

Freshwater Mussels in Kansas

Reference:

Missouri's Freshwater Mussels

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Download at: <http://www.conservation.state.mo.us/nathis/mollusks/> (4.7 meg file)

Don't call them clams! The bivalve mollusks found in the rivers and lakes of Kansas are freshwater mussels (or naiads) belonging mostly to the family Unionidae. The phylum of mollusks is a very diverse, ancient and successful group of animals. Other kinds of mollusks are marine clams, snails, slugs, squid and octopi. Unionid mussels, along with crayfish, are the largest invertebrate members of the freshwater community.

Mussels are bottom-dwellers in rivers, streams and lakes. Most species of mussels prefer loose, hard substrates such as gravel or cobbles in streams and rivers with relatively clear, cool and well-oxygenated water. However, a few species are adapted to backwater areas or oxbows where clay or silt is the primary substrate and some species survive in plains streams with a sand substrate. Because rivers in the western half of the state usually have shifting sand and/or muddy bottoms and are frequently turbid, warm, and have low oxygen levels, there are considerably fewer species of mussels west of Wichita (Salina).

The most noticeable part of a mussel is, of course, its shell, which has two symmetrical halves called **valves**. The **mantle**, which is the organ that secretes the shell, is attached to it at the **pallial line**. The outer "skin" of the shell, called the **periostracum**, is a thin organic layer that includes the various colors, patterns, and physical features of the shell. The inner, inorganic layer of the shell, called mother-of-pearl or **nacre**, also may have different colors. It is the thickest layer and is composed of calcite and aragonite, both of which are mineral forms of calcium carbonate (CaCO₃). The valves protect the animal from predators and some environmental hazards. Different species may be recognized by the presence or absence of certain features of the valves and differences in the shape, number and location of these features. These differences are often subtle and can be very challenging for a novice to recognize. The shell anatomy diagram below names the most obvious of these features.

Mussels can move, but very slowly! Their means of locomotion is to protrude a fleshy part of their body - called the **foot** - into the substrate, wedge it into place and then contract it to drag the shell a little ways. By this means they are capable of moving, at most, only a few feet a day. Mussels don't move laterally much, unless low water levels threaten to expose them to the air. Mostly, they use this technique to emplant themselves into the substrate if they are accidentally dislodged, or to migrate vertically in response to the seasons (down in fall and up in spring).

Mussels are filter feeders. They draw water through their body via a tube called an **incurrent siphon** and pass it over their gills to obtain oxygen while filtering out plankton and detritus for food. The water is then passed out of the body via an **excurrent siphon**. These siphons are open on the posterior end of the animal, which is the end that sticks out above the substrate.

Unionid mussels have an unusual method of breeding that uses (with a few exceptions) different species of fish as a host for a parasitic larval stage called a **glochidium** (plural: **glochidia**). During breeding season, males release their sperm into the water and females become fertilized by taking in sperm from the water drawn in via their incurrent siphon. The sperm fertilizes the eggs that are stored in the gills, which are temporarily modified as brood chambers. Some species of mussels brood the glochidia for a short period of time in the spring (**tachytictic**) before they are released, but other species brood the glochidia for several months over the winter (**bradytictic**). When ready, the female mussels release these larvae into the

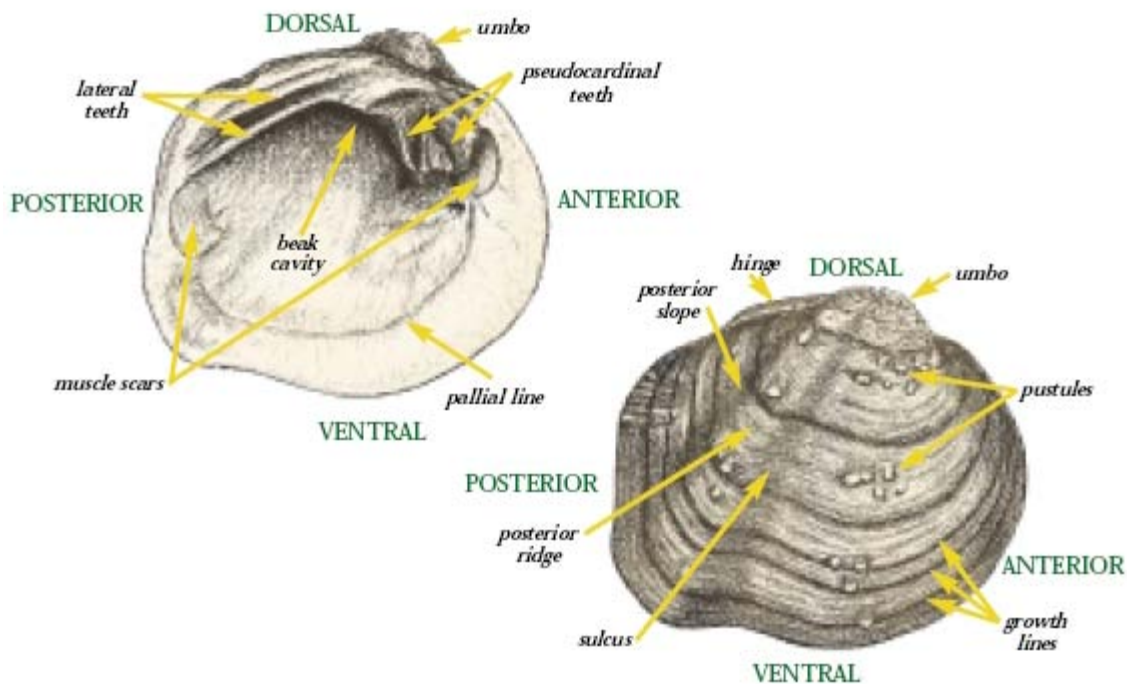
water where they clamp onto the gills or fins of fish and encyst themselves for a period of time, drawing nutrition from the blood of the fish. During this period of encystment, the glochidia go through a metamorphosis (similar to insects) where the adult organs are developed. After this period, which may last from a couple of weeks to a few months depending on a number of environmental conditions, the juvenile mussel drops off the fish and begins its life as a benthic (bottom-dwelling) organism.

Some unionid mussels use elaborate tricks to infect their fish hosts. The simplest ruse is to wave a flap of skin called a **mantle lure** in the water. These lures usually look like minnows, but one resembles a crayfish. When a fish strikes at the “meal”, the mussel squirts a bunch of glochidia into its mouth! Other species of mussels will pack their glochidia into gummy little packets that look like tiny fish or aquatic insect larvae and release them into the water. These packets are called **conglutinates**. When a predator fish tries to eat it, the conglutinate ruptures in its mouth, releasing the glochidia. The ultimate in mussel trickery is called a **super conglutinate!** This is made up of dozens of conglutinates formed into a larger shape and attached to the mother mussel by a long mucous ribbon, which allows it to wave back and forth in the water - just like a fishing lure on the end of a line! The tightly packed rows of conglutinates bear an incredible resemblance to the segmented appearance of some kinds of minnows. Any fish that chomps down on one of these REALLY gets a dose of glochidia!

There are ~300 species of Unionid mussels in North America, which has more species than any other continent by far. Most of the North American species are found in the eastern half of the country where rocky streambeds are more common. Forty eight species of Unionid mussels have been documented from Kansas. Twelve of them are illustrated in this document, along with two species of mussels from other families that have been introduced into our waters and may also be encountered.

- Jim Mason, Naturalist
Great Plains Nature Center
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Mussel Anatomy



Abridged list of mussels for the Kansas ECO-Meet

Family Unionidae



White Heelsplitter - *Lasmigona complanata*

KEY CHARACTERISTICS: Relatively flat profile viewed edge-on. Older specimens are black.

SIZE: Up to 8 inches, one of the largest mussels in Kansas.

RANGE: Found throughout the eastern half of the state and as far west as Kanopolis Lake

HABITAT: Wide ranging from mud to cobble substrates. Can survive in impoundments as well as streams.

KNOWN FISH HOSTS: banded killifish, carp, green sunfish, largemouth bass, orangespotted sunfish, white crappie



Floater - *Pyganodon grandis*

KEY CHARACTERISTICS: Hinge teeth absent. Thin and thick shelled forms may be found in the same body of water. Yellow/brown in younger specimens grading to very dark in older ones.

SIZE: Up to 10 inches, one of the largest mussels in Kansas.

RANGE: One of the few species found statewide.

HABITAT: Prefers softer substrates. Can survive in impoundments as well as streams.

KNOWN FISH HOSTS: black crappie, bluegill, carp, drum, golden shiner, green sunfish, largemouth bass, white crappie, yellow bullhead



Threeridge - *Amblema plicata*

KEY CHARACTERISTICS: Three prominent ridges on the posterior slope. Very dark.

SIZE: Up to 7 inches.

RANGE: Eastern third of the state. Formerly found further west.

HABITAT: Occurs in coarse sand to gravel/cobble substrates. Can survive in impoundments as well as streams.

KNOWN FISH HOSTS: black crappie, bluegill, flathead catfish, green sunfish, largemouth bass, northern pike, pumpkinseed, rock bass, sauger, shortnose gar, white bass, white crappie, yellow perch



Wabash Pigtoe - *Fusconaia flava*

KEY CHARACTERISTICS: Has a relatively thick shell and a triangular shape; brown.

SIZE: Up to 4.5 inches.

RANGE: Southeastern 1/3 of the state.

SINC SPECIES IN KANSAS

HABITAT: Streams and rivers with coarse sand to gravel/cobble substrates.

KNOWN FISH HOSTS: black crappie, bluegill, white crappie



Washboard - *Megalonais nervosa*

KEY CHARACTERISTICS: Adults are large and rectangular with a very dark shell having many ridges and ripples on it.

SIZE: Up to 11 inches; the largest mussel species in Kansas.

RANGE: Neosho, Fall and Verdigris Rivers; lower reaches of the Marais des Cygnes.

SINC SPECIES IN KANSAS

HABITAT: A large river species. Found in various substrates in sites with slow to moderate current.

KNOWN FISH HOSTS: black bullhead, bluegill, channel catfish, drum, flathead catfish, gizzard shad, green sunfish, tadpole madtom, white crappie



Rabbitsfoot - *Quadrula cylindrica*

KEY CHARACTERISTICS: Obviously longer than wide, like the hind foot of a rabbit. Yellow/brown color.

SIZE: Up to 5 inches.

RANGE: Presently only found in the Neosho and Spring Rivers. Formerly found in the Cottonwood, Fall and Verdigris Rivers.

ENDANGERED SPECIES IN KANSAS.

HABITAT: Prefers swift current over sand/gravel to gravel/cobble substrates.

KNOWN FISH HOSTS: bluntface shiner, cardinal shiner, red shiner, spotfin shiner.



Mapleleaf - *Quadrula quadrula*

KEY CHARACTERISTICS: Deep sulcus and prominent posterior ridge. Yellow/brown color.

SIZE: Up to 5 inches.

RANGE: Found as far west as Cedar Bluff Reservoir and the Arkansas River in Edwards county.

HABITAT: Streams and rivers with mud to sand/gravel substrates. Can survive in impoundments as well as streams.

KNOWN FISH HOSTS: flathead catfish.



Pistolgrip - *Tritogonia verrucosa*

KEY CHARACTERISTICS: Oblong shape, constricted in the middle, with many knobs and ridges on the surface. Yellow/brown color.

SIZE: Up to 7 inches.

RANGE: Mainly southeast 1/4 of state, with scattered populations in south central and northeast parts of Kansas.

HABITAT: Streams and rivers with sand/gravel substrates.

KNOWN FISH HOSTS: black bullhead, flathead catfish, yellow bullhead.



Pondmussel - *Ligumia subrostrata*

KEY CHARACTERISTICS: Rectangular. Straw brown when young, darkening with age.

SIZE: Up to 3 3/4 inches.

RANGE: Eastern 1/2 of the state.

HABITAT: Lakes, ponds and backwater areas of streams and rivers in mud to sand/gravel substrates.

KNOWN FISH HOSTS: bluegill, green sunfish, largemouth bass, orangespotted sunfish



Butterfly - *Ellipsaria lineolata*

KEY CHARACTERISTICS: Shaped like the hind wing of a butterfly, with radiating lines resembling the veins on the wing. Very thick shell. Straw yellow to yellow/brown.

SIZE: Up to 5 inches.

RANGE: Presently only found in the Fall, Neosho, Verdigris and lower Marais des Cygnes Rivers. Formerly found in the Spring River.

THREATENED SPECIES IN KANSAS.

HABITAT: Prefers moderate to swift current over sand/gravel substrate.

KNOWN FISH HOSTS: drum, green sunfish, sauger



Pink Papershell - *Potamilis ohioensis*

KEY CHARACTERISTICS: Broadly oval. Thin shelled. Brown. Nacre purple.

SIZE: Up to 6 inches.

RANGE: Eastern 1/2 of the state.

HABITAT: Lakes, ponds and backwater areas of streams and rivers in mud to sand/gravel substrates.

KNOWN FISH HOSTS: drum, white crappie



Bleufer - *Potamilis purpuratus*

KEY CHARACTERISTICS: Oval, wider at the posterior end. Dark brown to black. Nacre purple.

SIZE: Up to 7 inches.

RANGE: Southeast 1/4 of Kansas with scattered populations in south central part of the state.

HABITAT: Streams and rivers in mud to mud/sand substrates

KNOWN FISH HOSTS: drum

THE TWO SPECIES BELOW ARE CONSIDERED INVASIVE SPECIES. THEY HAVE TREMENDOUS REPRODUCTIVE RATES, NO NATURAL PREDATORS AND CAN COMPLETELY OVERWHELM THE NATIVE AQUATIC COMMUNITY.

IT IS VITAL TO LIMIT THEIR SPREAD IN NORTH AMERICA.

Family Corbiculidae



Asian Clam - *Corbicula fluminea*

KEY CHARACTERISTICS: Triangular, “seashell-like”. Has lateral teeth on both sides of the umbo. Tan color

SIZE: Up to 1.5 inches.

RANGE: Nearly statewide

HABITAT: Streams, rivers and lakes with various substrates

KNOWN FISH HOSTS: Does not use fish hosts. Has free-swimming veliger larvae.

Family Dreissenidae



Zebra Mussel - *Dreissena polymorpha*

KEY CHARACTERISTICS: Toothlike shape. Tan with obvious black stripes, hence the name.

SIZE: Small, less than 1.5 inches.

RANGE: As of fall 2008 found only in El Dorado, Marion, Cheney and Perry Reservoirs, Lake Afton and Winfield City Lake and the rivers below them.

HABITAT: Will attach to any solid surface

KNOWN FISH HOSTS: Does not use fish hosts. Has free-swimming veliger larvae.