Mollusca – Gastropoda – Other: gastropods

UNDERWATER FIELD GUIDE TO ROSS ISLAND & MCMURDO SOUND, ANTARCTICA

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Photographs: Rod Budd/Antarctica New Zealand, Peter Brueggeman, Canadian Museum of Nature (Kathleen Conlan), Shawn Harper, Adam G Marsh, Jim Mastro, Bruce A Miller, Rob Robbins, M Dale Stokes, & Norbert Wu

The National Science Foundation's Office of Polar Programs sponsored Norbert Wu on an Artist's and Writer's Grant project, in which Peter Brueggeman participated. One outcome from Wu's endeavor is this Field Guide, which builds upon principal photography by Norbert Wu, with photos from other photographers, who are credited on their photographs and above. This Field Guide is intended to facilitate underwater/topside field identification from visual characters, and there can be some uncertainty in identifications solely from photographs.

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June 2019: Taxonomic names checked in Zoological Record and World Register of Marine Species
Marseniopsis conica is found throughout Antarctica, the Antarctic Peninsula, and Macquarie Island from 18 to 860 meters depth [1,3,5]. Marseniopsis conica is readily distinguished by a polygonal bumpy outline on its mantle and its reddish brown coloration [1,5].

Marseniopsis conica has planktotrophic larvae unique among gastropods, covering their larval shell with a mantle which can change its volume by interaction of body fluid and muscle activity [4]. The shell covering tissue of juveniles and adults is known to produce acidic secretions, which repel predation [4].

Lamellarian species feed on ascidians and sponges [2].

lamellarian gastropod \textit{Marseniopsis mollis}

\textit{Marseniopsis mollis} is found in Antarctica and the Antarctic Peninsula, Peter I Island, and South Shetland Islands at depths from 1 to 800 meters [3,4,5,6,8,10,11,14].

\textit{Marseniopsis mollis} ranges from 1.4 to seven centimeters long [3,4,5].
The mantle covering *Marseniopsis mollis* is translucent lemon yellow and is soft, smooth, elliptical or rounded, thick, and fleshy [4,7,14].

*Marseniopsis mollis* is the most common species in the genus *Marseniopsis* in Antarctica [3].
The tail of *Marseniopsis mollis* projects slightly but is not visible from top view [7].

*Marseniopsis mollis* lays eggs in the tests of *Cnemidocarpa verrucosa* ascidians in the late austral summer and autumn (January to March), which hatch into larvae in the following late winter and early summer (mid-October and mid-December) [13].
*Marseniopsis mollis* does not have a shell for protection from predators, though it does have a thin, fragile, transparent, internal shell, which has two to three complete whorls [3,7,11]. *Marseniopsis mollis* has planktotrophic larvae unique among gastropods, covering their larval shell with a mantle which can change its volume by interaction of body fluid and muscle activity [12]. The shell covering tissue of juveniles and adults is known to produce acidic secretions, which repel predation [12].
Marseniopsis mollis has been found in the stomach contents of the fish *Trematomus hansoni* [9].
Here's the head of *Marseniopsis mollis* looking at its foot from the underside.

*Marseniopsis mollis* appears to be protected from predation by a chemical, homarine, which deters feeding [1,2].

*Marseniopsis mollis* is the primary predator of the tunicate *Cnemidocarpa verrucosa*, on which it is crawling in this photo [1]. *Marseniopsis mollis* appears to obtain its defensive chemical homarine from bryozoans and hydroids growing on the surface of the tunicate *Cnemidocarpa verrucosa* [1,2].
Marseniopsis mollis is probably feeding on this unidentified tunicate.

Marseniopsis syowaensis is found in Antarctica and Peter I Island, from 5 to 126 meters depth [1,2,3,4,5]. M. syowaensis is very large compared to other Antarctic lamellariids, up to 11.5 centimeters long [1,3]. The mantle of Marseniopsis syowaensis can be dome-like in shape, with numerous wrinkles and irregular warts of shrinkage, feeling soft and jelly-like but very thick [1,3,5]. The mantle of Marseniopsis syowaensis is colored pale pink with pale brown spots; its ventral underside is only pale pink, and its foot and head tentacles are white [1,3].

This photo of Marseniopsis syowaensis was taken at New Harbor at 33 meters depth; it was observed that the mantle surface felt almost smooth but a little bumpy [2].
Shown here are egg masses laid by a *Marseniopsis* spp. on a scallop at New Harbor, and a seastar (possibly *Pteraster affinis*) eating them, and probably the scallop too [4].

Lamellarian species feed on ascidians and sponges [3]. A Weddell seal was observed feeding on *Marseniopsis syowaensis*, and the large size of this mollusc may make it a good food resource for the Weddell seal [3].

The species name *syowaensis* commemorates the Japanese Antarctic Research Expedition's research station *Syowa* [3].

**References:**
2: Jim Mastro, personal communication, 1999;
4: Paul Dayton, personal communication, 2003 (found one at 160 ft at New Harbor);
Neobuccinum eatoni is found throughout Antarctica and the Antarctic Peninsula, Peter I Island, South Shetland Islands, South Orkney Islands, South Sandwich Islands, Kerguelen Island, and Heard Island at depths from 4 to 2,350 meters [2,3,6,8,9,12,13,15,20].

N. eatoni is one of the most widely distributed Antarctic molluscs in space and depth [4,5]. Fine wrinkles or growth lines appear on the smooth convex whorls of the shell, with deep sutures between the whorls [5,9,10,12].
The shell color of *Neobuccinum eatoni* is variable and has been reported as whitish or creamy with a dull brownish yellow or tawny tinge; light bluish-purple; dark purplish-brown; or a dark brown pattern over a gray background [9,10,11,12]. The shell of *N. eatoni* may have a thin straw-colored epidermis when perfect [5]. The spire height of *Neobuccinum eatoni* is variable with deep water specimens usually elongated [4]. Larger shells have been collected at nine centimeters in length [5,13,17]. The operculum is black brown, chitinous, and semi-ovoid [9].

Boring brown algae of genus *Phaeophyla* can form a complex net of holes and cavities on top of the *Neobuccinum eatoni* shell [19].
Neobuccinum eatoni has been collected from sand with pebble, rock with pebble, sandy mud, and mud [8]. *N. eatoni* eats dead animals (necrophagous) and its prey includes the Antarctic scallop *Adamussium colbecki* and damaged *Laternula elliptica* bivalves that become unburied by iceberg scouring [1,15,16]. *Neobuccinum eatoni* has been kept in captivity for over a year on a meat diet of shrimp, bivalve, and fish [7].

*Neobuccinum eatoni* has been found in the stomach contents of the fish *Trematomus hansonii* [14].
Neobuccinum eatoni ova (eggs) have been described as occurring singly or massed together, with each capsule a hemispherical orange shape about eight millimeters in diameter, surrounded by a marginal membrane [18].

Eggs of buccinoid gastropod *Antarctodomus theilei*

These are the eggs of *Antarctodomus theilei* [1]. *Antarctodomus theilei* is found in Antarctica and the Antarctic Peninsula, Peter I Island, and the South Shetland Islands, from 100 to 695 meters depth [2].

muricid gastropod *Trophonella longstaffii*

*Trophonella longstaffii* has been found in Antarctica and the Antarctic Peninsula and Peter I Island, in depths from 5 to 1,080 meters \[3,4,5,6,7,8,11\]. *T. longstaffii* has been collected up to five centimeters in length with greatest diameter of 2.5 centimeters \[2,3,5,8\]. The thin, white shell of *Trophonella longstaffii* has six or seven whorls, tapers toward each end, is ovoid with a broader basal end, and has its surface marked with delicate parallel ridges \[2\].
Here *Trophonella longstaffi* is just behind a juvenile giant Antarctic isopod *Glyptonotus antarcticus*. The last whorl of the shell of *T. longstaffi* produces a short snout [2].
The convex whorls of the shell of *Trophonella longstaffi* are shouldered and separated by a deep suture [2].

Here’s the aperture of the shell with the shielding operculum of *Trophonella longstaffi*.
**Trophonella longstaffi** is a predator of the bivalves *Laternula elliptica*, *Limatula hodgsoni* (shown here), and *Aequiyoldia eightsi* and the brachiopod *Liothyrella uva* \[1,8\]. In attacking prey, *T. longstaffi* drills through the prey shells using secreted chemicals and then uses its radula to eat the prey; *T. longstaffi* also may attack by wedging open a bivalve shell \[8\]. A drilling attack by *T. longstaffi* has a mean duration of 20-29 days until completion, depending on the prey species \[8\]. *Trophonella longstaffi* attacks and eats infrequently; in an aquarium study, the mean time between feeding was nine months, with some individuals not feeding for thirty months \[8\].

The seastar *Diplasterias brucei* is one of the predators of *Trophonella longstaffi* \[1\].

**Taxonomic Note:** New genus, with species reassigned to *Trophonella*; genus was formerly *Trophon* \[9,10\].

naticid gastropod *Amauropsis rossiana*

*Amauropsis rossiana* is found throughout Antarctica and the Antarctic Peninsula and the South Shetland Islands from 9 to 1,335 meters depth [1,4].

*Amauropsis rossiana* has a globose brownish-olive shell about three centimeters in size, with convex whorls, deep sutures, fine growth lines, and a raised, eroded spire [3].
Here's the aperture of the shell of *Amauropsis rossiana* with its shielding operculum pulled in.
*Amauropsis rossiana* is common at Cape Armitage in the second benthic zone between 15 - 33 meters depth [2].

Possibly an egg case of *Amauropsis rossiana*

**Taxonomic Note:** The Antarctic and sub-antarctic species of *Amauropsis* may be in a new genus *Pseudamauropsis* [5].

**References:**
Capulus subcompressus is found in Antarctica and the Antarctic Peninsula, from 33 to 640 meters depth [2,3,4]. Capulus subcompressus lives on the calcareous tube of the serpulid polychaete worm Serpula narconensis, close to the opening of its tube [1].

Capulus subcompressus has a dirty white cap-like smooth shell with an oval opening [1].
Capulids use their gills to entrap food, then passing it to the mouth [4]. *Capulus subcompressus* is also a kleptoparasite, stealing mucous food particles collected by the worm, by extending its pseudoproboscis, which can be seen here sticking out under its shell [1,4].
Juveniles or protoconchs of *Capulus subcompressus* have a Phyrrigian cap morphology showing gastropod coiling, which is lost as adults [1].

**Taxonomic Note:** Genetic analysis shows *Capulus subcompressus* does not belong in the *Capulus* genus [4].

Onoba (Onoba) turqueti is found throughout Antarctica and the Antarctic Peninsula, Peter I Island, South Shetland Islands, South Orkney Islands, Burdwood Bank, South Georgia Island, and Macquarie Island, from 2 to 385 meters depth [1,3,4,6].

The shell of Onoba turqueti is elongated, up to 3.1 millimeters long, with about 4 1/2 whorls, and colored white to pale yellowish-white [3].
Onoba (Onoba) turqueti has been found in the stomach of fish of the genus Notothenia [3].

Rissoids are small epifaunal gastropods abundant worldwide, feeding on diatoms, microalgae, foraminifers, or deposit feeders [2].

Taxonomic Note: Placed in Onoba genus by Ponder in 1983, previously having been in Subonoba and Rissoia genera [3]. In 1984, Ponder placed it in a subgenus Onoba of the genus Onoba [2]. Onoba turqueti synonymized into Subonoba turqueti in Molluscabase with no supporting reference to literature (?) [5].

calliostomatid gastropod *Falsimargarita gemma*

*Falsimargarita gemma* has been found in Antarctica and the South Shetland Islands [4,5].

*Falsimargarita* species in the Ross Sea include *gemma* and *thielei* [1]. *Falsimargarita gemma* has an iridescent shell whereas *F. thielei* is less so, and *F. thielei* is more strongly striated on its whorls than *F. gemma* [2,3].

Original description of *Falsimargarita gemma* (bottom illustration) describes it as “shell turbinate, moderately umbilicated, thin, greenish-iridescent, finely spirally lirate throughout, the threads upon the base below the periphery finer than those above, sculptured also with fine arenate lines of growth, which are coarser towards the suture, giving a somewhat cancellated appearance to the shell at this part; they cross the four or five spirals below the narrowly channeled suture, producing minute sharp points or nodules upon them; whorls 5 ½, the nucleus globose, white smooth, porcellaneous; the next whorl with four spirals; the third with seven, not all equal in thickness; the penultimate with eleven; and the last having about fourteen above the periphery and about twenty-five below; the umbilical area is smooth, dirty white; peristome thin, subcircular, interrupted on its junction with the whorl, the columellar margin slightly thickened, expanded upon the whorl and very narrowly reflexed; aperture iridescent and finely sulcate, the grooves corresponding to the external lirae.” [5].