



Varnish Clams

What's in a name? Apparently, a lot. Varnish clams are also commonly known as purple varnish clams, purple mahogany clams, dark mahogany clams and, more recently, as savory clams. Their scientific name is *Nuttalia obscurata* but they are definitely not "obscure".



The varnish refers to a brownish, organic layer on the outside of the shell called the periostracum. When the shell dries out this layer often flakes off. The inside of the shell is a beautiful purple color (shown above). Varnish clams are an introduced, often invasive species in the Salish Sea. To encourage clam diggers it has more recently been called the savory clam. Wouldn't you rather eat a savory clam than a varnish clam?

Varnish clams are native to Korea, China and southern Japan. How did they get to our shores in the Pacific Northwest? Presumably, they arrived in the ballast water of ships going to Vancouver B.C. and were first reported in the Salish Sea in Semiahmoo Bay in 1991. Ballast water is taken up and subsequently discharged as needed at different ports. Larvae and other planktonic species (animals, plants, bacteria, and virus) are often in the ballast water and many survive a transoceanic crossing. Dumping of ballast water in coastal waters or near ports of call has been a major factor in introducing non-native species. The U.S. Coast Guard now requires ships to have a ballast water management plan.

Varnish clams have an ecological niche that enables them to thrive in our waters. They can be



reproductively active at one year, earlier than most clams, and can live up to 6 years. Like many marine species, varnish clams reproduce by releasing a huge number of gametes into the water. This is called broadcast spawning. One clam can release 40,000 – 6,000,000 eggs in one season. Life in the plankton is perilous though, and only a small fraction of these eggs survive and grow to be larvae and then settle into the substrate as adults. A long larval time in the plankton expands their range as they travel with the currents. Varnish clams have spread throughout the Salish Sea and outer coast of B.C., Washington and

Oregon. A bivalve larva in the plankton is shown at left.

Varnish clams are versatile in their tolerance to different habitats, allowing them to efficiently compete or exist with other clams. They are often found near freshwater sources like streams, river mouths, and runoff from land. They may be found just a few inches below the surface but can also dig much deeper in the presence of other species of clams. Varnish clams are found in the mid to high intertidal zones. Under the right conditions they flourish. In the San Juan Islands as many as 700 have been reported in a square meter!



Oregon encourages people to dig for varnish clams by allowing up to 72 varnish clams per individual per day. Washington state includes varnish clams in the daily combined limit of 40 clams per individual. What else eats varnish clams? Notice all the broken shells on that sandy beach? Gulls, crows, crabs and moon snails seem to prefer varnish clams since they are abundant, often near the surface, readily available at low tides and have thin shells that are easy to break.



Clams are filter feeders. They have two siphons that extend to the surface which account for many of those holes you see at low tide. Cilia create a current that brings food laden water in through one siphon - appropriately called the incurrent siphon. Food is filtered through the gills and routed to their mouth to be ingested. The filtered water is expelled through their other siphon, the excurrent siphon. Varnish clams often have pea crabs (*Pinnixia faba*) within their shell, making them less attractive as food to some people.

Use caution if you decide to eat the savory varnish clam. They can accumulate higher concentrations of toxins produced by harmful algal blooms (HABs) and retain the toxins longer than most shellfish. Harmful algal blooms are proliferations of certain phytoplankton, like the *Alexandrium* shown at left, that can produce toxins. As filter feeders, clams and other shellfish ingest phytoplankton. When they feed on toxin producing phytoplankton, the toxins are concentrated in the shellfish. Most toxins don't affect the shellfish but can be hazardous to human health and to some marine animals.



Shellfish accumulate toxins at different rates. Mussels take up toxins rapidly and are used by the Washington State Department of Health (DOH) when they initially test for toxin levels. When the toxin reaches a harmful level, the DOH will close a beach for shellfish harvesting. The DOH has a shellfish safety map to show where beaches are closed for shellfish harvesting. Shellfish purge toxins at different rates. You might notice an area continues to be closed for butter and varnish clams since they retain toxins longer than most shellfish, up to two years in some cases.

Varnish clams may also be more susceptible to contaminants from freshwater input. Always consult the DOH Shellfish Safety Map <https://fortress.wa.gov/doh/biotoxin/biotoxin.html> before you dig for any shellfish. It is important to remember that shellfish toxins are not broken down by heating.

We have numerous introduced species in the Pacific Northwest. By 2002 there were over 90 nonindigenous marine species along the coast of British Columbia. An organism is described as introduced if it does not significantly alter the ecosystem and invasive when it decreases the number of native species. Varnish clams are considered invasive in Washington, but they aren't the first introduced species of clam in the northwest. Manila clams were accidentally introduced in the 1930s with oyster seed. Yes, varnish clams are invasive ... can they become perceived as savory?

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