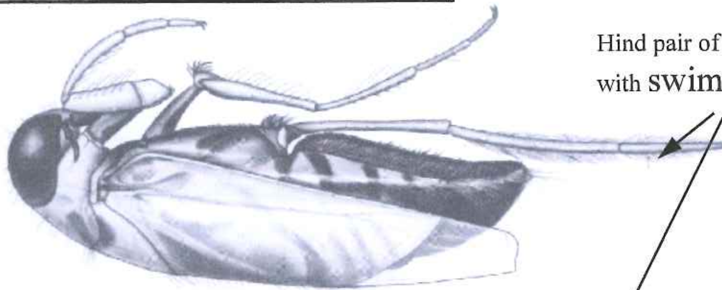
Backswimmer

Order: Hemiptera *Family: Notonectidae*

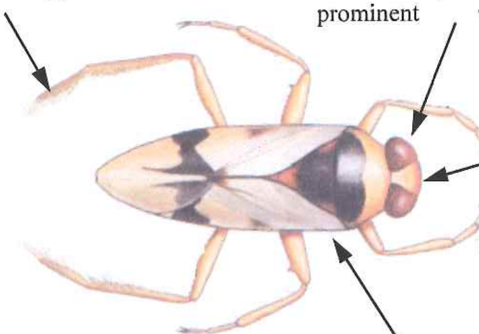
Size: 5-16 mm (adult)

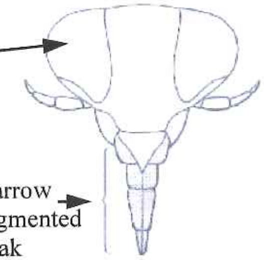
Number of species in North America: 32



ADULT

Hind pair of legs are oarlike with swimming hairs





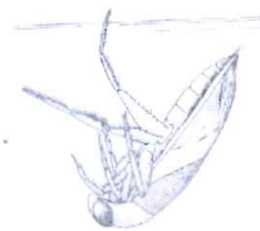
Usually red eyes, well-developed and prominent

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.

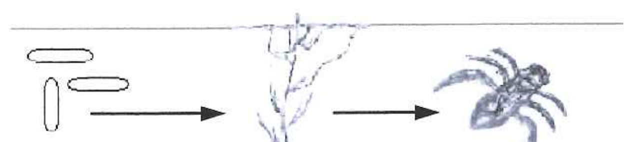
Credits:
McCafferty, W. Patrick. Aquatic Entomology, 1981.
Reid, K. George. A Golden Guide to Pond Life, 1995.
Voshell, J. Reese Jr. A Guide to Common Freshwater Invertebrates of North America, 2002.

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.

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

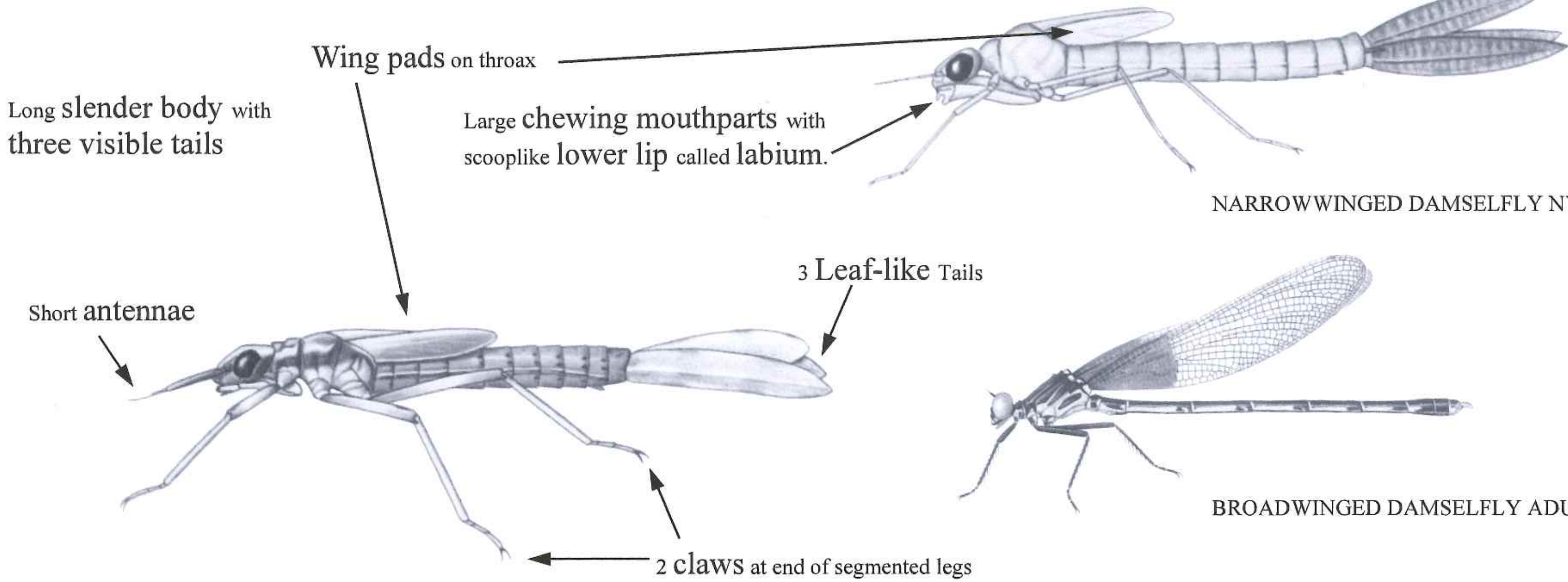
Damselfly Nymph

Order: Odonata

Families: Calopterygidae– Broadwinged
Lestidae– Spreadwinged

Number of species in North America: 407

Size: Broadwinged: 25-50mm (nymph) Spreadwinged: 22-26mm (nymph)



NARROWWINGED DAMSELFLY NYMPH

BROADWINGED DAMSELFLY ADULT

SPREADWINGED DAMSELFLY NYMPH

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

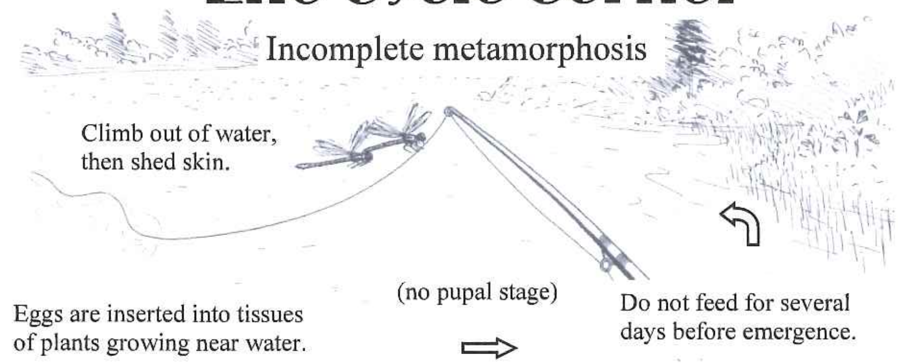
SIMILAR TO: dragonfly

- A damselfly's head is wider than thorax and abdomen, while a dragonfly's is narrower.
- Damselflies have three elongated gills rear of abdomen, while dragonflies do not.

Diet: Zooplankton, mayflies, other damselflies, any prey that can be subdued.
Food for: Game fish, predaceous water insects.
Habitat: Still waters, ponds, lakes, streams, and rivers.
Movement: Swim feebly by waving long thin abdomen side to side.
Breathing: Closed breathing system– spread gills as far as possible to circulate water and also diffusion across skin of body.
Water Quality Indicator: Group II– can exist under a wide range of water quality conditions; a large number indicates MODERATE water quality.

Life Cycle Corner

Incomplete metamorphosis



Dragonfly Nymph

Order: Odonata   *Families: Aeshnidae*– Darners
Gomphidae– Clubtails
Libellulidae– Common Skimmers

Number of species in North America: 243

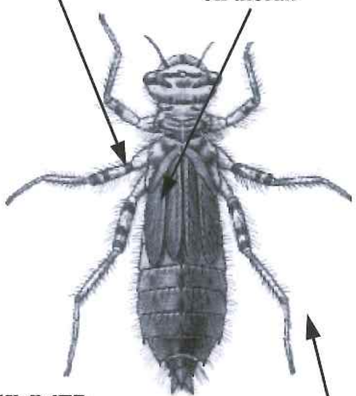
Size: Darners: 45mm (larvae) / 79mm (adult)
Clubtails: 30mm (larvae) / 50mm (adult)
Common Skimmers: 21mm (larvae) / 50mm (adult)

Short antennae

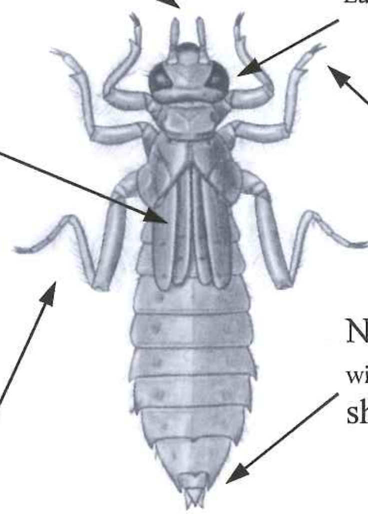
Large eyes

Thick, hardened skin on head and thorax

2 pairs of wing pads on thorax



COMMON SKIMMER DRAGONFLY NYMPH



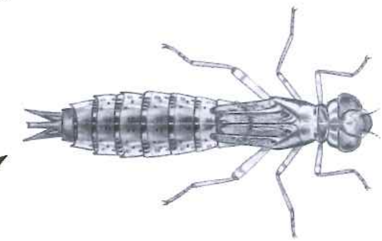
CLUBTAIL DRAGONFLY NYMPH

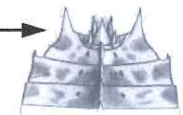
3 pairs of segmented legs extend from thorax

Scooplike lip (called labium) to capture food. Large chewing mouthparts.

2 claws at the end of each leg

No tail. Abdomen terminates with 3 stubby wedge-shaped structures.





DARNER NYMPH AND ADULT

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

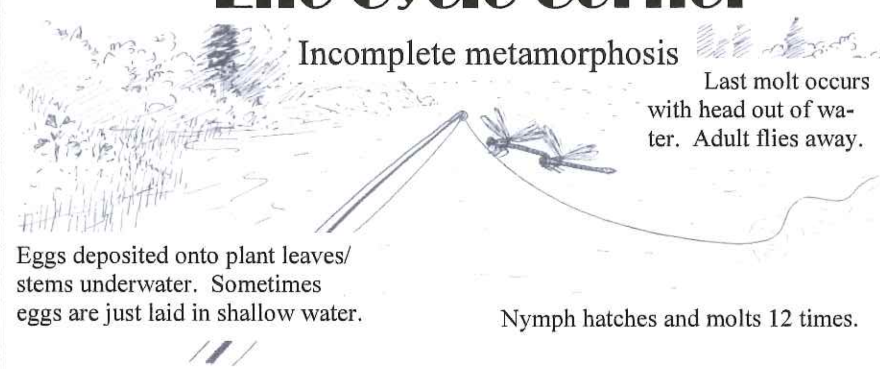
SIMILAR TO: damselfly

- A dragonfly's head is narrower than thorax and abdomen, while a damselfly's head is wider.

Diet: Insects (and larvae), other dragonfly nymphs, worms, small crustaceans. Will go after movement and even stalk prey.
Food for: Gamefish, frogs, birds, beetles, other dragonflies.
Habitat: Ponds, marshes, lake edges, shallow streams, slow streams and rivers
Movement: Climb and crawl on bottom. Some burrow. Can propel though water by sending water out their rear (rectal chamber).
Breathing: Through gill folds on rear area of body, and thin-walled body regions.
Water Quality Indicator: Group II– can exist under a wide range of water quality conditions; a large number indicates MODERATE water quality.

Life Cycle Corner

Incomplete metamorphosis



Last molt occurs with head out of water. Adult flies away.

Eggs deposited onto plant leaves/ stems underwater. Sometimes eggs are just laid in shallow water.

Nymph hatches and molts 12 times.

Mosquito Larvae

Order: Diptera *Family: Culicidae*

Number of species in North America: 166

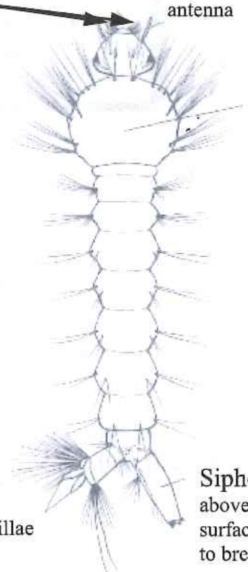
Size: 4-14 mm

Mouth brushes consist of 10 short rods used to collect food

antenna

thorax

Thorax is thicker than abdomen



papillae

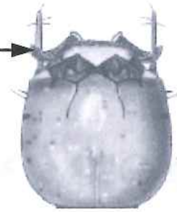
Siphon sticks out above the water surface and is used to breath air

CULICINAE LARVA

Reduced siphon

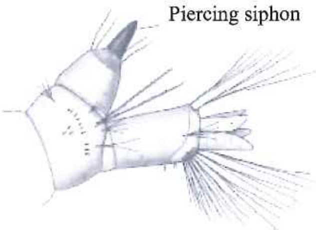
ANOPHELINAE LARVA end of abdomen

mouth brush rods



TOXORHYNCHITINAE LARVA head

Piercing siphon



CULICINAE LARVA, end of abdomen

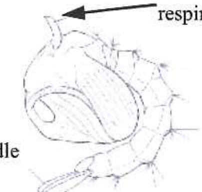
Credits: McCafferty, W. Patrick. Aquatic Entomology, 1981.
and
Voshell, Reese J. Jr.. A Guide to Common Freshwater Invertebrates of North America, 2002.

midrib

Paddle is used by pupa to swim in a jerking motion

respiratory horn

paddle



Diet: Collector-filterers collect algae, bacteria, fungi and protozoa, some feed on other species of mosquito larva.
Habitat: Any type of still water habitat.
Movement: Swimmers, both larvae and pupae swim below the surface by alternately bending and unbending the body.
Breathing: Siphons and respiratory horns collect oxygen from air above the surface.

Life Cycle Corner

Complete metamorphosis

Eggs can remain dormant until there is sufficient water to

Eggs are deposited individually or in groups called rafts in the water or on a land area that will be flooded.

Larva live in the water and shed their skin four times. Larvae live in the water from 4 to 14 days.

PUPA

The pupae stage takes place in a sealed cocoon (fixed to an object)

Days later, the mosquito emerges as an adult.

Water Boatman

Order: Hemiptera *Family: Corixidae*

Number of species in North America: 129

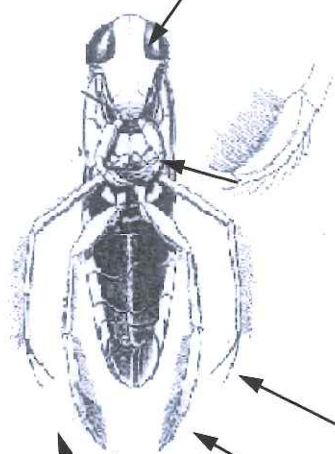
Size: 3 - 11 mm (adult)

Modified beak, (blunt, triangle shaped non-segmented mouth).

Swims upright.

Short front legs, much shorter than other pairs of legs.

Well developed, prominent eyes.



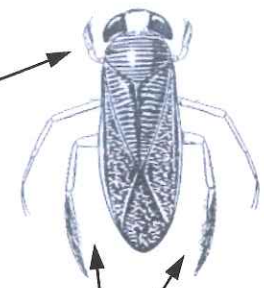
Two long claws on mid pair of legs.

Swimming hairs.

2 pair of long hind legs with swimming

Dark colored back, light colored stomach.

Front legs with stiff setae (hairs) to be used like a rake.



Hind legs are oarlike with swimming hairs

SIMILAR TO: Backswimmer.

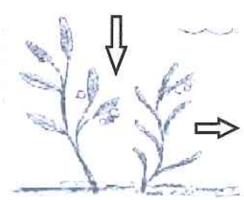
- Backswimmers swim on back. Water boatmen swim upright.
- Backswimmers have long front legs. Water boatmen have short front legs.

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

Diet: Insect fluids, small, dead insect parts, detritus, algae.
Food for: Fish (perch, bass, bluegill, crappie), predaceous water insects
Habitat: In the water and bottom. Ponds, shallow lakes, running and quiet waters, stagnant pools, even oceans.
Movement: Swims using hind legs and their swimming hairs. When not swimming, will rest on plants or the bottom, and must hold onto an object in order to stay under water.
Breathing: Surface for air. Thin film of air on the underside (plastron) kept on body. Hairs keep the air there.
Water Quality Indicator: Group III. Some are highly tolerant of water pollution.

Life Cycle Corner

Onion shaped egss are attached individually to underwater plants or even crayfish.



Young nymphs breathe through skin. As they grow, they start using trapped air that is next to their body.

Incomplete metamorphosis

Waterstrider

Order: Hemiptera *Family: Gerridae*

Number of species in North America: 47

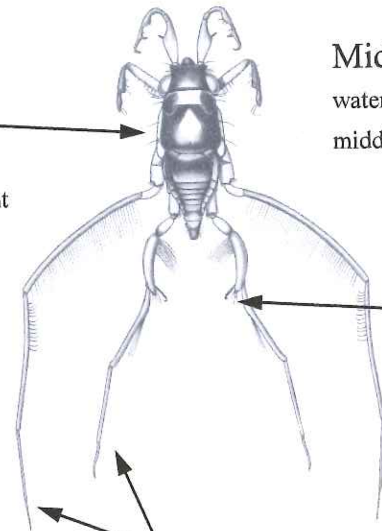
Size: 3-20mm (adult)

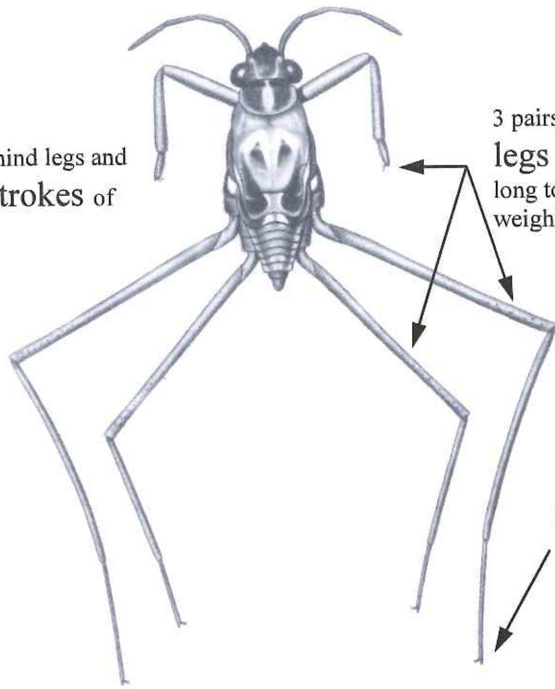
Also called pond skaters or Jesus bugs because they seem to "walk on water"

Wing pads present on thorax

No gills present

Middle and hind legs touch water– front legs are held up while middle legs row





Steer with hind legs and unequal strokes of middle legs

3 pairs of segmented legs on thorax, skinny and long to help distribute body weight on water surface.

Claws on upper leg – do not break surface tension

Ends of legs have non-wettable hairs

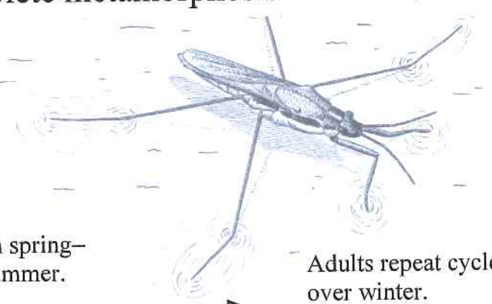
2 claws on segmented legs

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

Diet: Terrestrial and aquatic insects (living and dead).
Food for: Game fish, predaceous water insects.
Habitat: Surface of streams, lakes, ponds, marshes, and ditches.
Movement: Skate on surface of water.
Breathing: Openings in sides of bodies (spiracles). When diving, a thin layer of air is trapped on the unwettable hairs covering body.
Water Quality Indicator: Group II– can exist under a wide range of water quality conditions; a large number indicates MODERATE water quality.

Life Cycle Corner

Incomplete metamorphosis



Loose eggs usually deposited underwater. Attached to solid objects.

Adults lay eggs in spring– develop during summer.

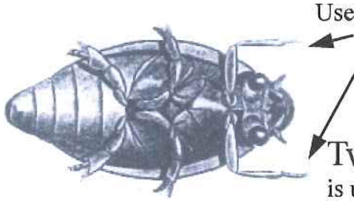
Adults repeat cycle over winter.

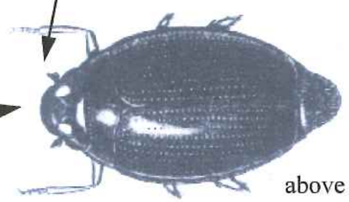
Whirligig Beetle

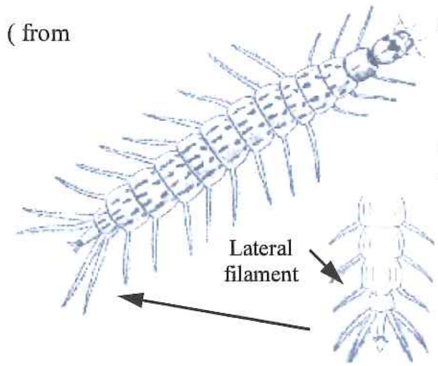
Order: Coleoptera   *Family: Gyrinidae*

Number of species in North America: 50

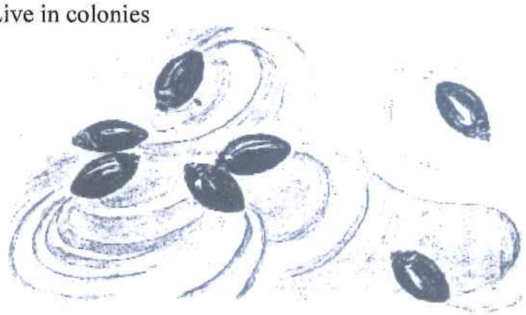
Size: 18 mm (larvae) 10-11 mm (adult)

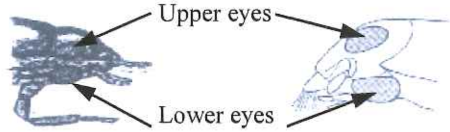






Live in colonies





Credits: McCafferty, W. Patrick. Aquatic Entomology, 1981.
and
Reid, K. George. A Golden Guide to Pond Life, 1995.

Diet: Adult: scavenges on floating materials, small organisms and insects.
Larvae: eat smaller insects.
Food for: Fish, other beetles.
Habitat: Can be found on the surface of ponds, streams, and slow rivers.
Movement: Moves in a circular motion through twists and turns. Uses a type of radar to sense surroundings. Also effective surface swimmers.
Breathing: Must surface for air, keeps air trapped next to body.
Water Quality Indicator: Group II– can tolerate some pollution; a large number indicates MODERATE water quality.

Life Cycle Corner

Complete metamorphosis