**Nucella lamellosa** (= Thais)

The wrinkled or frilled dogwinkle (Gmelin, 1791)

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**Description**

**Size**—to 50 mm (California) (Morris et al. 1980), 100 mm Puget Sound and north (Kozloff 1974a); largest specimen figured, 54 mm (fig. 1). Largest of the *Nucella*.

**Color**—white to brown, some are pink, lavender or orange tan; not highly polished. Inside whitish, sometimes with color showing through.

**Shell Shape**—shell heavy, solid, strong; spirally coiled, fusiform (spindle-shaped). 5-7 whorls; nuclear whorl small, in-conspicuous. Spire usually high; siphonal canal relatively long for genus; aperture ovate, almost 1/2 shell length.

**Sculpture**—extremely variable. Spire and base have similar sculpture: genus *Nucella* (Smith and Carlton 1975, Keen and Coan 1974). Axial ribs present (fig. 1). Three chief variations with many gradations): lamellar variety with strong axial ribs, developed in quiet water specimens into frilly ruffles (fig. 4); (2) *Nucella* from rough conditions are smooth, with only faint axial sculpture (figs. 1, 3); and (3) strongly sculptured spirally with one to two strong horizontal ribs at top of each whorl and smaller ribs below; axial sculpture only between ribs. This variety has flattened and angled whorls (fig. 2) (Kozloff 1974a).

**Outer Lip**—thickened, smooth, without denticles on posterior portion of aperture (near anal notch); no single strong tooth on edge near anterior canal (see Possible Misidentifications). Outer lips rounding smoothly to anterior end of shell. At least one row of denticles within lip (fig. 1).

**Columella**—(central pillar): without folds (Kozloff 1974a); incrusted, smooth.

**Suture**—(between whorls): Impressed, distinct, but not a deep groove.

**Anterior (Siphonal) Canal**—short, but longer than other *Nucella* species; narrow, slot-like, not spout-like (i.e. with edges touching, making a closed tube: see Possible Misidentifications). Not separated from large whorl by revolving groove (fig. 1).

**Aperture**—almost 1/2 length shell; ovate to quadrate in outline, with a siphonal notch, but no anal notch (fig. 1). Widest part of aperture (generally near its middle) at least half as wide as shell (Kozloff 1974a).

**Umbilicus**—small, often closed (fig. 1).

**Operculum**—usually large enough to close aperture; conspicuous, with strong spiral lines; with nucleus on one side (fig. 1a).

**Eggs**—vase-shaped, yellow, about 10 mm long; in clusters on underside of rocks (Morris et al. 1980); called "sea oats"; (fig. 1b).

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**Possible Misidentifications**

*Nucella* can be distinguished from other predatory estuarine snails by its sculpture, which is the same on the whorls and spire, by the large last whorl and by the ovate aperture (about 1/2 the shell length). Unlike *Nassarius*, it has no distinct revolving furrow setting off the body whorl from the anterior canal (Keen and Coan 1974). It has no single strong tooth on the anterior margin of the outer lip, as in *Acanthina*. There are no columellar folds as in *Olivella, Buccinus*, etc. The siphonal canal is not spout-like, as in *Ocenebra*, and *Ceratostoma*.

There are several species of *Nucella* in the northwest:

*Nucella lima*, the file dogwhelk, is a subtidal snail with about 16 alternating large and small file-like spiral ridges on the large whorl. It is fairly rare, is whitish to brown in color, short-spired and somewhat smaller than *N. lamellosa* (to 43 mm).

*Nucella canaliculata*, the channeled dogwhelk, is white to or orange, sometimes banded. It has a high spire, a prominent shoulder below the deep suture, and rounded spiral ridges of equal size with axial lamellae between them. It is small, to just over 30 mm. Usually found in mussel beds, it is rare in bays (Kozloff 1974a).

*Nucella emarginata* (which see) is the other *Nucella* most often to be found in estuaries; it usually occurs in heavier surf than *N. lamellosa*. Called the rock-dwelling dogwinkle, it is generally only up to 20 mm long. This snail has alternately large and small, often...
nodulose, spiral ridges over most of the shell. (These ridges are often obscure). It has no noticeable axial sculpture. Found in the mid- and high intertidal in mussel beds, it is easily confused with variation of N. lamellosa (fig. 2).

*Nucella* was previously called *Thais*. This name is now re-served for subtropical and tropical species.

**Ecological Information**

**Range**—Bering Strait to central California (Morris et al. 1980).

**Local Distribution**—Coos Bay: Pigeon Point, Empire; Umpqua estuary: Ziolkowski Beach (1/2 mile from mouth).

**Habitat**—on rocks with mud, sand substrate; often in protected bays (Carlton and Roth 1975); below mussel beds on outer shores.

**Salinity**—collected at 30 ‰ salt: lower, more marine parts of bays with more constant saline concentrations.

**Temperature**—cold to temperate waters: geographic distribution would indicate a preference for cool temperatures. Lower part of bay does not generally have high temperatures. Smallest individuals have highest thermal limits; snails active at 0-30 °C (Bertness 1977).

**Tidal Level**—found at low intertidal, below other species of the genus. Largest animals lowest in tidal range (Bertness 1977).

**Associates**—its primary prey: barnacle *Balanus*; the under-rock community: porcelain crab *Petrolisthes*, brachyuran crabs *Hemigrapsus* and *Cancer oregonensis*, chiton *Mopalia*, isopod *Idotea*, anemones *Anthopleura elegantissima* and *A. artemesia*, nudibranch *Onchidoris*, gastropod *Tegula*; *Pisaster ochraceus*. Discarded *N. lamellosa* shells are often inhabited by the hermit crab *Pagurus hirsuitusculus*.

**Quantitative Information**

**Weight**—largest collected (including shell) 28 gr. (wet).

**Abundance**—one of the most abundant intertidal snails of the northwest; becomes less abundant in California. By far the most common *Nucella* species in the Coos Bay estuary.

**Life History Information**

**Reproduction**—breeding in winter and spring (California) by aggregations of snails; individuals become sexually mature in 4th year, when they often return to their hatching site and join a breeding group (Morris et al. 1980); individuals tend to breed with same group. Egg capsules deposited synchronously by females; development varies with temperature: snails emerge after 140 days (at 6.8°C), after 67-91 days (9.6-11 °C). Capsules rarely contain "nurse eggs" (sterile eggs to be consumed by the developing snail larvae): nearly all eggs are fertile (Lyons and Spight 1973). Just over half of eggs reach hatching stage; high mortality among young snails: of 1000 eggs (from one female, one year), probably fewer than 10 grow to 1 year of age.

**Growth Rate**—varies greatly with food supply. Shell growth, type, dependent on food: barnacle diet produced heavy, stout shells.

**Longevity**—sexually mature at four years (Morris et al. 1980).

**Food**—primarily barnacles: *Balanus glandula* and *B. cariosus*, on which it is the primary predator (Puget Sound) (Kozloff 1974a). Mussels (outer shores), periwinkles and other mollusks. Radula penetrates shell of prey with aid of secretions from boring organ on foot (Morris et al. 1980).

**Predators**—egg capsules and young snails heavily preyed upon by other *Nucella*.

**Literature Cited**


**Nucella lamellosa**

1. *Nucella lamellosa* (posterior view, H:54mm) x2:
   smooth variety; fusiform; 5 whorls (nuclear whorl inconspicuous); axial sculpture on both spire and body whorl; ovate aperture almost 1/2 shell length; narrow anterior canal; smooth outer lip without posterior denticles, anal notch or marginal tooth; columella without folds; interior rows of denticles, umbilicus closed; suture not deep.

2. Spiral ribbed variation x2:
   1-2 strong horizontal ribs at top of each whorl, smaller ribs below; fine axial sculpture between ribs; whorls angled, flattened.

3. Smooth, banded variation x2

4. Frilly, lamellar variation x1:
   axial sculpture strong.

1a. Operculum x2

1b. Egg cluster x1