear to have entered the province on a broad front from Manitoba via the Red Deer River, Pipestone Creek and possibly other waterways, in addition to those connected with North Dakota. The collection from the Gravelbourg area suggests a wide east-west distribution in Saskatchewan.

**Marsh treader (*Hydrometra martini* Kirkaldy: Hydrometridae)**

Marsh treaders are very slender in appearance (Figure 4). The adult specimen collected is 9 mm long and 0.5 mm wide. Unfortunately, it has been broken into two parts just anterior to the last pair of legs. The overall body colour is brown. The head is elongated and makes up almost one quarter of the total body length. The eyes are set on the sides of the head, well back from the anterior end. All the legs are thin and similar to each other. The beak is

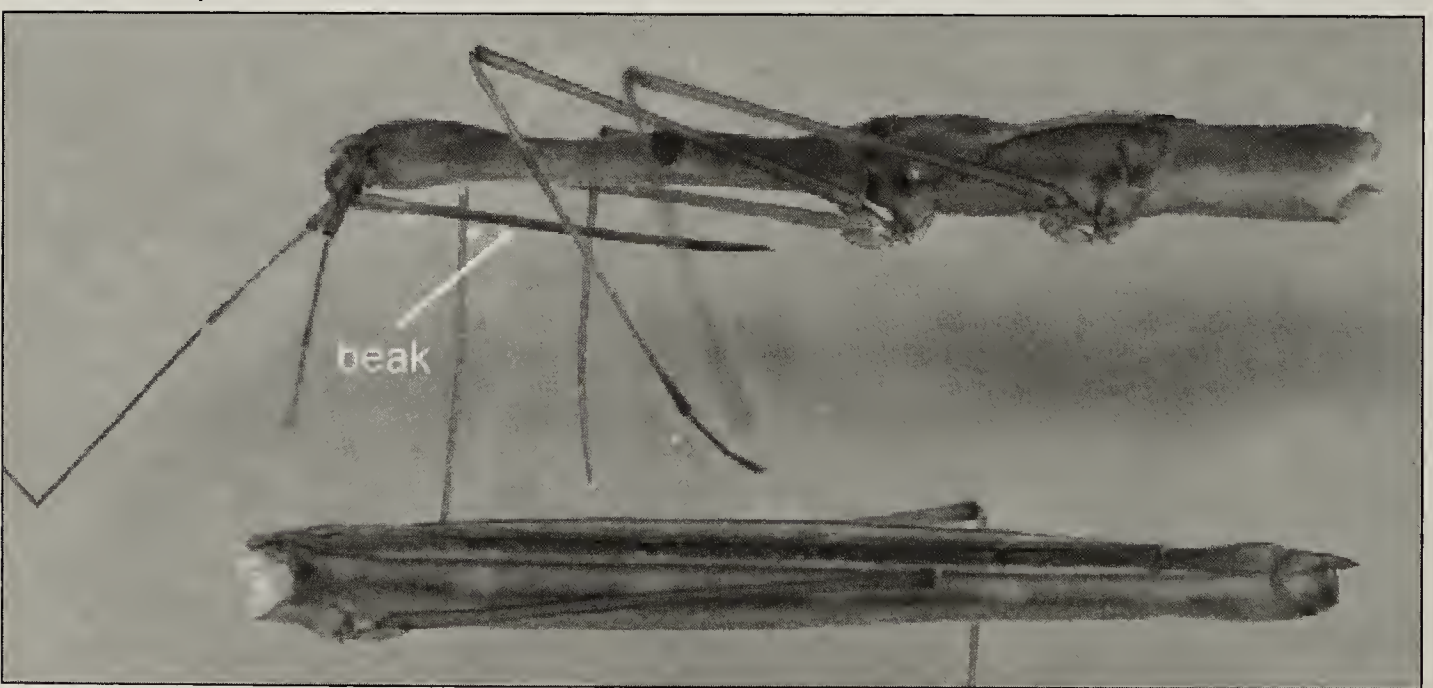


Figure 4: Side view of marsh treader (*Hydrometra martini*) head and pro- and meso-thorax above, and meta-thorax and abdomen below. Elongated beak is indicated.

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an elongated piercing tube that is held back along the underside of the head. Marsh treaders are found in all types of permanent waters where they feed on small crustaceans (water fleas and seed shrimps) and aquatic insect larvae associated with the surface film.<sup>12</sup> The prey is pierced by the long slender beak and the body fluids are sucked out.<sup>10</sup> The life cycle includes five instars and takes about 21 days to complete.<sup>12</sup> There can be multiple generations in a year, with the adult being the overwintering stage.<sup>12</sup>

A single marsh treader specimen was collected in 1984 from a small, well-vegetated wetland in the vicinity of Waskesiu River (54° 04' 45" N; 105° 56' 21" W) (Figure 2). *H. martini* is the only species of Hydrometridae to occur in Canada. It has also been reported from British Columbia, Ontario and Nova Scotia.<sup>8</sup> In the United States, it has been recorded from the eastern states south to Florida, and from Minnesota, Texas, California and the two states bordering Saskatchewan: North Dakota and Montana.<sup>2,6,14,15</sup> Since only one specimen has been collected from Saskatchewan, no immigration route can be ascertained, but its presence well within the province suggests further sampling in eastern Saskatchewan should yield more specimens.

## Conclusions

The collection of these three families increases the number of aquatic Heteroptera families recorded in Saskatchewan to eleven.

Sampling of Saskatchewan's aquatic habitats continues to yield new aquatic insect records and distribution information for the province. Results, such as those presented in this paper, are important in refining species distributions for the province, Canada

and North America as a whole. As well, the information provides data for testing biogeography hypotheses, monitoring climate change-related species distribution shifts and determining potential waterways that invasive pest species may use to enter Saskatchewan, and possible monitoring methods for these species.

Representative specimens will be deposited in the Royal Saskatchewan Museum in Regina.

## Acknowledgements

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## CHECKLIST OF SASKATCHEWAN MOTHS: PART 18-GEOMETRIDAE (4), LARENTIINAE

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This is the completion of the list of Saskatchewan geometrid moths. The first geometrid article was published in *Blue Jay*, Volume 64, Number 2.

Unless otherwise indicated, all the species are represented in the Royal Saskatchewan Museum collection in Regina. The species are arranged according to the website of Jim Troubridge and Don Lafontaine, *The Moths of Canada*,<sup>6</sup> with updates to 2006 provided to the author by Greg Pohl. This website also has colour photographs of the moths. The preferred food plants that are listed are primarily based on Prentice.<sup>4</sup> The common names that are used are mostly according to J. R. J. L. Jones and C. V. Covell, Jr..<sup>2,3</sup> Recent scientific name changes are according to M. J. Scoble.<sup>5</sup>

In this article, the size and early and late dates of Saskatchewan specimens are given. Abbreviations: s=south, n=north, w=west, e=east, CNC=Canadian National Collection in Ottawa, RSM=Royal Saskatchewan Museum in Regina.

### Subfamily LARENTIINAE

Many moths of this group have wavy designs of black and white, or brown and white, and are called Carpets. The pattern of many of them would indeed make a beautiful design for a carpet. The Scallop Shell Moth is nicely marked with many parallel wavy lines like a sea shell. The Spear Mark and White-banded Black have a white marking shaped like a spear point along the outer edge of the forewing. (Figure 1)