

"Body-BUILDER" Mayfly

Panel 1
Most Sensitive



DORSAL VIEW



VENTRAL VIEW

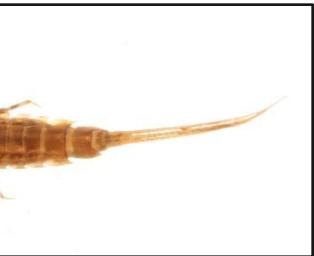
KEY FEATURES



- Flat body with obvious legs.



- The first section of the front legs look like muscular biceps being flexed.
- Front legs have a serrated edge.



- Three hair-like tails at the end of the abdomen.



- Single set of wing pads.



- Small, round gills on the side of the abdomen

Taxonomic Information

Order: Ephemeroptera
Family: Ephemerellidae
Genus: *Drunella*

Ecological Information

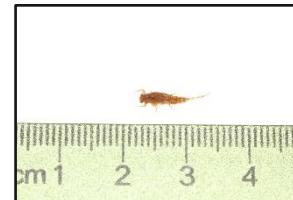
Tolerance Value = 0
Feeding Group = Scraper
Stream Habitat = On rocks or coarse organic substrates

Key Behaviors

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

Important Notes

This organism can be confused with other members of the Ephemerellidae family. The distinguishing characteristic of *Drunella* is the enlarged front legs, each with a serrated margin along the front edge. These mayfly can be very abundant under appropriate conditions, however they typically emerge in the spring and are therefore uncommon in RBV samples.



Size and Color

Size: 6-15 mm
Color: Tan to dark brown, legs may have orange or yellow bands

"Brush-Legged" Mayfly

Panel 2
Most Sensitive



LATERAL VIEW

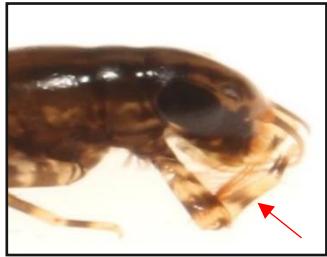


DORSAL VIEW

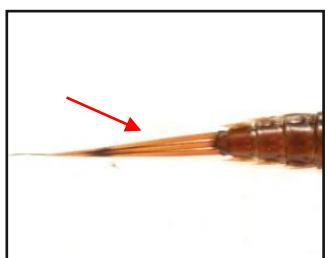
KEY FEATURES



- Streamlined body, taller than wide.
- Often with a "humped back" or "S-shaped" appearance when swimming.



- Front legs have a double row of long hairs on the inside edge.



- Three feather-like tails at the end of the abdomen.



- Small, round gills on the side of the abdomen.



- Single set of wing pads.

Taxonomic Information

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

Ecological Information

Tolerance Value = 2
Feeding Group = Collector-Filterer
Stream Habitat = Moderate to fast flows, rock surfaces

Key Behaviors

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

Identification Notes

There is only one genera (*Isonychia*) of Isonychidae in Connecticut. *Isonychia*, often called "Minnow Mayflies" by experienced volunteers, are the strongest swimmers of any aquatic insect. The three tails are made up of a series of fine hairs that act like an oar on a boat, propelling the mayfly through the water. No other mayfly has a double row of fine hairs on the front legs.



Size and Color

Size: 8-17 mm (3/4 of an inch)
Color: Light brown to dark brown body, sometimes with yellow or white markings

"Two-Tailed Flathead" Mayfly

Panel 3
Most Sensitive



DORSAL VIEW



VENTRAL VIEW

KEY FEATURES



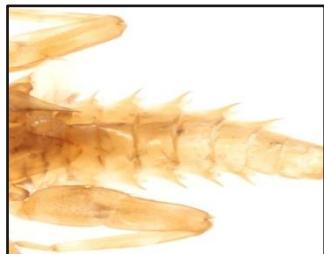
- ☐ Extremely flat, almost translucent body, long thin legs.



- ☐ Two Long thin tails at the end of the abdomen, may be broken.



- ☐ Single set of wing pads.



- ☐ Small round gills on the sides of the abdomen.



- ☐ Wide flat head, obvious eyes.

Taxonomic Information

Order: Ephemeroptera
Family: Heptageniidae
Genus: *Epeorus*

Ecological Information

Tolerance Value = 0
Feeding Group = Scraper
Stream Habitat = Cobble and organic substrates

Key Behaviors

- This mayfly nymph crawls very fast on the surface of stones.
- Will move quickly in the tray and try to hide under any leaves or sticks present.
- *Epeorus* may try to swim by wiggling side to side.

Important Notes

The best way to find *Epeorus* is to carefully 'wash off' cobbles in the net before kicking. When present, these mayflies will scurry along the surface of the rock. Because of the body color and shape, they can be very difficult to spot. Positive ID combines the body shape with only two tails. *Epeorus* can be extremely abundant when conditions are appropriate.



Size and Color

Size: 2-10 mm (1/2 an inch)
Color: Tan to dark brown, sometimes with lighter gills and markings on the legs and head.

"Roach-Like" Stonefly

Panel 4
Most Sensitive



DORSAL VIEW

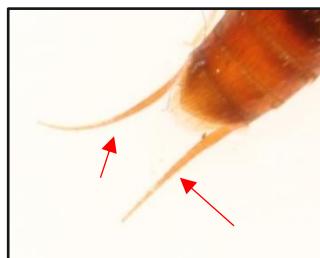


LATERAL VIEW

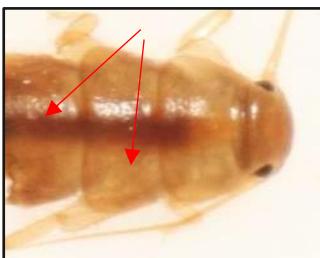
KEY FEATURES



- Tear-drop shaped body with a uniformly shiny brown exoskeleton.



- Two short tails at the end of the abdomen.



- Two sets of wing pads.



- No gills on the sides of the abdomen.



- Commonly found on leaves

Taxonomic Information

Order: Plecoptera
Family: Peltoperlidae
Genus: All

Ecological Information

Tolerance Value = 0
Feeding Group = Shredder
Stream Habitat = In and on coarse organic substrates

Key Behaviors

- This stonefly nymph is commonly found crawling in and amongst leaf packs in riffle areas. To locate, peel apart leaves in any packs present!
- Typically not observed swimming in the tray.

Important Notes

Peltoperlids are very intolerant of environmental stresses. Its characteristic inverted tear drop shape, short tails, and head which is broadly joined to the thorax, differentiate the Roach-Like Stonefly from other stoneflies.



Size and Color

Size: 6-11 mm (1/4 of an inch)
Color: Light to dark brown, uniform

"Common" Stonefly

Panel 5A
Most Sensitive



DORSAL VIEW

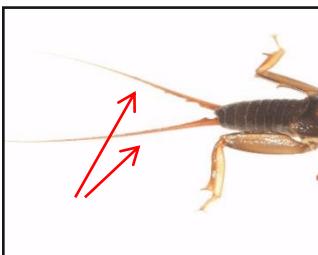


VENTRAL VIEW

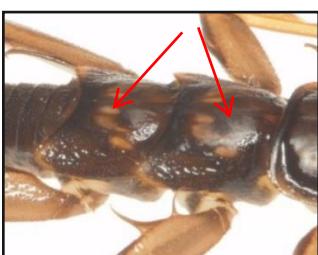
KEY FEATURES



- Flat body with obvious, segmented legs. Some specimens (not all) have a tortoise-shell pattern on the head and thorax.



- Two long tails at the end of the abdomen.



- Two sets of wing pads



- Rounded thoracic plate



- Gill tufts resembling armpit hairs at the base of each leg.

Taxonomic Information

Order: Plecoptera
Family: Perlidae
Genus: All

Ecological Information

Tolerance Value = 1
Feeding Group = Predator
Stream Habitat = Burrowed in substrate

Key Behaviors

- Very active crawler, highly mobile. (Watch out – they will crawl out of your ice cube trays!)
- May hide on like colored objects in the tray.
- May be observed doing “push-ups” in the tray. (This helps circulate water over their gills.)

Important Notes

When present in a sample, this organism will crawl out of the debris. Don't be confused by size or color - often different sizes will be collected at the same site and coloration can vary quite a bit between organisms. Darker and/or larger versions of common stoneflies are often misidentified as the giant stonefly (see panel 5B).



Size and Color

Size: 8-30 mm (3/4 – 1 ½ inches)
Color: Variable. Light yellowish, brown to very dark, some with a tortoise-shell pattern.

"Giant" Stonefly

Panel 5B
Most Sensitive



DORSAL VIEW



VENTRAL VIEW

KEY FEATURES



- ❑ Robust body, typically dark but occasionally with white or yellow markings.



- ❑ Pointed edges along the sides of the abdomen.



- ❑ Two, short tails at the end of the abdomen.



- ❑ First thoracic plate is rectangular with flared edges
- ❑ Two sets of wing pads, very angular in shape.



- ❑ Gill tufts on the thorax and the sides of the first three sections of the abdomen.

Taxonomic Information

Order: Plecoptera
Family: Pteronarcidae
Genus: *Pteronarcys*

Ecological Information

Tolerance Value = 0
Feeding Group = Shredder
Stream Habitat = Fast flowing, high-gradient riffles

Key Behaviors

- This stonefly nymph is not very active. If it moves at all, it will crawl very slowly around the tray.
- May curl into a C-shape when disturbed.

Important Notes

Pteronarcys is often confused with the Common Stonefly as both can grow to be quite big. The Giant Stonefly is distinguished easily by its relatively sluggish activity level and more armored appearance. Don't be fooled by size – all giant stoneflies must start out small! Typically, only a few Pteronarcidae are collected at any site when conditions are appropriate.



Size and Color

Size: 35-50 mm (1-2 inches)
Color: Brown to black, sometimes with white or yellow tail tips

Miscellaneous Small Stoneflies

Panel 5C
Most Sensitive

SMALL STONEY FAMILIES

{Insert Key Feature #1
photo – sized 1.31x1.65}

{Insert Key Feature #2
photo – sized 1.31x1.65}

{Insert Key Feature #3
photo – sized 1.31x1.65}

{Insert Key Feature #4
photo – sized 1.31x1.65}

{Insert Key Feature #3
photo – sized 1.31x1.65}

{Insert Key Feature #4
photo – sized 1.31x1.65}

Small Winter Stoneflies

(*Capniidae*)

- Often dark
- Legs short
- Abdomen slightly wider at middle

Green Stoneflies

(*Chloroperlidae*)

- No distinctive color patterns
- Tails shorter than the abdomen is long

Rolledwinged

Stoneflies (*Leuctridae*)

- Long, slender body
- Short legs
- Abdomen same width along length

Nemourid Stoneflies

(*Nemouridae*)

- Long legs (tips extend to the tip of the abdomen or beyond)

Perlodid Stoneflies

(*Perlodidae*)

- Very similar to the Common Stonefly but without gill tufts near the base of the legs

Winter Stoneflies

(*Taeniopterygidae*)

- Wing pads form a distinct triangle
- Typically only present in late November RBV samples

General Identification

The following characteristics are universally true of the miscellaneous stonefly families at left:

- Two tails
- Two tarsal claws ('toes') at the end of each leg
- Dorsally flattened
- Small in size (typically <10 mm; *Taeniopterygidae* can reach up to 15 mm)

Taxonomic Information

Order: Plecoptera

Family: See families at left

Genus: All within families at left

Ecological Information

Tolerance Value = See below

Feeding Group = See below

Stream Habitat = Fast moving water, under rocks/debris

	Tolerance Value	Feeding Group
<i>Capniidae</i>	1	Shredder
<i>Chloroperlidae</i>	1	Predator
<i>Leuctridae</i>	0	Shredder
<i>Nemouridae</i>	2	Shredder
<i>Perlodidae</i>	2	Predator
<i>Taeniopterygidae</i>	2	Shredder

Important Notes

All stoneflies are intolerant of organic pollutants and therefore indicate high water quality.

{Insert Size Reference Picture (1.03x1.5 inches)}

Size and Color

Size: 4-10 mm average

Color: Variable. Many light brown or cream colored



"Saddlecase Maker" Caddisfly

Panel 6A
Most Sensitive



LATERAL VIEW

DORSAL VIEW

KEY FEATURES



- Small oval stone case made of sand grains and/or tiny pebbles, resembles a saddle or a turtle shell. (Case is NOT tube-shaped.)



- Underside of case has two round openings.

Taxonomic Information

Order: Trichoptera
Family: Glossosomatidae
Genus: *Glossosoma*

Ecological Information

Tolerance Value = 0
Feeding Group = Scraper
Stream Habitat = Exposed upper surfaces of rocks

Key Behaviors

- This caddisfly larva is often attached to the surface of rocks in fast current.
- *Glossosoma* may not move at all while in the tray. If so it will crawl very slowly along the bottom of the tray.

Important Notes

Glossosoma is often confused with other small stone case building caddisflies. Unlike other caddisfly cases, the *Glossosoma* case is not tube shaped but rather resembles a turtle shell with only a thin 'strap' of pebbles holding the case around the organism. Keep an eye out for both the case and the organism in your tray as the two are easily separated.



- Larva body is maggot-like and slightly C-shaped.



- Larva has a light (white to light brown) body with a dark head and legs.



- End of the abdomen has an attached 'butt plate'



Size and Color

Size: 3-10 mm (1/4 inch)
Color: White to light brown, with dark head, legs and butt plate

"Cornucopia-Case" Caddisfly

Panel 6B
Most Sensitive



DORSAL VIEW

VENTRAL VIEW

KEY FEATURES



- Very small case made of sand grains; cone-shaped like a Thanksgiving cornucopia.



- Tiny (<1/4 inch) light-bodied organism. Hunched appearance when in case.



- Triangular head with dark legs.

Taxonomic Information

Order: Trichoptera

Family: Apataniidae

Genus: *Apatania*

Ecological Information

Tolerance Value = 3

Feeding Group = Scraper

Stream Habitat = Fast flowing, shallow riffles

Key Behaviors

- This caddisfly larva is tiny and therefore easily overlooked, however if you watch your tray closely you may see a tiny sand horn walking around the bottom!
- Resembles a tiny hermit crab in that it drags its case along as it walks.

Important Notes

This organism is commonly confused with other stone case building caddisflies including *Glossosoma*. The easiest distinguishing characteristic is that that *Apatania* is VERY tiny, typically smaller than the width of your pinky nail. This caddisfly can be abundant under appropriate conditions. Look very carefully in your trays for these tiny caddisfly larvae!



Size and Color

Size: 2-6 mm (1/8 of an inch)

Color: Light colored body with dark head

"Free-Living" Caddisfly

Panel 7
Most Sensitive



LATERAL VIEW



DORSAL VIEW

KEY FEATURES



- Nicknamed "Michelin Man" caddisfly due to its smooth, lumpy abdomen
- Six short legs near the head



- Hard tan or yellow and brown patterned head with a single thoracic plate.



- Armored plate and two hooks at the end of the abdomen, somewhat loosely attached

Taxonomic Information

Order: Trichoptera
Family: Rhyacophilidae
Genus: *Rhyacophila*

Ecological Information

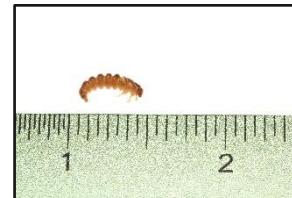
Tolerance Value = 0
Feeding Group = Predator
Stream Habitat = Fast flowing, high-gradient riffles

Key Behaviors

- Clings very well to the net.
- Moderately active organism; will crawl or wiggle in the tray.
- Will try to hide under objects.

Important Notes

Rhyacophila is called the 'free-living' caddisfly because larvae of this genus do not build a case until they are about to pupate. (At which point they will build a loosely constructed stone shelter.) This organism is often found among aquatic mosses. A key field characteristic is the bright green or lavender abdominal coloring.



Size and Color

Size: 10-30 mm (1/2 – 1 ½ inches)
Color: Variable. White, green, purple

"Plant Case Maker" Caddisfly

Panel 8A
Most Sensitive



LATERAL VIEW

DORSAL VIEW

KEY FEATURES



- Builds a case out of small, rectangular or square pieces of bark or wood (no sand grains).
- Case is typically slightly wider at the head end.
- Light colored body with dark head and legs.



- Lateral humps present on the first section of the abdomen.

Taxonomic Information

Order: Trichoptera
Family: Lepidostomatidae
Genus: *Lepidostoma*

Ecological Information

Tolerance Value = 1
Feeding Group = Shredder
Stream Habitat = Accumulated plant debris on bottom

Key Behaviors

- Typically does not move in the tray. If it does move, will carry its case with it as it slowly crawls.

Important Notes

These caddisfly can be very abundant under the appropriate conditions, particularly in forested areas. Look carefully for *Lepidostoma* when the sample contains old leaves, sticks or bark. The cases may be attached to sticks, leaves or larger rocks.



Size and Color

Size: 7-15 mm (1/2 an inch)
Color: Light body with dark head and legs

"Humpless Case Maker" Caddisfly

Panel 8B
Most Sensitive



LATERAL VIEW



DORSAL VIEW

KEY FEATURES



- Case constructed of thin strips of plant material assembled in a circular or square form.
- Wider at head opening than at tail end.
- Light colored body with dark head and legs.
- No abdominal humps.

Taxonomic Information

Order: Trichoptera
Family: Brachycentridae
Genus: *Brachycentrus*

Ecological Information

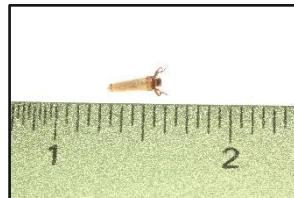
Tolerance Value = 1
Feeding Group = Shredder
Stream Habitat = Upper surfaces of rocks

Key Behaviors

- Typically does not move in the tray. If it does move, will carry its case with it as it slowly crawls.

Important Notes

These caddisfly can be very abundant under the appropriate conditions. Look carefully for *Brachycentrus* when the sample contains old leaves, sticks or bark. The cases may be attached to sticks, leaves or larger rocks.



Size and Color

Size: 10-17 mm (1/3 of an inch)
Color: Light body with dark head and legs

"Common Netspinner" Caddisfly

Panel 9
Moderately Sensitive



LATERAL VIEW

DORSAL VIEW

KEY FEATURES



- ❑ Worm-like, dark colored (sometimes greenish) body.



- ❑ Fluffy gills on the underside (ventral sections) of the abdomen.



- ❑ Series of three dark plates on the dorsal side of the thorax below the head.



- ❑ Two paintbrush-like tails with hooks at the end of the abdomen.

Taxonomic Information

Order: Trichoptera
Family: Hydropsychidae
Genus: All

Ecological Information

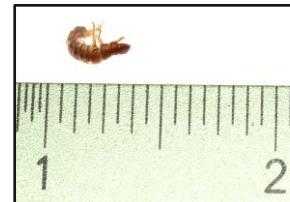
Tolerance Value = 4
Feeding Group = Collector-filterer
Stream Habitat = Rock surfaces, woody debris, plants

Key Behaviors

- Extremely active, wiggles violently back and forth
- Gregarious, will form clumps of 2-4 in the tray
- May cling strongly to the net!

Important Notes

Hydropsychidae is probably one of the most common organisms encountered during benthic sampling. These can be extremely abundant under appropriate conditions. Because some are greenish in color they may be confused as *Rhyacophila*. Hydropsychidae have a dark plate above each pair of legs & fluffy gills on the underside of the abdomen, *Rhyacophila* does not.



Size and Color

Size: 13-18 mm (1/2 an inch)
Color: Light brown to black, sometimes with green tint

“Fingernet” Caddisfly

Panel 10
Moderately Sensitive



LATERAL VIEW

VENTRAL VIEW

KEY FEATURES



- ❑ Elongate, slender worm-like, bright yellow, beige, white, or transparent body.



- ❑ Bright orange head with a transparent, t-shaped upper lip.

Taxonomic Information

Order: Trichoptera
Family: Philopotamidae (Subfamily Chimarrinae)
Genus: *Chimarra*

Ecological Information

Tolerance Value = 3
Feeding Group = Collector-filterer
Stream Habitat = Undersides of rocks in high gradient

Key Behaviors

- Extremely active, wiggles violently back and forth.
- Gregarious, will form clumps of 2-4 in the tray.
- Very active, will crawl around the bottom of the tray.

Important Notes

Chimarra is a very common organism encountered during RBV sampling, and can be extremely abundant under appropriate conditions. This organism is commonly confused with *Dolophilodes* (Subfamily Philopotaminae); the two can be differentiated by a notch along the front margin of the *Chimarra* head, however this is difficult to see without the aid of a microscope.



- ❑ Black border along the back edge of pronotum
(a plate that covers dorsal surface of thorax)



- ❑ No gills on or along the abdomen.
- ❑ Two hooks at the end of the abdomen.



Size and Color

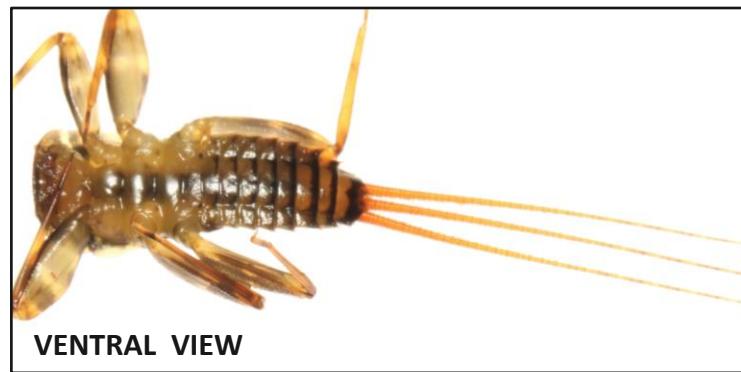
Size: 13-17 mm (1/2 an inch)
Color: Yellow-orange, bright yellow, beige, white, or transparent

"Flat Headed" Mayfly

Panel 11
Moderately Sensitive



DORSAL VIEW



VENTRAL VIEW

KEY FEATURES



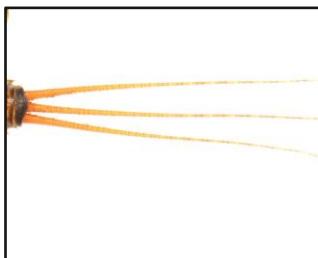
- ☐ Extremely flattened body.



- ☐ Head is flat with large eyes on top.
- ☐ Resembles 'Jack Skellington' from Nightmare Before Christmas.



- ☐ Small, oval or square-shaped gills along the sides of the abdomen.



- ☐ Three very long tails at the end of the abdomen. (Tails are fragile and can break off giving the appearance of only one or two.)



- ☐ Single set of wing pads.

Taxonomic Information

Order: Ephemeroptera
Family: Heptageniidae
Genus: *Stenonema* and *Maccaffertium*

Ecological Information

Tolerance Value = 4
Feeding Group = Scraper
Stream Habitat = On/underneath cobbles and organics

Key Behaviors

- Very mobile; can move and swim fast when in water.
- Doesn't move well in the net
- It will try to hide on any flat dark colored object like stones, leaves, and other invertebrates

Important Notes

Very common across Connecticut. Flat headed mayflies can be found by slowly lifting the cobbles out of the water. They may run to the other side of the rock. Be careful not to confuse this organism with the two-tailed version (*Epeorus*/Panel 3); the legs, gills, and tails of the flat headed mayfly tend to break off during the collection process.



Size and Color

Size: 5-20 mm (1/5 -3/4 inches)
Color: Light golden brown to dark brown, often with spots or stripes on the legs and body

“Water Penny” Beetle

Panel 12
Moderately Sensitive



DORSAL VIEW



VENTRAL VIEW

KEY FEATURES



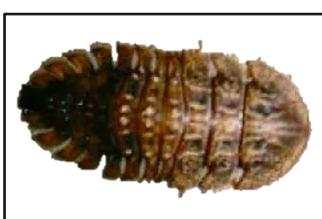
- Small, flat, disc-shaped organism.



- Head and legs only visible from ventral view (i.e. from underneath)



- Uniform in color



- Often confused with the False Water Penny (*Eubriidae*). *Eubriidae* is more ovoid in shape and has a serrated or more jagged outer edge.



Taxonomic Information

Order: Coleoptera

Family: Psephenidae

Genus: *Psephenus*

Ecological Information

Tolerance Value = 4

Feeding Group = Scraper

Stream Habitat = Attached to rocks in fast flows

Key Behaviors

- Cling very well to rocks and smooth surfaces such as the sorting tray
- May glide along the bottom of the tray
- May curl up when disturbed

Important Notes

Water penny beetle larvae are common in RBV samples, but can be very hard to locate in the field due to their cryptic nature. Look very closely at any cobbles in your sample area; water penny beetle larva will adhere strongly to rock surfaces. They are very distinctive due to their penny like shape and coloration. These organisms can be locally abundant when conditions are appropriate.



Size and Color

Size: 3-10 mm (2/8 – 1/2 inches)
Color: Uniform in color. Ranges from golden to dark brown.

Fishfly

Panel 13B
Moderately Wanted



DORSAL VIEW



VENTRAL VIEW

KEY FEATURES



- ☐ Elongate body with a pair of long soft spine-like appendages on each section of the abdomen.



- ☐ Large pinching mouth parts.



- ☐ Two prolegs at the end of the abdomen, each with two hooks.



- ☐ No gills at the base of the abdominal projection.

Taxonomic Information

Order: Megaloptera
Family: Corydalidae
Genus: *Nigronia*

Ecological Information

Tolerance Value = 4
Feeding Group = Predator
Stream Habitat = Under loosely embedded stones

Key Behaviors

- Very mobile, will be very active crawling or wiggling in the tray
- Will curl their abdomen around your finger if picked up
- May cling to the net
- **May pinch! Use caution when handling!**

Important Notes

Very common in RBV samples. *Nigronia* is often confused with *Corydalus* (Panel 13B). The fishfly can be distinguished by its smaller size, more reddish color, and **absence** of fluffy gill tufts on the underside of the abdomen.



Size and Color

Size: 25-50 mm (1-2 inches)
Color: Variable. Light brown to reddish orange.

Dobsonfly

Panel 13A
Moderately Wanted



DORSAL VIEW



VENTRAL VIEW

KEY FEATURES



- ❑ Elongate body with a pair of long soft spine-like appendages on each section of the abdomen.



- ❑ Large pinching mouth parts.
- ❑ Will bite sampling spoons and your fingers so watch out!



- ❑ Two prolegs at the end of the abdomen, each with two hooks.



- ❑ Tufts of fluffy gills at the base of each abdominal projection.



- ❑ Can be extremely large (up to 4 inches)

Taxonomic Information

Order: Megaloptera
Family: Corydalidae
Genus: *Corydalus*

Ecological Information

Tolerance Value = 6
Feeding Group = Predator
Stream Habitat = Under loosely embedded stones

Key Behaviors

- Very mobile, will be very active crawling or wiggling in the tray
- Will curl their abdomen around your finger if picked up
- May cling to the net
- May pinch! Use caution when handling!

Important Notes

Dobsonflies are very common in RBV samples. These macroinvertebrates are sometimes called "Hellgrammies" by fishermen and are a trout favorite! *Corydalus* is often confused with *Nigronia* (Panel 13A). The Dobsonfly can be distinguished by its larger size, darker brown color, and the presence of fluffy gill tufts on the underside of the abdomen.



Size and Color

Size: 25-90 mm (1-3 ½ inches)
Color: Variable. Brown to nearly black

Dragonflies

Panel 14A
Moderately Wanted

DRAGONFLY FAMILIES



- Darner Dragonfly**
(*Aeshnidae*)
- Very common
 - Usually very dark and almost black
 - Elongate body with small thin legs



- Biddie Dragonfly**
(*Cordulergastridae*)
- Somewhat common
 - Extremely robust and hairy appearance
 - Light brown to blend in with sand and silt
 - Deeply rounded labium extends out almost half the length of the body



- Club Tail Dragonfly**
(*Gomphidae*)
- Very common
 - Short antennae similar in shape to a Q-tip
 - Adapted for burrowing into the substrate to wait for prey



- Common Skimmer Dragonfly**
(*Libellulidae*)
- Rare – prefers ponds and wetlands

General Identification

The following characteristics are universally true of the dragonfly families at left:

- Robust body
- Three short spike-like tails
- Two sets of wing pads
- Very large eyes
- Extendable lower jaw

Taxonomic Information

Order: Odonata (Suborder Anisoptera)

Family: All families at left

Genus: All genera within families at left

Ecological Information

Tolerance Value = See below

Feeding Group = See below

Stream Habitat = Typically among rocks and vegetation, or burrowed in soft substrate

	Tolerance Value	Feeding Group
<i>Aeshnidae</i>	3	Predator
<i>Cordulergastridae</i>	3	Predator
<i>Gomphidae</i>	1	Predator
<i>Libellulidae</i>	9	Predator

Important Notes

Dragonfly nymphs can be very common when conditions are appropriate. They are very mobile and move with jet propulsion or by walking. There are several types of dragonflies found in riffle areas, however the majority of species live in slow moving or standing water.

Size and Color

Size: 8-42mm
Color: Variable. Light brown to nearly black

Damselflies

Panel 14B
Moderately Wanted

DAMSELFLY FAMILIES



- Broad Winged Damselfly**
(Calopterygidae)
- First antennae segment is almost half the length of the antenna
 - Uncommon in RBV samples; prefers slow flows and low gradients

- Narrow Winged Damselfly**
(Coenagrionidae)
- Two-toned gills at end of abdomen
 - Occasionally in RBV samples; prefers rocks and vegetation in moderate to slow flowing waters

- Spread Winged Damselfly** (*Lestidae*)
- Lower lip (labium) is long and slender
 - Gills at end of abdomen are very dark and thick
 - Rare in RBV samples; prefers thick vegetation in very slow flows, especially vernal pools

General Identification

The following characteristics are universally true of the damselfly families at left:

- Slender, delicate body with long legs.
- Three long feather-like caudal gills at the end of the abdomen that resemble tails.
- Two sets of wing pads.
- Very large eyes and extendable lower jaw.

Taxonomic Information

Order: Odonata (Suborder Zygoptera)

Family: All families at left

Genus: All genera within families at left

Ecological Information

Tolerance Value = See below

Feeding Group = See below

Stream Habitat = Slow or standing water, on vegetation

	Tolerance Value	Feeding Group
<i>Calopterygidae</i>	5	Predator
<i>Coenagrionidae</i>	9	Predator
<i>Lestidae</i>	9	Predator

Important Notes

Damselflies are rare in riffle areas; the majority of species live in slow moving or standing water. These larvae are very active and will move by wiggling side to side.

Don't be fooled by appearances – damselfly nymphs do not closely resemble their adult counterparts!



Size and Color

Size: 13-50mm (1/2 – 2 inches)

Color: Variable. Yellow to dark brown. Sometimes with patterns.

Scuds

Panel 15 A
Least Sensitive



KEY FEATURES



- Body strongly flattened from side to side.



- Seven pairs of walking legs.
- The first two pairs of legs have hinged claws.



- Two pairs of antennae are about the same length.

Taxonomic Information

Order: Amphipoda
Family: All
Genus: All

Ecological Information

Tolerance Value = 6
Feeding Group = Collector-gatherer
Stream Habitat = In and on organic substrate, slow flows

Key Behaviors

- Can swim very rapidly on their sides when disturbed; also called “sideswimmers”
- Turn bleach white when preserved

Important Notes

Common in CT streams, but less likely in RBV samples due to their preference for slower flows and lower gradients. They are typically found in areas of loose substrate and prefer cool, shallow streams and the backwaters of larger rivers. Most are omnivorous and feed in organic debris that accumulate in the stream margins. Scuds are an important food source for fish.



Size and Color

Size: 5-20 mm (1/8 – ¼ inch)
Color: White to gray

Aquatic Sow Bug

Panel 15 B
Least Sensitive



DORSAL VIEW



VENTRAL VIEW

KEY FEATURES



- Body is strongly flattened from top to bottom.



- Two pairs of antennae, of which one pair is significantly longer than the other pair.



- Seven pairs of legs.
- First pair of walking legs has enlarged ends with hinged claws.



- Six pairs of short appendages on the underside of the abdomen. The sixth pair extends behind like a pair of flat tails.

Taxonomic Information

Order: Isopoda
Family: Asellidae
Genus: All

Ecological Information

Tolerance Value = 8
Feeding Group = Collector-gatherer
Stream Habitat = In and on substrate, slow flows

Key Behaviors

- Crawl slowly amongst the debris.
- Sow bugs will avoid light by hiding under leaves or other debris.
- Turn gray when preserved

Important Notes

Aquatic sow bugs prefer darker, slower, shallow habitats; they are not typically found in high quality riffles and therefore are rare in RBV samples. Sow bugs are an important food source for fish in low gradient CT streams.



Size and Color

Size: 5-20 mm (1/8- 1/4 inch)
Color: Medium to dark gray is most common but can also be blackish or brownish

Leech

Panel 15 C
Least Sensitive



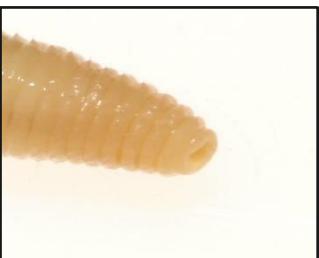
DORSAL VIEW

VENTRAL VIEW

KEY FEATURES



- Somewhat soft but muscular, flattened body with many segments and no legs.



- Two distinct suction discs on the bottom of the body, one on each end.



- Several small eyespots on top of first segments.

Taxonomic Information

Phylum: Annelida

Class: Clitellata

Sub-Class: Hirudinea

Ecological Information

Tolerance Value = 10

Feeding Group = Predator

Stream Habitat = Slow or standing water, among debris

Key Behaviors

- Leeches will stick to the bottom of the tray and move like inch worms
- Tend to curl up when preserved

Important Notes

Leeches are rare in RBV samples due to their preference for slow flows. They feed on the blood of a host organism by using a drill-like rasping tongue to penetrate the skin. The leech injects hirudin, a chemical which prevents the blood from clotting. Some leeches are used in medical practice to remove the build-up of blood and body fluids in bruised or surgically reattached appendages or tissues.



Size and Color

Size: 4-450 mm (1/12 – 4 ½ inches)

Color: Variable. Tan, brown, gray or black sometimes with colored patterns

Midge Fly

Panel 15 D
Least Sensitive



LATERAL VIEW

VENTRAL VIEW

KEY FEATURES



- Small, very thin, wormlike body
- Red or white in color



- Distinct head capsule, though very tiny

Taxonomic Information

Order: Diptera
Family: Chironimidae
Genus: All

Ecological Information

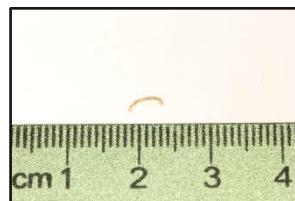
Tolerance Value = 6 (White) or 8 (Red)
Feeding Group = Collector-gatherer
Stream Habitat = On substrate in all flow types

Key Behaviors

- Midges swim by violent side to side wiggling
- Red midges turn white when preserved.

Important Notes

Look carefully for midge larvae, they are common but extremely small! There are approximately 100 different genera of midges in Connecticut. These can be divided into two main groups: the white and red midges. The color in the red midges comes from a hemoglobin-like compound which allows the midge to survive in very low oxygen levels.



Size and Color

Size: 5-25 mm (1/8 to 1/3 inch)
Color: White (clear to cream) or red

Black Fly

Panel 15 E
Least Sensitive



DORSAL VIEW

VENTRAL VIEW

KEY FEATURES



- ❑ Bowling pin shaped body with a capsule-like head that is distinct from the thorax.



- ❑ Two clumps of long hairs on the top of the head on each side of the mouth.



- ❑ There is a proleg on the bottom of the first thorax segment.



- ❑ Enlarged rear one-third of the body. Resembles the shape of a vase.

Taxonomic Information

Order: Diptera
Family: Simuliidae
Genus: All

Ecological Information

Tolerance Value = 6
Feeding Group = Collector-filterer
Stream Habitat = Attached to rocks in riffle areas

Key Behaviors

- Black flies will attach to the bottom of the tray
- Move like inch-worms

Important Notes

Black fly larvae are common in RBV samples, but are relatively small so may be easily overlooked.

Black fly larvae have a ring of small hooks at the back end of the abdomen that enables them to adhere to a rock and not be swept away by the current. They use a brush-like structure to filter fine organic matter from the water column.



Size and Color

Size: 5-10 mm (1/8 – 1/4 inch)
Color: Whitish-gray

Snails

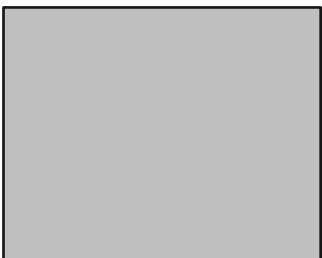
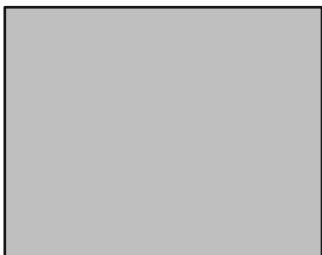
Panel 15 F
Least Sensitive



DORSAL VIEW

VENTRAL VIEW

KEY FEATURES



Gilled Snails (*Scientific Name?*)

- Open to the right
- Obtain dissolved oxygen from the water; indicative of high water quality

Lunged Snails (*Scientific Name?*)

- Open to the left
- Take in oxygen from the air; can tolerate very low dissolved oxygen levels

Chinese Mystery Snail (**Invasive!**)

Taxonomic Information

Phylum: Mollusca
Class: Gastropoda

Ecological Information

Tolerance Value = 7
Feeding Group = Scraper
Stream Habitat = On rock surfaces and finer sediments

Key Behaviors

- {Insert Key Behavior #1}
- {Insert Key Behavior #2}
- {Insert Key Behavior #3}

Important Notes

Freshwater snails in CT are most commonly located below ponds and in wetlands areas and are therefore relatively uncommon in RBV samples.

There are two major groups of snails in CT; they can be differentiated by facing the snail toward you and determining the direction to which the snail opens at the bottom.



Size and Color

Size: 3-60 mm (1/12 – 2 inches)
Color: Variable. Light tan to dark brown.

Aquatic Earthworm

Panel 15 G
Least Sensitive



DORSAL VIEW

VENTRAL VIEW

KEY FEATURES



- Soft, long, cylindrical bodies consisting of many ring-like segments

Taxonomic Information

Phylum: Annelida
Class: Oligochaeta

Ecological Information

Tolerance Value = 8
Feeding Group = Collector-gatherer
Stream Habitat = In and on fine substrate

Key Behaviors

- May wiggle or curl up in a 'knot' while in the tray

Important Notes

Aquatic earthworms can be found in any flows, but prefer slower flows and are therefore not common in RBV samples. Aquatic earthworms, especially tubifex worms, can live in extremely polluted water with very low dissolved oxygen levels. Often, severely impacted streams will have large populations of these worms.



Size and Color

Size: 1-30 mm avg. (up to 150 mm)
(.03- 1 inch avg, up to 5 inches)
Color: Variable, but typically white or reddish.

Crane Fly #1

Miscellaneous Taxa
(Other)



DORSAL VIEW (SP. TIPULIDAE)



DORSAL VIEW (SP. HEXTOMA)

KEY FEATURES



- Body is cylindrical and usually stout.
- Typically very soft bodied.



- Head is withdrawn and not visible.



- Skin has fleshy lumps or short, fine hairs.



- Two spiracles at the end of the abdomen surrounded by several pairs of short, fleshy lobes.



- One to seven pairs of lobes that often have a fringe of hair.

Taxonomic Information

Order: Diptera
Family: Tipulidae and Hextoma

Ecological Information

Tolerance Value = 3
Feeding Group = Shredder
Stream Habitat = Burrowed in substrate and leaf packs

Key Behaviors

- {Insert Key Behavior #1}
- {Insert Key Behavior #2}
- {Insert Key Behavior #3}

Important Notes

Tipuliidae are common in RBV samples. All crane flies have what appear to be tails, however they are respiratory organs. Most crane fly larvae are very large at around 2 inches long. Some species have a bulb-like structure near the tails, while others have dark areas on the top and bottom of the abdomen.

{Insert Size Reference Picture (1.03x1.5 inches)}

Size and Color

Size: 5-25 mm (up to 100 mm) (1/4 – 3 inches)
Color: Tan to White

Riffle Beetle

Miscellaneous Taxa
(Other)



LATERAL VIEW



VENTRAL VIEW

KEY FEATURES (Larva)



- ☐ Small, hard-bodied, cylindrical and slightly "C" shaped



- ☐ Long legs in relation to body size.



- ☐ Two prominent claws on the ends of the legs.

KEY FEATURES (Adult)



- ☐ Small, dark brown or black beetles.

Taxonomic Information

Order: Coleoptera
Family: Elmidae
Genus: All

Ecological Information

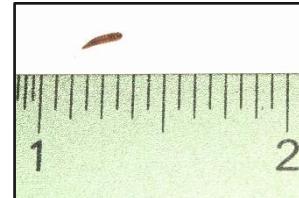
Tolerance Value = 4
Feeding Group = Scraper
Stream Habitat = On organic substrate in riffles

Key Behaviors

- Larval form is relatively inactive, but adult riffle beetles will crawl around the sorting tray.

Important Notes

Riffle Beetles are common in RBV samples. *Elmidae* is one of the very few benthic macroinvertebrates who remain aquatic in both its larval and adult stages.



Size and Color

Size: 5-15 mm (Larva) (1/8 – 1/4 inch)
Color: Brown

Small Minnow Mayfly

Miscellaneous Taxa
(Other)

{Replace with Dorsal View Photo –
sized 1.9x3.84, w/ 1 pt 25% Gray
border}

DORSAL VIEW

KEY FEATURES

{Insert Key Feature #1
photo – sized 1.31x1.65}

{Key Feature #1 Text}

{Insert Key Feature #2
photo – sized 1.31x1.65}

{Key Feature #2 Text}

{Insert Key Feature #3
photo – sized 1.31x1.65}

{Key Feature #3 Text}

{Insert Key Feature #4
photo – sized 1.31x1.65}

{Key Feature #4 Text}

{Insert Key Feature #5
photo – sized 1.31x1.65}

{Key Feature #5 Text}

{Replace with Ventral View Photo –
sized 1.9x3.84, w/ 1 pt 25% Gray
border}

VENTRAL VIEW

Taxonomic Information

Order: Ephemeroptera
Family: Baetidae
Genus: All

Ecological Information

Tolerance Value = 4
Feeding Group = Collector-gatherer
Stream Habitat = On and in rocky substrates

Key Behaviors

- {Insert Key Behavior #1}
- {Insert Key Behavior #2}
- {Insert Key Behavior #3}

Important Notes

Baetidae are common in RBV samples, however due to their small size they are often easily missed when sampling. Baetidae is commonly confused with Isonychidae (Panel 2). Baetidae can be differentiated by its smaller size and lack of fine hairs along the inside edge of the front legs. (Some genera of Baetidae may also appear to only have two tails.)

{Insert Size Reference
Picture (1.03x1.5
inches)}

Size and Color

Size: 3-12 mm
Color: {Insert Color Notes}



Aquatic Snipe Fly

Miscellaneous Taxa
(Other)



VENTRAL VIEW



DORSAL VIEW

KEY FEATURES



- Body is elongate with a pointed head end and tail-like structures at the end of the abdomen.
- Rough appearance to the exoskeleton.



- The head is not a distinct capsule, but rather a narrowed point.
- The major mouthparts are two parallel hooks that move vertically.



- Two stout, pointed tails with a fringe of hairs at the end of the abdomen

Taxonomic Information

Order: Diptera
Family: Athericidae
Genus: *Atherix*

Ecological Information

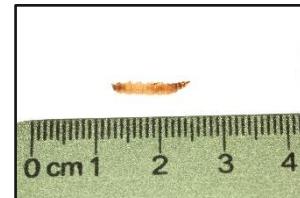
Tolerance Value = 2
Feeding Group = Predator
Stream Habitat = Buried in the substrate in fast flows

Key Behaviors

- {Insert Key Behavior #1}
- {Insert Key Behavior #2}
- {Insert Key Behavior #3}

Important Notes

Atherix is relatively rare in RBV samples. They are piercer-predators that prey on midge and mayfly larvae.



Size and Color

Size: 10-20 mm (7/8 of an inch)
Color: Brown

Flatworm

Miscellaneous Taxa
(Other)



LATERAL VIEW



DORSAL VIEW

KEY FEATURES



- Soft, elongate, flattened body without segmentation or legs



- Slightly triangular head with two eyespots on top. (Resemble a cross-eyed, unsegmented leech)

Taxonomic Information

Order: Tricladida

Family: Planariidae

Genus: *Planaria*

Ecological Information

Tolerance Value = 4

Feeding Group = Predator

Stream Habitat = On rocky substrate

Key Behaviors

- Move by beating microscopic cilia to glide along a film of mucus.
- Tend to curl up when preserved

Important Notes

Although flatworms occur in a wide variety of habitats, they are rarely collected in RBV samples. When a large number of planarians are present in a collection, the site is most likely affected by organic pollution.

Flatworms are heavily studied due to their regenerative capacity; when split lengthwise or crosswise they will regenerate into two genetically identical, individuals!

{Insert Size Reference Picture (1.03x1.5 inches)}

Size and Color

Size: 5-20 mm (1/8 to 2/3 of an inch)

Color: Gray, brown or black on top, sometimes with spots or pattern, light on bottom