

Alderfly Larvae

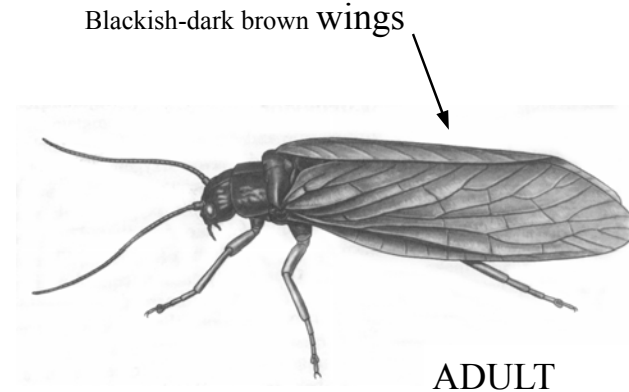
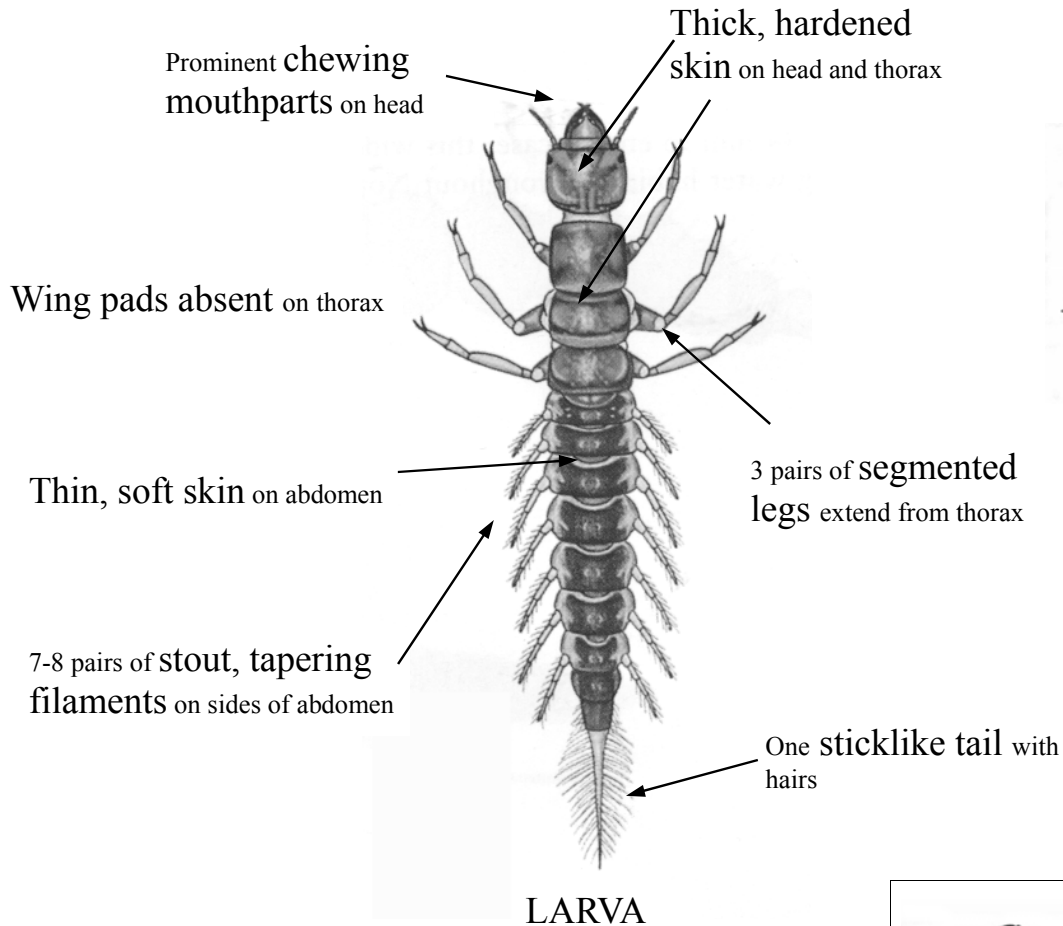
Order: Megaloptera Family: Sialidae

Number of species in North America: 24



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Allegheny College

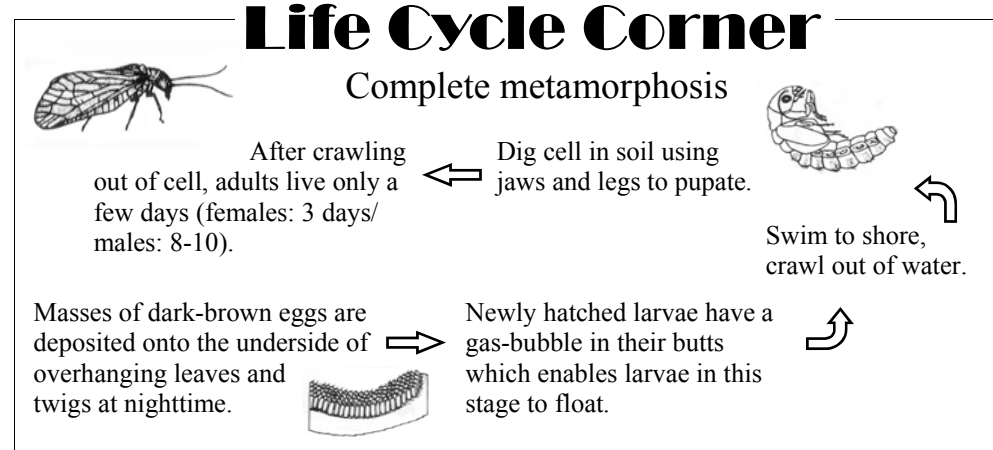
Size: 10-25mm (larvae) / < 20mm (adult)



Adult alderflies are **awkward fliers**, but **good runners**.

Credits: McCafferty, W. Patrick. Aquatic Entomology, 1981.

Diet: Actively roam for small prey; search in mud and on bottom.
Food for: Game fish, predaceous water insects.
Habitat: Standing water or slow parts of moving water. Found on soft bottom.
Movement: Burrowers; dig in upper 10cm of substrate.
Breathing: Open breathing system— diffusion across soft, fleshy tissues.
Water Quality Indicator: Group II— can exist under a wide range of water quality conditions; a large number indicates MODERATE water quality.



Backswimmer

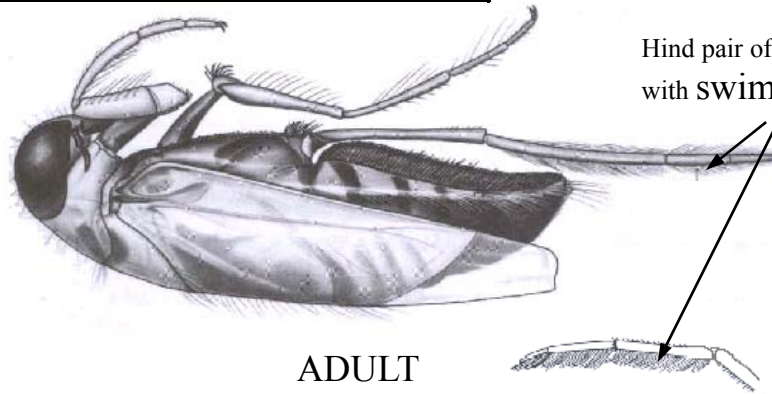
Order: Hemiptera Family: Notonectidae



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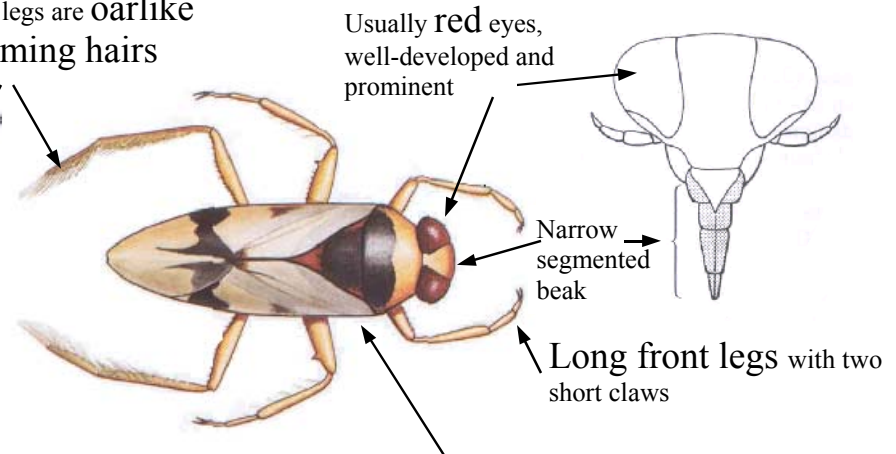
Size: 5-16 mm (adult)

Number of species in North America: 32



ADULT

Hind pair of legs are oarlike
with swimming hairs



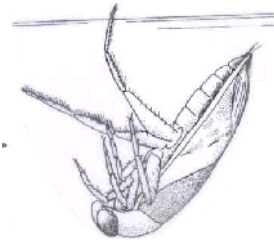
Usually red eyes,
well-developed and
prominent

Narrow
segmented
beak

Long front legs with two
short claws

**Oval-shaped body, dark colored stomach,
light colored back, sometimes with patterns**

The backswimmer, like the diving beetle, uses its hind legs as oars but because it is buoyant and its legs move relatively slowly, it travels along a series of arcs, moving forward and downward on the power stroke and floating upward during the recovery stroke.



SIMILAR TO: Water Boatman

- Backswimmer swims on back; the Water Boatman swims upright.
- Backswimmer has long front legs; the Water Boatman has short front legs.
- Backswimmer has narrow segmented beak (mouth); the Water boatman beak is blunt and non-segmented.

Credits:

McCafferty, W. Patrick. *Aquatic Entomology*, 1981.

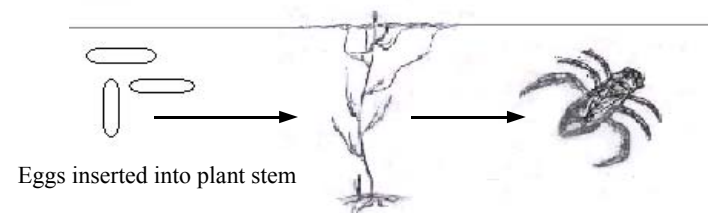
Reid, K. George. *A Golden Guide to Pond Life*, 1995.

Voshell, J. Reese Jr. *A Guide to Common Freshwater Invertebrates of North America*, 2002.

Life Cycle Corner

Incomplete Metamorphosis

In Spring, cigar shaped eggs are glued to or inserted inside the stems of water plants in a still water environment. The young hatch in one or two weeks and have red eyes and a white body.



Eggs inserted into plant stem

Diet: Body fluids of insects, crustaceans, snails, fish, tadpoles.

Food for: Predaceous fish.

Habitat: Bodies of still water, slower parts of streams and rivers (usually benthic).

Movement: Swims on back. Will rest on plants or on bottom.

Breathing: Swims to surface for air. Thin film of air kept on underside of body by thin hairs. Oxygen is then taken up through openings called spiracles. Oxygen can also be stored under the wings.

Water Quality Indicator: Group III- can exist under a wide range of water quality conditions including polluted waters.

Black Fly Larvae

Also known as: Buffalo gnat

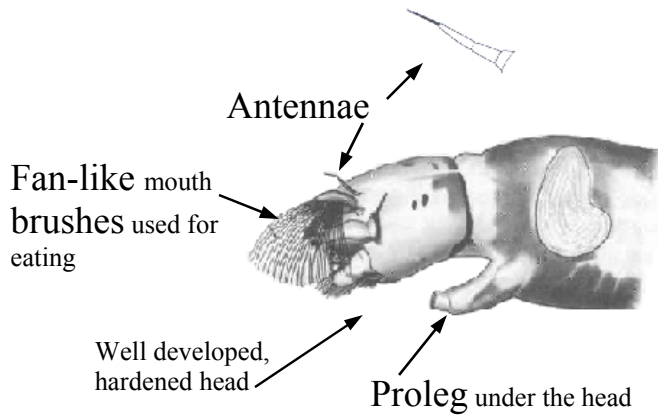
Size: 3-12 mm (larvae) / 4 mm (adult)

Order: *Diptera* Family: *Simuliidae*

Number of species in North America: 150



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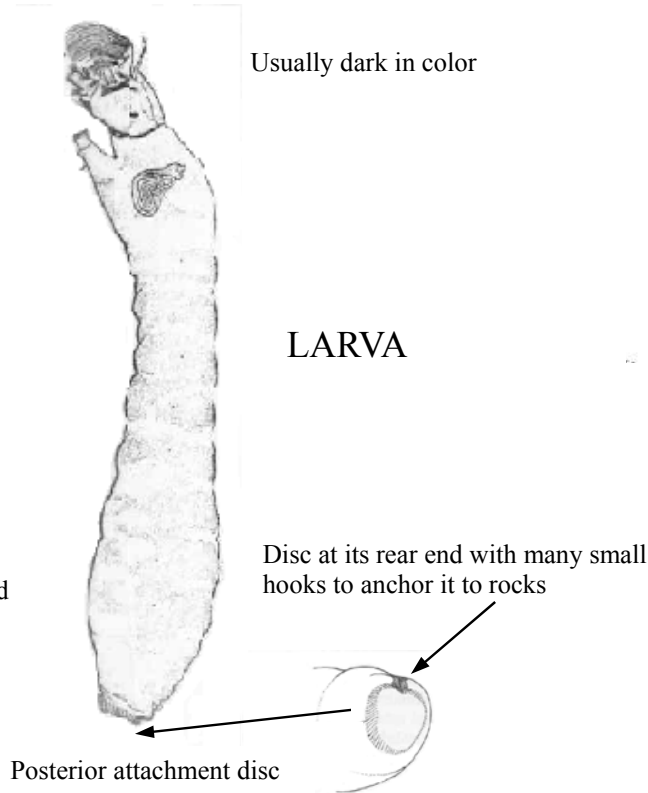
Key characteristic: swollen end (like a bowling pin)

Usually live in colonies



Usually stands upright in one place, attaching itself to hard surfaces.

Diet: Filter feeders; feed on algae, organic debris and detritus.
Food for: Game fish, predaceous aquatic insects and crayfish.
Habitat: Bottom dweller in ponds, lakes, and streams.
Movement: Attached by its rear to rocks or on woody debris. Can move downstream on a long silken tread.
Breathing: Open breathing system; breaths mainly through skin.
Water Quality Indicator: Group III—can tolerate polluted waters.



ADULT

Credits: McCafferty, W. Patrick. *Aquatic Entomology*, 1981.

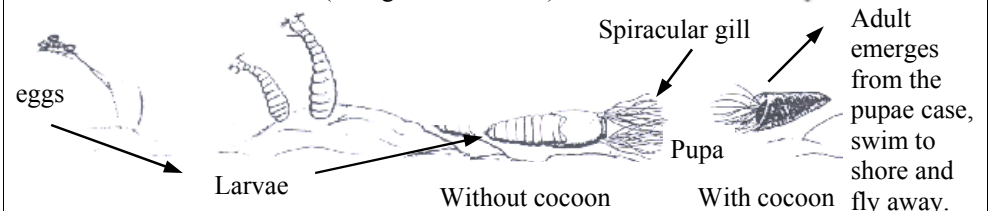
Reid, K. George. *A Golden Guide to Pond Life*, 1995.

Life Cycle Corner

Groups of eggs are laid underwater each year on logs, rocks, and plants of shallow, swift waters.

Complete metamorphosis

In 2-6 weeks, the larvae will pupate (change into an adult)



Net-spinning Caddisfly Larvae

Order: Trichoptera Family: Hydropsychidae

Number of species in North America: 149



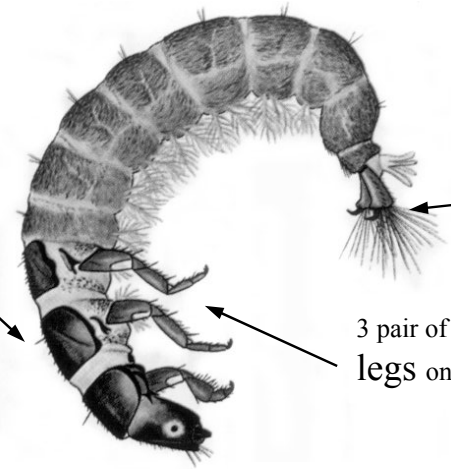
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Size: 10-16mm



No wing pads on thorax

Usually captured clinging to rocks and vegetation



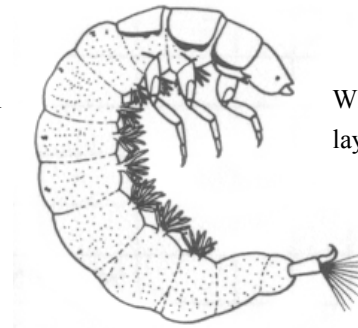
1 pair of prolegs with 1 claw on each

Thick, hardened skin on head

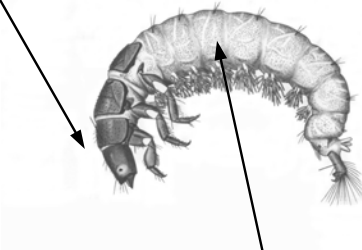
3 pair of segmented legs on thorax

COMMON NETSPINNER

Antennae very short, barely visible



When removed from water, larvae lay on side in C-shape

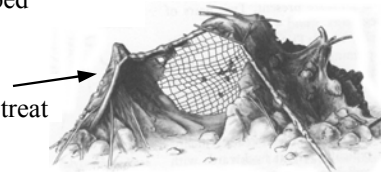


Abdomen is made of thin, soft skin

Build mesh net for filter feeding—quickly abandon when disturbed

Credits: McCafferty, W. Patrick. Aquatic Entomology, 1981.

Use silk to secure retreat



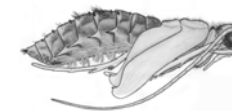
Life Cycle Corner

Complete metamorphosis

Eggs are deposited near the shore.



5 larval instars— the pupal stage takes place in a sealed cocoon (fixed to an object).



Three weeks later, the caddisfly emerges as an adult.

Diet: Collector-feeders; construct mesh net to remove particles from water.
Food for: Game fish, predaceous water insects.
Habitat: Flowing waters, usually between rocks or submerged debris.
Movement: Clingers; live in tubular retreats attached to solid objects in current.
Breathing: Closed breathing system; diffusion over soft body tissue.
Water Quality Indicator: Group II— can exist under a wide range of water quality conditions; a large number indicates MODERATE water quality.

Case Building Caddisfly

Order: *Hydropsychidae* Family: *Limnephilidae*
 Number of species in North America: more than 300



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Size: body: 20-30 mm/ case 25-50 mm



Limnephilus larval case



Farula larval case



Pycnopsyche larval case



Apatania larval case



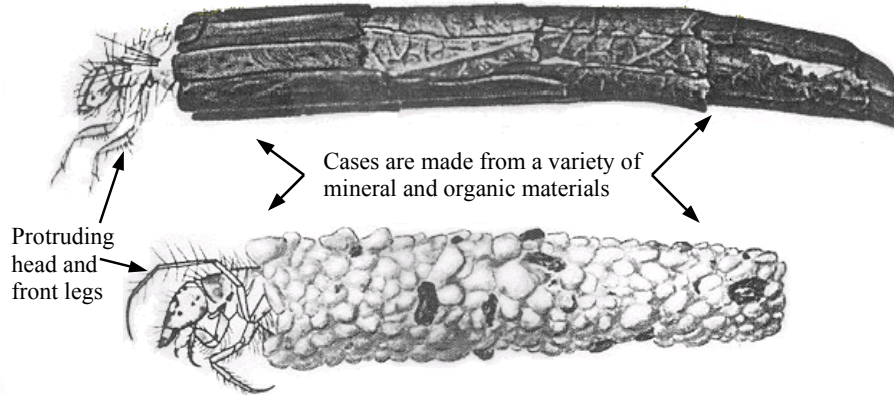
Manophylax larval case



Limnephilus larval case

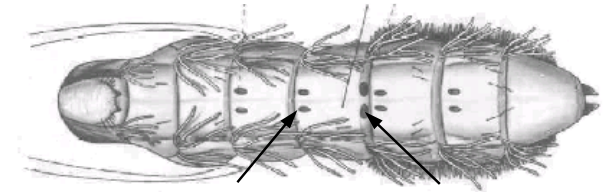


Neophylax larval case



Protruding head and front legs

Cases are made from a variety of mineral and organic materials



Anterior hook plate

Posterior hook plate

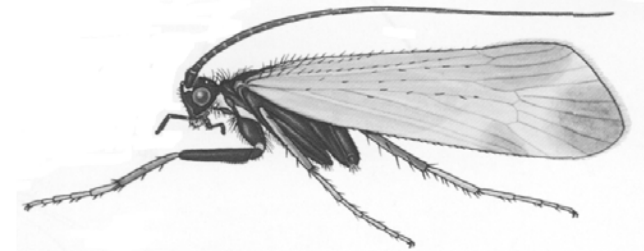
Thick, hardened skin on head and thorax

bristles

dorsal hump

lateral hump

LARVA



ADULT

Credits: McCafferty, W. Patrick. *Aquatic Entomology*, 1981.
 and
 Voshell, J. Reese Jr. *A Guide to Freshwater Invertebrates of North America*, 2002.

Life Cycle Corner

Complete metamorphosis

Adults emerge in late spring or early fall and live for approximately 30 days.

The pupa stage lasts 2-3 weeks. Pupae are aquatic and obtain oxygen in the same way as larvae.

Larvae create a cocoon in the water for the pupa.

Eggs are deposited in gelatin masses in the stream. Masses vary from a few eggs each to several hundred eggs in each mass. Egg masses are sometimes green, yellow or orange.

The larval stage can last from 2-3 months to 2 years. Larva shed their exoskeleton an average of 5 times.

Diet: Shredder-detritivores, shredder-herbivores, collector-gatherers, scraper.
Food for: Game fish, predaceous water insects.
Habitat: Lentic and lotic habitats, streams, rivers, springs, marshes and ponds.
Movement: clingers, crawlers and climbers.
Water Quality Indicator: Groups I and II- can exist under a limited or wide range of water quality conditions; a large number indicates GOOD water quality.