

# Mollusca – Gastropoda – Other: gastropods

## UNDERWATER FIELD GUIDE TO ROSS ISLAND & MCMURDO SOUND, ANTARCTICA

Peter Brueggeman

Photographs: Norbert Wu, Peter Brueggeman, Canadian Museum of Nature (Kathleen Conlan), Bjørn Gulliksen (UWPhoto ANS), Jim Mastro, Bruce A. Miller, Rob Robbins, & M. Dale Stokes



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. This Field Guide 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. Organisms were identified from photographs with no specimen collection. Therefore these identifications are to the taxonomic level possible from photographs, and there can be some uncertainty in identifications solely from photographs.

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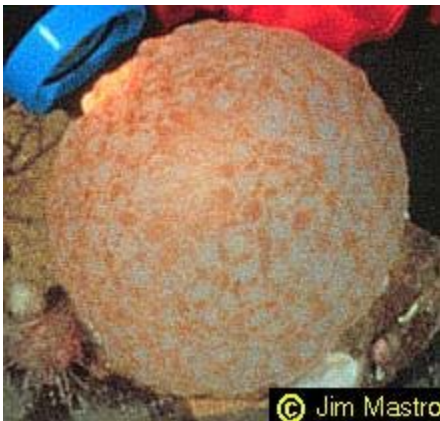
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## lamellarian gastropod *Marseniopsis conica*



*Marseniopsis conica* is found throughout Antarctica, the Antarctic Peninsula, and Macquarie Island from 18 to at least 270 meters depth [1,3]. *M. conica* is readily distinguished by a polygonal bumpy outline on its mantle and its reddish brown coloration [1]. Lamellarian species feed on ascidians and sponges [2].

**References:** **1:** Taxonomic Study on Antarctic Gastropods Collected by Japanese Antarctic Research Expeditions. H Numanami. Memoirs of National Institute of Polar Research, Series E (Biology and Medical Science), Number 39. Tokyo : National Institute of Polar Research, 1996; **2:** Proceedings of the NIPR Symposium on Polar Biology 4: 50-68, 1991; **3:** Rob Robbins, personal communication, 2005

## lamellarian gastropod *Marseniopsis mollis*



*Marseniopsis mollis* is found in Antarctica and the Antarctic Peninsula and South Shetland Islands at depths from 1 to 800 meters [3,4,5,6,8,10,11]. *M. mollis* ranges from 1.4 to seven centimeters long [3,4,5]. The mantle covering *M. mollis* is translucent lemon yellow and is soft, smooth, rounded, thick, and fleshy [4,7]. *M. mollis* is the most common species in the genus *Marseniopsis* in Antarctica [3].

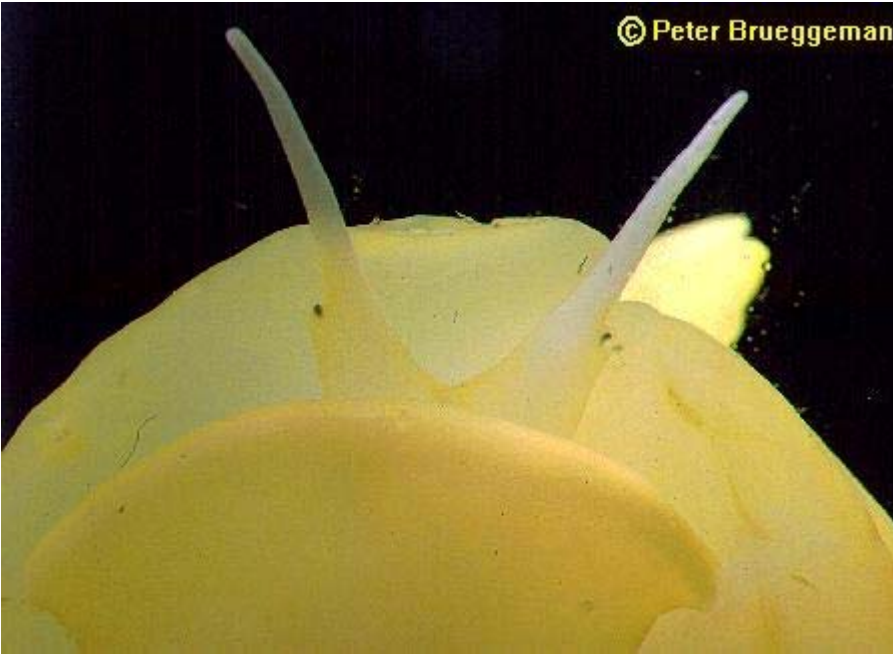


The tail of *Marseniopsis mollis* projects slightly but is not visible from top view [7].

*M. 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].

*M. mollis* has been found in the stomach contents of the fish *Trematomus hansonii* [9].

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Here's the head of *Marseniopsis mollis* looking at its foot from the underside.

*M. 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]. *M. mollis* appears to obtain its defensive chemical homarine from bryozoans and hydroids growing on the surface of the tunicate *Cnemidocarpa verrucosa* [1,2].



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*Marseniopsis mollis* is probably feeding on this unknown tunicate.

**References:** **1:** Antarctic Journal of the United States 29(5):151-153, 1994; **2:** Journal of Chemical Ecology 20(10):2539- 2549, 1994; **3:** Proceedings of the NIPR Symposium on Polar Biology 4:50- 68, 1991 (National Institute of Polar Research, Tokyo); **4:** Tethys Supplement 4:105-134, 1972; **5:** Antarctic Mollusca : with Special Reference to the Fauna of the Ross Sea. RK Dell. Wellington, NZ : Royal Society of New Zealand, 1990. Bulletin 27, Royal Society of New Zealand; **6:** Records of the Auckland Institute and Museum 5(3,4):117-193, 1960; **7:** British Antarctic "Terra Nova" Expedition, 1910. Natural History Reports: Zoology. Volume 7. Mollusca. Polychaeta. Chaetognatha. London : Trustees of the British Museum, 1923; **8:** Polish Polar Research 7(1-2):25-62, 1986; **9:** Bulletin de l'Institut Oceanographique 66(1368), 1966; **10:** Polar Biology 20(4):229-247, 1998; **11:** Taxonomic Study on Antarctic Gastropods Collected by Japanese Antarctic Research Expeditions. H Numanami. Memoirs of National Institute of Polar Research, Series E (Biology and Medical Science), Number 39. Tokyo : National Institute of Polar Research, 1996

## probably lamellarian gastropod *Marseniopsis syowaensis*



*Marseniopsis syowaensis* is found in Antarctica from 5 to 49 meters depth [1,2,3,4]. *M. syowaensis* is very large compared to other Antarctic lamellariids, up to 11.5 centimeters long [1,3]. The mantle of *M. 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]. The mantle of *M. 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 aculeatus*) 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:** **1:** Taxonomic Study on Antarctic Gastropods Collected by Japanese Antarctic Research Expeditions. H Numanami. Memoirs of National Institute of Polar Research, Series E (Biology and Medical Science), Number 39. Tokyo : National Institute of Polar Research, 1996; **2:** Jim Mastro, personal communication, 1999; **3:** Proceedings of the NIPR Symposium on Polar Biology 4: 50-68, 1991; **4:** Paul Dayton, personal communication, 2003 (found one at 160 ft at New Harbor)

## Antarctic whelk *Neobuccinum eatoni*



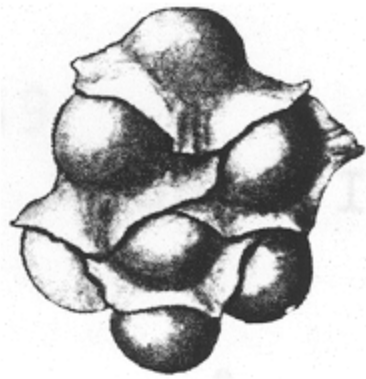
*Neobuccinum eatoni* is found throughout Antarctica and the Antarctic Peninsula, South Shetland Islands, South Orkney Islands, South Sandwich Islands, Kerguelen Island, and Heard Island at depths from 4 to 1,335 meters [2,3,6,8,9,12,13,15]. *N. eatoni* is one of the most widely distributed Antarctic 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 *N. 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 *N. 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].



*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]. *N. eatoni* has been kept in captivity for over a year on a meat diet of shrimp, bivalve, and fish [7].

*N. 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].

**References:** **1:** Polar Biology 6(3):139-143, 1986; **2:** Records of the Auckland Institute and Museum 5(3,4):117-193, 1960; **3:** British, Australian, and New Zealand Antarctic Research Expedition Reports. Series B (Zoology and Botany) Volume 6, Part 9, 1957; **4:** British, Australian, and New Zealand Antarctic Research Expedition Reports. Series B (Zoology and Botany) Volume 6, Part 7, 1957. p.132; **5:** Australasian Antarctic Expedition 1911-1914. Scientific Reports. Series C, Zoology and Botany. Volume 4, Part 1. Mollusca. Sydney : David Harold Paisley, 1916; **6:** Archiv fuer Naturgeschichte 45(1-2):129, 1879; **7:** Memoirs of National Institute of Polar Research. Special Issue 32:103-104, 1984; **8:** Memoirs of National Institute of Polar Research. Special Issue 32:105-111, 1984; **9:** Korean Journal of Polar Research 5(2):15-28, 1994; **10:** Annals and Magazine of Natural History: Zoology, Botany, and Geology (Series 4) 16:67-73, 1875; **11:** EA Smith, Report on the Collections of Mollusca Made in Antarctica during the voyage of the "Southern Cross." IN: Report on the Collections of Natural History Made in the Antarctic Regions During the Voyage of the "Southern Cross" Part 7, London : Printed by Order of the Trustees, 1902. page 202; **12:** FAO Species Identification Sheets for Fishery Purposes : Southern Ocean (Fishing Areas 48, 58 and 88) (CCAMLR Convention Area) / W Fischer & JC Hureau, eds. Rome : Food and Agriculture Organization of the United Nations, 1985; **13:** Antarctic Mollusca : with Special Reference to the Fauna of the Ross Sea. RK Dell. Wellington, NZ : Royal Society of New Zealand, 1990. Bulletin 27, Royal Society of New Zealand; **14:** Bulletin de l'Institut Oceanographique 66(1368), 1966; **15:** Tethys Supplement 4:105- 134, 1972; **16:** Antarctic Science 10(4):369-375, 1998; **17:** Ross Sea ecology : Italian Antarctic Expeditions (1987-1995). FM Faranda, L Guglielmo, A Ianora, eds. Berlin : Springer, 2000. pp.503-514; **18:** Reports on the Scientific Investigations: Biology. British Antarctic Expedition (1907-1909). London: W. Heinemann, 1910-1911. Volume II, Part I. Mollusca. Charles Hedley

muricid gastropod *Trophon longstaffi*

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*Trophon longstaffi* has been found in Antarctica and the Antarctic Peninsula in depths from 5 to 1,080 meters <sup>[3,4,5,6,7,8]</sup>. *T. longstaffi* has been collected up to five centimeters in length with greatest diameter of 2.5 centimeters <sup>[2,3,5,8]</sup>. The thin, white shell of *T. longstaffi* 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 <sup>[2]</sup>.



Here *Trophon longstaffi* is just behind a juvenile giant Antarctic isopod *Glyptonotus antarcticus*.

The last whorl of the shell of *T. longstaffi* produces a short snout <sup>[2]</sup>. The convex whorls of the shell of *T. longstaffi* are shouldered and separated by a deep suture <sup>[2]</sup>.

The seastar *Diplasterias brucei* is one of the predators of *T. longstaffi* <sup>[1]</sup>.



*Trophon longstaffi* is a predator of the bivalves *Laternula elliptica*, *Limatula hodgsoni* (shown here), and *Yoldia eightsi* and the brachiopod *Liothyrella uva* <sup>[1,8]</sup>. 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 <sup>[8]</sup>. A drilling attack by *T. longstaffi* has a mean duration of 20-29 days until completion, depending on the prey species <sup>[8]</sup>. *T. 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 <sup>[8]</sup>.

**References:** **1:** Antarctic Ecology, Volume 1. MW Holdgate, ed. NY: Academic Press, 1970. pp.244-258; **2:** Mollusca. II. Gastropoda. EA Smith IN: Natural History : Volume II. Zoology (Vertebrata: Mollusca: Crustacea). British National Antarctic Expedition 1901-1904. J Bell, ed. London : British Museum, 1907. p.3; **3:** Tethys Supplement 4:105-134, 1972; **4:** Advances in Marine Biology 10:1-216, 1972; **5:** Antarctic Mollusca : with Special Reference to the Fauna of the Ross Sea. RK Dell. Wellington, NZ : Royal Society of New Zealand, 1990. Bulletin 27, Royal Society of New Zealand; **6:** A Survey of the Marine Fauna in Shallow Coastal Waters of the Vestfold Hills and Rauer Islands, Antarctica. MJ Tucker & HR Burton. ANARE Research Notes 55, 1987; **7:** Taxonomic Study on Antarctic Gastropods Collected by Japanese Antarctic Research Expeditions. H Numanami. Memoirs of National Institute of Polar Research, Series E (Biology and Medical Science), Number 39. Tokyo : National Institute of Polar Research, 1996; **8:** Polar Biology 26(3):208-217, 2003

naticid gastropod *Amauropsis rossiana*



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

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*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.

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*Amauropsis rossiana* is common at Cape Armitage in the second benthic zone between 15 - 33 meters depth <sup>[2]</sup>.

**References:** **1:** Antarctic Mollusca : with Special Reference to the Fauna of the Ross Sea. RK Dell. Wellington, NZ : Royal Society of New Zealand, 1990. Bulletin 27, Royal Society of New Zealand; **2:** Peter Brueggeman, personal communication, 1999; **3:** Mollusca. II. Gastropoda. EA Smith IN: Natural History : Volume II. Zoology (Vertebrata: Mollusca: Crustacea). British National Antarctic Expedition 1901-1904. J Bell, ed. London : British Museum, 1907. p.5; **4:** Polar Biology 24(2):105-112, 2001

## rissoid gastropod *Onoba (Onoba) turqueti*



*Onoba (Onoba) turqueti* is found throughout Antarctica and the Antarctic Peninsula, South Shetland Islands, South Orkney Islands, and Burdwood Bank from 4 to 362 meters depth <sup>[1,3,4]</sup>.

The shell of *O. turqueti* is elongated, up to 3.1 millimeters long, with about 4 1/2 whorls, and colored white to pale yellowish- white <sup>[3]</sup>.



*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:** *Onoba turqueti* was placed in a subgenus *Onoba* [2]. Previous genera include *Subonoba* and *Rossoa* [3].

**References:** **1:** Antarctic Mollusca : with Special Reference to the Fauna of the Ross Sea. RK Dell. Wellington, NZ : Royal Society of New Zealand, 1990. Bulletin 27, Royal Society of New Zealand; **2:** A Review of the Genera of the Rissoidae (Mollusca: Mesogastropoda: Rissoacea). WF Ponder. Records of the Australian Museum, Supplement 4, 1985; **3:** Rissoaform Gastropods from the Antarctic and Sub-Antarctic. WF Ponder. British Antarctic Survey Scientific Reports No. 108. Cambridge : British Antarctic Survey, 1983; **4:** Ross Sea Ecology : Italian Antarctic Expeditions (1987-1995). FM Faranda, L Guglielmo, A Ianora, eds. Berlin : Springer, 2000. pp. 530-538