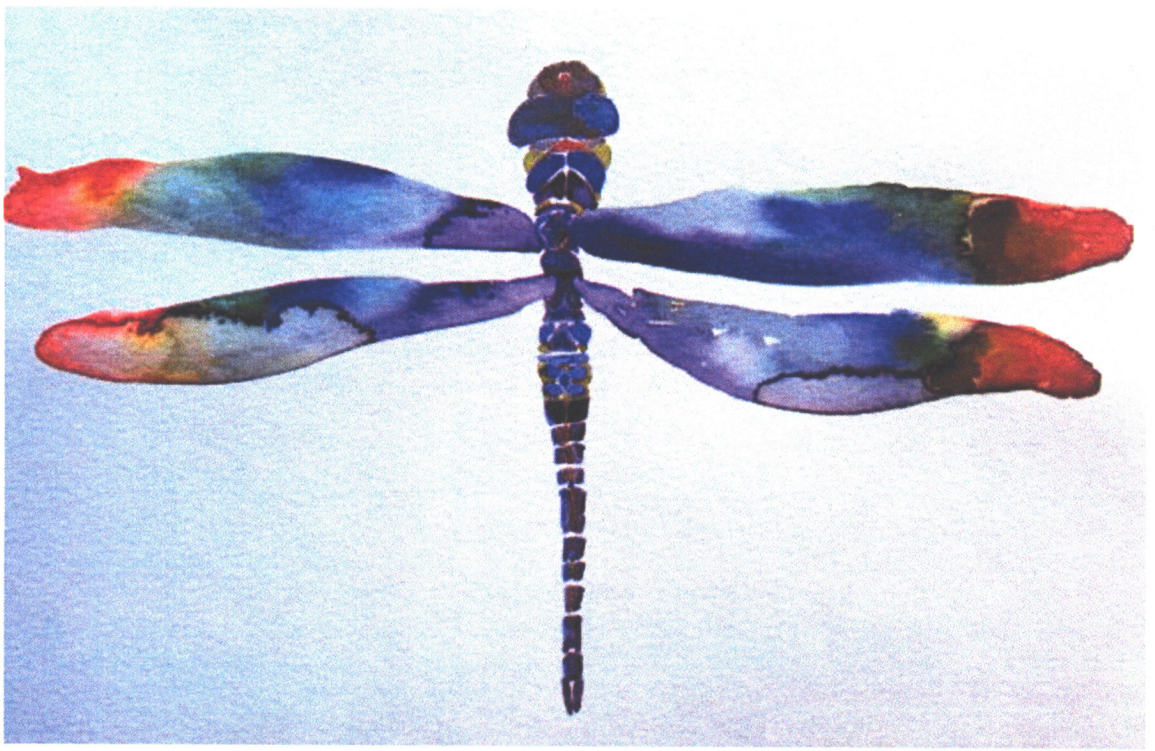
AQUATIC ORGANISMS OF THE CITY OF GREATER SUDBURY AREA LAKES

By: Tina K. Grzela & Patricia Wright



December 3, 2003

Body-Builder Mayfly

Genus: *Drunella*
Family: Ephemerellidae
Order: Ephemeroptera

Sensitivity to pollution = very sensitive
MOST WANTED

Key Features to Look For:
- First section of the front legs look like muscular biceps
- Front legs have a serrated edge
- Flat body with obvious legs
- Three tails at the end of the abdomen
- Single set of wing pads
- Small round gills on the sides of the abdomen
- 5-25 mm in length

Key behaviors:
- This mayfly nymph will crawl among leaves, stones and other debris in the tray.
- Occasionally it may swim by slowly undulating back and forth.

Points of note:
This organism can be confused with other members of the same family. These mayflies can be very abundant under appropriate conditions. The defining feature of this organism is the enlarged front legs with a serrated edge.

Habitat: Some cling to rocks, some burrow in mud, and others are free swimmers. Diversity of mayfly species decreases with stream degradation.

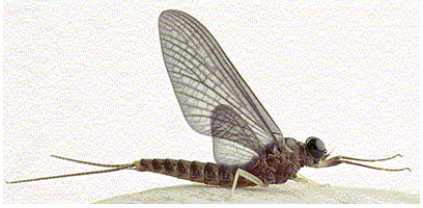
Minnow Mayfly

Genus: *Isonychia*
Family: Isonychidae (Oligoneuriidae)
Order: Ephemeroptera

Sensitivity to pollution = very sensitive
MOST WANTED

nymph

adult



Key Features to Look For:
- Streamline body, taller than wide, humped back
- Front legs have many long hairs on the inside edge
- 3 feather-like tails at the end of the abdomen
- Single set of wing pads
- Small round gills on the sides of the abdomen
- Large size, approximately ¾ inch

Key behaviors:
- This mayfly nymph is an extremely strong swimmer. It swims by undulating back and forth very rapidly.
- This mayfly often stands on rocks, leaves and sticks.

Points of note:
When present in a sample, these organisms are easy to locate in the tray. They are extremely fast and strong swimmers. Unlike most mayfly nymphs, the body is taller than it is wide. Look for the three tails each with many small hairs. The tails act as an oar propelling the nymph through the water.

Habitat: Some cling to rocks, some burrow in mud, and others are free swimmers. Diversity of mayfly species decreases with stream degradation.

common stonefly

Family: Perlidae
Order: Plecoptera

Sensitivity to pollution = very sensitive
MOST WANTED

nymph

adult

Key Features to Look For:
- Large active organism (up to 1.25 inches)
- Flat body with obvious legs
- Dark body with or without pattern
- Two tails at the end of the abdomen
- Two sets of wing pads
- Gill tufts at the base of each leg

Key behaviors:
- Very active crawler, highly mobile.
- May hide on like-colored objects in the tray.
- May be observed doing “push-ups” in the tray.

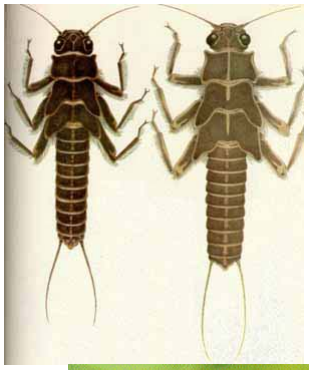
Points of note:
When present in a sample, this organism will crawl out of the debris in the net. It is very active and extremely hard to miss. Often different sizes can be extremely hard to miss. Often different sizes can be collected at the same site. For the smaller versions, be sure to check the key characteristics. Some of the darker versions of Perlidae can be confused for a giant stonefly.

Habitat: Found in streams and large valley rivers usually with rocky bottoms. Swiftly moving streams with high oxygen levels.

Giant stonefly

Genus: *Pteronarcys*
Family: Pteronarcyidae
Order: Plecoptera

Sensitivity to pollution = very sensitive
MOST WANTED



nymph

adult

Key Features to Look For:
- Vary large organism (up to 1.5 inches)
- Robust body, pointed edges of abdomen and wing pads
- Very dark body with white tips on antenna and tails
- Two tails at the end of the abdomen
- Two sets of wing pads
- Gill tufts on the sides of the first three sections of the abdomen

Key behaviors:
- This stonefly nymph is not very active, crawls slowly.
- May curl into a C-shape when disturbed.

Points of note:
This organism can be confused with the common stonefly. A good indicator is the activity level. Compared to common stonefly, these move like sloths. Typically, only a few Pteronarcyidae are collected at any site when conditions are appropriate.

Habitat: Found in streams and large valley rivers usually with rocky bottoms. Swiftly moving streams with high oxygen levels.

Fingernet caddisfly

Genus: *Chimarra*
Family: Philopotamidae
Order: Trichoptera

Sensitivity to pollution = very sensitive
MODERATELY WANTED

nymph

adult

Key Features to Look For:
- Orange head
- Bright yellow, beige, white, or semi-transparent body
- Slender worm-like body
- No gills on or along the abdomen
- T-shaped mouth part, in between jaws
- Two hooks at the end of the abdomen
- Black border along the back edge of the pronotum

Key behaviors:
- Extremely active, wiggles violently back and forth.
- Gregarious, will form clumps of two to four in the tray.
- Very active. Will crawl around the bottom of the tray.

Points of note:
This is a very common organism encountered during benthic sampling. These can be extremely abundant under appropriate conditions. The filtering nets of this organism can be observed on and between the substrate.

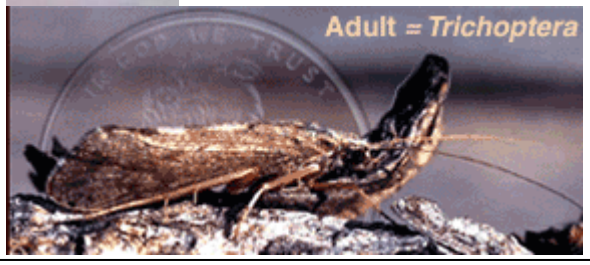
Habitat: High-quality streams; some are tolerant of mild pollution.

Mid-size plant casebuilder

Genus: *Lepidostoma*
Family: Lepidostomatidae
Order: Trichoptera

Sensitivity to pollution = very sensitive
MOST WANTED

nymph



Key Features to Look For:
- Case constructed of organic material only
- Each case is made of either strips or small blocks
- Case and larva taper from front to back
- Larvae have light bodies with dark head and legs
- Almost ½ inch in length

Key behaviors:
- Cryptic, it will not move around the tray very much.
- Cases may be attached to sticks, leaves or larger rocks.
- When crawling, it resembles a hermit crab.

Points of note:
This caddisfly larva can be very abundant under the appropriate conditions. Look carefully when the sample contains old leaves, sticks or bark.

Habitat: High-quality streams; some are tolerant of mild pollution.

Michelin-man caddisfly

Genus: *Rhyacophila*
Family: Rhyacophilidae
Order: Trichoptera

Sensitivity to pollution = very sensitive
MOST WANTED

larva

adult

Key Features to Look For:
- Large cylindrical bright green body up to 1 inch
- Tan or patterned head
- Short legs all close to the head
- Smooth lumpy abdomen, no gills
- Two hooks at the end of the abdomen

Key behaviors:
- Clings to net very well.
- Moderately active organism. Will crawl or wiggle in the tray.
- Will try to hide under objects.
- Larvae do not build a case until it is about pupate. Then it will build a loosely constructed shelter out of small stones and gravel.

Points of note:
This organism is often found in and amongst aquatic mosses. A key field characteristic is the bright green color, especially on the underside of the abdomen. Be careful not to confuse this organism for Hydropsychidae, which can also have a green body but has abdominal gills and a dark plate above each pair of legs.

Habitat: Crawls through rocky riffles looking for prey.

Mid-size plant casebuilder

Genus: *Brachycentrus*
Family: Brachycentridae
Order: Trichoptera

Sensitivity to pollution = very sensitive
MOST WANTED

larva

adult

Key Features to Look For:
- Case constructed of organic material only
- Each case is made of either strips or small blocks
- Case and larva taper from front to back
- Larvae have light bodies with dark head and legs
- Almost ½ inch in length

Key behaviors:
- Cryptic, it will not move around the tray very much.
- Cases may be attached to sticks, leaves or larger rocks.
- When crawling, it resembles a hermit crab.

Points of note:
This caddisfly larva can be very abundant under the appropriate conditions. Look carefully when the sample contains old leaves, sticks or bark.

Habitat: High-quality streams; some are tolerant of mild pollution.

Saddle casemaker

Genus: *Glossosoma*
Family: Glossosomatidae
Order: Trichoptera

Sensitivity to pollution = very sensitive
MOST WANTED

Key Features to Look For:
- Small oval stone case, turtle shell shape
- Case is made of 15-25 very small pebbles
- Underside of the case has two round openings
- Larva body is cylindrical and slightly arc shaped
- Larva has light body with dark head and legs
- No larger than ¼ inch

Key behaviors:
- This caddisfly larva is often attached to the surface of rocks in fast current.
- May not move at all when in the tray. If so, it will crawl slowly along the bottom of the tray.

Points of note:
This organism can be confused with other small case building caddisflies like *Apatania* and *Neophylax*. This caddisfly can be abundant under appropriate conditions. Look very carefully for these very small caddisfly larvae. It may be easier to locate by observing rocks in the stream before any kicks are made.

Habitat: Larvae crawl with case over smooth surfaces of rocks. Prefers moderate to fast currents with shallow riffles and runs.

Cornucopia casebuilder

Genus: *Apatania*
Family: Limnephilidae
Order: Trichoptera

Sensitivity to pollution = very sensitive
MOST WANTED

nymph

adult

Key Features to Look For:
- Very small case made of sand and shaped like a Cornucopia
- Small cylindrical light bodied larva
- Triangular head and dark legs
- Hunched appearance when in the case
- No larger than ¼ inch

Key behaviors:
- This caddisfly larva is fairly active and will crawl along the bottom of the tray.
- Resembles a hermit crab. Drags its case along.

Points of note:
This organism can be confused with other small casebuilding caddisflies like Glossosoma and Hydroptilidae. This caddisfly can be abundant under appropriate conditions. Look very carefully for these very small caddifly larvae.

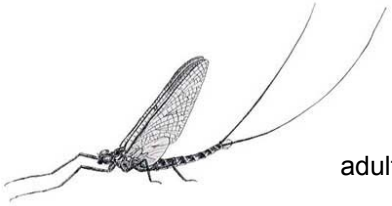
Habitat: High-quality streams; some are tolerant of mild pollution. Found in all kinds of habitats and can be extremely abundant.

Two-tailed flathead mayfly

Genus: *Epeorus*
Family: Heptageniidae
Order: Ephemeroptera

Sensitivity to pollution = very sensitive
MOST WANTED

nymph



adult

Key Features to Look For:
- Extremely flat body, long thin legs
- Almost translucent body
- Two long thin tails at the end of the abdomen
- Single set of wing pads
- Small round gills of the sides of the abdomen
- Wide flat head, obvious eyes
- 5-25 mm in length

Key behaviors:
- This mayfly nymph crawls very fast on the surface of stones.
- It may try to swim by wiggling side to side.
- Will try to hide under any object in the tray.

Points of note:
The best way to find these Mayfly nymphs is to carefully examine cobbles before kick sampling. When present, these mayflies will scurry along the surface of the rock. Because of their body color and shape, they can be very difficult to spot. Positive ID combines the body shape with only two tails. They can be extremely abundant when conditions are appropriate.

Habitat: Some cling to rocks, some burrow in mud, and others are free swimmers. Hangs on to the surface of rocks in riffles and runs.

Roach-like stonefly

Family: Peltoperlidae
Order: Plecoptera

Sensitivity to pollution = very sensitive
MOST WANTED

nymph

adult

Key Features to Look For:
- Tear-drop body shape
- Uniformly shiny brown exoskeleton
- Two tails at the end of the abdomen
- Two sets of wing pads
- No gills on the sides of the abdomen
- No larger than ½ inch

Key behaviors:
- This stonefly nymph is commonly found crawling in and amongst leaf packs in riffle areas.
- Peel apart leaves, look for these stoneflies crawling around.
- May occasionally try to swim by moving side to side.

Points of note:
This stonefly nymph is easily identified by the tear-drop body shape. Many times they are described as horseshoe crab-like or little trilobites. The smooth exoskeleton makes them very slippery when trying to pick them up with forceps.

Habitat: These stoneflies live in cool streams in moderately fast runs and riffles preferably where organic debris is present.

r i f f l e b e e t l e

Genus*: Stenelmis*
Family: Elmidae
Order: Coleoptera

Sensitivity to pollution = sensitive

larva

adult

Key Features to Look For:
- Larvae have gills at the end of the abdomen, protected by an operculum, while adults use plastron respiration
- Small oval body
- 1.4 inch long
- one pair of tiny antennas

Key behaviors:
- Walks very slowly under water.
- Does not swim on surface.

Points of note:
- Adults overwinter under leaves and debris along the shores of streams and lakes.
- A single generation is produced each year

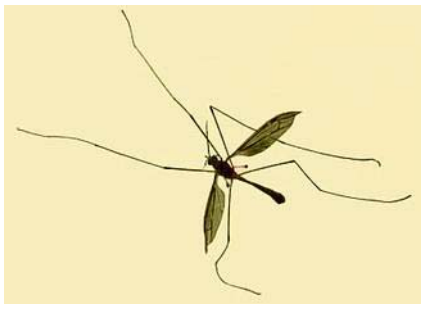
Habitat: They are found where water is rich in oxygen.

C r a n e f l y l a r v a

Genus*: Antocha*
Family: Tipulidae
Order: Diptera

Sensitivity to pollution = sensitive

larva



adult

Key Features to Look For:
- The gills are found below a pair of elongate ventral lobes on the last abdominal segment
- Abdominal segments 2 to 7 have conspicuous sclerotized "creeping welts" on their dorsal and ventral surfaces
- The welts are on the ventral surface
- A close look at a creeping welt will reveal small and hard little projections, called spicules or denticles

Key behaviors:
- This genus is unusual amongst the tipulids in that even the pupae are not air breathers.

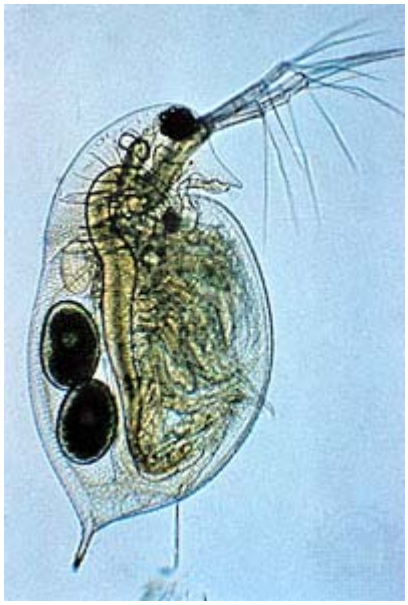
Points of note:
- Antocha larvae are truly aquatic; they have no spiracles, and obtain oxygen directly from the water using elongate anal gills.

Habitat: Larvae spin tubes of silk attached to rocks and woody debris in well-oxygenated, fast-flowing water.

Water flea

Genus: *Daphnia*

Sensitivity to pollution = sensitive



Key Features to Look For:
- Length 1mm
- Tiny crustacean
- The body is almost transparent and internal organs can be seen through carapace
- Body usually pinkish and has single dark compound eye

Key behaviors:
- Swims through the water as if by hopping by beating second antennae.

Points of note:
- They're not really fleas – in fact they're not insects at all, but rather crustaceans, more closely related to crabs and shrimp.
- Water fleas are extremely important in the food chains of ponds and lakes - they harvest the tiny algae cells that convert sun energy into food, and then they pass this energy along to other animals such as fish or other predators.

Habitat: They are found in lakes or ponds located in limestone-based areas.

crayfish

Genus*: Orconectes*
Family: Cambaridae
Order: Decapoda

Sensitivity to pollution = sensitive

Key Features to Look For:
- Length up to 40mm
- Resembles the lobster

Key behaviors:
- Normally, crayfish scuttle about near the substrate, but when disturbed can swiftly scoot away by flicking the abdomen and tail-fans ventrally.

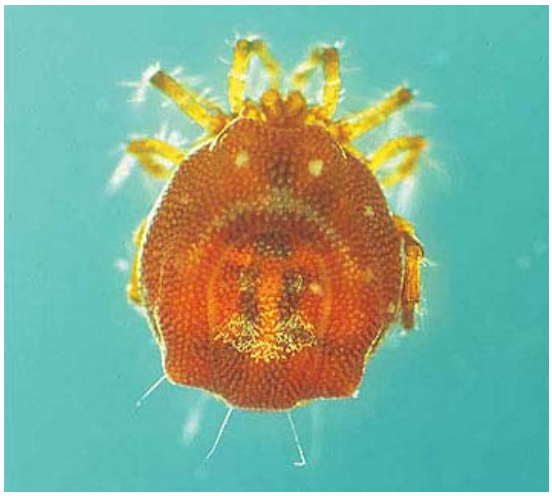
Points of note:
- Normally, crayfish scuttle about near the substrate, but when disturbed can swiftly scoot away by flicking the abdomen and tail-fans ventrally.
- The bulk of their diet is vegetation, which they shred with the paired appendages near their mouths.
- They also eat aquatic insects, snails, other crayfish, and even small fish; most of these items are either dead, or injured, when encoutered and consumed, as crayfish are primarily scavengers rather than predators.

Habitat: Needs fast-flowing, well-oxygenated water and, during daytime, hides under stones and in holes in bank.

Water mite

Genus*: Hydrarachna*
Family: Psephenidae
Order: Coleoptera

Sensitivity to pollution = sensitive



Key Features to Look For:
- Water mites can be green, brown, blue, or black and measure 0.5mm (about the size of a pin head) to 10mm
- When you look at these tiny parasites, you can only see one part but there is actually a line that separates the thorax from the abdomen
- Tiny organism is round and eight-legged
- Two sets of eyes

Key behaviors:
- It swims through the water with the hair on it's legs.

Points of note:
- They are eaten by fish and carnivourous insect larvae.
- When growing up, the larvae attach themselves to an aquatic insect known as ectoparasitic.
- The phyla Hydrarachna, or water mite, are tiny parasites which are a part of the Arachnid group.

Habitat: Water Mites swim in slow flowing and shallow water among plants. They live in all freshwater environments, but are more abundant in species and number in slow-moving waters.

alderfly

Order: Megaloptera

Sensitivity to pollution = sensitive

larva

adult

Key Features to Look For:
- Larva <3 cm
- Adult 2.4-5 cm
- Six legs and six to eight filaments on each side of abdomen
- Distinguished from dobsonfly larvae by single tail projection with hairs but no hooks

Key behaviors:
- Very mobile, will be very active crawling or wiggling in the tray.
- Will curl the abdomen around your finger if picked up.
- May cling to the net.

Points of note:
- Aggressive predators.

Habitat: High- or medium-quality water.

Common net-spinner

Family: Hydropsychidae
Order: Trichoptera

Sensitivity to pollution = moderately sensitive
MODERATELY WANTED

Key Features to Look For:
- Worm-like body
- Dark color, sometimes greenish body
- Two paint brush-like tails at the end of the abdomen
- Fluffy gills on the underside of the abdomen
- Dirty or hairy appearance (sometimes)
- Two hooks at the end of the abdomen
- Dark plates above each pair of legs

Key behaviors:
- Extremely active, wiggles violently back and forth.
- Gregarious, will form clumps of two to four in the tray.
- MAY CLING STRONGLY TO THE NET.

Points of note:
This is probably one of the most common organism encountered during benthic sampling. These can be extremely abundant under appropriate conditions. Because some are greenish in color, they may be confused as *Rhyacophila*. Hydrophychidae have a dark plate above each pair of legs and fluffy gills on the underside of the abdomen, *Rhyacophila* do not. The tiny filtering nets of this organism can be observed on and between substrate.

Habitat: Commonly found in waters with floating particles.

Water penny beetle larva

Genus: *Psephenus*
Family: Psephenidae
Order: Coleoptera

Sensitivity to pollution = moderately sensitive
MODERATELY WANTED

Bottom

Top

Key Features to Look For:
- Small disk shaped organism
- Very flat
- Uniformly brown
- No visible head or legs from top view

Key behaviors:
- Sticks very well to rocks.
- Glides along the bottom of the tray.
- May curl up when disturbed.
- Very cryptic.

Points of note:
Water penny beetle larvae are very distinctive. They can also be very hard to locate in the field. Look very closely at the surfaces of rocks. They will adhere extremely close to the surface. These organisms can be locally abundant when conditions are appropriate.

Habitat: Water penny beetle larvae live attached to stones in streams, rivers or lakes. The water penny can be found in moderate to swift currents or in well oxygenated pools.

Snipe fly

Family: Leptidae

Sensitivity to pollution = moderately sensitive

larva

adult

Key Features to Look For:
- Larvae can be separated from other aquatic dipteran larvae by their robust shape
- Paired prolegs, lateral and dorsal spines on the body, and divergent terminal fringed processes
- About 15 mm in length

Key behaviors:
- Often sunbathes on vegetation but also sits head-down on tree trunks and will sometimes suddenly fly straight at observer.

Points of note:
- Adult feeds on nectar; larva is carnivorous and lives in leaf litter.

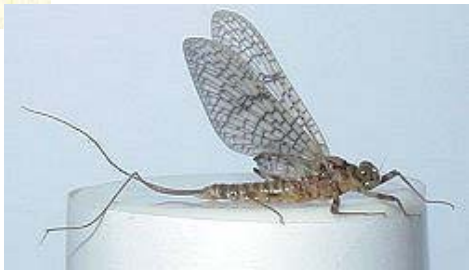
Habitat: Common and widespread, seen May-July.

Flat-head mayfly

Genus: *Stenonema*
Family: Heptageniidae
Order: Ephemeroptera

Sensitivity to pollution = moderately sensitive
MODERATELY WANTED

larva



adult

Key Features to Look For:
- Very flat body with long thin legs
- Three very long tails at the end of the abdomen
- Single set of wing pads
- Small round gills on the sides of the abdomen
- Very broad head with large eyes

Key behaviors:
- This mayfly nymph is very mobile and can move and swim fast when in water.
- Doesn't move well in the net.
- Occasionally, it may swim by undulating from side to side.
- It will try to hide on any flat, dark colored object like stones, leaves and other invertebrates.

Points of note:
They can be found by slowly lifting cobbles out of the water. They may run to the other side of the rock. Be sure not to confuse this organism with the two-tailed version (*Epeorus*). The legs, gills and tails tend to break off during the collection process.

Habitat: Some cling to rocks, some burrow in mud, and others are free swimmers. Diversity of mayfly species decreases with stream degradation.