
Lottia pelta

The shield, or helmet limpet

Phylum: Mollusca

Class: Gastropoda, Patellogastropoda

Order:

Family: Lottioidea, Lottiidae

Taxonomy: A major systematic revision of the northeastern Pacific limpet fauna was undertaken by MacLean in 1966. *Notoacmea* was at first considered a subgenus and then later a full genus (MacLean 1969). *Colisella* was synonymized with *Lottia*, and later *Notoacmea* was replaced with *Tectura* (Lindberg 2007). The current practice in The Light and Smith Manual is to use only *Acmaea* and *Lottia* to describe Pacific Northwest species (Lindberg 2007).

Description

Size: 25mm (Brusca and Brusca 1978); can reach 40 mm farther north (Kozloff 1974b Yanes and Tyler 2009); illustrated specimen, 32.5 mm.

Color: Extremely variable dependent on substrata (Sorensen and Lindberg 1991); called the brown and white shield limpet by Ricketts (Ricketts and Calvin 1971); gray, slightly raised ribs with white, sometimes green, between them; some specimens without ribs, but with a checkered or striped pattern. Slightly hooked apex eroded.

Shell:

Shape: Elevated, height usually greater than $\frac{1}{3}$ length (Carlton and Roth 1975); surface with fine regular ribbing, anterior space straight or very slightly concave; apex subcentral, very slightly directed anteriorly (fig 2); posterior slope slightly convex, nearly straight (Kozloff 1974a). Margin slightly scalloped with contour intervals 1.11 mm on a 3 cm individual, and when oriented anteriorly upstream exhibits 40% reduction in drag at 1.6 m/s water velocity (Denny 1989). Exhibits several ecophenotypes or “morphs” based on its substrata and diet

(Sorensen and Lindberg 1991). May be fouled with a sabellid (Kuris and Culver 1999).

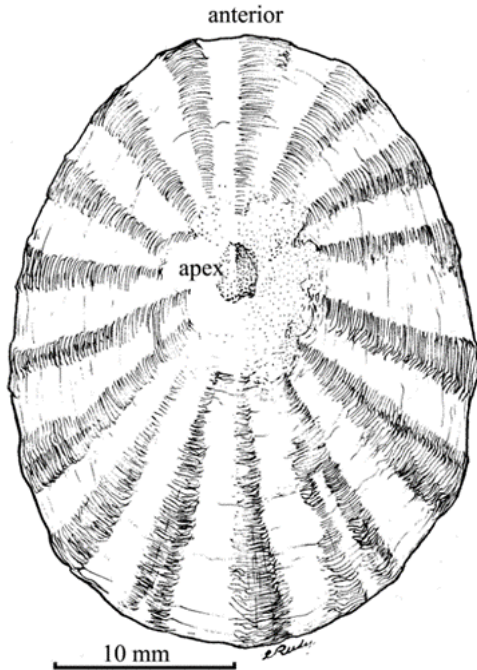
Interior: Blue gray to white, with subapical brown spot (fig 3), and horseshoe-shaped muscle scar joined by a thin, faint line (fig. 3) (Keen and Coan 1974). Uses suction to attach to substratum, as well as a glue that may be helpful in maintaining a seal around the edge of their feet on irregular surfaces (Smith 1991).

Possible Misidentifications

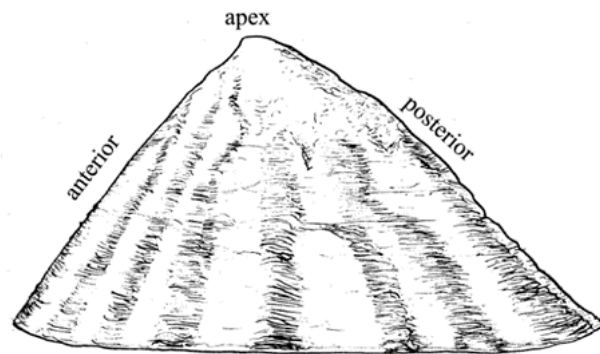
Many species of limpets of the family Acmaeidae occur on our coast, but only about four are found in estuarine conditions. *Lottia scutum* (= *Notoacmaea*), which, like *Lottia pelta*, have a horseshoe-shaped muscle scar on the shell interior, joined by a thin curved line, and various coloration, but not pink-rayed or white. These two genera differ in that *L. pelta* has a pair of uncini or teeth on the radula (not figured), while *L. scutum* does not. *L. scutum* also has significantly longer cephalic tentacles (5.5mm) than *Lottia* (3.7mm) (Bros 1986) and are usually not as heavily ribbed as *Lottia* species (Keen 1971). *Lottia scutum* is also found only occasionally in bays, is thick shelled, and rather flat with coarse lines quite like those of *L. pelta*. It has a subcentral apex and a low elevation and is often filmed with algae.

Lottia digitalis, the common fingered limpet, differs from *L. pelta* in having an apex very close to or even overhanging the anterior margin, which forms a strong hook; its anterior slope is concave. This species has strong raised ribs and a moderately scalloped edge; its rough ribs may show only on the posterior slope. It occurs higher in the tidal range than

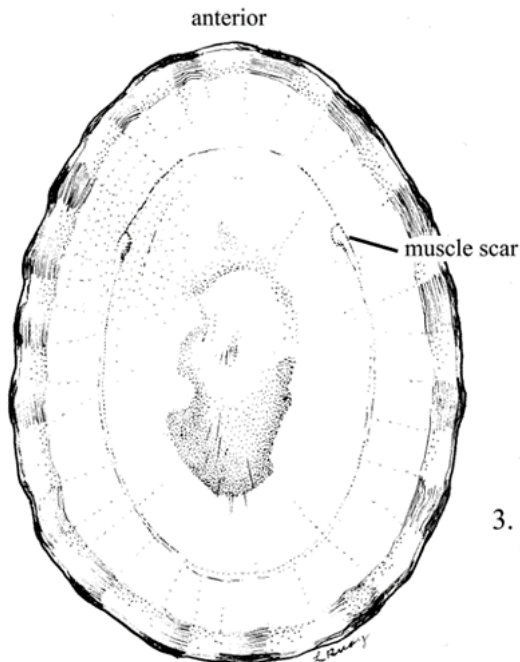
Lottia pelta



1. *Lottia pelta* (L:32.5mm, W:24mm) x3:
uniform gray, low ribs; apex subcentral;
margin slightly scalloped.



2. (Lateral view, H: 17mm) x3:
anterior slope straight, posterior slope
slightly convex; apex subcentral, slightly
hooked.



3. Interior:
horseshoe-shaped muscle scar joined by
thin line; subapical brown spot.

does *L. pelta*.

Lottia strigatella, once thought to be a hybrid of *Lottia digitalis* and *L. pelta*, has been found just inside Coos Bay. Like *L. digitalis*, it has a hooked apex near the anterior margin, and a slightly concave anterior slope. It is a bay dwelling form of *Lottia limatula*, *L. l. moerchii*, has a higher elevation than the usual form of that species. It has buff and dark mottling, or greenish brown with white bands; its ribs are imbricated (set like tiles); its edges are serrated. It has not been found as far north as Oregon.

Lottia persona is also found in bays. It is large, nocturnal and smooth. It has an anterior hooked apex and is dark brown with white checked edges.

Lottia pelta young can resemble the limpet *Lottia insessa* which lives only on the marine alga *Egregia*. *N. insessa* adults are brown, translucent and smooth. (See Young, above).

Ecological Information

Range: Aleutian Islands to Punto Santo Tomas, Baja California (Ricketts and Calvin 1971).

Local Distribution: Coos Bay, South Slough and Cape Arago.

Habitat: On rocks (locally), also with various algae (e.g. *Laminaria*, *Egregia*; Abbott and Haderlie 1980) and in mussel beds (Carlton and Roth 1975); eurytopic; South Slough: on floats, under rocks.

Salinity: Collected at 30.

Temperature:

Tidal Level: Just below *L. digitalis* and *N. persona* (Puget Sound) at 0.15 to 1.8 m (Tyler et al. 2014); on rocks usually uncovered by the tide. On outer coast, upper-mid to lower mid-intertidal (Brusca and Brusca 1978).

Associates: *Lottia digitalis*; in mussel barnacle aggregations on pilings. With algae *Egregia*, *Postelsia*, *Laminaria*, and *Endo-*

cladia.

Abundance: Not common in bays; relatively common on outer coast (Brusca and Brusca 1978).

Life-History Information

Reproduction: Separate sexes; eggs rose colored (Hadfield and Strathmann 1996) with sperm shed into sea. In lab, ova developed into trochophore larvae 24 hours post-spawn, and after 3-4 days are capable of retracting into their post-torsional shells; many settled after 8 days and metamorphosed after 28 (Hadfield and Strathmann 1996). Estimated pelagic period of 6-7 days in situ with a 3+ week-long settlement phase following thereafter (Hadfield and Strathmann 1996). Active throughout year; spawns at sea temperatures of 48.5°-60°F (Fritchman 1962).

Larva:

Juvenile: Some subadults (over 6 mm) with dark brown exterior, lustrous, smooth and with fine radial sculpture, living on alga *Egregia*. Interior light brown to gray, with postapical brown spot. (*Lottia insessa*, of which subadult *pelta* is similar, is dark brown inside.)

Longevity:

Growth Rate: Probably grows faster than *C. digitalis*, to 30 mm in 3 years (Abbott and Haderlie 1980).

Food: They consume a variety of microscopic and large algae, but especially common erect algae (Abbott and Haderlie 1980); was shown to eat more of the red algae *Mazzaella* in shaded, warm conditions (Menge et al. 2002); significantly reduce the crust thickness of coralline algae *Lithophyllum impressum* (Steneck et al. 1991).

Predators: Seastars: *Pisaster ochraceus*, for which it has developed an escape mechanism (Margolin 1964); few (2.4%) drilled by *Nucella*, to which *L. pelta* may be resistant at a certain size (14mm in elevation, 25 mm in length; Yanes and Tyler, 2009); black oyster catcher (*Haematopus bachmani*), whom has difficulty

in visually predated *L. pelta* morphs that match their substrate (Sorensen and Lindberg 1991); experimental caged protection against bird depredation did not result in increased *L. pelta* abundance (Wootton, 1992); one laboratory feeding trial reported 57% mortality due to predation by cancrid crabs (Tyler et al. 2014).

Behavior: A small percentage exhibit homing behavior (Abbott and Haderlie 1980); do not feed at all high tides and will only move and feed when submerged or wet by waves (Abbott and Haderlie. 1980).

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