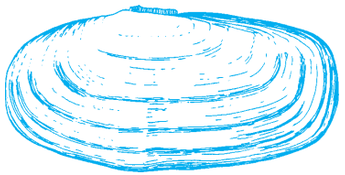
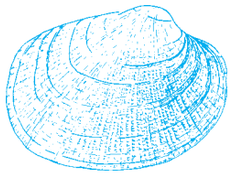
Common Clams, Cockles, Scallops, Oysters of Alaska



Pacific Razor Clam

Siliqua patula
Distribution: Bristol Bay to southern California
Habitat: Intertidal zone, open coasts in sand
Size: Up to 8"
Identification: Long narrow shell, thin and brittle, olive green to brown color

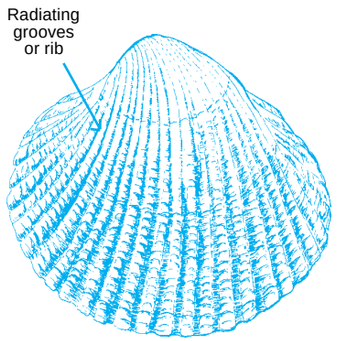


Pacific Littleneck Clam

Prototheca staminea
Distribution: Aleutian Islands to mid-California
Habitat: Midtidal to subtidal zone, mud to coarse gravel beaches
Size: Up to 2½"
Identification: External surface of shell with radiating and concentric grooves

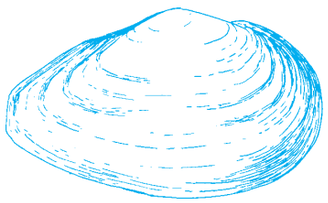
Blue Mussel

Mytilus edulis
Distribution: Northern Hemisphere
Habitat: Rocky intertidal areas of exposed and protected coastline
Size: Up to 4"
Identification: Blue-black to brownish shell, shell pointed at one end and round at the other, has a thread-like structure to attach to substrate



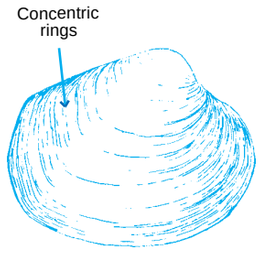
Cockle

Clinocardium nuttalli
Distribution: Bering Sea to southern California
Habitat: Intertidal zone to 90 feet, mud to sand beaches
Size: Up to 6"
Identification: Thick cupped shells, up to 35 strong ribs spreading from the hinge to shell margin



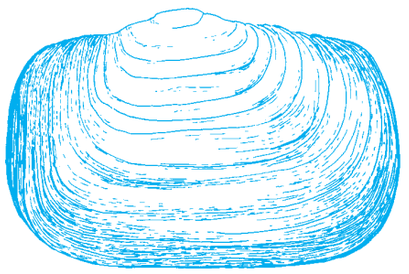
Softshell Clam

Mya arenaria
Distribution: Worldwide north of mid-California
Habitat: Upper tidal level mud flats
Size: Up to 6"
Identification: Shell soft, easily broken, one end of shell rounded, other end pointed, concentric rings only



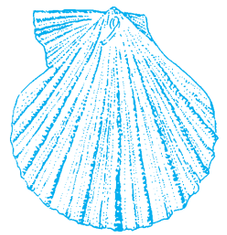
Butter Clam

Saxidomus giganteus
Distribution: Aleutian Islands to mid-California
Habitat: Intertidal zone to 120 feet depth, on protected gravel, sandy beaches
Size: Up to 5"
Identification: Dense shell, external surface with concentric rings, prominent growth rings



Geoduck

Panopea abrupta
Distribution: Sitka, Alaska to Gulf of California
Habitat: Intertidal to deep water, buried deeply in sand and mud bottom
Size: Shell up to 8"
Identification: Shells heavy, one end of shell rounded the other end flat, rough concentric grooves on shell surface

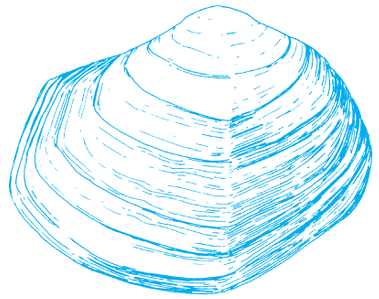


Spiny Scallop

Chlamys hastata
Distribution: Gulf of Alaska to California
Habitat: Low intertidal area to 400 feet depth
Size: Up to 3½"
Identification: Shell thin and flattened, auricles uneven size, 20-30 ribs on each shell, ribs spiny textured

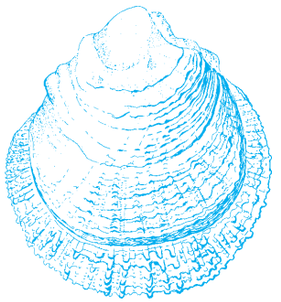
Pink Scallop

Chlamys rubida
Distribution: Bering Sea to mid-California
Habitat: Low tidal area to 900 feet depth, rocky shoreline
Size: Up to 2½"
Identification: Shell thin and flattened, 20-30 ribs on each shell, auricles uneven size, red-pink on one shell, opposite shell color pale



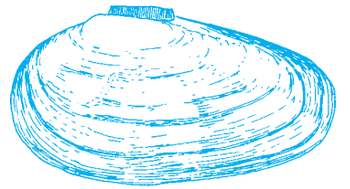
Horse (Gaper) Clam

Tresus capax
Distribution: Shumagin Islands, Alaska to California
Habitat: Intertidal zone, imbedded deeply
Size: Up to 8"
Identification: Shell large and thick, wide gape between shells at posterior end when held together, dark covering on shell surface often partially worn off



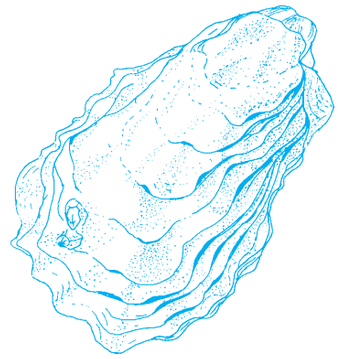
Purple Hinge Rock Scallop

Crassadoma gigantea
Distribution: Aleutian Islands to southern California
Habitat: Low tidal area to 200 feet depth, attached to rocks and in crevices
Size: Up to 10"
Identification: Very heavy rough shell, purple color hinge area when shell open



Alaska Razor Clam

Siliqua alta
Distribution: Bering Sea to Cook Inlet
Habitat: Intertidal zone to 30 feet on open sandy beaches
Size: Up to 6"
Identification: Long narrow shaped shell, shell thin and brittle, brown to olive green color



Pacific Oyster

Crassostrea gigas
Distribution: Kachemak Bay to California
Habitat: Intertidal in mud to rocky beaches. In Alaska only on aquatic farms, but may be a few small populations in southern southeastern Alaska. Does not reproduce in Alaska waters
Size: Up to 8"
Identification: Shell irregular shape, rough surface, upper shell cupped while lower shell flat

Shellfish drawings from *Intertidal Bivalves: A Guide to Common Marine Bivalves of Alaska*, Nora R. Foster. 1991. University of Alaska Press.

Truths and Myths about PSP

Are months with an "r" safe for eating shellfish?

No. Months without an "r" occur during the summer when toxic dinoflagellate blooms that cause PSP most often occur. With the unlikely possibility that shellfish will become toxic outside the summer season, consumers assume shellfish are safe to eat. This answer is wrong in three ways.

1. In some locations in Alaska shellfish remain highly toxic in the spring and fall. PSP outbreaks have occurred in all seasons.

2. Toxic dinoflagellate algae can form cysts that reside in the sediment during the non-bloom seasons. These cysts are as toxic as the suspended vegetative form that are present during a toxic bloom. Shellfish, being bottom dwelling filter feeders, can continue to consume cysts during non-bloom periods and accumulate PSP toxin.

3. Some shellfish can retain the PSP toxin for a long period. Blue mussels in the Skagway area took 28 days before they were safe to eat. Such a long retention time could extend into the fall season. Other shellfish like the butter clams can chemically bind PSP toxin and retain it for as long as two years.

Is there an antidote for PSP?

No. PSP is a neurotoxin that blocks movement of sodium through membranes of nerve cells. Without sodium transmission, nerve cells cannot function. This leads ultimately to the symptoms of PSP: numbness, paralysis, respiratory failure, and coma. There is no specific antidote to stop the effect of PSP toxicity.

Is there a treatment for PSP?

Yes. Induce vomiting by sticking a finger down the throat, drinking warm saltwater, or taking Syrup of Ipecac to expel shellfish from the victim's stomach. Treat the victim for shock and transport to a medical facility. Application of life support services at the medical care facility may be necessary to sustain the life of the victim. Reduction of symptoms normally occurs within 9 hours and complete recovery usually within 24 hours. You must not underestimate the seriousness of PSP. Once the symptoms begin to appear, the victim must be transported immediately to a medical care facility.

Is a toxic algae bloom the same thing as a red tide?

Not always. A number of marine organisms in Alaska cause red tides, including non-toxic dinoflagellates of the genera *Noctacula* and *Mesodinium*. During bloom conditions, single celled organisms can cause the surface water to become red. Toxic dinoflagellate blooms turn red only when a certain density is reached. Individual toxic dinoflagellate cells may actually be most dangerous during the early part of bloom when the red color is less likely to appear. Red coloration often occurs in patches created by winds and water currents passing through the area. Shellfish left in the wake of these moving poisonous patches may remain toxic long after evidence of the algae bloom has passed. Thus, water color alone is not a consistent indicator of PSP toxicity. To emphasize this point, none of the five PSP outbreaks in Kodiak in 1993 were preceded by a red tide. However, if a red tide is in progress, do not eat the shellfish! You may not know what is causing the red coloration.

Is shellfish purchased at a seafood retailer safe to eat?

Yes. Shellfish sold for human consumption must meet the Food and Drug Administration standard of less than 80 µg of PSP toxin per 100 grams of shellfish tissue. Alaska regulations require regular monitoring of commercially harvested shellfish or batch certification that requires each commercially harvested or farm grown batch of shellfish to pass the PSP test prior to market.

Are some clam beaches in Alaska certified to be free from PSP toxin?

No. Unlike other West Coast states, Alaska does not certify recreational beaches for evidence of PSP toxin. The term "certified beach" is used in Alaska, but a certified beach is one that has passed a fecal coliform test. This test certifies a beach free from sewage-caused pollution and indicates the shellfish are free of human pathogens like cholera or hepatitis.

Can I test for PSP in shellfish by chewing a small piece of shellfish tissue and see if I feel tingling in my lips? If no tingling or numbness occurs, is the shellfish OK to eat?

No. Only a mouse bioassay is approved by the U.S. Food and Drug Administration for detection of PSP toxins. The test procedure first extracts PSP toxins from 150 grams of shellfish tissues. The extract is injected into 3 Swiss Webster strain white mice 18-23 grams in weight. The amount of time required for the mice to die is recorded then converted to micrograms (µg) of toxin by substitution into a prescribed mathematical formula.

Chewing on a small piece of shellfish gives you no clue as to the PSP dosage in the tissue. In addition, PSP toxins in an acid pH environment undergo chemical transformations that may produce more potent toxins than originally found in the shellfish. Since your mouth has a nearly neutral pH, the toxins in your mouth may not have the same potency as the toxins that are formed in acidic conditions of your stomach. With data collected during recent outbreaks, the Alaska Department of Epidemiology found evidence of toxin transformations in the digestive tract of humans. The amount of change in PSP toxicity caused by these transformations has not been confirmed and requires additional research.

Is my risk of getting PSP reduced if I dig clams in an area where there is an ongoing commercial fishery?

It depends. In the Cook Inlet region, PSP has not been a problem with razor clam harvesting. During the razor clam fishery for example, commercial harvesters submit a sample for PSP analysis at every other tidal change. The Alaska Department of Environmental Conservation then fills in the remainder of the sampling schedule. This massive testing program has not found PSP levels that exceed the FDA standard. The same is true for the littleneck clam fishery in Kachemak Bay. However, reliance on commercial fishery sampling has a major drawback since you do not have immediate knowledge of the commercial fishery PSP test results.

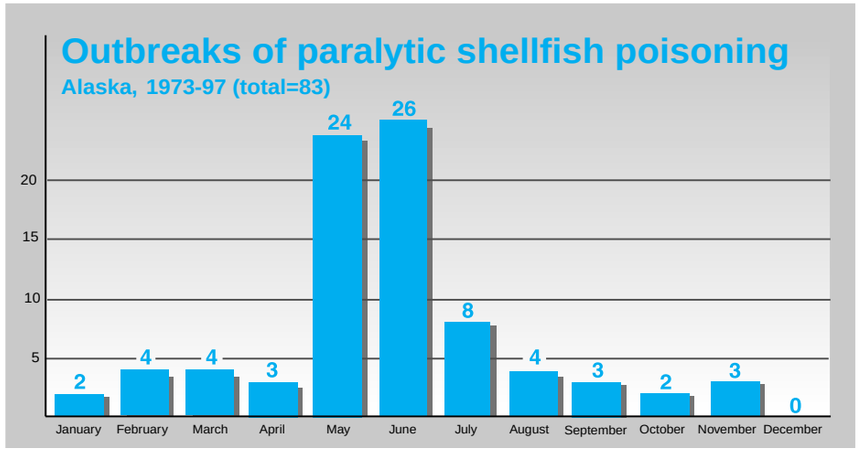
Shellfish from other locations around the state—southeast Alaska, Prince William Sound, Kodiak, and the Aleutians—have PSP toxin problems. Commercial harvest of shellfish in these areas requires certification of the harvested batch before marketing. Again, as a personal use harvester, you do not have access to the PSP test results.

Does cleaning the intestinal contents of the shellfish make them safer to eat?

Sometimes. The digestive tract of the shellfish is the first tissue to accumulate PSP toxin from the food they consume, and cleaning the intestinal contents can reduce your risk if done during the early part of the toxic bloom. The problem, however, is that you have no indication of how long the shellfish have been consuming the toxic algae. After initial consumption by the shellfish, the toxin distributes to other tissues, and the level of toxicity these other tissues achieve depends on a number of factors. Butter clams store highly toxic forms of toxins in their siphon, the part most often eaten. Along with the intestinal contents the most toxic tissues tend to be gonad, siphon, foot, mantle, and gills.

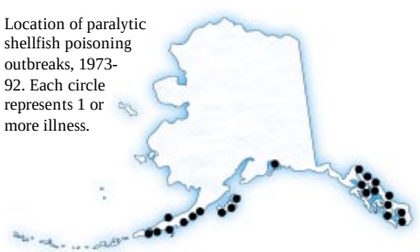
Does cooking eliminate PSP from shellfish?

No. PSP toxins are heat stable. Even when pressure cooked at a temperature of 250ºF for 15 minutes, PSP remains toxic.



Symptoms of 143 people with paralytic shellfish poisoning, Alaska, 1973-94

Symptom	Number
Paresthesia (tingling on skin)	113
Perioral (lip) numbness	64
Perioral (lip) tingling	61
Nausea	45
Extremity numbness	43
Extremity tingling	39
Vomiting	34
Weakness	33
Ataxia (immobility)	32
Shortness of breath	29
Dizziness	28
Floating sensation	24
Dry mouth	23
Diplopia (double vision)	19
Dysarthria (difficulty speaking)	16
Diarrhea	10
Dysphagia (difficulty swallowing)	6
Limb paralysis	4



Location of paralytic shellfish poisoning outbreaks, 1973-92. Each circle represents 1 or more illness.

This information was taken from the Alaska Sea Grant Marine Advisory publication, *Alaska's Marine Resources: Paralytic Shellfish Poisoning, the Alaska Problem.* You can view and download the entire 20-page booklet in PDF format from the Alaska Sea Grant web site at http://www.uaf.alaska.edu/seagrant/issues/PSP/psp_page.html, or call (907) 474-6707 to order your free copy and a complete catalog of all Alaska Sea Grant publications and videos.

Sea Grant Alaska

A Little Bit Goes a Long Way!

It doesn't take much PSP toxin to kill you—just 738 micrograms can kill a 180-pound person. That's equal in volume to about 10 grains of table salt. And even that is invisible because it's dissolved throughout the shellfish body tissue. So BEWARE! No matter what you may hear, there's no way to tell without a laboratory test whether or not shellfish you gather are contaminated.

most deadly ↓ least deadly

Blue Mussel
Toxicity: 20,000 µg toxin

Spiny Scallop
Toxicity: 11,945 µg toxin

Pink Scallop
Toxicity: 11,945 µg toxin

Butter Clam
Toxicity: 7,750 µg toxin

Pacific Razor Clam
Toxicity: 3,294 µg toxin

Alaska Razor Clam
Toxicity: 3,294 µg toxin

Cockle
Toxicity: 2,252 µg toxin

Purple Hinge Rock Scallop
Toxicity: 2,000 µg toxin

Geoduck
Toxicity of viscera: 1,526 µg toxin

Pacific Oyster
Toxicity: 910 µg toxin

Pacific Littleneck Clam
Toxicity: 580 µg toxin

Horse (Gaper) Clam
Toxicity: 281 µg toxin

Softshell Clam
Toxicity: 47 µg toxin

Toxicity levels shown (in a single shellfish) are the highest recorded in Alaska as of 1994. The FDA considers anything above 80 µg (micrograms) of toxin not safe to consume.