
Callianax biplicata (= *Olivella biplicata*)

The purple olive (Sowerby, 1825)

Phylum: Mollusca
Class: Gastropoda
Order: Neogastropoda (=Stenoglossa)
Family: Olividae

Description

Size—large for family: to 30 mm long (Carlton and Roth 1975); mature at 16 mm (Edwards 1968); males larger than females. Width usually about twice as high as wide (Kozloff 1974a). This specimen 18 mm high, 9 mm wide.

Color—gray, purple fasciole (band) at base offset with dark line (fig. 1); faint vertical striations, but surface otherwise polished, unsculptured: genus *Olivella* (*Callianax*) (Carlton and Roth 1975).

Shell Shape—stout, robust, sub-cylindrical; spire only slightly elevated; 5-6 whorls. Body whorl convex, nearly flat near thin straight outer lip; aperture elongate, triangular, with anterior notch (fig. 2).

Columella—strong callus, with a fold of 2 incised spiral lines or plications in lower portion: sp *biplicata* (fig. 2).

Operculum—small, horny, thin, half ovate, apical nucleus (not figured).

Animal—eyeless; foot plow-shaped, for burrowing (McLean 1969). Long siphon for water intake (fig. 3). Radula with 3 teeth to the row: Neogastropoda (not figured).

Eggs and Young—egg like a dome-shaped hat, about 0.5 mm diameter (fig. 4a). Veliger 0.2-0.3 mm (fig. 4b) (Edwards 1968).

Possible Misidentifications

Callianax species are the only genus of the family Olividae in our north temperate waters; the larger *Oliva* is a warm water genus. The genus *Callianax* may be distinguished by its smooth surface, slight spire, elongate, notched aperture, clean sand habitat, and in *C. biplicata* by its columellar folds. At least 3 *Callianax* are found on the west coast:

Callianax baetica, slenderer than *C. biplicata* ($2\frac{1}{2}$ x as high as wide), shell tan or cream with red, brown or purple markings and lines: it can be found on protected beaches and subtidally. It is smaller than *C. biplicata*—only up to 19 mm. It is found in Puget Sound as well as in California (Kozloff 1974a; Carlton and Roth 1975).

Callianax pycna, another small olive (to 19 mm), is stout, and has brownish zig-zag lines on its whorls (Carlton and Roth 1975). It is not found in Puget Sound, but is a more southern species.

Characteristics of the family Olividae include a polished shell (indicating that the mantle often covers it), a subcylindrical, spired shell with an aperture greater than $\frac{1}{2}$ the shell length. They are usually sand dwellers.

Ecological Information

Range—Vancouver Island to Magdalena Bay, Baja California: Oregonian and Californian shallow water marine faunal provinces.

Local Distribution—outer, marine portions of most bays and estuaries, including Coos Bay, Netarts (Stout 1976).

Habitat—sandy beaches and spits of bays, as well as outer coast. Can concentrate metals in tissues, apparently without harm (Morris et al 1980).

Salinity—full sea water.

Temperature—

Tidal Level—low intertidal to subtidal waters: lives in quite a wide band (Kozloff 1974b); found higher than and associated with the razor clam: *Siliqua patula*.

Associates—*Siliqua patula*; parasitic nematodes (Edwards 1969): in southern California, hydroids on spire.

Quantitative Information

Weight—

Abundance—common intertidally (Carlton and Roth 1975).

Life History Information

Reproduction—dioecious (two sexes); mating behavior observed at every low tide, all year: no 'year classes' in Oregon waters. Mate selection by chemosensory means; internal fertilization. Only sexual dimorphism observable is larger size of males. Sterility rate may be as high as 50% due to trematode infestation. Single egg cases deposited usually on empty shells; egg development

time variable: 10-28 days (Edwards 1968).

Veligers nonpelagic: swim near substrate (Edwards 1968).

Growth Rate—to maturity (16 mm) in one year. Males grow faster than females and are larger. Growth rate varies from 0.1 mm to 9.7 mm/year (Stohler 1969). Few young reach maturity; mostly populations of older animals, which have a low mortality rate (Edwards 1969).

Longevity—possibly several years: as many as ten (Edwards 1968).

Food—family is carnivorous; scavengers animal matter; large *Callianax* will eat polychaetes (Edwards 1969).

Predators—*Pisaster brevispinus* (Coos Bay, North Spit) (Edwards 1969): small *Cancer antennarius* and *C. magister*, shorebirds, particularly gulls; fish; man, for ornament (Stohler 1969). In southern California: mollusks *Octopus*, *Polinices*, *Conus*, echinoderm *Astropecten* (Stout 1976).

Behavior— reacts to predator *Pisaster brevispinus* by crawling or by rapid upside down swimming (Edwards 1969). Trails near surface. shell partly exposed. Larger animals active at night and hide from predators during the day.

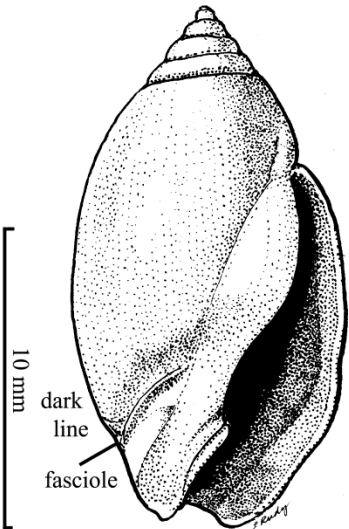
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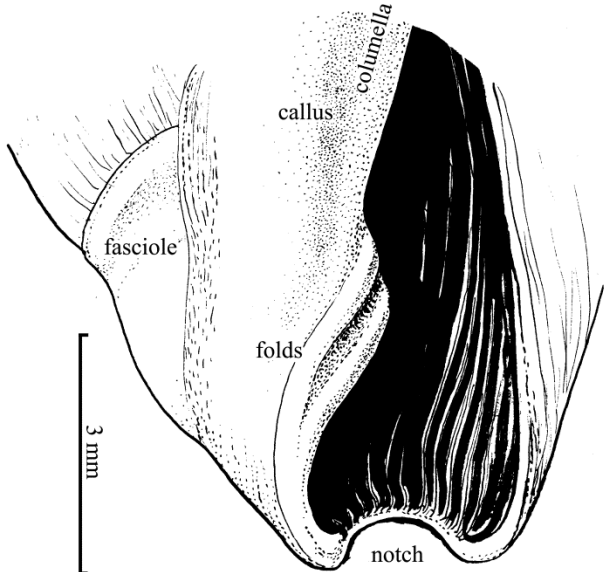
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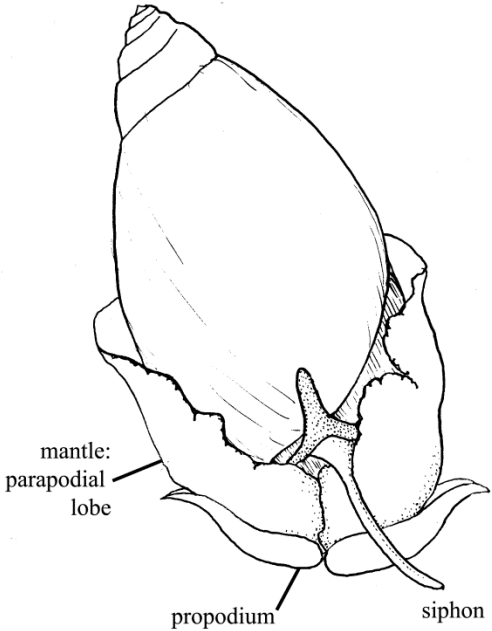
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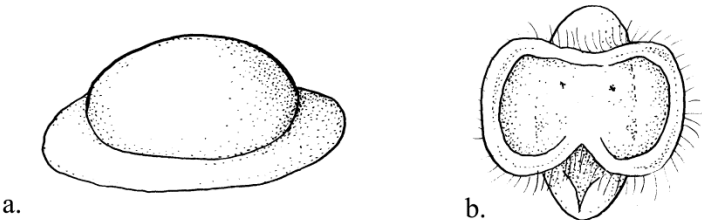
1. *Callianax biplicata* (anterior view, H:18mm) x4.5: about twice as high as wide; polished surface: gray with purple fasciole; stout, subcylindrical; slight spire; 5-6 whorls; long aperture.



2. Columella and aperture x12: columella with strong callus, two fold; aperture notched.



3. *C. biplicata* (dorsal view)



4. Egg and larva x100:
 a. egg case
 b. veliger (frontal view)
 (Edwards, 1968)