

**Atlas of the
Aquatic and Semiaquatic True Bugs
(Class Insecta: Order Hemiptera)
Recorded at the
Old Woman Creek
National Estuarine Research Reserve
& State Nature Preserve, Ohio**

by

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Acknowledgments

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Copies of this publication are available from the
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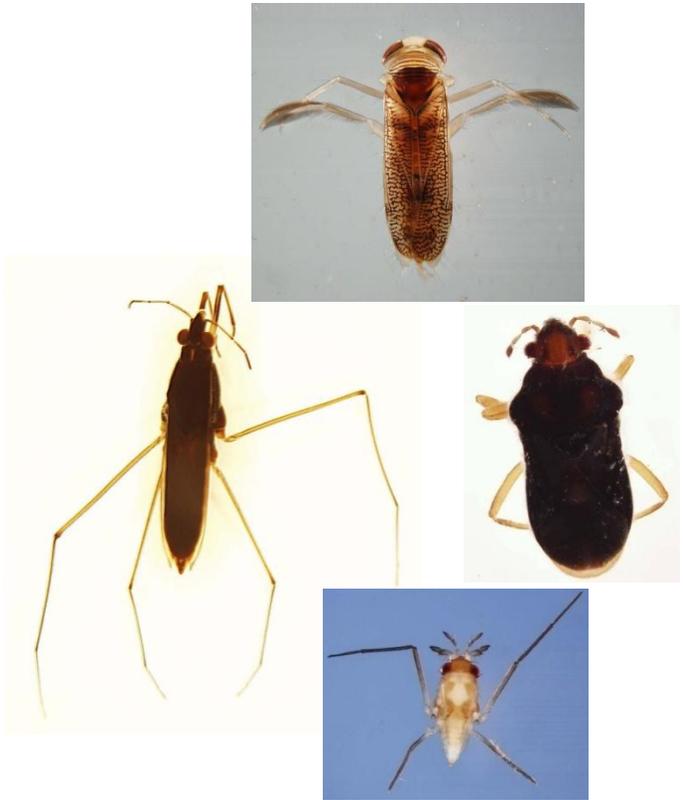
This publication can be downloaded at www.heidelberg.edu/wql/educationoutreach/reports.

Introduction

Biologists and naturalists often encounter lists of animals and plants when they visit nature centers or read scientific reports. Rarely can they readily access drawings or photographs for each member of a list so that they can distinguish one from the other. The purpose of this atlas is to provide a detailed photographic record of the aquatic and semiaquatic true bugs (insect Order Hemiptera) found within the Old Woman Creek coastal wetland system (OWC) along Lake Erie in Ohio.

Invertebrates occur in great abundance in freshwater ecosystems, including Great Lakes wetlands such as the marshes and swamps that make up OWC. Members of the Order Hemiptera live in a wide variety of habitats. Some are bugs that live entirely submerged, while others are semiaquatic, only skimming the surface of the water or living along the water's edge. With the exception of the Corixidae, which feed primarily on detritus, most aquatic hemipterans are predatory. They consume large quantities of mosquito larvae. The genera *Notonecta* and *Belostoma*, in particular, are notorious for being a biting nuisance to humans wading or swimming in the water.

This atlas constitutes one of several chapters that will comprise a comprehensive atlas of the biota of the OWC wetland system. This particular chapter presents detailed photographs of critical diagnostic features that permit the correct identification to the taxonomic level of genus (plural, genera) of most aquatic and semiaquatic Hemiptera found as of 2007 at OWC.



Counterclockwise from top: *Trichocorixa*, *Gerris*, *Microvelia* and *Merragata* – some Hemiptera genera of Old Woman Creek

Adult aquatic and semiaquatic Hemiptera found in OWC range in length from less than 2 mm (0.08 inch, *Microvelia*) up to 42 mm (1.7 inches, *Ranatra*). Each of the eight families collected at OWC exhibits a characteristic body shape and markings.

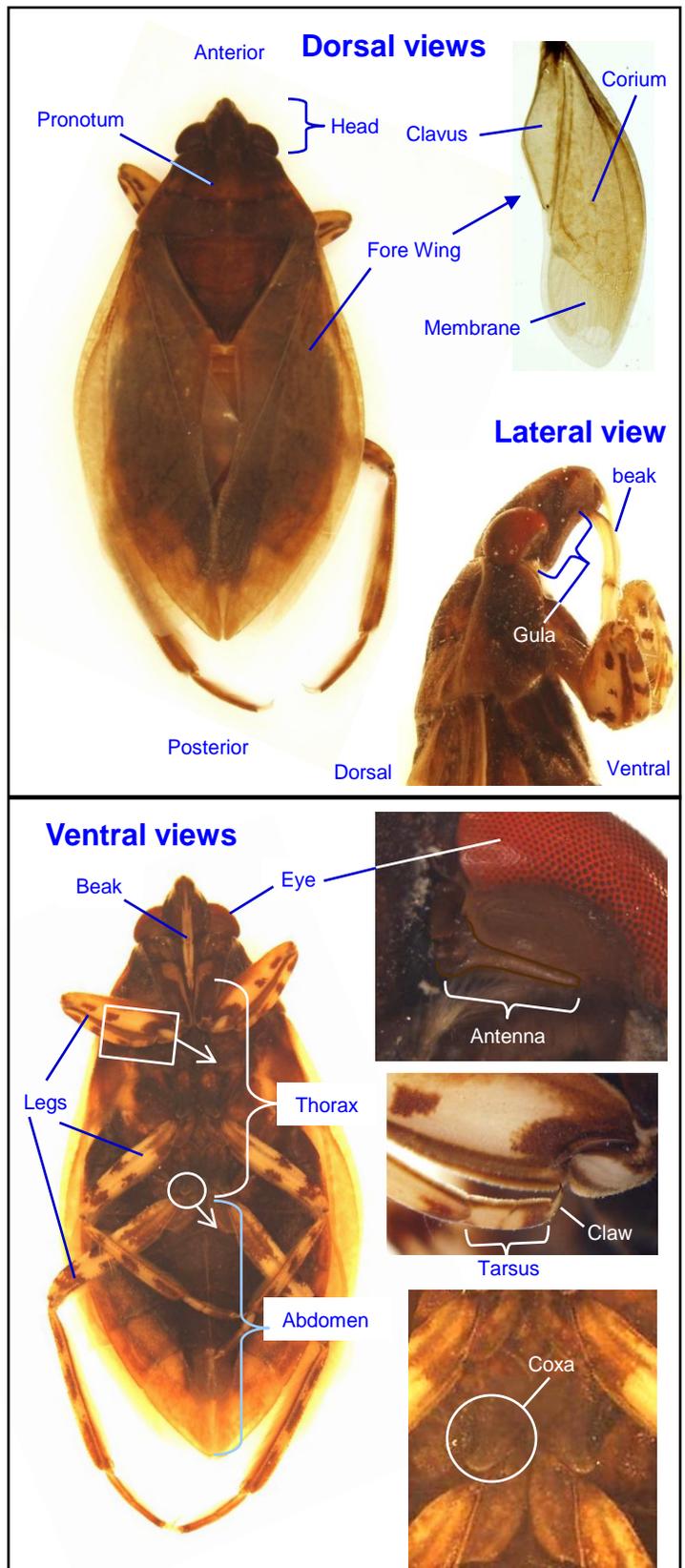
Characteristics of Hemiptera

Most members of the aquatic and semiaquatic Hemiptera overwinter as adults and lay their eggs in spring. Once hatched, the larvae proceed through four or (mostly) five stages, or instars. Although the instars look similar to adults, they do not exhibit all the physical

differentiation; therefore, the adult Hemiptera are most reliable to use for identification. Nevertheless, many times only earlier instars are available in samples for identification.

General features of an adult hemipteran are shown in the photographs on this page. The body is divided into three regions: the head, the thorax consisting of three (often indistinct) segments, and the abdomen, whose ten segments may not all be distinguishable. Diagnostic head structures include paired **antennae** inserted near the **eyes** and a **gula**, or gular region, on the ventral surface between the segmented **beak** and the joint between the head and thorax. The dorsal surface of the first segment of the thorax (nearest the head) is the **pronotum**. A pair of **fore wings**, or hemelytra (wingpads in immature specimens), attaches to the mesonotum (second thoracic segment) and a pair of **hind wings** attaches to the metanotum (third thoracic segment). The fore wings have a leathery area (inner **clavus** and outer **corium**) plus a posterior **membrane**, while the hind wings are entirely membranous. Some adult hemipterans are wingless.

Both larvae and adults possess three pairs of segmented **legs**. The first segment of each leg, the **coxa**, is attached to the thorax. The last segment of larvae, and the last one or two segments of adults, is the **tarsus**, which may be tipped with one or two **claws**. The legs of some species exhibit specialized modifications for swimming, such as scoop-shaped tarsi.



Layout of this Atlas

The following pages are organized alphabetically by family. Collectors have identified fifteen genera of aquatic and semiaquatic hemipterans in ten families (Belostomatidae, Corixidae, Gerridae, Hebridae, Hydrometridae, Mesoveliidae, Nepidae, Notonectidae, Saldidae, Veliidae) within the OWC wetland system, which excludes the free-flowing upland reaches of Old Woman Creek. Specimens in eight families and twelve genera were available for inclusion in this atlas.

This publication should not be used as the sole source to identify aquatic and semiaquatic hemipterans of OWC because it is likely that additional families and genera will be found in new collections. The references cited on this page should be used to obtain definitive identifications. The species within each genus are not addressed here.

Each genus of Hemiptera is illustrated and described on a single page of this atlas. Because the identifying features of the Order Hemiptera, Suborder Heteroptera, and the particular family are repeated on each page, the page for each genus can be used independently. Photographs are labeled with lines that point to diagnostic structures and insets are provided for more detail. Some photographs show specimens collected within OWC; specimens from other ecosystems were used if they were of superior quality. The exact specimens photographed are recorded at the bottom of the page.

Beneath the descriptive features, each page lists where within OWC the genus has been found. That information was derived from reports compiled by Herdendorf et al. (2001).* It is likely that future collections will reveal some of the genera in additional habitats. The general ecology of the genus is briefly summarized, including its **habit** (such as skater or climber) and its **functional feeding group** (all are predators except Corixidae, which are primarily collectors that feed on detritus).

All taxonomic information on each page was derived from two references, which are abbreviated as shown below followed by the page number(s):

Hil = Hilsenhoff, W.L. 1995. *Aquatic insects of Wisconsin, keys to Wisconsin genera and notes on biology, habitat, distribution and species*. Publication No. 3 of the Natural History Museums Council, Univ. of Wisconsin-Madison. Cooperative Extension Publications, Madison, Wisconsin.

Pol = Polhemus, J.T. 1996. Chapter 15. Aquatic and semiaquatic Hemiptera, pp. 267-297. *In*: Merritt, R.W., and K.W. Cummins (Eds.). *An introduction to the aquatic insects of North America*. 3rd edition. Kendall/Hunt Publishing Co., Dubuque, Iowa.

* Herdendorf, C.E., R.C. Herdendorf, and D.M. Klarer. 2001. *Catalogue of the invertebrate fauna of Old Woman Creek Estuary, Watershed, and adjacent waters of Lake Erie*. Technical Report No. 12. Old Woman Creek National Estuarine Research Reserve & State Nature Preserve, Huron, Ohio.

**Checklist of Genera of Aquatic and Semiaquatic
Hemiptera (True Bugs)
Reported in the OWC Wetland System**

Three genera that have been reported but for which no specimens were available for presentation in this atlas are indicated with an asterisk (*).

Family Belostomatidae

Belostoma

Family Corixidae

*Corisella**

Hesperocorixa

Palmacorixa

Sigara

Trichocorixa

Family Gerridae

Gerris

Trepobates

Family Hebridae

Merragata

Family Hydrometridae

*Hydrometra**

Family Mesoveliidae

Mesovelia

Family Nepidae

Ranatra

Family Notonectidae

Notonecta

Family Saldidae

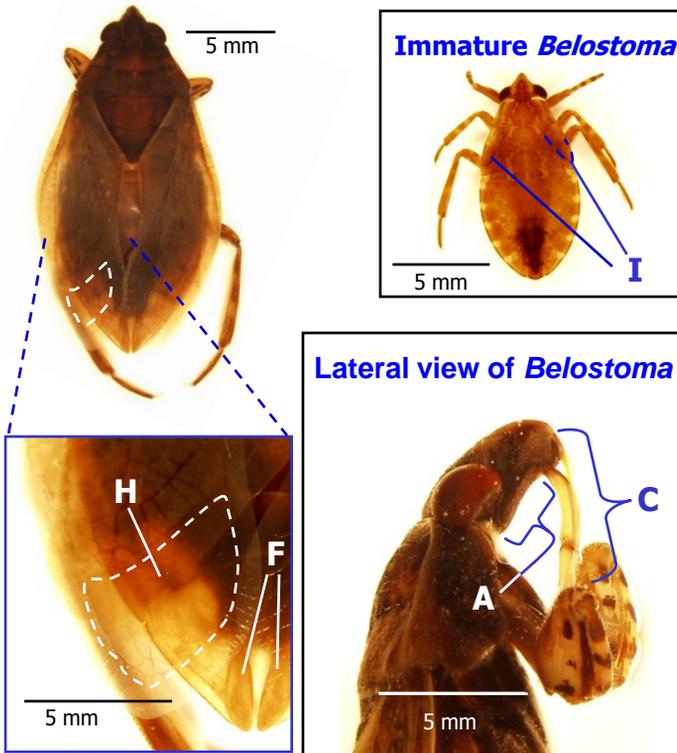
*Micracanthia**

Family Veliidae

Microvelia

Insecta: Hemiptera (True Bugs):
Heteroptera: Belostomatidae: *Belostoma* sp.
Giant Water Bugs

Dorsal views of *Belostoma*



Features of Order Hemiptera

Three pairs of legs attached to thorax
 Wings or wingpads usually present; anterior portion of fore wing hard or leathery
 Mouthparts formed into segmented beak

Features of Suborder Heteroptera

Gular region on head easily seen laterally (A)

Features of Family Belostomatidae

Antennae shorter than head, beneath eyes, not visible dorsally (B)
 Beak cylindrical with 3 or 4 segments (C, 1-4)
 Front tarsus not scoop-like or fringed with stiff hairs (D)
 Hind legs with swimming hairs (E)
 One flattened pair of respiratory appendages at apex of abdomen (F)
 Adult length 18 mm or greater

Features of Genus *Belostoma*

Shape of middle and hind legs similar (G)
 Basal segment (1) of beak roughly equal in length to second segment (2)
 Veined membrane on upper wings, about 1/4 of total wing area (H)
 Adult length 18-26 mm
 Immature individual may have wing pads (I)

Where Recorded at Old Woman Creek

Under water in sedge meadow (*Carex* sp.), around giant bur-reed (*Sparganium eurycarpum*) bed, and free-swimming near water surface

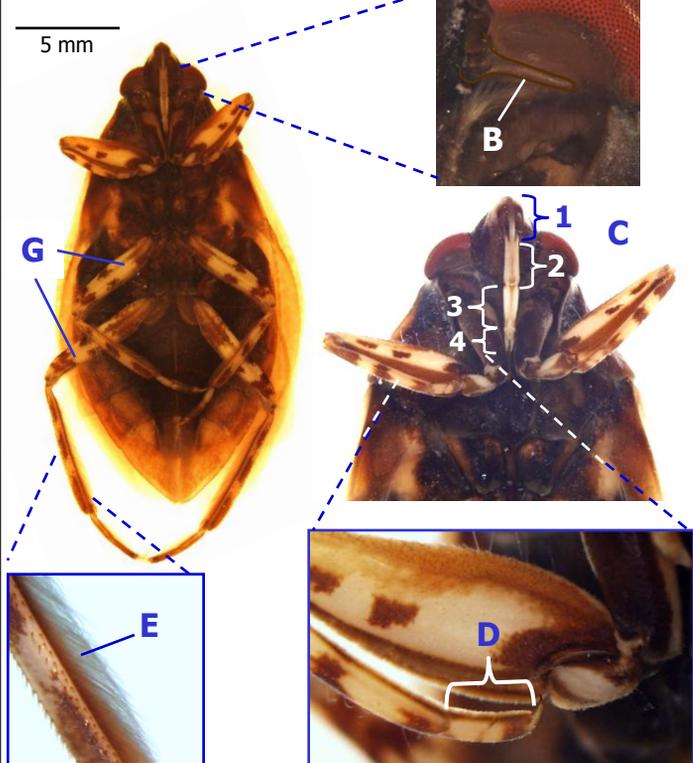
General Ecology

Habit: Climbers, swimmers
 Functional feeding group: Predators (piercers)

References: Hil 3, 37-39; Pol 269-271

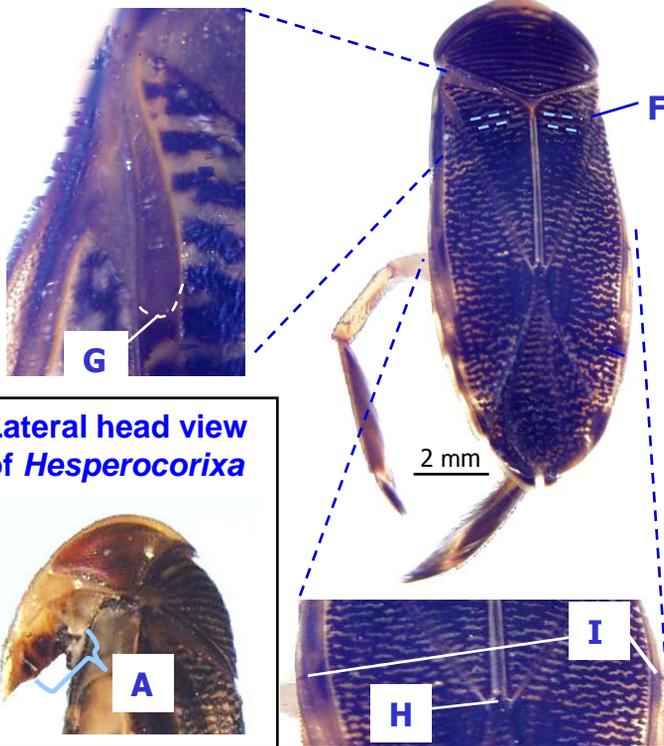
Photographs: KK, August 6, 2002 OWCI

Ventral views of *Belostoma*

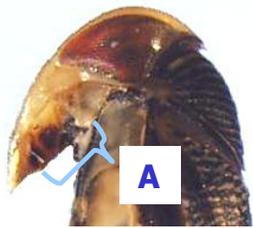


Insecta: Hemiptera (True Bugs):
Heteroptera: Corixidae: *Hesperocorixa* sp.
Water Boatmen

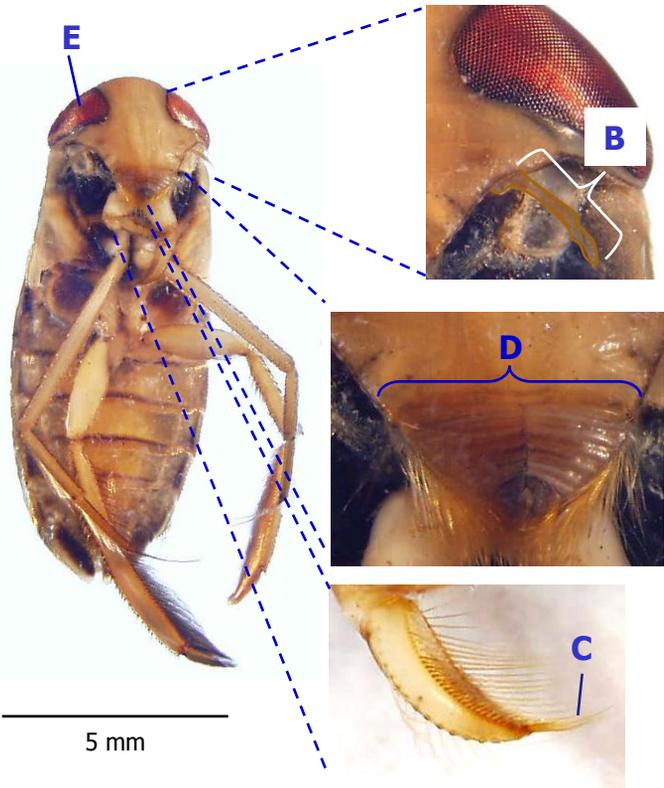
Dorsal views of *Hesperocorixa*



Lateral head view of *Hesperocorixa*



Ventral views of *Hesperocorixa*



Features of Order Hemiptera

Three pairs of legs attached to thorax
 Wings or wingpads usually present; anterior portion of fore wing hard or leathery
 Mouthparts formed into segmented beak

Features of Suborder Heteroptera

Gular region on head easily seen laterally (A)

Features of Family Corixidae

Antennae shorter than head, beneath eyes (B), not visible dorsally
 Front tarsus a single scoop-like segment fringed with stiff hairs (C)
 Beak triangular, appearing as end of head (D)

Features of Genus *Hesperocorixa*

Beak with transverse grooves (D)
 Front tarsus broad with thin, spine-like apical claw (C)
 Eyes not protuberant (E)
 Stripes on clavus distinct and transverse (F) (dashed lines indicate direction of stripes)
 Frosted area (outlined with dashed line) on clavus short, broadly rounded posteriorly (G)
 Apex of clavus (H) further posterior than nodal furrows (I)
 Adult length greater than 5.9 mm

Where Recorded at Old Woman Creek

Near water surface with duckweed (Lemnaceae) and submerged grass

General Ecology

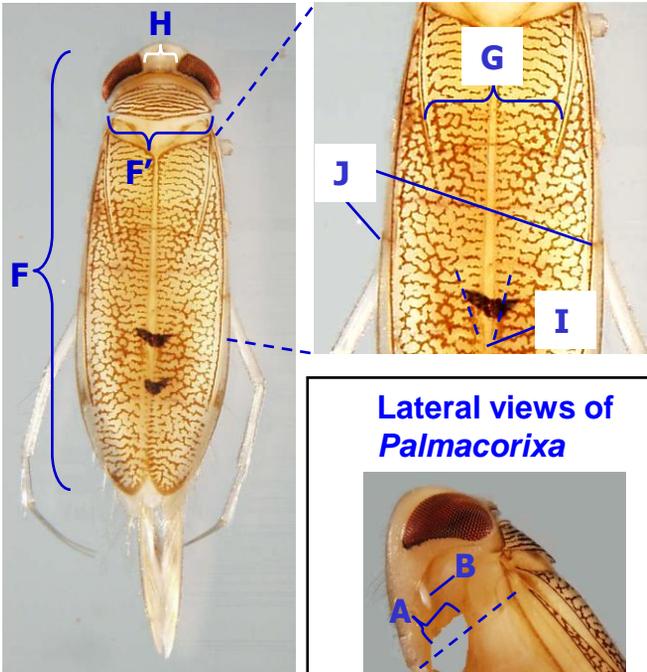
Habit: Swimmers
 Functional feeding group: Herbivores (piercers)

References: Hil 3, 37-39; Pol 269, 271-272, 295

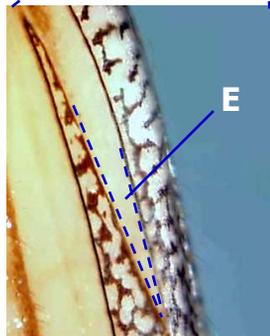
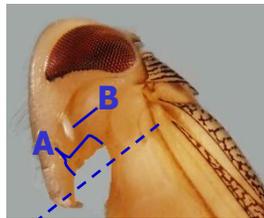
Photographs: Qual LL, August 6, 2002 OWCI

Insecta: Hemiptera (True Bugs):
Heteroptera: Corixidae: *Palmacorixa* sp.
Water Boatmen

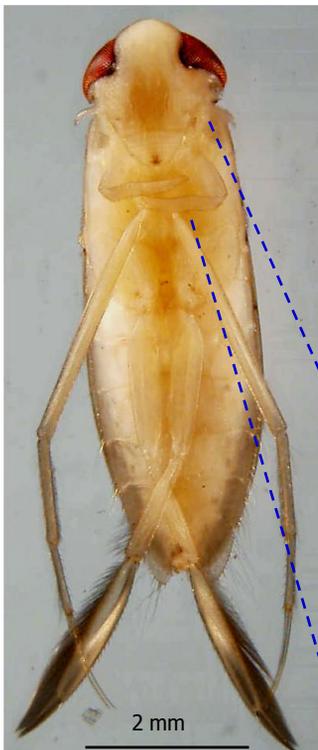
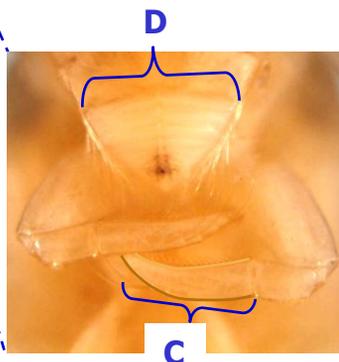
Dorsal views of *Palmacorixa*



Lateral views of *Palmacorixa*



Ventral views of *Palmacorixa*



Features of Order Hemiptera

Three pairs of legs attached to thorax
 Wings or wingpads usually present; anterior portion of fore wing hard or leathery
 Mouthparts formed into segmented beak

Features of Suborder Heteroptera

Gular region on head easily seen laterally (A)

Features of Family Corixidae

Antennae shorter than head, beneath eyes (B), not visible dorsally
 Front tarsus a single scoop-like segment fringed with stiff hairs (C)
 Beak triangular, appearing as end of head (D)

Features of Genus *Palmacorixa*

Beak with transverse grooves (D)
 Frosted area on clavus (outlined with dashed line) elongate, pointed posteriorly (E)
 Distinct pattern on fore wings; markings on clavus (G) branch-like
 Apex of clavus (I) much further posterior than nodal furrows (J)
 Eyes not protuberant; space between eyes much smaller than an eye width (H)
 Body elongate, more than three times longer (F) than width of pronotum (F')
 Adult length greater than 5.9 mm

Where Recorded at Old Woman Creek

In swamp forest

General Ecology

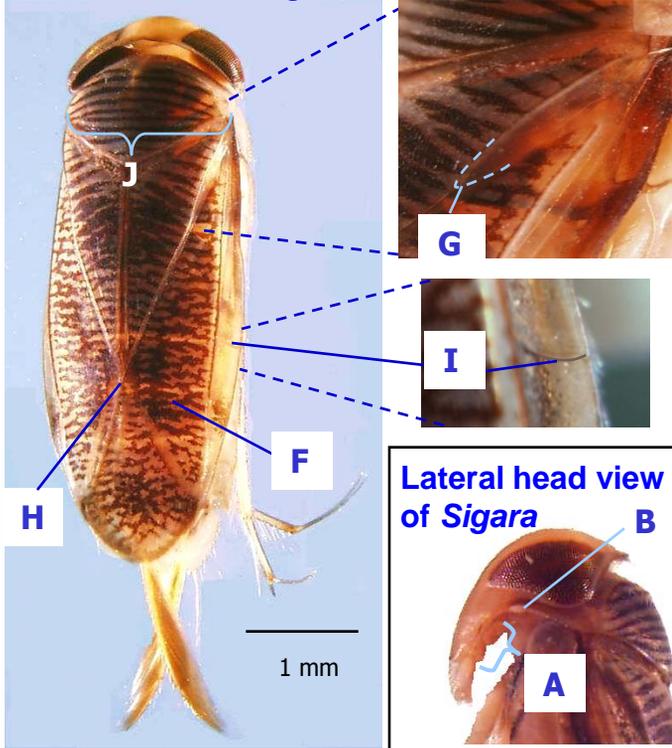
Habit: Swimmers
 Functional feeding group: Herbivores or predators (piercers)

References: Hil 3, 37-39; Pol 269, 271-272, 277, 295

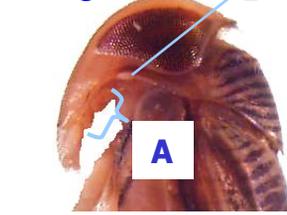
Photographs: DD8 October 5, 1992, OWCI

**Insecta: Hemiptera (True Bugs):
Heteroptera: Corixidae: *Sigara* sp.
Water Boatmen**

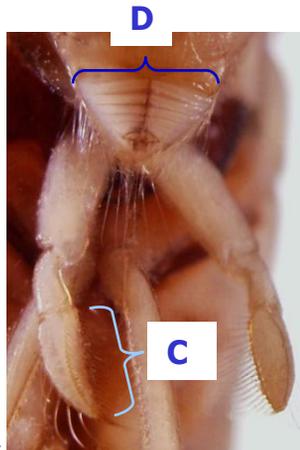
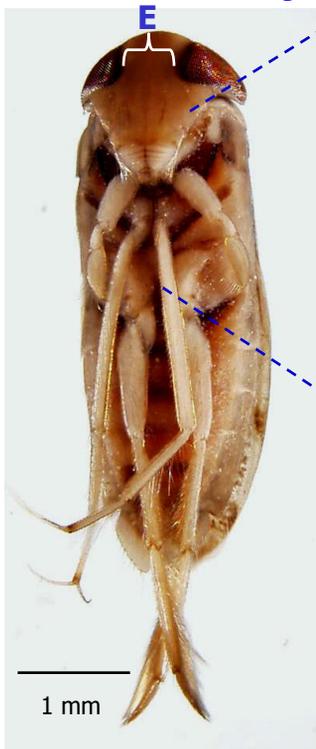
Dorsal views of *Sigara*



Lateral head view of *Sigara*



Ventral views of *Sigara*



Immature *Sigara*



Features of Order Hemiptera

Three pairs of legs attached to thorax
Wings or wingpads usually present; anterior portion of fore wing hard or leathery
Mouthparts formed into segmented beak

Features of Suborder Heteroptera

Gular region on head easily seen laterally (A)

Features of Family Corixidae

Antennae shorter than head, beneath eyes (B), not visible dorsally

Front tarsus a single scoop-like segment fringed with stiff hairs (C)

Beak triangular, appearing as end of head (D)

Features of Genus *Sigara*

Beak with transverse grooves (D)

Front tarsus broad with thin, spine-like apical claw (C)

Eyes not protuberant; space between eyes about equal to eye width (E)

Bold contrast of fore wing pattern against yellowish background (F)

Frosted area (see outline) on clavus pointed apically (G)

Apex of clavus (H) much further posterior than nodal furrows (I)

Body elongate, more than three times longer than width of pronotum (J)

Adult length 3.6-9.2 mm

Where Recorded at Old Woman Creek

In sedge (*Carex* sp.) meadow sediment, in sediment near water lilies (*Nymphaea* sp.), in American lotus (*Nelumbo lutea*) beds and around giant bur-reed (*Sparganium eurycarpum*)

General Ecology

Habit: Swimmers

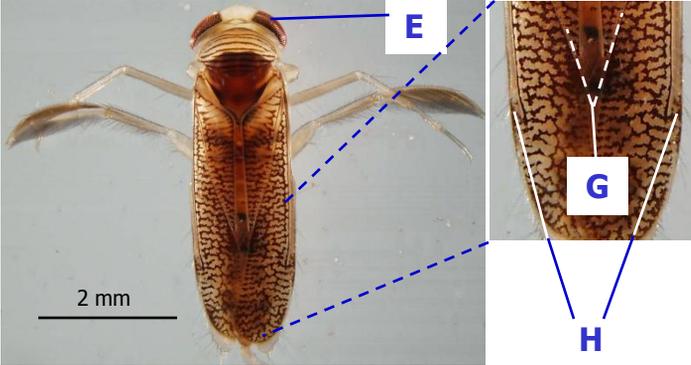
Functional feeding group: Herbivores (piercers), collectors

References: Hil 3, 37-39; Pol 269, 271-275, 295

Photographs: UHC 5A, August 2, 1979

**Insecta: Hemiptera (True Bugs):
Heteroptera: Corixidae: *Trichocorixa* sp.
Water Boatmen**

Dorsal view of *Trichocorixa*



Features of Order Hemiptera

Three pairs of legs attached to thorax
Wings or wingpads usually present; anterior portion of fore wing hard or leathery
Mouthparts formed into segmented beak

Features of Suborder Heteroptera

Gular region on head easily seen laterally (A)

Features of Family Corixidae

Antennae shorter than head, beneath eyes (B), not visible dorsally

Front tarsus a single scoop-like segment fringed with stiff hairs (C)

Beak triangular, appearing as end of head (D)

Features of Genus *Trichocorixa*

Front tarsus broad with thin, spine-like apical claw (C)

Beak with transverse grooves and stripes (D)

Eyes not protuberant (E)

Front tibia (male only) (F) overlaps tarsus (Note difference between male and female tibial ends –see arrows)

Apex of clavus (G) not, or slightly, further posterior than nodal furrows (H)

Adult length less than 5.6 mm

Where Recorded at Old Woman Creek

Near grasses (Poaceae); in sediment and near surface of water lily (*Nymphaea* sp.) bed, and around giant bur-reed (*Sparganium eurycarpum*)

General Ecology

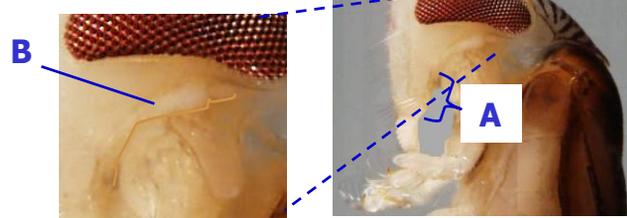
Habit: Swimmers

Functional feeding group: Predators (piercers)

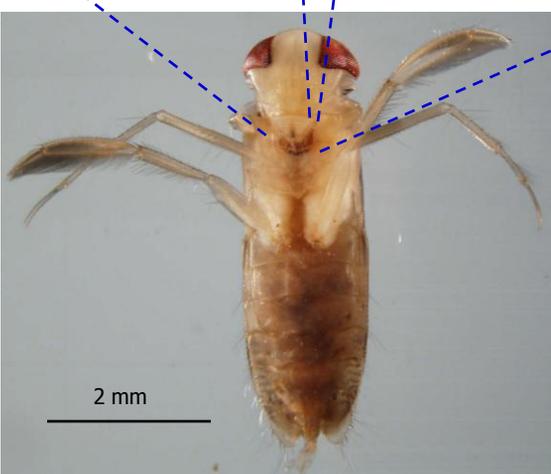
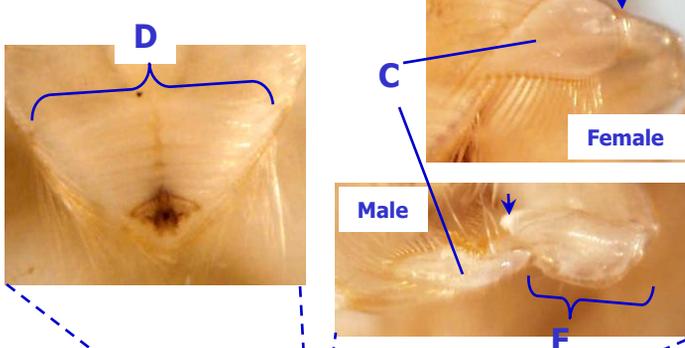
References: Hil 3, 37-39; Pol 269, 271-272, 295

Photographs: Qual 10, October 30, 2002 and DD6 1992, OWCI

Lateral views of *Trichocorixa*

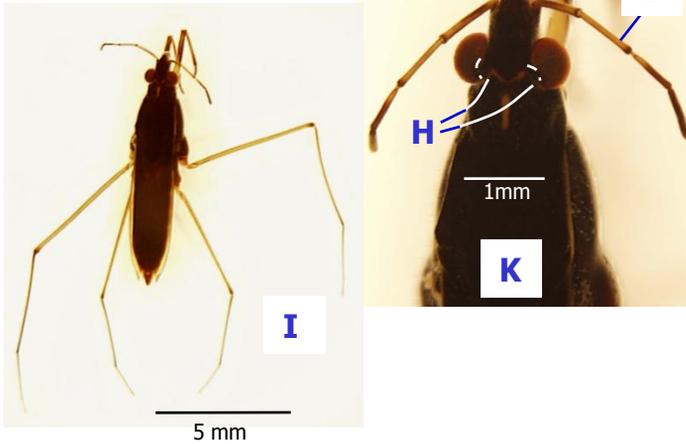


Ventral views of *Trichocorixa*



Insecta: Hemiptera (True Bugs): Heteroptera: Gerridae: *Gerris* sp. Water Striders

Dorsal views of *Gerris*



Features of Order Hemiptera

Three pairs of legs attached to thorax
Wings or wingpads usually present; anterior portion of fore wing hard or leathery
Mouthparts formed into segmented beak

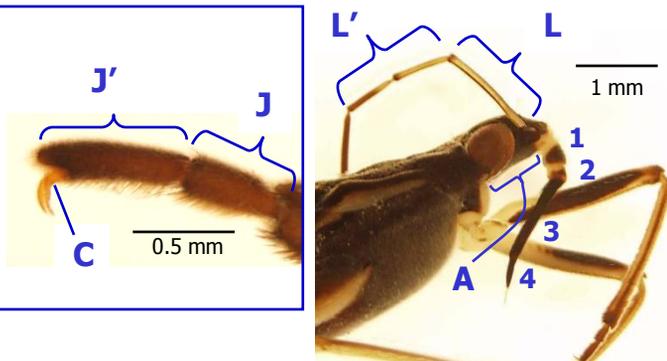
Features of Suborder Heteroptera

Gular region on head easily seen laterally (A)

Features of Family Gerridae

Antennae longer than head, attached in front of eyes, visible dorsally (B)
Claws of front tarsus inserted before apex (C)
Hind coxae small, and cylindrical or conical (D)
Head (E) shorter than thorax (F)
Beak four-segmented (1-4)
Hind femur extends far beyond apex of abdomen (G)

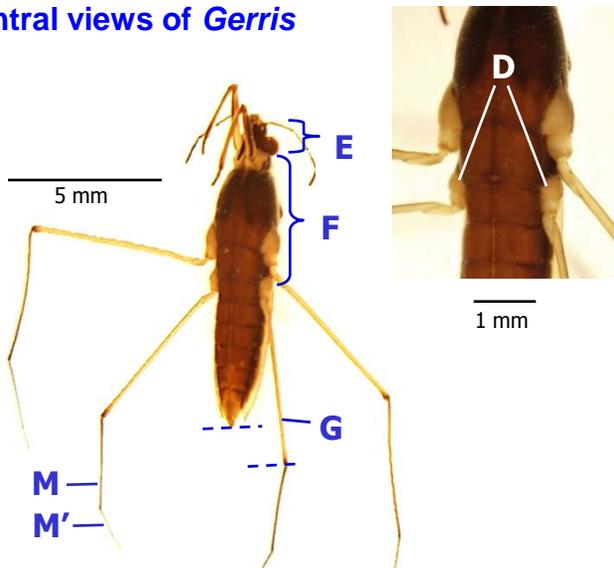
Lateral views of *Gerris*



Features of Genus *Gerris*

Inner margin of eyes concave beyond middle (H)
Body long and narrow (I)
Basal tarsal segment (J) of front leg more than two-thirds length of second segment (J')
Pronotum dull, not shiny (K)
Antenna segment 1 (L) length at least 90% of lengths of segments 2+3 combined (L')
(Note: Only right antenna shown in photo)
Hind tibia (M) less than three times length of first tarsal segment (M')
Adult length 6.8-10.8 mm

Ventral views of *Gerris*



Where Recorded at Old Woman Creek

On water surface at landward side of barrier beach and gaging station near US Hwy 6

General Ecology

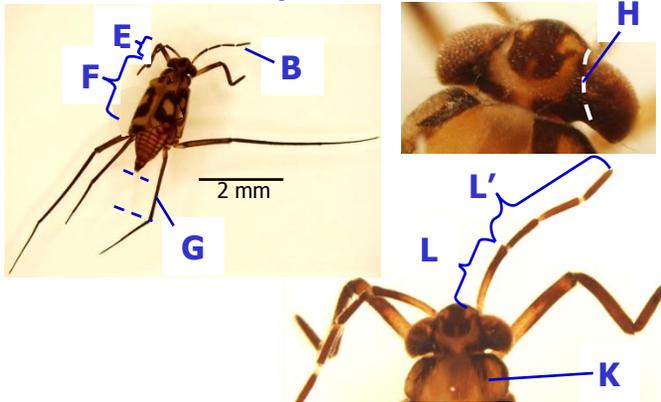
Habit: Skaters
Functional feeding group: Predators (piercers), scavengers

References: Hil 3, 37-39; Pol 269-271, 275, 293

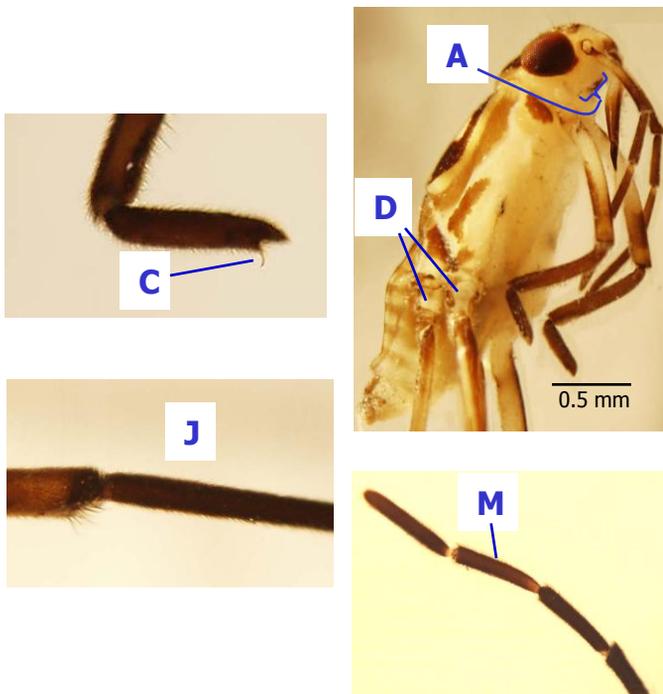
Photographs: EE, August 6, 2002 OWC1

Insecta: Hemiptera (True Bugs): Heteroptera: Gerridae: *Trepobates* sp. Water Striders

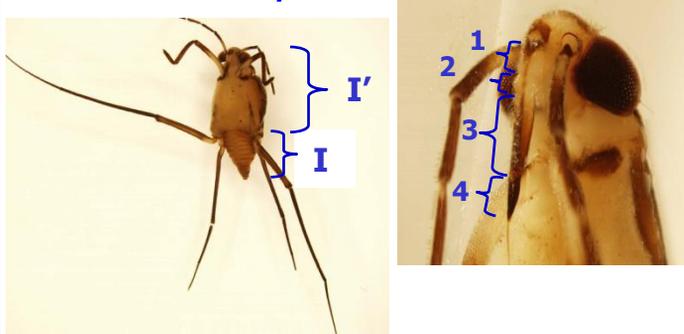
Dorsal views of *Trepobates*



Lateral views of *Trepobates*



Ventral views of *Trepobates*



Features of Order Hemiptera

Three pairs of legs attached to thorax
Wings or wingpads usually present; anterior portion of fore wing hard or leathery
Mouthparts formed into segmented beak

Features of Suborder Heteroptera

Gular region on head easily seen laterally (A)

Features of Family Gerridae

Antennae longer than head, attached in front of eyes, visible dorsally (B)
Claws of front tarsus (C) inserted before apex
Hind coxae small, and cylindrical or conical (D)
Head (E) shorter than thorax (F)
Beak four-segmented (1-4)
Hind femur (G) extends far beyond apex of abdomen

Features of Genus *Trepobates*

Inner margin of eyes convex beyond middle (H)
Body short and broad; abdomen (I) much shorter than rest of body (I')
Tibia of middle leg lacking long hairs (J)
Pronotum dull, not shiny (K)
Antenna segment 1 (L) much shorter than segments 2 through 4 combined (L')
Third antenna segment with fine hairs only, lacking bristles (M)
Adult length 3.0-4.3 mm

Where Recorded at Old Woman Creek

On water surface around giant bur-reed (*Sparganium eurycarpum*) and in swamp forest

General Ecology

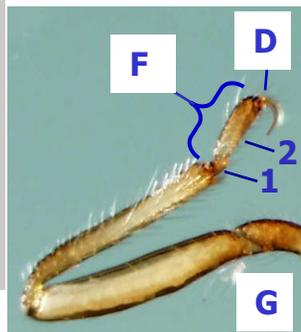
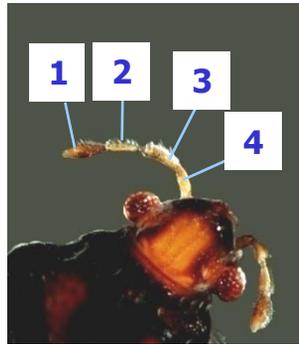
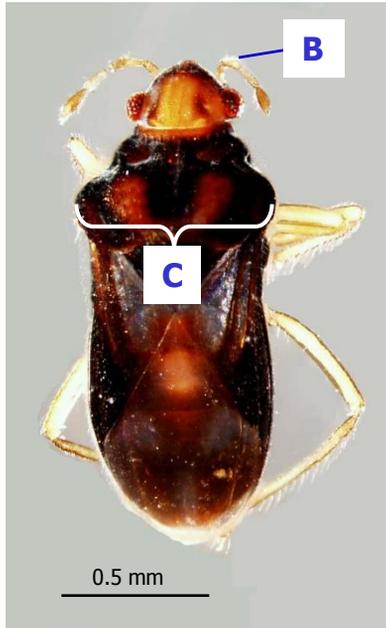
Habit: Skaters
Functional feeding group: Predators (piercers)

References: Hil 3, 37-39; Pol 269-271, 275-278, 293

Photographs: EE, August 6, 2002 OWCI

Insecta: Hemiptera (True Bugs):
Heteroptera: Hebridae: *Merragata* sp.
Velvet Water Bugs

Dorsal views of *Merragata*



Features of Order Hemiptera

Three pairs of legs attached to thorax
 Wings or wingpads usually present; anterior portion of fore wing hard or leathery
 Mouthparts formed into segmented beak

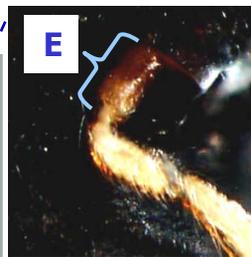
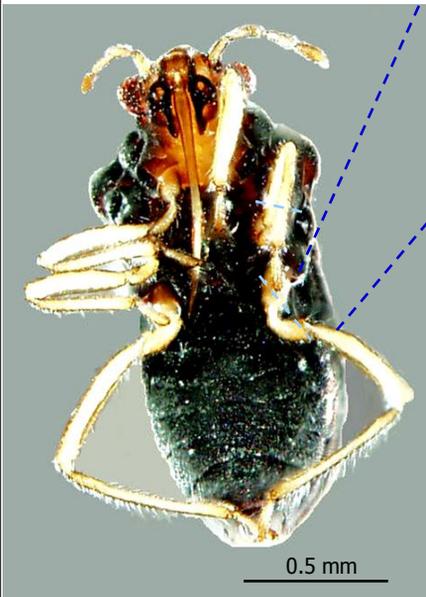
Features of Suborder Heteroptera

Gular region on head easily seen laterally (A)

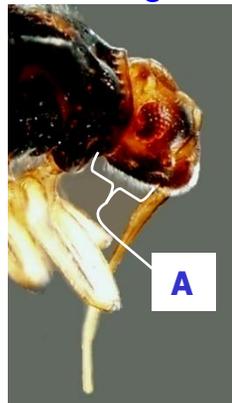
Features of Family Hebridae

Antennae as long as or longer than head, attached in front of eyes, visible dorsally (B)
 Head and body stout, head shorter than thorax
 Claws of all tarsi inserted at apex (D)
 Coxae small, and cylindrical or conical (E)
 Tarsi with 2 segments (F)
 Legs without stiff black bristles (G)
 Adult length less than 2.5mm

Ventral views of *Merragata*



Lateral view of *Merragata*



Features of Genus *Merragata*

Antennae with 4 segments (1-4) and distinctly shorter than greatest width of pronotum (C)
 Adult length 1.7-2.2 mm

Where Recorded at Old Woman Creek

On water surface in lotus (*Nelumbo lutea*) bed

General Ecology

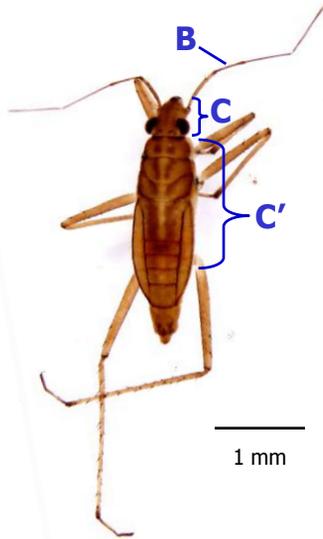
Habit: Skaters and climbers
 Functional feeding group: Predators (piercers)

References: Hil 3, 37-39; Pol 269-271, 278, 296

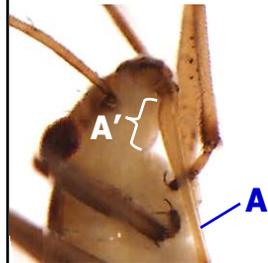
Photographs: Qual 8, October 9, 2002 OWCI

Insecta: Hemiptera (True Bugs):
Heteroptera: Mesoveliidae: *Mesovelia* sp.
Water Treaders

Dorsal view of *Mesovelia*



Lateral view of *Mesovelia*



Features of Order Hemiptera

Three pairs of legs attached to thorax
 Wings or wingpads usually present; anterior portion of fore wing hard or leathery
 Mouthparts formed into segmented beak (A)

Features of Suborder Heteroptera

Gular region on head easily seen laterally (A')

Features of Family Mesoveliidae

Antennae longer than head, attached in front of eyes, visible dorsally (B)
 Head (C) shorter than thorax (C')
 Wingless (shown here), or winged without veins in membrane
 Claws inserted at tips of tarsi (D)
 Hind coxae small, and cylindrical or conical (E)

Tarsi with 3 segments (1-3)
 Large black spines on legs (F)
 Adult length 2.5- 4.0 mm

Features of Genus *Mesovelia*

Mesovelia is the only genus of Mesoveliidae reported in North America – see features of family above.

Where Recorded at Old Woman Creek

On water surface in swamp forest, in elm (*Ulmus* sp.) root wads at barrier beach, in lotus (*Nelumbo lutea*) beds, and in giant bur-reed (*Sparganium eurycarpum*) beds

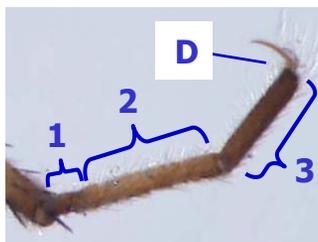
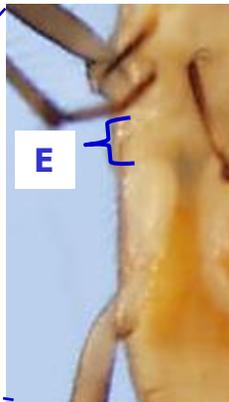
General Ecology

Habit: Skaters, climbers
 Functional feeding group: Predators (piercers), scavengers

References: Hil 3, 37; Pol 269-271, 295

Photographs: Qual 5, October 9, 2002 OWCI

Ventral views of *Mesovelia*

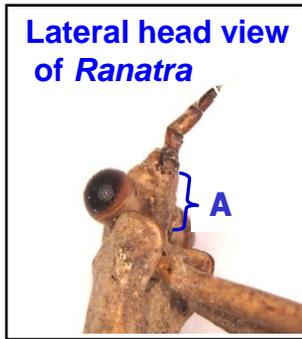


**Insecta: Hemiptera (True Bugs):
Heteroptera: Nepidae: *Ranatra* sp.
Water Scorpions**

Dorsal view of *Ranatra*



Lateral head view of *Ranatra*



Features of Order Hemiptera

Three pairs of legs attached to thorax
Wings or wingpads usually present; anterior portion of fore wing hard or leathery
Mouthparts formed into segmented beak

Features of Suborder Heteroptera

Gular region on head easily seen laterally (A)

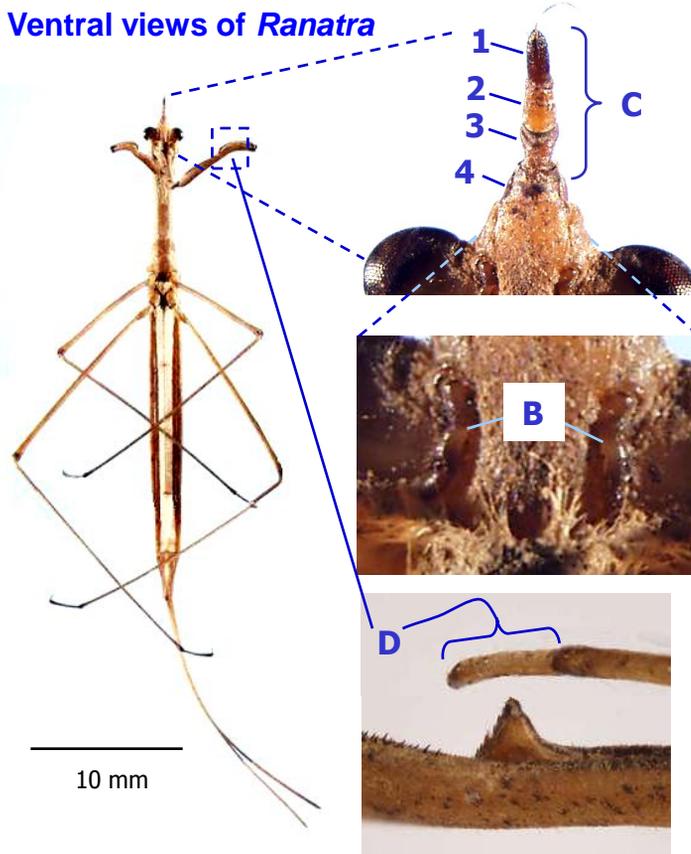
Features of Family Nepidae

Antennae shorter than head, beneath eyes (B), not visible dorsally
Beak cylindrical with 3 or 4 segments (C, 1-4)
Front tarsus not scoop-like (D)
Cylindrical breathing tube (two filaments) at apex of abdomen (E)

Features of Genus *Ranatra*

Body long and thin, stick-like (F)
Adult length 23-42 mm

Ventral views of *Ranatra*



Where Recorded at Old Woman Creek

Unspecified aquatic habitats at several locations near wetland margins and in creek channel near Darrow Rd.

General Ecology

Habit: Climbers
Functional feeding group: Predators (piercers)

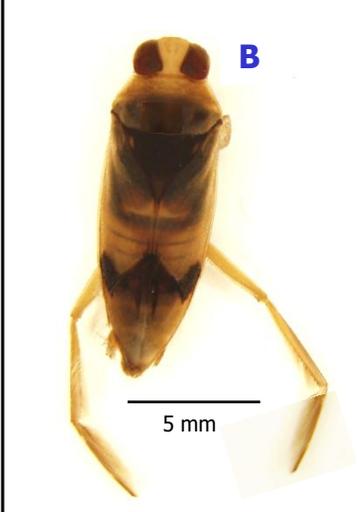
References: Hil 3, 37-39; Pol 269, 278, 294

Photographs: UHC 5A, August 2, 1979

Note: photographed in air due to large size; debris coating many surfaces of specimen

Insecta: Hemiptera (True Bugs):
Heteroptera: Notonectidae: *Notonecta* sp.
Backswimmers

Dorsal view of *Notonecta*



Lateral views of *Notonecta*



Features of Order Hemiptera

Three pairs of legs attached to thorax
 Wings or wingpads present; anterior portion of wing hard or leathery

Mouthparts formed into segmented beak

Features of Suborder Heteroptera

Gular region on head easily seen laterally (A)

Features of Family Notonectidae

Antennae (G) shorter than head, beneath eyes, not visible dorsally (B)

Thorax and abdomen very convex dorsally (C)

Front tarsus not scoop-like or fringed with stiff hairs (D)

Front legs slender; hind legs oar-like and fringed with swimming hairs (E)

Beak cylindrical with 4 segments (F, 1-4)

Apex of abdomen without respiratory appendages

Adult length 5-17mm

Features of Genus *Notonecta*

Antenna with four segments (G, 1-4)

Eyes separate, not touching (B)

Adult length 8.5-17 mm

Where Recorded at Old Woman Creek

Under water in open water areas, swamp forest, among grasses, and in sedge meadow

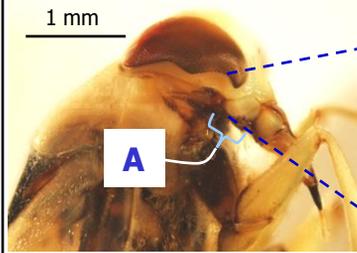
General Ecology

Habit: Swimmers, climbers

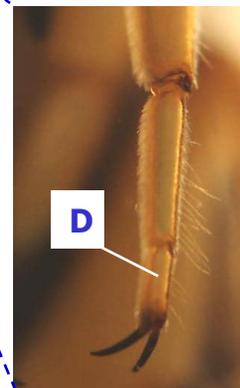
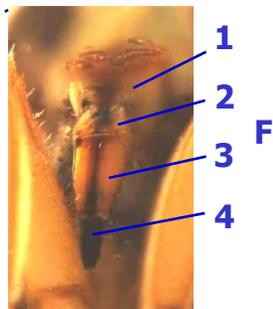
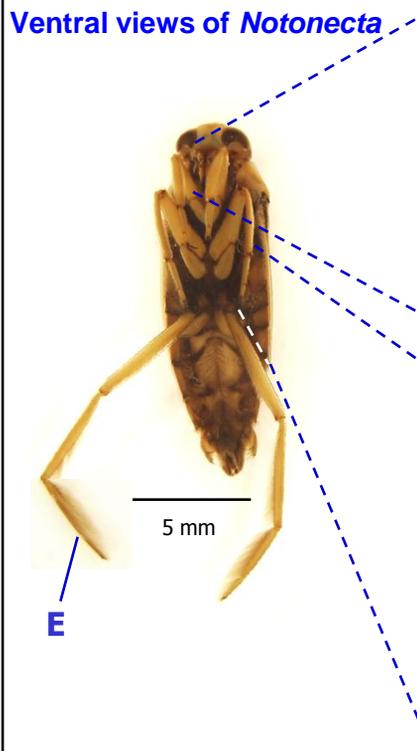
Functional feeding group: Predators (piercers)

References: Hil 3, 37-39; Pol 269-271, 278, 284-285, 295

Photographs: KK, August 6, 2002 OWCI

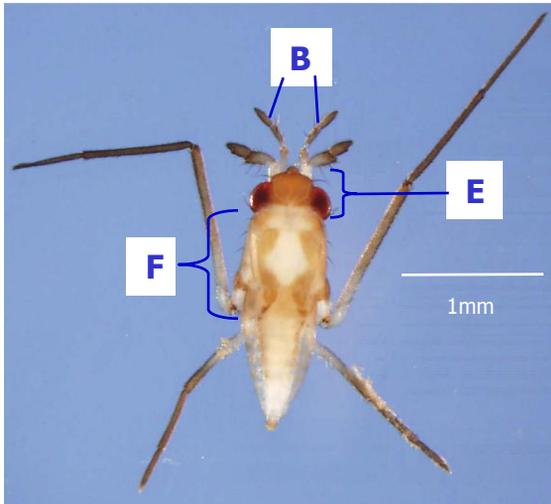


Ventral views of *Notonecta*



**Insecta: Hemiptera (True Bugs):
Heteroptera: Veliidae: *Microvelia* sp.
Broad-shouldered Water Striders**

Dorsal view of *Microvelia*



Features of Order Hemiptera

Three pairs of legs attached to thorax
Wings or wingpads usually present; anterior portion of fore wing hard or leathery
Mouthparts formed into segmented beak

Features of Suborder Heteroptera

Gular region on head easily seen laterally (A)

Features of Family Veliidae

Antennae longer than head, attached in front of eyes, visible dorsally (B)
Claws of front tarsus inserted before apex (C)
Hind coxae small and cylindrical or conical (D)
Head (E) shorter than thorax (F)
Beak cylindrical with four segments (1-4)
Hind femur (G) short, not extending beyond apex of abdomen

Features of Genus *Microvelia*

Middle tarsi without plumose hairs, not deeply cleft, and with narrow claws (H)
Adult length 1.5-3.0 mm

Where Recorded at Old Woman Creek

On a partially submerged log at water surface

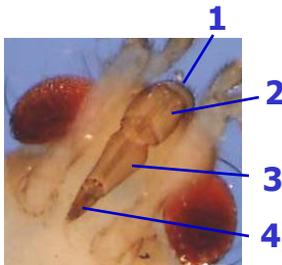
General Ecology

Habit: Skaters
Functional feeding group: Predators (piercers)

References: Hil 3, 39; Pol 269-271, 288, 292

Photographs: Qual C, July 31, 2002 OWCI

Ventral views of *Microvelia*



Lateral views of *Microvelia*

