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Ligumia nasuta

eastern pondmussel

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By *Renee Sherman Mulcrone*

Geographic Range

The eastern pond mussel is found from the James River of Virginia north to the St. Lawrence drainages in Canada, west to Lake Erie, Ohio and Michigan.

In Michigan *L. nasuta* is found in the lower peninsula in drainages on the eastern side of the state. Generally, this is a pond and lake species. (Burch, 1975; van der Schalie, 1938; Watters, 1995)

Kingdom: [Animalia](#)
 Phylum: [Mollusca](#)
 Class: [Bivalvia](#)
 Order: [Unionoida](#)
 Family: [Unionidae](#)
 Genus: [Ligumia](#)
 Species: ***Ligumia nasuta***

Biogeographic Regions:

nearctic [Q](#) (native [Q](#)).

Habitat

The eastern pondmussel is usually found in lakes, ponds, or quiet waters of streams. Substrates it inhabits are variable. In the Huron River this species was found on sandy bottoms of quiet pools or in sandy areas of beach pools. (Cummings and Mayer, 1992; van der Schalie, 1938; Watters, 1995)

These animals are found in the following types of habitat:

freshwater [Q](#).

Aquatic Biomes:

rivers and streams.

Physical Description

The eastern pondmussel is up to 10 cm (4 inches) long, and is [Q](#)elongate in shape, usually over twice as long as high. The shell is usually fairly thin and compressed, and this species has a distinct posterior ridge. The [Q](#)anterior end is rounded, the posterior end pointed. The dorsal margin is straight and the ventral margin is straight to curved as it.

Length
 10 cm (high)
 (3.94 in)

[Q](#)Umbo are low, being raised only slightly above the hinge line. The beak sculpture has double-looped ridges.

The periostracum (outer shell layer) is smooth, except for growth lines and tan to dark green, sometimes with fine green rays. Older specimens tend to be more brown or black.

On the inner shell, the [Q](#)left valve has one to two [Q](#)pseudocardinal teeth, which are triangular and delicate. The two lateral teeth are straight and long. The right valve has one triangular pseudocardinal tooth. The one lateral is also straight and long.

The beak cavity is shallow to moderately deep. Although the nacre is white, occasionally it has a pink or salmon tint and is iridescent at the posterior end.

In Michigan, this species can be confused with the [black sandshell](#). The black sandshell is more cylindrical, not as pointed posteriorly, and is generally larger and thicker. (Cordeiro, 2003; Nedeau, McCollough, and Swartz, 2000; Watters, 1995)

Some key physical features:


ectothermic ; heterothermic ; bilateral symmetry .

Sexual dimorphism: sexes shaped differently.

Development


Fertilized eggs are brooded in the marsupia (water tubes) up to 11 months, where they develop into larvae, called glochidia. The glochidia are then released into the water where they must attach to the gill filaments and/or general body surface of the host fish. After attachment, epithelial tissue from the host fish grows over and encapsulates a glochidium, usually within a few hours. The glochidia then metamorphoses into a juvenile mussel within a few days or weeks. After metamorphosis, the juvenile is sloughed off as a free-living organism. Juveniles are found in the substrate where they develop into adults. (Arey, 1921; Lefevre and Curtis, 1910)

Special features of growth:

metamorphosis .

Reproduction

Age to sexual maturity for this species is unknown. [Unionids](#) are gonochoristic (sexes are separate) and viviparous. The glochidia, which are the larval stage of the mussels, are released live from the female after they are fully developed.

In general, gametogenesis in [unionids](#) is initiated by increasing water temperatures. The general life cycle of a [unionid](#), includes open fertilization. Males release sperm into the water, which is taken in by the females through their respiratory current. The eggs are internally fertilized in the suprabranchial chambers, then pass into water tubes of the gills, where they develop into glochidia.

Ligumia nasuta is a long-term brooder. In the Huron River in Michigan, it was gravid from early August to late June. It probably spawns in July in Michigan. (Lefevre and Curtis, 1912; Watters, 1995)

Breeding interval

The eastern pondmussel breeds once in the warmer months of the year.






Breeding season

In Michigan, the breeding season is probably July.

Gestation period

11 months (high)

Key reproductive features:

seasonal breeding ; gonochoric/gonochoristic/dioecious (sexes separate); sexual ; fertilization  (internal ); viviparous .

Females brood fertilized eggs in their marsupial pouch. The fertilized eggs develop into glochidia. There is no parental investment after the female releases the glochidia.

Parental investment:

pre-fertilization (provisioning); pre-hatching/birth (provisioning: female).




Lifespan/Longevity

The age of mussels can be determined by looking at annual rings on the shell. However, no demographic data on this species has been recorded.

Behavior

Mussels in general are rather sedentary, although they may move in response to changing water levels and conditions. Although not thoroughly documented, the mussels may vertically migrate to release glochidia and spawn. (Oesch, 1984)

Key behaviors:

parasite ; motile ; sedentary .

Communication and Perception

The middle lobe of the mantle edge has most of a bivalve's sensory organs. Paired [statocysts](#), which are fluid filled chambers with a solid granule or pellet (a statolity) are in the mussel's foot. The statocysts help the mussel with georeception, or orientation.

Mussels are heterothermic, and therefore are sensitive and responsive to temperature.

[Unionids](#) in general may have some form of chemical reception to recognize fish hosts. Mantle flaps in the [lampsilines](#) are modified to attract potential fish hosts. How the eastern pondmussel attracts and/or recognizes its fish host is unknown.

Glochidia respond to touch, light and some chemical cues. In general, when touched or a fluid is introduced, they will respond by clamping shut. ([Arey, 1921](#); [Brusca and Brusca, 2003](#); [Watters, 1995](#))

Communicates with:

chemical [Q](#).

Perception channels:

visual [Q](#); tactile [Q](#); vibrations [Q](#); chemical [Q](#).

Food Habits

In general, [unionids](#) are filter feeders. The mussels use cilia to pump water into the [incurrent siphon](#) where food is caught in a mucus lining in the demibranchs. Particles are sorted by the [labial palps](#) and then directed to the mouth. Mussels have been cultured on algae, but they may also ingest bacteria, protozoans and other organic particles.

The parasitic glochidial stage absorbs blood and nutrients from hosts after attachment. Mantle cells within the glochidia feed off of the host's tissue through phagocytosis. ([Arey, 1921](#); [Meglitsch and Schram, 1991](#); [Watters, 1995](#))

Primary Diet:

planktivore [Q](#); detritivore [Q](#).

Plant Foods:

algae; phytoplankton [Q](#).

Other Foods:

detritus [Q](#); microbes.

Foraging Behaviors:

filter-feeding [Q](#).

Predation

[Unionids](#) in general are preyed upon by [muskrats](#), [raccoons](#), [minks](#), [otters](#), and some birds. Juveniles are probably also fed upon by [freshwater drum](#), [sheepshead](#), [lake sturgeon](#), [spotted suckers](#), [redhorses](#), and [pumpkinseeds](#).

Unionid mortality and reproduction is affected by unionicolid mites and monogenic [trematodes](#) feeding on gill and mantle tissue. Parasitic [chironomid](#) larvae may destroy up to half the mussel gill. ([Cummings and Mayer, 1992](#); [Watters, 1995](#))

Ecosystem Roles

While freshwater mussels require a host fish for metamorphosis, the host for the eastern pondmussel is unknown.

Key ways these animals impact their ecosystem:

parasite [Q](#).

Economic Importance for Humans: Negative

There are no significant negative impacts of mussels on humans.

Known predators

- muskrat, [*Ondatra zibethicus*](#)
- mink, [*Neovison vison*](#)
- raccoon [*Procyon lotor*](#)
- otter, [*Lontra canadensis*](#)
- turtles, [*Testudines*](#)
- hellbenders, [*Cryptobranchus*](#)
- freshwater drum, [*Aplodinotus grunniens*](#)
- sheepshead, [*Archosargus probatocephalus*](#)
- lake sturgeon, [*Acipenser fulvescens*](#)
- shortnosed

Economic Importance for Humans: Positive

Mussels are ecological indicators. Their presence in a water body usually indicates good water quality.

Conservation Status

Ligumia nasuta is listed as Endangered in Delaware and Ohio, Threatened in New Jersey and Special Concern in Massachusetts. It is also a Species of Concern in Rhode Island. The IUCN Red List considers this species Lower Risk, near Threatened on the IUCN Red List. (Hove, 2004)

IUCN Red List: [\[link\]](#):
Lower Risk - Near Threatened.

US Federal List: [\[link\]](#):
No special status.

CITES: [\[link\]](#):
No special status.

sturgeon, [Acipenser brevirostrum](#)

- spotted suckers, [Minytrema melanops](#)
- common red-horse, [Moxostoma](#)
- catfish, [Siluriformes](#)
- pumpkinseed, [Lepomis gibbosus](#)

For More Information

Find *Ligumia nasuta* information at

- [Encyclopedia of Life](#)

Contributors

Renee Sherman Mulcrone (author).

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