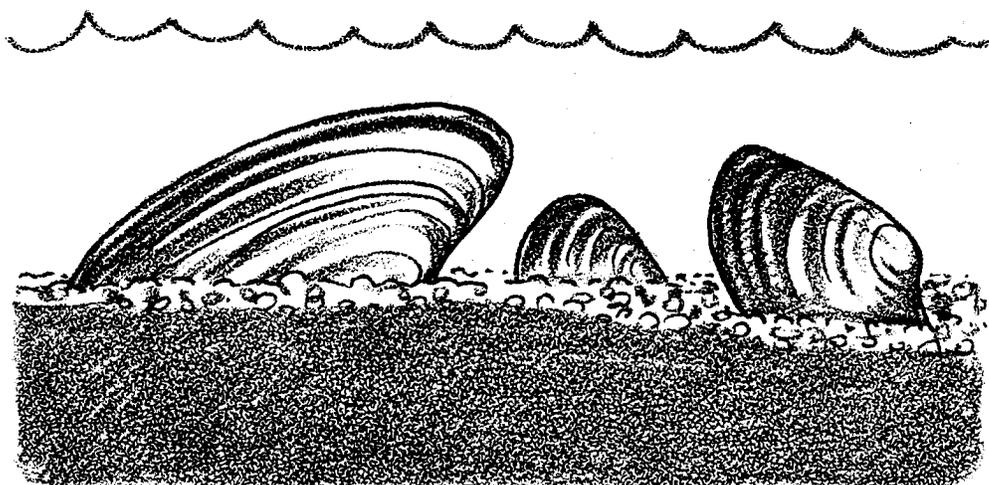


Asian Clam: Part II

Key Concepts

1. Human activities, such as shipping, can transport species long distances and introduce them to new areas.
2. Introduced species affect the ecosystem of their new environment.



Background

The Asian clam, *Potamocorcula amurensis*, has recently become very abundant in San Francisco Bay. It is a native of China, Japan and Korea, and is thought to have been released into the bay in the ballast water of cargo ships. Many of these cargo vessels arrive with thousands of tons of ballast water that has been taken up at the home port. Ballast water helps a ship maintain stability on ocean voyages when the cargo load is uneven or light. Ballast water is often released at dockside upon arrival. This water contains large numbers of larval forms of marine life. Many species have been introduced to new areas through shipping activity.

The Asian clam was first recorded in San Francisco Bay in 1986. Within two years it had spread throughout the area. It has a number of characteristics which make it a tough competitor with local species:

1. Tolerant of a wide range of salinity: from less than .1% (nearly fresh water) to 3.3% (ocean water). This clam is found up near the mouth of rivers that empty into the bay, as well as out in the more saline south bay.

2. Lives in a wide range of sediment types. This clam has been found in mud, hard clay, coarse sand, and abundantly on mixed mud-sand bottoms.
3. Grows to about the size of a thumbnail, a size usually not practical for harvesting as a menu item. (Although, a close cousin of *P. amurensis* is harvested for poultry feed in Asia.)
4. Lives near the surface, with 1/2 or more of the shell exposed above the sediment. This behavior may provide a competitive advantage for collecting planktonic food. It has very short siphons, and can in effect lengthen them by projecting its shell above the mud.
5. Consumes diatoms as well as other planktonic forms. Since diatoms are extremely small, it appears that the clam's filtering mechanism is extremely efficient. In large numbers it could affect the planktonic population of the bay. This could deprive other plankton feeders, such as the young of Striped Bass.
6. Appears to be fairly mobile, as is common with shallow-dwelling clams. The movements significantly disturb the surface sediment layers. Other sediment dwellers may be affected by this disturbance, such as other clams, worms, crabs.
7. Although it is too early to tell, *P. amurensis* could become an important prey item for diving birds, sturgeon, and crabs.

Teaching Hints

When the students have some knowledge of clam anatomy and lifestyles from Part I of this activity, introduce them to the Asian clam. Provide the following information about the Asian clam to the students.

Asian clams are:

- a. tolerant of a wide range of salinity: from less than .1% (nearly fresh water) to 3.3% (ocean water).
- b. live in a wide range of sediment types. This clam has been found in mud, hard clay, coarse sand, and mixed mud-sand bottoms.
- c. grow to a size slightly larger than your thumbnail.
- d. live very near the surface, with 1/2 of more of the shell exposed above the sediment.
- e. have very short siphons.
- f. consume diatoms as well as other types of plankton. Since diatoms are extremely small, these clams have very efficient filtering mechanisms.

- g. appear to be quite mobile, as is common with shallow-dwelling clams. The movements significantly disturb the surface sediment layers.

Ask your students to work in groups and decide what effects can be expected from the introduction of this new species into San Francisco Bay. Encourage students to think of how the Asian clam might affect other filter-feeding organisms, sediment dwellers, the local clam population. How might it affect the food supply of animals that eat clams, such as crabs, diving and wading birds? Encourage the groups to discuss each piece of information above, and incorporate it into their conclusions as supporting evidence.

Your students will be thinking about this new species in the same way that biologists do. Since the lifestyle of the Asian clam is becoming known, what effects can we expect from its abundant presence? Ask each group to present and defend their conclusions.

Extensions

1. For more information, contact:

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