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Siliqua patula

The flat razor clam (Dixon, 1789)

Phylum: Mollusca
Class: Bivalvia; Heterodonta
Order: Veneroida
Family: Solenidae

Description

Size—to 150 mm (5 ¾") (Morris et al. 1980); average size 41/2 x 2'1; adults over 40 mm (Coan and Carlton 1975).
Color—periostracum smooth, brown, shiny, lacquerlike. Exterior white, obscurely rayed, with faint violet coloration; interior white, tinged with violet and pink.
Shell Shape—"smooth within and without" (Dixon 1789); elongate, rather cylindrical; length about 2 1/2 times width. Valves similar, gaping at both ends. Beaks toward anterior end. family Solenidae (Coan and Carlton 1975), (beaks in Siliqua sp. are subcentral; toward the anterior, but not close to its). Posterior end round, shell very thin, sharp edged, profile thin (fig. 4).
Hinge Area—left valve with two cardinal and two lateral teeth; right valve with one cardinal and one lateral tooth (fig. 2); a vertical or radial rib projects downward and anteriorly from hinge in both valves: genus *Siliqua* (Keen and Coan 1974) (fig. 2).
Ligament—external, not on nymph (fig. 2).
Animal—siphons short, fused except at very tips (fig. 4); exhalant and inhalant openings ringed by tentacles.
Young—oval outline until about 2.5 mm long (Pohlo 1963): (with central beak, not elongate).

Possible Misidentifications

Solenidae are cylindrical, about 2 1/2 times as long as high, and gape at both ends. One other local giitilut.t has beaks quite near the anterior end, not subcentrally in Siliqua: *Solen* sp. have an almost straight dorsal margin, a terminal beak, and one cardinal tooth in each valve (Keen 1971). Solen sicarius, the blunt razor shell, is found occasionally in permanent burrows in mud or muddy sand, ie both intertiaally and sub-tidally (Kozloff 1974a). It is the species most likely. to be confused with *Siliqua patula*. It lacks *Silqua*'s interior vertical rib and multiple hinge teeth, and is 4 times as long as wide, not 21/2 times. (Keen and Coan 1974)

One other species of *Siliqua* is found farther south (to Monterey Bay): *Siliqua lucida*, a small (to 40 mm) razor clam, lives in protected bay sands, has a truncate posterior end, a vertical internal radial rib and concentric brown bands on its exterior. Old bookslist *S. patula* variation nuttalli, with a more oval shape, purple beaks and four hinge teeth in the left valve, not two (Oldroyd 1924).

There are other razor-shaped clams besides the Solenidae. The Mytiiidae (mussels) include some genera, Adula for instance, which are long and cylindrical. Adula is usually a boring species, however; it has a hairy posterodorsal slope (Coan and Carlton 1975), a very small anterior adductor scar, and no hinge teeth. (Keen and Coan 1974) Hiatellidae, including the geoduck, Panope, are large, quad-rate, gaping bivalves, without hinge teeth, and with nearly equal adductor muscle scars (Keen and Coan 1974).

One long, cylindrical bivalve of the family Psammobiidae, Tagelus californianus, the jackknife clam, could be confused with Siliqua. It too has nearly central beaks, is about 21/2 times as long as wide, and gapes at both ends. It never has the internal strengthening rib of Siliqua, however, and its ligament is seated on a nymph or projection (as in Protothaca staminea, see plate). Tagelus is gray, has no lateral teeth, and has short siphons (Coan and Carlton 1975). It is found below Humboldt Bay, California, in mudflats.

Ecological Information

Range—Aleutian Islands to Pismo Beach, California; but uncommon in California (Weymouth and Holmes et al 1931).
Local Distribution—Coos Bay: Pt. Adams spit near Bay mouth; usually on open coast.
Habitat—flat, open beaches with fine, clean sand; in strong surf zone with aeration (Anonymous 1968) No permanent burrow. Niche assumed farther south by the Pismo

clam, Trivela stultorum (Ricketts and Calvin 1971).
Salinity—full seawater.
Temperature—lives in cold to temperate wsterc
Tidal Level—about - 1.0 ft. and lower (Kozloff 1974a).
Associates—olive snail *Olivella biplicata*, caprellid amphipods, polychaetes, including *Ophelia*. Commensal nemertean *Malacobdella grossa* occurs in up to 80% of the clams (fig. 1a).

Quantitative Information

Abundance—can be very abundant in certain local areas; populations move and fluctuate, due partly to storms, surf. Once harvested commercially along northwest coasts. Unrestricted digging severely harmed populations (Weymouth and McMillin 1931): down-ward trend began around 1925. Densest near mean low water (Anonymous 1968). 1976 Oregon total harvest 2,211,000 clams (Link 1977).

Life History Information

Reproduction—high fecundity, high mortality (Anonymous 1968). Separate sexes; eggs and sperm discharged into sea, fertilization by chance; 6-10 million eggs can be produced by a female. Spawning activated by minimum water temperature of 13°C (Fraser 1936). 86% of third year clams (10 cm long) mature or maturing (Queen Charlotte Island) (Fraser 1936). Mass spawning late May or June (Washington): occasionally huge sets of young. Larval stage 8 weeks; larvae free swimming but stay close to sand. After metamorphosis, size of wheat grain or smaller; to 1.5 cm by end of growing season (December, Washington) (Anonymous 1968).
Growth Rate—3½ years to legal size of 4 1/2" (11.5 cm) (Washington), where animals grow rapidly, do not reach a large final size or live as long as they do in Alaska (Weymouth and Holmes 1925). Growth rate slows after 10 cm size reached (Weymouth and Holmes et al 1925); growing seasons show as wide brown areas between rings, which are annual. Mortality in young probably 99%; greatest losses from storm movement (Anonymous 1968).
Longevity—
Food—a filter feeder of planktonic diatoms.
Predators—man probably the most highly prized food mollusk in the northwest; seagulls, ducks, perch, crab (Anonymous 1968).
Behavior—known for its quick, efficient digging ability: it can bury itself in less than 7 seconds, and moves especially rapidly in the second or "slosh" layer of sand (Anonymous 1968). Digging accomplished by ability of the anchor-shaped foot to change shape. Extra-ordinary muscle capacity and the displacement of body fluids are responsible for this (Pohlo 1963). Digging is vertical, sometimes angled toward the sea; very little horizontal movement.

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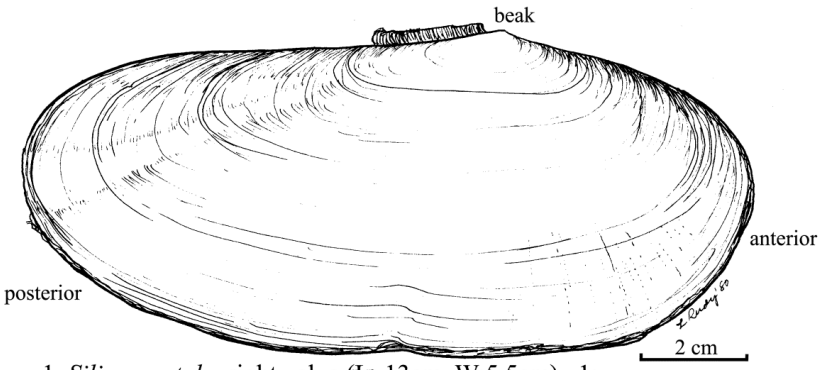
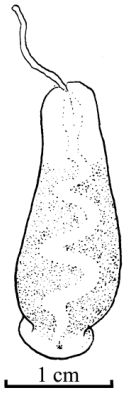
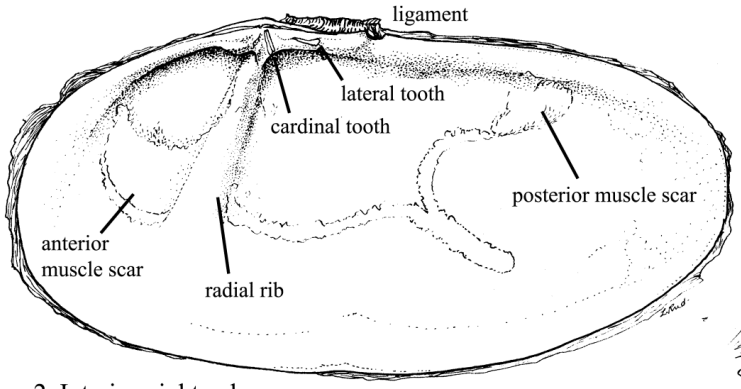


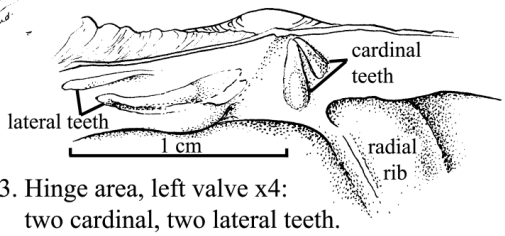
1. *Siliqua patula*, right valve (L: 13cm, W:5.5cm) x1:
length 2.5x width; shell cylindrical, shiny, brown; beaks subcentral, slightly anterior; posterior rounded.



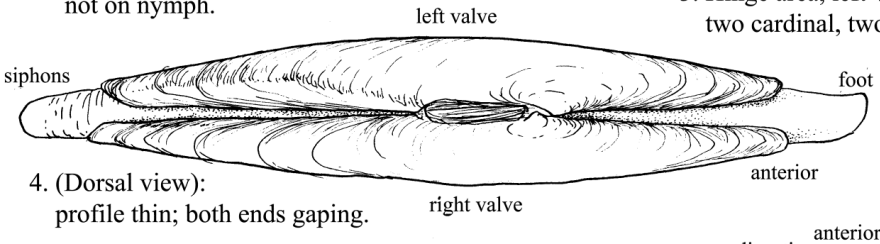
1a. *Malacobdella grossa* x2:
actural size 2.5 cm, commensal nemertean (Smith & Carlton, 1975).



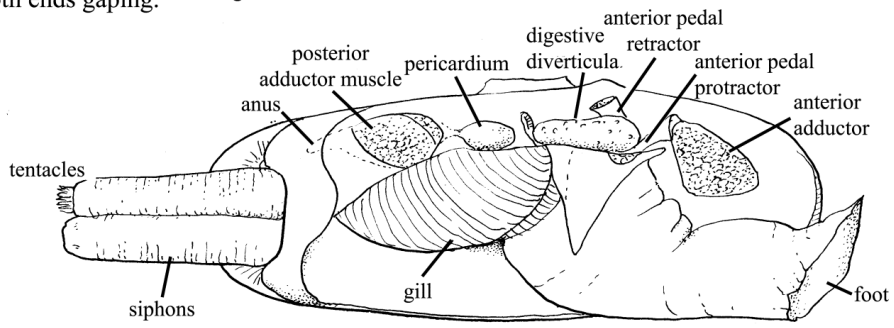
2. Interior, right valve:
one cardinal tooth, one lateral tooth; prominent radial rib; ligament external, not on nymph.



3. Hinge area, left valve x4:
two cardinal, two lateral teeth.



4. (Dorsal view):
profile thin; both ends gaping.



5. Dissection, right valve removed
(Pohlo, 1963)