








# CT DEEP Riffle Bioassessment by Volunteers (RBV) Program

A CT DEEP Tier 2 Volunteer Water Quality Monitoring Network

## MACROINVERTEBRATE FIELD IDENTIFICATION CARDS



Giant Stonefly		Most Sensitive <b>5B</b>
		
<b>KEY FEATURES</b>	<b>Taxonomic Information</b> Order: Plecoptera Family: Pteronarcyidae Genus: Pteronarcyis	
	<input type="checkbox"/> Robust body, typically dark but occasionally with white or yellow markings.	<b>Ecological Information</b> Tolerance Value = 0 Feeding Group = Shredder Stream Habitat = Fast flowing, high-gradient riffles
	<input type="checkbox"/> Pointed edges along the sides of the abdomen.	<b>Key Behaviors</b> <ul style="list-style-type: none"> <li>This stonefly nymph is not very active. If it moves at all, it will crawl very slowly around the tray.</li> <li>May curl into a C-shape and pretend to be dead when disturbed.</li> </ul>
	<input type="checkbox"/> Two, short tails at the end of the abdomen.	<b>Important Notes</b> Pteronarcyis is often confused with the Common Stonefly (Panel 5A) 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 Pteronarcyidae are collected at any site when conditions are appropriate.
	<input type="checkbox"/> First thoracic plate is rectangular with flared edges. <input type="checkbox"/> Two sets of wing pads, very angular in shape.	<b>Size and Color</b> Size: 35-50 mm. Color: Brown to black, sometimes with white or yellow tail tips.
	<input type="checkbox"/> Gill tufts on the thorax and the sides of the first three sections of the abdomen.	CT Dept. of Energy & Environmental Protection Riffle Bioassessment by Volunteers Program www.ct.gov/deep/rbv

Photograph courtesy of Joshua Puterbaugh, The Mansfield School



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# RBV Field Identification Card Overview

Common name

Panel number and RBV category

Full-body photograph of organism

Line drawing – highlights key identification features

Key Features section - bullet points of primary identification features along with supporting photographs

Photography credits for photos shown on the card

Scientific name

Pollution sensitivity and habitat information

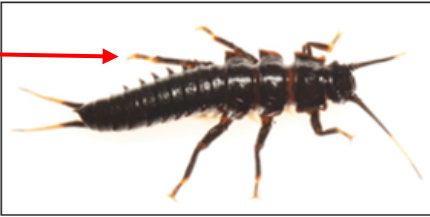
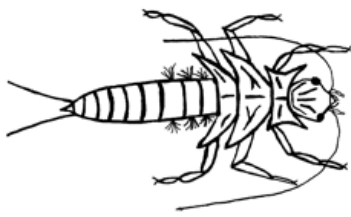
Unique behaviors to help with ID

Important miscellaneous notes and facts



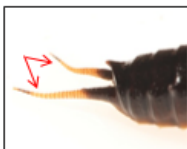


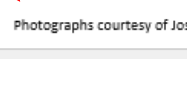
Size and color – includes a scale bar representing the minimum and maximum size

Giant Stonefly

Most Sensitive 5B

**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: Pteronarcyidae  
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 and pretend to be dead when disturbed.

**Important Notes**

*Pteronarcys* is often confused with the Common Stonefly (Panel 5A) 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 Pteronarcyidae are collected at any site when conditions are appropriate.


**Size and Color**

Size: 35-50 mm  
Color: Brown to black, sometimes with white or yellow tail tips



Photographs courtesy of Joshua Fusaro/ The Marvelwood School

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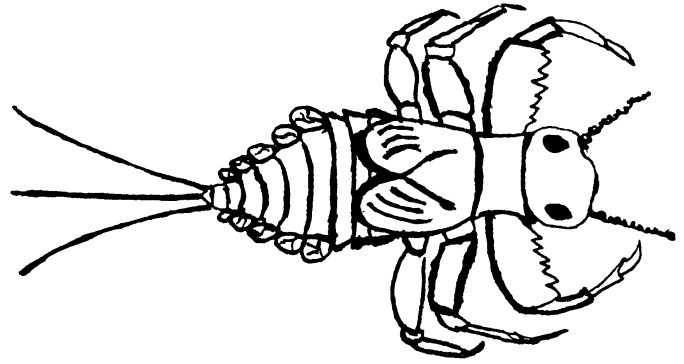
## Acknowledgements

The 2016 RBV Field Identification Cards are the second version of these cards; the original RBV Field Identification Cards were developed and authored by **Mike Beauchene**, former CT DEEP State RBV Program Coordinator. All line drawings are courtesy of Mike Beauchene/CT DEEP. Photography credits are noted on the bottom of each card. Special thanks to former **Marvelwood School (Kent, CT)** students **Jake Renkert** and **Joshua Fusaro**, along with their advisor, **Laurie Doss**, for the amazing macrophotography images included throughout the cards. Jake Renkert is also credited with the redesign of the card template into the standardized format shown above. Jake, Josh and Laurie's involvement in this project would not have been possible without the support of the **Kent Conservation Commission** and the **Uconn Natural Resources Conservation Academy**. Additional photography credit is owed to **Kelsey Quarticco**, 2014 CT DEEP intern. The 2016 RBV Field Identification Card revision project was managed by **Meghan Lally**, CT DEEP State RBV Program Coordinator. For more information about the RBV Program please visit <https://portal.ct.gov/DEEP-RBVProgram>

# Body-Builder Mayfly

Most Sensitive

1



## KEY FEATURES



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



- Flat body with obvious legs.
- Single set of wing pads.
- Three hair-like tails at the end of the abdomen.
- 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



Photographs courtesy of (top to bottom): Kelsey Quartuccio/CT DEEP; Kelsey Quartuccio/CT DEEP; Jake Renkert/The Marvelwood School

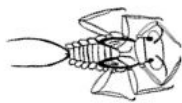
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# Brush-Legged Mayfly

Most Sensitive

2



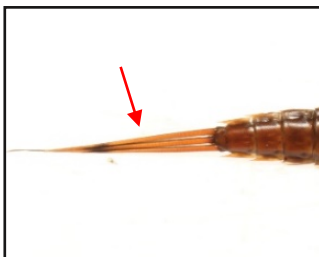
## KEY FEATURES



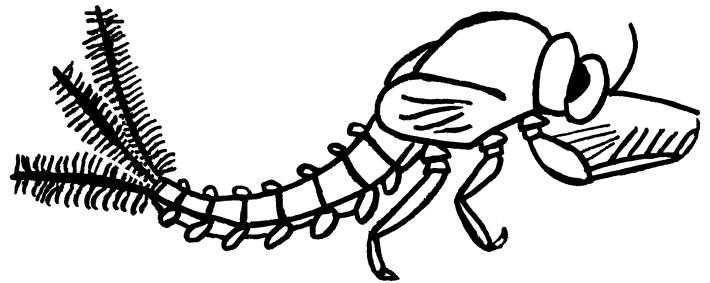
- ❑ Streamlined body, taller than wide.
- ❑ Often with a “humped back” or “S-shaped” appearance when swimming.



- ❑ Front legs have a double row of long hairs on the inside edge.
- ❑ Single set of wing pads.
- ❑ Small, round gills on the side of the abdomen.



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



## 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 very strong swimmers. 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  
Color: Light brown to dark brown body, sometimes with yellow or white markings



Photographs courtesy of (top to bottom): Kelsey Quartuccio/CT DEEP; Jake Renkert/The Marvelwood School; NY DEC Biomonitoring Unit; Jake Renkert/The Marvelwood School

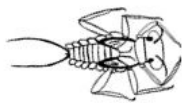
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# Two-Tailed Flathead Mayfly

Most Sensitive

3



## KEY FEATURES



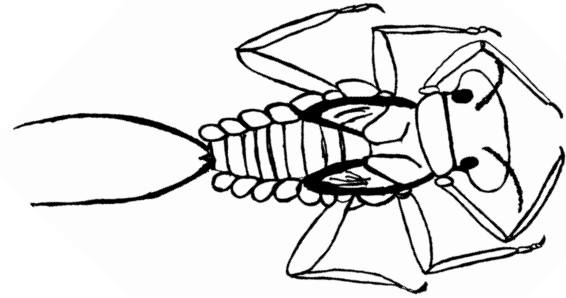
- Extremely flat, almost translucent body, long thin legs.



- Small round gills on the sides of the abdomen.
- Two Long thin tails at the end of the abdomen (easily broken)



- Single set of wing pads.
- 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. *Epeorus* can be extremely abundant when conditions are appropriate.

## Size and Color

Size: 2-10 mm  
Color: Tan to dark brown, sometimes with lighter gills and markings on the legs and head.



Photographs courtesy of (top to bottom): Kelsey Quartuccio / CT DEEP; DEEP files, author unknown; NY DEC Biomonitoring Unit; DEEP files, author unknown

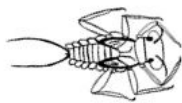
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# Roach-Like Stonefly

Most Sensitive

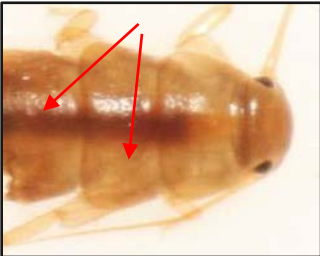
4



## KEY FEATURES



- Tear-drop shaped body with a uniformly shiny brown exoskeleton.
- Two short tails at the end of the abdomen.



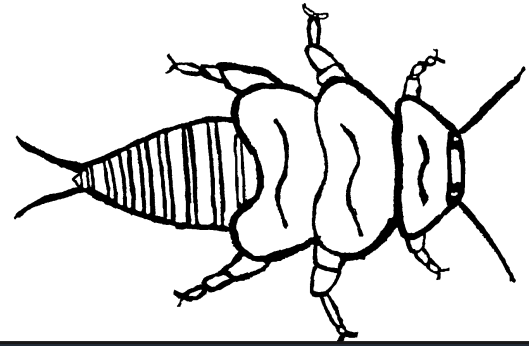
- Two sets of wing pads.



- 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

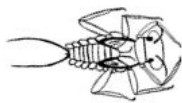
Size: 6-11 mm  
Color: Light to dark brown, uniform



# RBV



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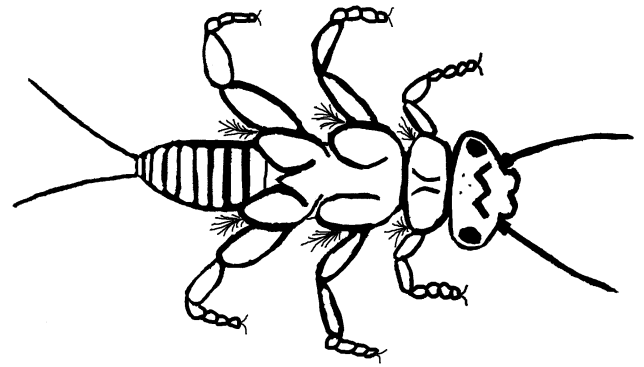


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# Common Stonefly

Most Sensitive

5A



## 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

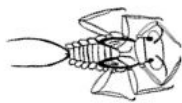
Size: 8-30 mm  
Color: Variable. Light yellowish, brown to very dark, some with a tortoise-shell pattern.



# RBV



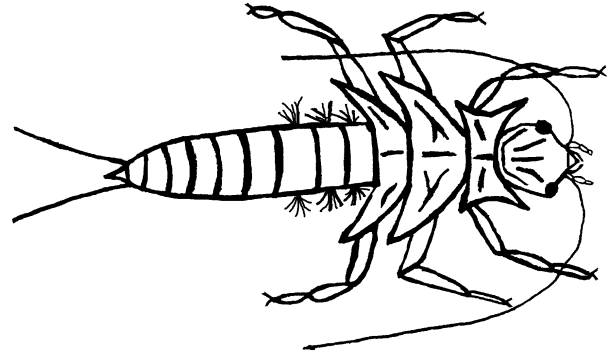
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# Giant Stonefly

Most Sensitive **5B**



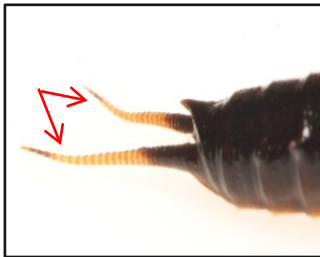
## KEY FEATURES



- 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: Pteronarcyidae  
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 and pretend to be dead when disturbed.

## Important Notes

*Pteronarcys* is often confused with the Common Stonefly (Panel 5A) 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 Pteronarcyidae are collected at any site when conditions are appropriate.

## Size and Color

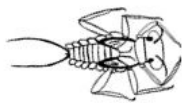
Size: 35-50 mm  
Color: Brown to black, sometimes with white or yellow tail tips



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# Miscellaneous Small Stoneflies

Most Sensitive

5C

## SMALL STONELY FAMILIES



- ❑ **Small Winter Stoneflies<sup>1</sup>** (*Capniidae*)
  - Often dark
  - Legs short
  - Abdomen slightly wider at middle



- ❑ **Green Stoneflies<sup>1</sup>** (*Chloroperlidae*)
  - No distinctive color patterns
  - Tails shorter than the abdomen is long



- ❑ **Rolled-winged Stoneflies<sup>2</sup>** (*Leuctridae*)<sup>2</sup>
  - Long, slender body
  - Short legs
  - Abdomen same width along length



- ❑ **Nemourid Stoneflies<sup>1</sup>** (*Nemouridae*)
  - Long legs (tips extend to the tip of the abdomen or beyond)



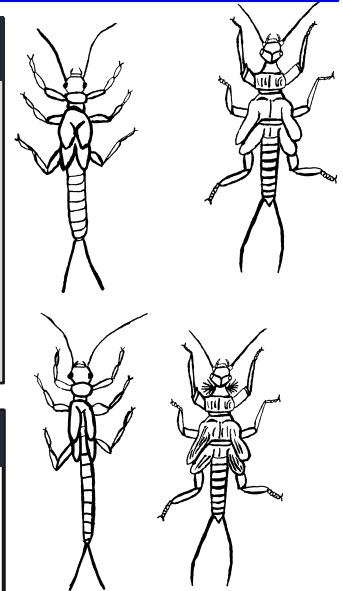
- ❑ **Perlodid Stoneflies<sup>3</sup>** (*Perlodidae*)
  - Very similar to the Common Stonefly but without gill tufts near the base of the legs



- ❑ **Winter Stoneflies** (*Taeniopterygidae*)<sup>4</sup>
  - Wing pads form a distinct triangle
  - Typically only present in late November RBV samples

## General Identification

- The following characteristics are universally true of the stonefly families at left:
- Two tails
  - Two tarsal claws ('toes') at the end of each leg
  - Dorsally flattened
  - Small in size



## 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.

## Size and Color

Size: 4-10 mm average (*Taeniopterygidae* can reach up to 15 mm)  
 Color: Variable. Many light brown or cream colored



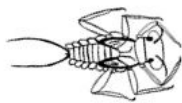
Photographs courtesy of: <sup>1</sup>Donald S. Chandler – [www.discoverlife.org](http://www.discoverlife.org); <sup>2</sup>Author unknown; <sup>3</sup>Unknown – <http://aquaticinsectsofcentralvirginia.blogspot.com>; <sup>4</sup>Jake Renkert – The Marvelwood School



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# Saddlecase Maker Caddisfly

Most  
Sensitive

6A



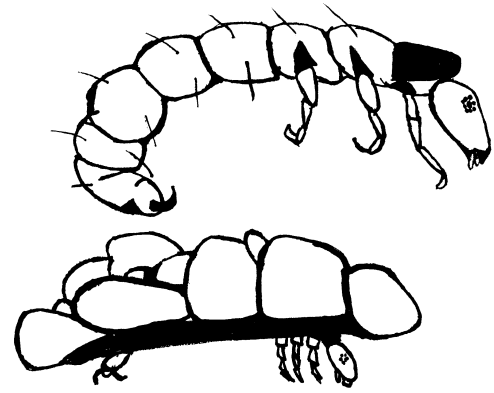
## KEY FEATURES



- ❑ 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.



- ❑ 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' (red arrow)



## 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 it does, 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.

## Size and Color

Size: 3-10 mm  
Color: White to light brown, with dark head, legs and butt plate



Photographs courtesy of (top to bottom): NY DEC Biomonitoring Unit; Kelsey Quartuccio/CT DEEP; Jake Renkert/The Marvelwood School

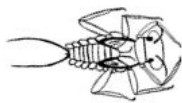
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## KEY FEATURES



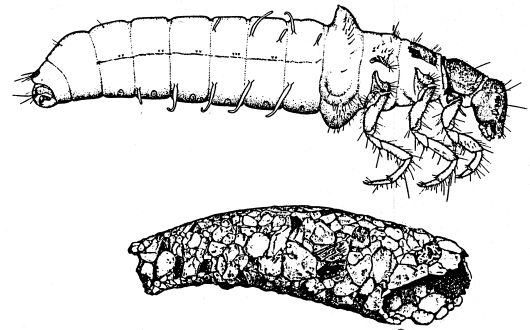
- Tiny* light-bodied organism
- Hunched appearance when in case.
- Triangular head with dark legs.
- Very small, delicate case made of sand grains
- Case is cone-shaped like a Thanksgiving cornucopia.



## Don't be Fooled by This Imposter!



- The Strong Case-Maker Caddisfly (Odontoceridae) also makes a case of small grains of sand. To tell the two apart, inspect the case closely. Odontoceridae cases are very difficult to break apart and are the same width at both ends. In comparison, the *Apatania* case is quite small (see above), more easily broken apart, and noticeably wider at the opening than at the other end.



## 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

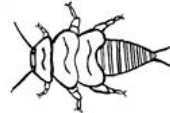
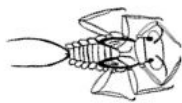
Size: 2-6 mm  
Color: Light colored body with dark head



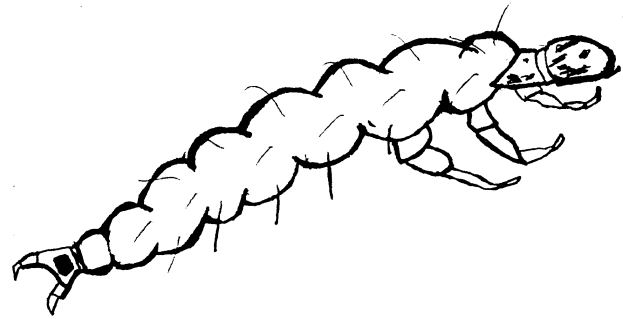
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## KEY FEATURES



- 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

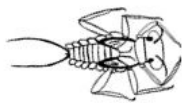
Size: 10-30 mm  
Color: Variable. White, green, purple



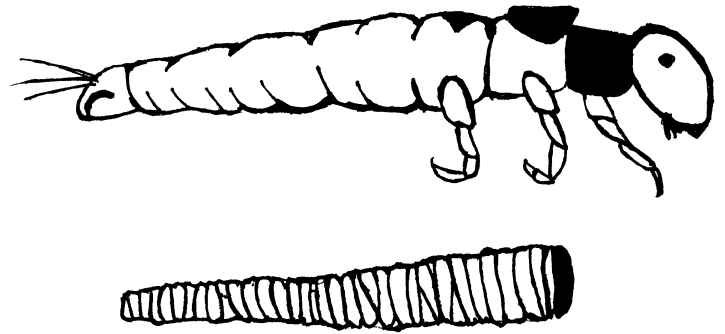
# RBV



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## KEY FEATURES



### Case Construction:

- Case constructed of thin strips of plant material assembled with a square opening.
- Wider at head opening than at tail end.



### Macroinvertebrate Features:

- Light colored body with dark head and legs.
- Very long 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 *Brachycentrus* does not move in the tray. If it does move, it will carry its case with it as it slowly crawls along.

## Important Notes

This 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

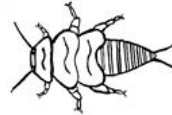
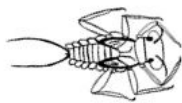
Size: 10-17 mm  
Color: Light body with dark head and legs



# RBV



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## KEY FEATURES

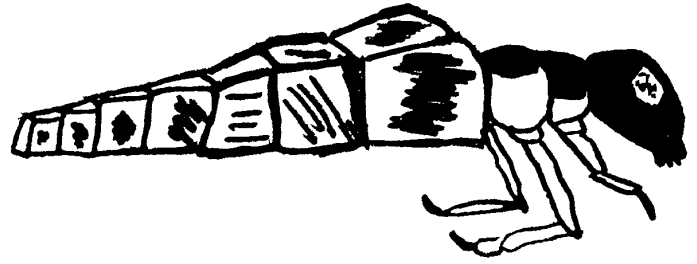


### Case Construction:

- 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.

### Macroinvertebrate Features:

- 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

This 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

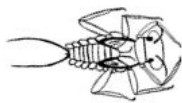
Size: 7-15 mm  
Color: Light body with dark head and legs



# RBV



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# Common Netspinner Caddisfly

Moderately Sensitive

9



## KEY FEATURES



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



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



- ❑ Two paintbrush-like tails with hooks at the end of the abdomen.
- ❑ May have a 'dirty' or hairy appearance



## 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* (Panel 7). 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  
Color: Light brown to black, sometimes with green tint



Photographs courtesy of (top to bottom): NY DEC Biomonitoring unit; The Marvelwood School & Kent Conservation Commission RBV Program; Jake Renkert / The Marvelwood School; Becky Martorelli / Quinnipiac River Watershed Association; Jake Renkert / The Marvelwood School

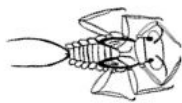
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# RBV



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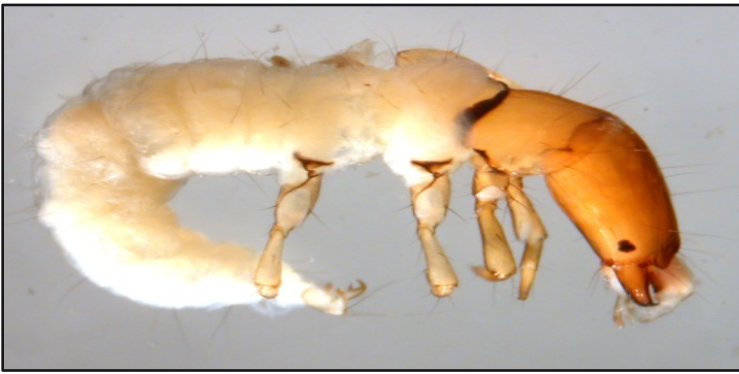


<https://portal.ct.gov/DEEP-RBVProgram>

# Fingernet Caddisfly

Moderately  
Sensitive

10



## KEY FEATURES



- Elongate, slender worm-like body.
- No gills on or along the abdomen.
- Two hooks at the end of the abdomen.



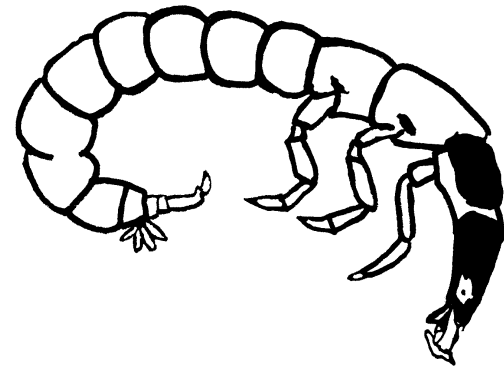
- Bright orange head with a transparent, t-shaped upper lip.



- Black border along the back edge of pronotum (the plate located behind the head capsule.)



Photographs courtesy of (top to bottom): NY DEC Biomonitoring unit; The Marvelwood School/Kent Conservation Commission RBV program; The Marvelwood School/Kent Conservation Commission RBV program; The Marvelwood School/Kent Conservation Commission RBV program; Jake Renkert / The Marvelwood School



## Taxonomic Information

Order: Trichoptera  
Family: Philopotamidae  
Genus: *All*

## 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

Philopotamidae is a very common organism encountered during RBV sampling, and can be extremely abundant under appropriate conditions.

## Size and Color

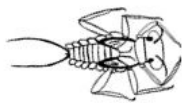
Size: 13-17 mm  
Color: Yellow-orange, bright yellow, beige, white, or transparent



# RBV



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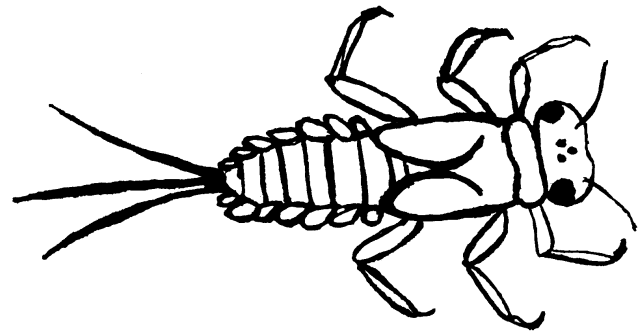
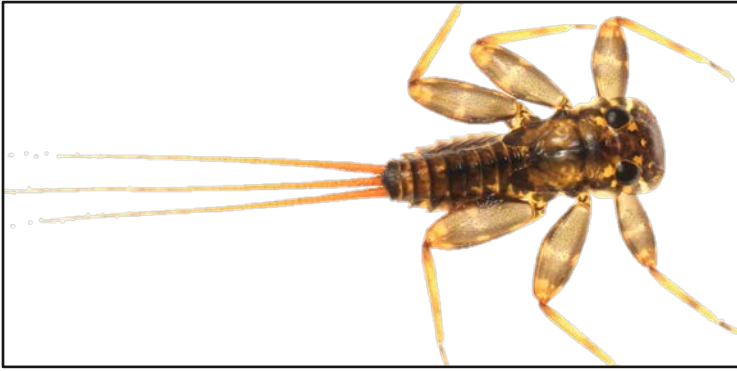


<https://portal.ct.gov/DEEP-RBVProgram>

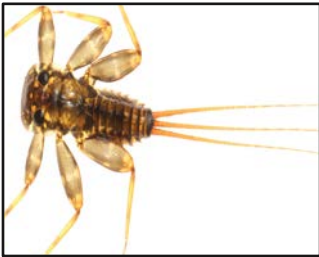
# Three-Tailed Flat Headed Mayfly

Moderately Sensitive

11



## KEY FEATURES



- Extremely flattened body.
- 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.)



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



- 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  
Color: Light golden brown to dark brown, often with spots or stripes on the legs and body



Photographs courtesy of Jake Renkert / The Marvelwood School

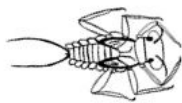
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# RBV



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# Water Penny Beetle

Moderately Sensitive

12



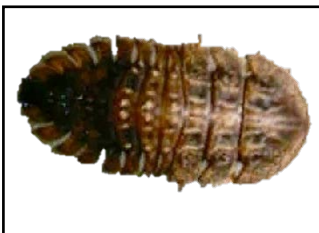
## KEY FEATURES



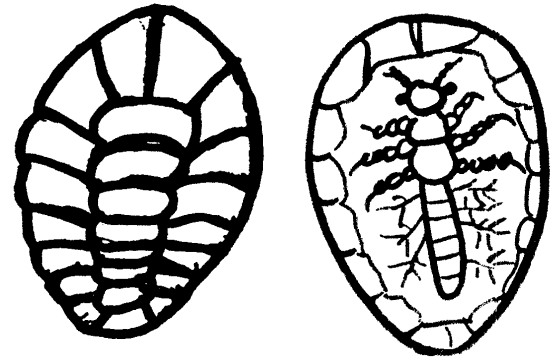
- ❑ Small, flat, disc-shaped organism.
- ❑ Uniform in color
- ❑ Head and legs only visible from ventral view (i.e. from underneath)



## Don't be Fooled by This Imposter!



- ❑ 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 (see image at left)
- 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  
Color: Uniform in color. Ranges from golden to dark brown.



Photographs courtesy of (top to bottom): Jake Renkert / The Marvelwood School (top three); Meghan Lally/CT DEEP; The Marvelwood School/Kent Conservation Commission RBV program; The

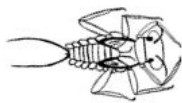
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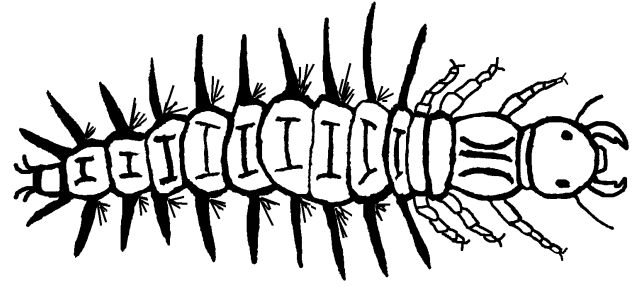
# RBV



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## KEY FEATURES



- Elongate body with a pair of long soft spine-like appendages on each section of the abdomen.
- Can be extremely large (up to 4 inches)



- 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.

## Taxonomic Information

Order: Megaloptera  
Family: Corydalidae  
Genus: *Corydalis*

## 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 "Hellgrammites" by fishermen and are a trout favorite! *Corydalis* is often confused with *Nigronia* (Panel 13B). 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.

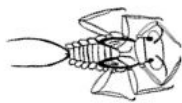
## Size and Color

Size: 25-90 mm  
Color: Variable. Brown to nearly black

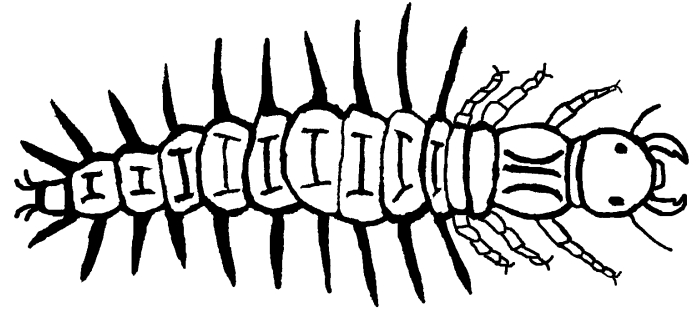
# RBV



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## 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 *Corydalis* (Panel 13A). 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

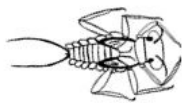
Size: 25-50 mm  
Color: Variable. Light brown to reddish orange.



# RBV



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## General Identification

The following characteristics are universally true of the dragonfly families below:

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

## DRAGONFLY FAMILIES



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



- ❑ **Biddie Dragonfly** (*Cordulergastridae*)
  - Somewhat common
  - Light brown; robust, hairy appearance
  - 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



## 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

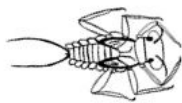
Size: 8-42mm  
 Color: Variable. Light brown to nearly black



# RBV



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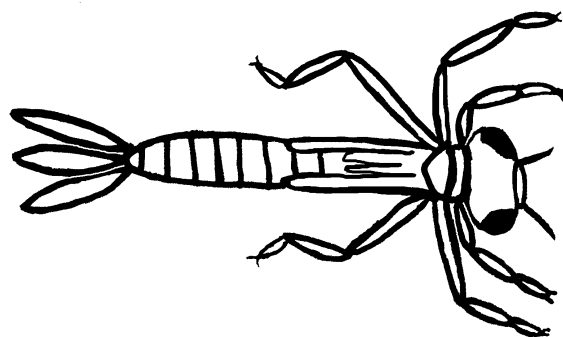
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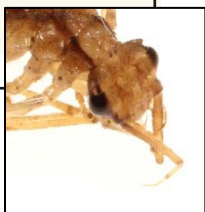
## General Identification

The following characteristics are universally true of the damselfly families below:

- 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.



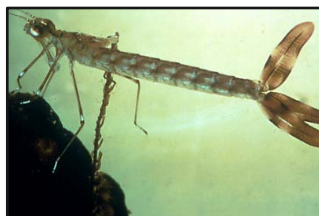
## DAMSELFLY FAMILIES



- ❑ **Broad Winged Damselfly** (*Calopterygidae*)
  - First antennae segment is very long, almost half the length of the antenna
  - Uncommon in RBV samples; prefers low gradient habitat



- ❑ **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

## 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

These larvae are very active and will move by wiggling side to side.

Damselflies are rare in riffle areas; the majority of species live in slow moving or standing water. If you find a lot of damselflies in your sample check that you are in the right habitat for the RBV program.

## Size and Color

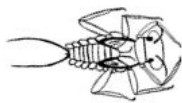
Size: 13-50mm  
 Color: Variable. Yellow to dark brown. Sometimes with patterns.



# RBV



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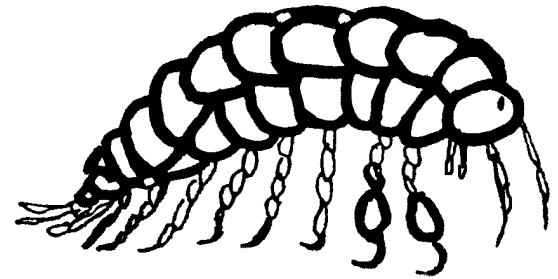
## KEY FEATURES



- Body strongly flattened from side to side.
- Two pairs of antennae are about the same length.



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



## 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 “side swimmers”
- 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  
Color: White to gray

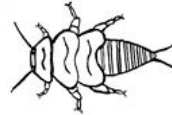
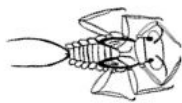


Photographs courtesy of (top to bottom): Jake Renkert / The Marvelwood School (top); Becky Martorelli / Quinnipiac River Watershed Coalition; Kelsey Quartuccio / CT DEEP

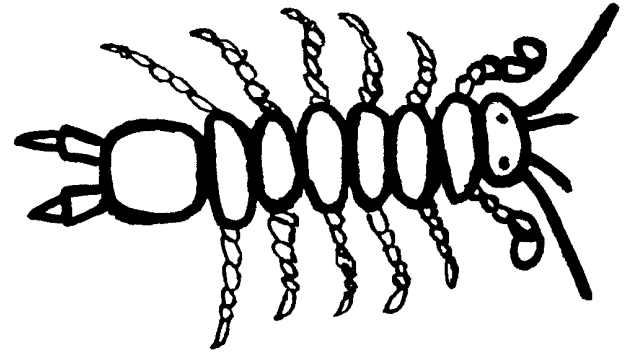
# RBV



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## 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

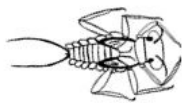
Size: 5-20 mm  
Color: Medium to dark gray is most common but can also be blackish or brownish



# RBV



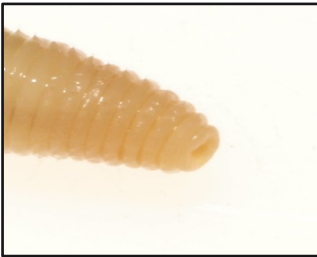
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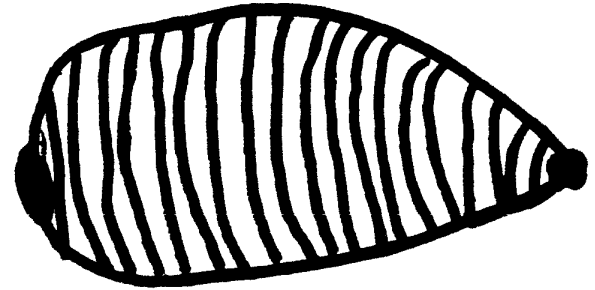
<https://portal.ct.gov/DEEP-RBVProgram>



## 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

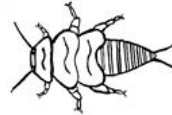
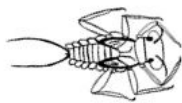
Size: 4-450 mm  
Color: Tan, brown, gray or black sometimes with colored patterns



# RBV



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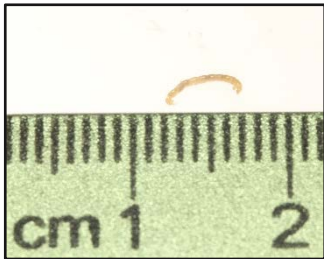
<https://portal.ct.gov/DEEP-RBVProgram>





## KEY FEATURES

- Small, very thin, wormlike body
- Red or white in color
- Distinct head capsule, though very tiny
- May be found hiding in very finely constructed cases



## 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

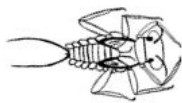
Size: 5-25 mm  
Color: White (clear to cream) or red



# RBV



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## KEY FEATURES



- ❑ Bowling pin shaped body with a capsule-like head that is distinct from the thorax.
- ❑ Enlarged rear one-third of the body. Resembles the shape of a vase.
- ❑ There is a proleg on the bottom of the first thorax segment..



## 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  
Color: Whitish-gray



Photographs courtesy of (top to bottom): Jake Renkert / The Marvelwood School; The Marvelwood School/Kent Conservation Commission Local RBV program; ): Jake Renkert / The Marvelwood School

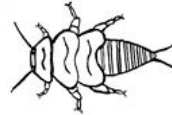
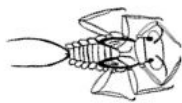
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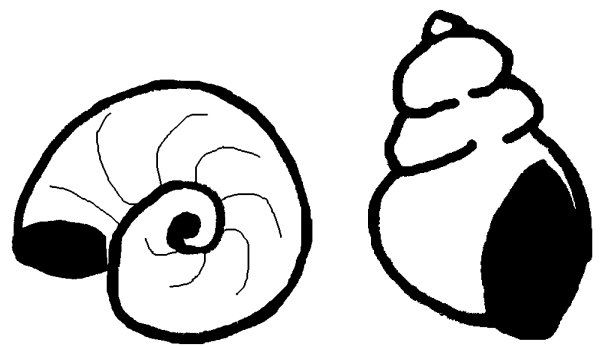
# RBV



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## KEY FEATURES

### Gilled Snails

Subclass: Prosobranchia

- Breathe by absorbing dissolved oxygen from the water through gills
- Sensitive to pollution; indicative of high water quality

### Lunged Snails

Subclass: Pulmonata

- Take in oxygen from the air into an internal lung-like structure
- Can tolerate low dissolved oxygen levels



### Chinese Mystery Snail (*Bellamya chinensis*)

#### Invasive!

- Relatively large, globose shells with concentrically marked opercula

## Taxonomic Information

Phylum: Mollusca  
Class: Gastropoda

## Ecological Information

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

## Key Behaviors

- May glide along the bottom of the tray or cling to tray walls

## 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 – ‘right handed’ and ‘left handed’; they can be differentiated by facing the snail toward you and determining the direction to which the snail opens at the bottom.

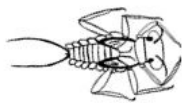
## Size and Color

Size: 3-60 mm  
Color: Variable. Light tan to dark brown.

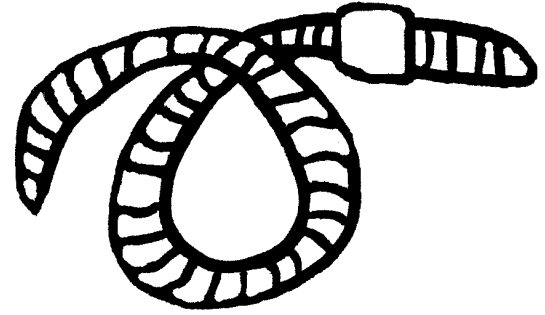
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## KEY FEATURES



- ❑ Soft, long, cylindrical bodies consisting of many ring-like segments
- ❑ No suckers or eyespots



## 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 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

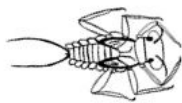
Size: 1-30 mm avg. (up to 150 mm)  
Color: Variable, but typically white or reddish.



# RBV



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## CAMBARUS SPECIES IN CT



- ❑ **Common Crayfish**  
(*Cambarus bartonii*)
  - Native, rare (western CT)
  - No depression on large claw
  - 1 row of tubercles
  - Lower part of gonopod 'pipe' longer than the top part



- ❑ **Robust Crayfish**  
(*Cambarus robustus*)
  - Introduced, common (Statewide)
  - Deep depression on outer margin of large claw
  - Pipe-wrench shaped gonopods of equal length
  - 2 rows of tubercles

## PROCAMBARUS SPECIES IN CT



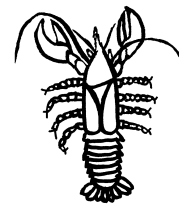
- ❑ **White River Crayfish**  
(*Procambarus acutus*)
  - Introduced, common (eastern CT)
  - Elongated claws, no spikes on inside margin or red bumps
  - Brown mottled color
  - Areola open



- ❑ **Red Swamp Crayfish**  
(*Procambarus clarkii*)
  - **Invasive!**
  - Dark red color, look like small lobsters
  - Bright red bumps on the front legs and claws.

## General Identification

- Cambarus crayfish species:
- Rostrum is not "J" shaped
  - Gonopods are pipe-wrench shaped
- Procambarus crayfish species:
- Long, slender, curved claws
  - Rostrum is "J" shaped w/ spines
  - Gonopods not pipe-wrench; males with 4 hooks



## Taxonomic Information

Order: Decapoda  
 Family: Cambaridae  
 Genus: Cambarus, Procambarus

## Ecological Information

Tolerance Value = 6  
 Feeding Group = Gatherer, collector  
 Stream Habitat = All flows, shallows (1-2m) burrowed in substrate or under rocks

## Important Notes

Crayfish resemble small lobsters. They have a hard exoskeleton, long "nose"; large eyes; 5 pairs of walking legs; flipper at end of tail; and large claws. When disturbed in the water, crayfish use their "flipper" to quickly scoot backwards through the water.

**DO NOT INCLUDE CRAYFISH IN YOUR VOUCHER COLLECTION;** photograph any crayfish found and return them alive to the stream from which you collected them. You may also submit your observations using [iNaturalist](https://www.iNaturalist.org/).

## Size and Color

Size: 10-150mm  
 Color: Usually brownish green but ranges from blackish to red/orange, often speckled



## FAXONIUS SPECIES IN CT



- ☐ **Spiny Cheek Crayfish** (*Faxonius limosus*)
  - Native, common (Statewide)
  - Spiny cheeks! (Can feel if rub finger along side of head)
  - Claw tips are orange with a black band



- ☐ **Rusty Crayfish** (*Faxonius rusticus*)
  - **Invasive!** Common in western CT
  - Rusty colored patch near tail above legs
  - Claw tips orange with black band
  - No spines on cheeks



- ☐ **Virile or Northern Crayfish** (*Faxonius virilis*)
  - Occasional, statewide
  - Blue claws with prominent white bumps
  - Pair of dark tail spots
  - Scissor-like gonopods
  - No spines on cheeks

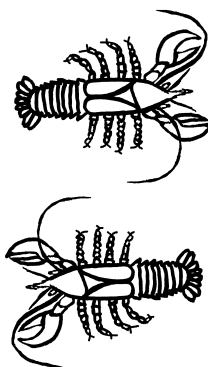


- ☐ **Ringed Crayfish** (*Faxonius neglectus*)
  - Introduced, Rare (Hudson drainage)
  - Heavy black banding
  - Claw tips orange with black “racing stripe”
  - No spines on cheeks

## General Identification

The following characteristics are universally true of the Orconectes crayfish species in CT:

- Rostrum is “J” shaped and spines present
- Gonopods are not pipe-wrench like in shape



## Taxonomic Information

Order: Decapoda  
 Family: Cambaridae  
 Genus: Faxonius (\*Previously assigned to Orconectes)

## Ecological Information

Tolerance Value = 6  
 Feeding Group = Gatherer, collector  
 Stream Habitat = All flows, shallows (1-2m) burrowed in substrate or under rocks

## Important Notes

Crayfish are the largest stream invertebrates and can be extremely numerous under appropriate conditions. Crayfish are tolerant of most pollution and environmental stress (temperature, pH, alkalinity). Although, they bioaccumulate some metals (mercury); crayfish tissue samples can be used to detect contamination.

**DO NOT INCLUDE CRAYFISH IN YOUR VOUCHER COLLECTION;** photograph any crayfish found and return them alive to the stream from which you collected them. You may also submit observations using [iNaturalist](https://www.inaturalist.org).

## Size and Color

Size: 10-150mm  
 Color: Usually brownish green but ranges from blackish to red/orange, often speckled





Hexatoma sp.



Antocha sp.

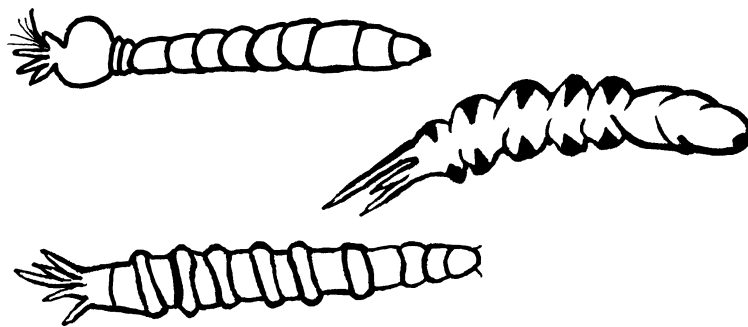


Tipula sp.

## KEY FEATURES

The following characteristics are universally true of crane fly:

- Body is cylindrical and usually stout.
- Typically very soft bodied.
- Head is withdrawn and not visible.
- 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  
 Genera: Hexatoma, Antocha, Tipula

## Ecological Information

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

## Key Behaviors

- Often found in leaf packs within sample

## Important Notes

Craneflies 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.

## Size and Color

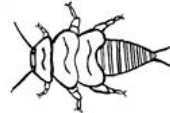
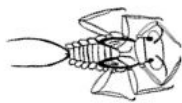
Size: 5-25 mm average (up to 100 mm)  
 Color: Tan to White.



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## KEY FEATURES (Larva)



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



- ❑ Long legs in relation to body size.

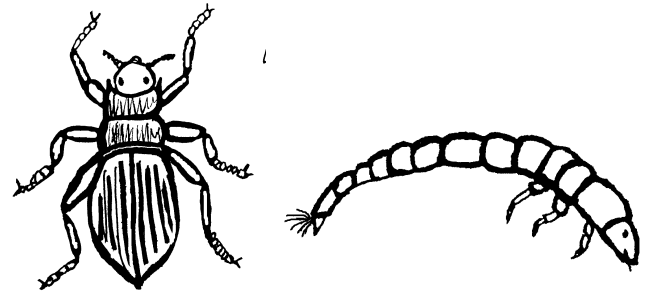


- ❑ Two prominent claws on the ends of the legs.

## 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)  
 Color: Brown



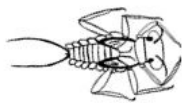
Above photographs courtesy of (top to bottom): Jake Renkert / The Marvelwood School); NY DEC Biomonitoring Unit; Jake Renkert / The Marvelwood School); Jake Renkert / The Marvelwood School); NY DEC Biomonitoring Unit



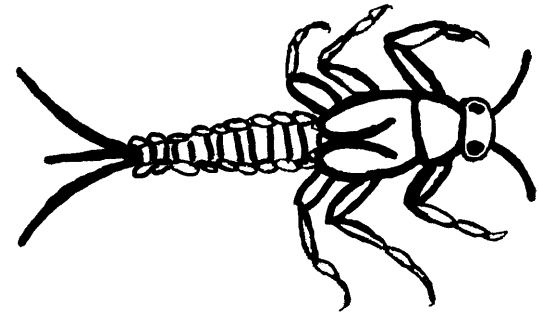
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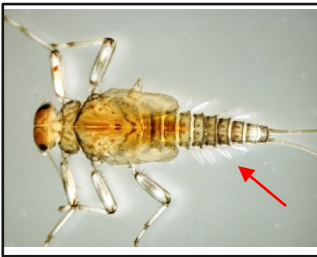
<https://portal.ct.gov/DEEP-RBVProgram>



## KEY FEATURES



- Small in overall size.
- Three pairs of legs; legs do not have a feathery fringe of hairs
- 2-3 hair-like tails, sometimes with a shorter middle tail



- Small, round gills along the sides of the abdomen – may be difficult to see without magnification
- Elongated wing pads



## 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

- Swim very well and will quickly swim in short bursts from one hiding spot to another in the tray

## 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.)

## Size and Color

Size: 3-12 mm  
Color: Light brown



Above photographs courtesy of (top to bottom): NY DEC Biomonitoring Unit; Kelsey Quartuccio / CT DEEP; NY DEC Biomonitoring Unit; CT DEEP files, author unknown

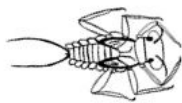
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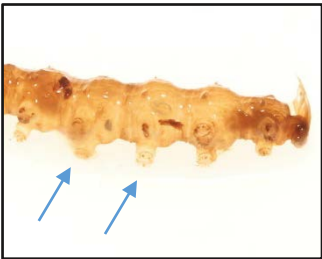




## KEY FEATURES



- ❑ Body is elongate with a pointed head end and tail-like structures at the end of the abdomen.



- ❑ Series of small, paired prolegs along abdomen
- ❑ Rough appearance to the exoskeleton.



- ❑ 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

- No unique behaviors; may be observed crawling in tray

## 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  
 Color: Golden brown to dark brown



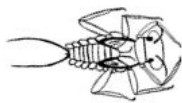
Above photographs courtesy of (top to bottom) Kelsey Quartuccio / CT DEEP; Becky Martorelli / Quinnipiac River Watershed Association; Jake Renkert / The Marvelwood School; and Kelsey Quartuccio / CT DEEP



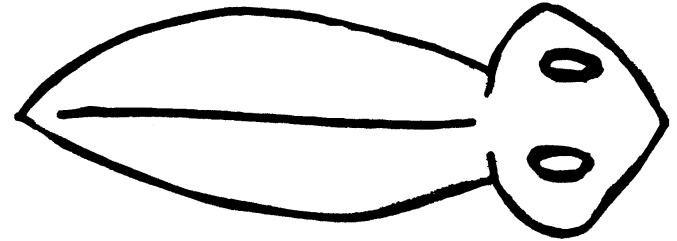
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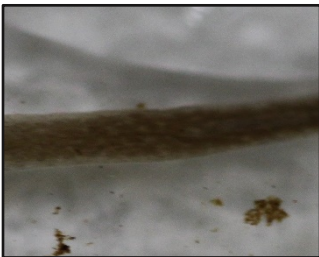
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## KEY FEATURES



- ❑ 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

- Planaria are able to 'glide' by beating microscopic cilia 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!

## Size and Color

Size: 5-20 mm  
 Color: Gray, brown or black on top, sometimes with spots or pattern; light on bottom

Above photographs courtesy of Meghan Lally / CT DEEP (top);  
 Becky Martorelli / Quinnipiac River Watershed Association  
 (bottom two)

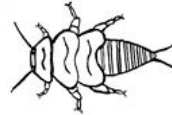
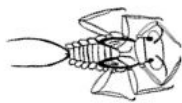
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# RBV



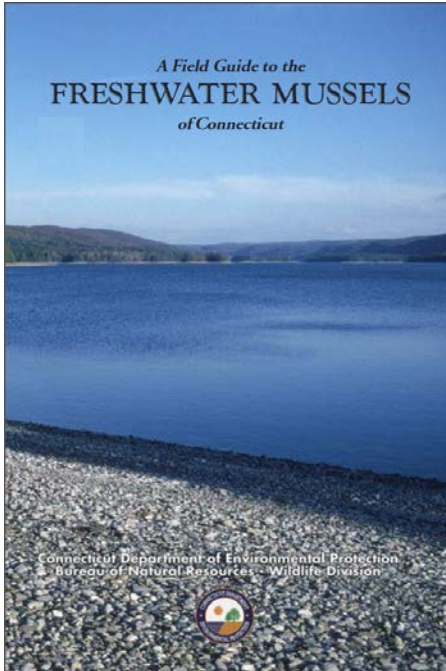
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<https://portal.ct.gov/DEEP-RBVProgram>

## FRESHWATER MUSSELS IN CONNECTICUT

Refer to the CT DEEP publication "[A Field Guide to the Freshwater Mussels of Connecticut](#)" for identification details.



To download a PDF version visit:  
<https://portal.ct.gov/DEEP/Wildlife/Freshwater-Mussels/Freshwater-Mussels-of-Connecticut>

## INTRODUCED MUSSELS IN CONNECTICUT



- ❑ **Zebra Mussel**  
*(Dreissena polymorpha)*
  - Small (< 1inch)
  - Triangular shaped
  - Distinct black or gray stripes
  - Strongly adheres to surfaces



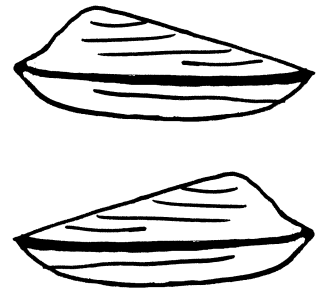
- ❑ **Asian Clam**  
*(Corbicula fluminea)*
  - Small (0.5-.75 inches wide)
  - Triangular shaped
  - Yellowish, light brown or black

Photographs courtesy of Dave Brenner, Michigan Sea Grant (top) and USGS, author unknown (bottom)

## General Identification

The following characteristics are universally true of the freshwater mussels in CT:

- Two shells connected by a strong hinge
- No distinct head



## Taxonomic Information

Order: Unionoida  
 Family: Margaritiferidae, Unionidae  
 Genus: See Field Guide

## Ecological Information

Tolerance Value = 7  
 Feeding Group = Collector-filterer  
 Stream Habitat = Buried in substrate, slower flows

## Key Behaviors

- Live on stream bottom, typically partially buried

## Important Notes

Almost all kinds of mussels are sensitive to pollution and environmental stress. In Connecticut, 6 of the 12 native freshwater mussel species are listed as special concern, threatened, or endangered.

To avoid accidentally injuring a listed species, please **DO NOT DISTURB OR HANDLE LIVE MUSSELS** observed at your RBV monitoring location. **Photograph live mussels only; report observations by email or via iNaturalist. Empty shells can be submitted with with your voucher.**

## Size and Color

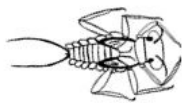
Size: Variable (refer to guide)  
 Color: Variable (refer to guide)



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