Chordata: fish

UNDERWATER FIELD GUIDE TO ROSS ISLAND & MCMURDO SOUND, ANTARCTICA

Peter Brueggeman

Photographs: Steve Alexander, Jeffrey Bozanic, Peter Brueggeman, Paul Cziko, Paul Dayton, Shawn Harper, Julian Gutt, Adam G Marsh, 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. 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.

© 1998+: Text © Peter Brueggeman; Photographs © Steve Alexander, Jeffrey Bozanic, Peter Brueggeman, Paul Cziko, Paul Dayton, Julian Gutt/AWI, Shawn Harper, Adam G Marsh, Bruce A Miller, Rob Robbins, M Dale Stokes, & Norbert Wu. Photographs may not be used in any form without the express written permission of the photographers. Norbert Wu does not grant permission for uncompensated use of his photos; see www.norbertwu.com
naked dragonfish *Gymnodraco acuticeps*
page 6

plunderfish *Histiodraco velifer*
page 10

eelpout *Lycodichthys dearborni*
page 12

*Pagetopsis macropterus*
Page 13
Trematomus amphitreta
page 15

Bald notothen Trematomus borchgrevinki
Page 16

Emerald notothen Trematomus bernacchii
Page 20

Striped notothen Trematomus hansonii
Page 31
deepwater notothen *Trematomus loennbergii*

page 33

Dusky notothen *Trematomus newnesi*

Page 34

Spotted notothen *Trematomus nicolai*

page 36

Sharp-spined notothen *Trematomus pennellii*

Page 37
DeVries' paraliparis *Paraliparis devriesi*

page 41

*Antarctic toothfish* *Dissostichus mawsoni*

page 44

*Eaton's skate* *Bathyraja eatonii*

page 46

*Antarctic silverfish* *Pleuragramma antarctica*

page 47

Hagfish, family Myxinidae

Page 49

May 2019: taxonomic names checked in Eschmeyer's Catalog of Fishes, Zoological Record, and World Register of Marine Species
Naked dragonfish *Gymnodraco acuticeps*

©Bruce A. Miller

*Gymnodraco acuticeps* occurs throughout Antarctica and the South Shetland Islands, at depths from 0 to 1,000 meters (usually found in the first 50 meters) [1,4].
Gymnодraco acuticeps can grow up to 42 centimeters in length, and spawning occurs in September, with egg hatching in spring \([1,5]\).

Gymnодraco acuticeps eats other fish (including *Pleuragramma antarctica*, *Trematomus borchgrevinki*, and *Trematomus nicolai*), amphipods, fish eggs, polychaetes, and krill \([1,2]\). Predators of *Gymnодraco acuticeps* include the Antarctic toothfish *Dissostichus mawsoni* \([7]\).

Dragonfishes are a small, diverse group of Antarctic fishes living at great depths near the Antarctic continent with some species adapted to living under the ice \([9]\).
These are eggs of *Gymnodraco acuticeps*.
Recently hatched Gymnodraco acuticeps.

Plunderfish *Histiodraco velifer*

*Histiodraco velifer* is found in Antarctica, at depths from 210 to 667 meters [1]. Here it was photographed at scuba diving depth. *Histiodraco velifer* is up to 21.8 centimeters in length [3].
Antarctic plunderfish have a mental or chin barbel that is used as lure or tactile organ [2].

The Antarctic plunderfish family comprises several genera and species endemic to Antarctic waters, and are sedentary members of the benthic fish fauna in the Southern Ocean continental shelf and slope habitats [1,2].

**eelpout *Lycodichthys dearborni***

*Lycodichthys dearborni* has been collected in the Ross Sea at depths from 466 to 600 meters [1,3,4,5]. *L. dearborni* has been collected at lengths up to 23 centimeters [1,3,4].

Body color of *Lycodichthys dearborni* is light or yellowish with brown mottling; largest specimens are mostly uniform dark brown with the head and nape darker [3,4]. Body color of *L. dearborni* has also been described as brownish to pale yellowish brown with a dark back and lighter sides with a small light fleck under each dark scale [1].

Pectoral fins of *Lycodichthys dearborni* are yellowish with light brown mottling when young, which fades in larger specimens [3,4]. Smaller specimens have a dark brown dorsal surface of head, body, and tail which breaks up into blotches on cheeks, abdomen, and tail [4].

The eelpout family (Zoarcidae) of fishes are usually benthic slope dwellers and are found around the world; benthic forms are usually sexually dimorphic [2]. Benthic eelpouts like *Lycodichthys dearborni* feed on polychaetes, bivalves, and gastropods [3]. The species name *dearborni* honors John Dearborn who collected the first specimens.

**References:**
Pagetopsis macropterus

Pagetopsis macropterus is found in Antarctica the Antarctic Peninsula, and the South Shetland Islands, at depths from 5 to 752 meters [1,3].

Pagetopsis macropterus is up to 33 centimeters in length [2,3].

P. macropterus has a greyish-green body with a whitish ventral side [3]. P. macropterus has fifteen narrow dark cross-bars on the side of its body, with a lighter area in center, and its cheeks have dark stripes [3]. First dorsal and pelvic fins of P. macropterus are black; the pelvic fins lack oblique stripes; other fins are pale [3].
Pagetopsis macropterus post-larvae and juveniles feed on krill and fish larvae, and adults feed on fish, such as Pleuragramma antarctica and Notothenia nudifrons [3].

P. macropterus has been often found in the stomachs of Weddell seals [3].
A female *Trematomus amphitreta* was collected in 20 meters depth at McMurdo Station saltwater intake jetty, at 30.3 centimeters in length [1].

The body of *Trematomus amphitreta* is bronze-colored with silver undertones and iridescence [1].

**Taxonomic Note:** Genus changed from *Cryothenia* to *Trematomus* [2,3].

Bald notothen or bald rockcod *Trematomus borchgrevinki*

*Trematomus borchgrevinki* is found throughout Antarctica, the Antarctic Peninsula, South Orkney Islands, and South Shetland Islands from 0 to 695 meters depth [8,11,13]. *T. borchgrevinki* is a commonly seen fish associated with the sea ice along the Antarctic shore, and has been observed clinging to the underside of thick ice shelves [8,16]. *T. borchgrevinki* can grow up to 28 centimeters in length [8].
*Trematomus borchgrevinki* collected under the sea ice are pale all over in coloration while those collected in association with the bottom are a dark phase with a dark olive-brown spotted pattern above and silver-white below [9]. Color has also been recorded as yellowish with dark spots or irregular crossbars and dorsal and caudal fins with a series of spots but caudal fin without transverse bands [11].

*Trematomus borchgrevinki* lives in the upper six meters of water swimming beneath the sea ice undersurface and entering it to feed and take refuge where it is well-camouflaged by special adaptations in its body coloration. A silvery protective layer beneath the skin masks dark-colored internal organs (i.e. liver) from appearing on its lightly colored body; the iris and choroid of the eye are similarly masked to avoid their brown or black color [3,6].

The undersurface of sea ice is a feeding and refuge site for many organisms with a profusion of amphipods, euphausiids, and fish including *Trematomus borchgrevinki*. *T. borchgrevinki* is well adapted as a hunter; its lateral line sensory system can detect prey by recognizing the low vibration frequencies emitted by swimming crustaceans like *Pseudorchomene plebs*, *Euphausia crystallorophias*, and *Euchaeta antarctica* [17]. *T. borchgrevinki* eats the free-swimming shelled pteropod mollusc *Limacina helicina antarctica*, ice krill *Euphausia crystallorophias*, copepods (including the calanoid copepod *Euchaeta antarctica*), decapod crustacean larvae, chaetognaths, amphipods (including the medusa-hitchhiking hyperiid amphipod *Hyperiella dilatata*, *Pseudorchomene plebs* and *Epimiriella macronyx*), and juvenile fish (including *Pleuragramma antarctica*, a key species in the food web) [2,3,6,10,11,12].

*Trematomus borchgrevinki* is eaten by emperor penguins and other predators [4].
Here *Trematomus borchgrevinki* is seen in a crack on a grounded iceberg just south of Cape Evans on Ross Island. Termed cryopelagic for its lifestyle preference, *T. borchgrevinki* is ideally suited for its close association with sea ice. Living in such close association with sea ice crystals is a physiological challenge; you couldn't pick a colder place to live and risk freezing. *Trematomus borchgrevinki*, *Pleuragramma antarctica* and *Pagothenia brachysoma* are among the most southern fish [11].

Antarctic fish like *T. borchgrevinki* are well-adapted to the extremely low and stable temperatures of McMurdo Sound where seawater has a nearly constant mean annual temperature of -1.86 degrees Celsius (28.65 degrees Fahrenheit) and temperature doesn't vary much with depth or season -- 0.2 degrees Celsius (0.36 degrees Fahrenheit) [5]. The flip side is that *T. borchgrevinki* and some other cold-adapted Antarctic fish die of heat at approximately 6 degrees Celsius (42.8 degrees Fahrenheit) which is the lowest known heat death temperature of any animal [7].

*Trematomus borchgrevinki* is protected from freezing by glycopeptide antifreeze compounds in its body fluids, that bind to emerging ice crystals and prevent their growth [1,15]. These antifreeze compounds are being commercially marketed for product development [14].
Trematomus borchgrevinki eggs located in a hole in a grounded iceberg south of Cape Evans being protected by a parent fish.

The species name borchgrevinki honors Carsten Egeberg Borchgrevink, the Norwegian commander of the British Southern Cross Antarctic Expedition of 1898-1900 which established the first wintering-over base on the Antarctic continent, and which first collected this fish.

**Taxonomic Note:** Genus was changed from Pagothenia to Trematomus [18,19,20].

Emerald notothen or emerald rockcod *Trematomus bernacchii*

*Trematomus bernacchii* is found throughout Antarctica, the Antarctic Peninsula, South Shetland Islands, South Orkney Islands and Peter I Island, from the shore to 695 meters depth [8,13]. *T. bernacchii* is commonly found within the first 200 meters of depth, but it can be found down to 700 meters [1].

*Trematomus bernacchii* has been observed taking refuge within volcano sponges with their heads sticking out [2].
*Trematomus bernacchii* has two morphs, with or without a white blotch spreading out on the nape, behind the eyes, and before the pectoral fins [11,12].
*Trematomus bernacchii* has black or dark brown blotches over a pale brown or pink-brown body that is darker dorsally; its dorsal and anal fins are uniformly light-brown [8]. The pectoral fins of *T. bernacchii* are dark with numerous light spots and it has three green spots on the upper part of the pectoral fin base [8].
In deeper water, *Trematomus bernacchii* can be less pigmented and more pinkish-brown in coloration as shown here [9].
Trematomus bernacchii females can be up to 35 centimeters long, and males up to 28 centimeters long; females live up to 21 years, and males up to 16 years [1,19].

Trematomus bernacchii lives on the seafloor (benthic) and is primarily a benthic feeder, eating sedentary and moving prey, by ambush or hunt-and-peck feeding [1,2,3,4,7,8,10,14].
*Trematomus bernacchii* has a varied diet: algae; testate amoeba *Gromia*; crustaceans (including euphausiid krill, mysids, copepods, pycnogonids, tanaids, cumaceans, ostracods, isopods, amphipods, shrimp); nemerteans; sipunculids; priapulids; nematodes; oligochaetes; pterobranchs; polychaetes; hydroids; soft coral (including *Clavularia*); medusae; anemone *Edwardsia meridionalis*; echinoderms (holothurians, brittle stars, sea urchin *Sterechinus neumayeri*); bivalves; gastropods; tunicates; thaliaceans; fish; and fish eggs [1,2,3,4,7,8,10,14,16,17,18,19,23].
Spawning takes place in December-January in McMurdo Sound and in October-November in other reported areas [1]. *Trematomus bernacchii* deposits its eggs on the seafloor (demersal) or within Rossellid volcano sponges; parental guarding of the egg mass within volcano sponges has been observed [2]. Hatching may occur towards the end of summer or early autumn [1].
Antarctic fish like *Trematomus bernacchii* are well-adapted to the extremely low and stable temperatures of McMurdo Sound where seawater has a nearly constant mean annual temperature of -1.86 degrees Celsius (28.65 degrees Fahrenheit) and temperature doesn't vary much with depth or season -- 0.2 degrees Celsius (0.36 degrees Fahrenheit) [5].
The flip side is that *Trematomus bernacchii* and some other cold-adapted Antarctic fish die of heat at approximately 6 degrees Celsius (42.8 degrees Fahrenheit) which is the lowest known heat death temperature of any animal [6]. This freezing resistance is accomplished with special antifreeze glycopeptides in its body fluids, that bind to emerging ice crystals and prevent their growth; these antifreeze compounds are being commercially marketed for product development [15,20].
The species name *bernacchii* honors L.O. Bernacchi, an Australian physicist-meteorologist who collected on the Southern Cross Expedition and who also served on Scott's 1901 expedition.
Taxonomic Note: In 1982, Balushkin split the *Trematomus* species into two genera, *Trematomus* and *Pseudotrematomus*, with the species *T. newnesi* retained in *Trematomus*, and all other species placed in *Pseudotrematomus* [22]. Balushkin based division on pectoral fin morphology [22]. Molecular studies don't support this division, so all species are in the older name *Trematomus* [21]. Eschmeyer’s Catalog of Fishes says its current status is "Valid as *Pseudotrematomus bernacchii*" [24].

Striped notothen / striped rockcod / green rockcod (*Trematomus hansoni*)

*Trematomus hansoni* is found throughout Antarctica, the Antarctic Peninsula, South Shetland Islands, South Orkney Islands, and South Georgia Island, at depths from 0 to 640 meters [1,3,6,8,12]. *T. hansoni* is colored greenish-grey with large black crossbars; its head is bluish mauve at the lower part [6]. The dorsal and anal fins of *T. hansoni* have greyish-green rays and black membrane and the caudal fin has dark transverse narrow bands with a clear membrane [6]. The pectoral fins of *T. hansoni* have light and grey bands with a dark membrane between the four last rays; its pelvic fins are punctuated with black spots on the rays [6]. *T. hansoni* can reach 45.5 centimeters in length [1,6,13,18].

Depending on location, *Trematomus hansoni* becomes sexually mature and spawning in December - February; eggs probably hatch in winter [1,6,12,13]. Antarctic fish like *Trematomus hansoni* are well-adapted to the extremely low and stable temperatures of McMurdo Sound where seawater has a nearly constant mean annual temperature of -1.86 degrees Celsius (28.65 degrees Fahrenheit) and temperature doesn’t vary much with depth or season -- 0.2 degrees Celsius (0.36 degrees Fahrenheit) [5]. The flip side is that *T. hansoni* and some other cold-adapted Antarctic fish die of heat at approximately 6 degrees Celsius (42.8 degrees Fahrenheit) which is the lowest known heat death temperature of any animal [4]. This freezing resistance is accomplished with special antifreeze glycopeptides in its body fluids, that bind to emerging ice crystals and prevent their growth; these antifreeze compounds are being commercially marketed for product development [9,14].
Trematomus hansoni eats juvenile fish, fish eggs, algae, polychaetes (including Harmothoe spinosa, Haploscoloplos kerguelensis, Spiophanes tcherniai, Gyptis sp., Capitella sp.), krill, mysids, isopods (including Austrostigmus glaciale, Antarcticus sp.), amphipods (including Monoculodes scabriculosus, Heterophoxus videns, Hyperiella sp.), tanaid Nototanais dimorphus, shrimp (Chorismus antarcticus, Notocrangon antarcticus), copepods, nemertean, crinoids, holothurians, anemones (including Edwardsia meridionalis), medusae, pycnogonids, pterobranchs, and gastropods (including Neobuccinum eatoni, Marseniopsis mollis)

T. hansoni tends to take more prey from the water column than other primarily benthic feeding fish like T. pennelli or T. bernacchii [2].

The species name hansoni honors Nicolai Hanson, the biologist of the Southern Cross Expedition.

Taxonomic Note: Sometimes reported with the genus Pagothenia. In 1982, Balushkin split the Trematomus species into two genera, Trematomus and Pseudotrematomus, with the species T. newnesi retained in Trematomus, and all other species placed in Pseudotrematomus [16]. Balushkin based division on pectoral fin morphology [16]. Molecular studies don't support this division, so all species are in the older name Trematomus [15]. Eschmeyer’s Catalog of Fishes says its current status is "Valid as Pseudotrematomus hansoni" [17].

**Trematomus loennbergii**

*Trematomus loennbergii* is found throughout Antarctica and the Antarctic Peninsula at depths from 0 to 1,191 meters [1,2,3,4]. *T. loennbergii* is light brown or reddish and has four to five irregular crossbars from back to below mid-side [1,3].

*Trematomus loennbergii* can be up to 33 centimeters long, and is common up to twenty centimeters [1,3,7].

*Trematomus loennbergii* often leaves the bottom in order to feed on prey in the water column [1]. *T. loennbergii* feeds on algae, amphipods (including *Pseudorochromene plebs*, *Epimeria* spp., and *Eusirus perdentatus*), isopods, shrimp (*Chorismus antarcticus*, *Notocrangon antarcticus*), polychaetes (including *Barrukia cristata*), fish, and fish eggs [1,5,6,7].

**Taxonomic Note:** In 1982, Balushkin split the *Trematomus* species into two genera, *Trematomus* and *Pseudotrematomus*, with the species *T. newnesi* retained in *Trematomus*, and all other species placed in *Pseudotrematomus* [9]. Balushkin based division on pectoral fin morphology [9]. Molecular studies don't support this division, so all species are in the older name *Trematomus* [8]. Eschmeyer’s Catalog of Fishes says its current status is "Valid as *Pseudotrematomus loennbergii*" [10].

Dusky notothen *Trematomus newnesi*

*Trematomus newnesi* is found in Antarctica, the Antarctic Peninsula, South Shetland Islands, and South Orkney Islands, at depths from 0 to 400 meters [1,4].

*Trematomus newnesi* is up to 24.9 centimeters in length [3]. The body and head of *T. newnesi* is brown to almost blackish, and paler below, with a blueish-black belly [4]. Some specimens of *T. newnesi* can have a pale horizontal line extending the scales of the middle lateral line [4]. The first dorsal fin of *T. newnesi* is dusky to blackish [4].
Trematomus newnesi is a benthic and midwater feeder, and feeds on euphausiids, amphipods, polychaetes, copepods, gastropods, isopods [4]. Predators of Trematomus newnesi include Weddell seals [2].

Spotted notothen *Trematomus nicolai*

*Trematomus nicolai* is found in Antarctica, at depths from 0 to 460 meters [1,6]. *T. nicolai* is up to 36 centimeters in length [3]. *T. nicolai* feeds on amphipods, other fish, molluscan larvae, polychaetes and mysids [6].

**Taxonomic Note:** In 1982, Balushkin split the *Trematomus* species into two genera, *Trematomus* and *Pseudotrematomus*, with the species *T. newnesi* retained in *Trematomus*, and all other species placed in *Pseudotrematomus* [3]. Balushkin based division on pectoral fin morphology [3]. Molecular studies don't support this division, so all species are in the older name *Trematomus* [2]. Eschmeyer’s Catalog of Fishes says its current status is "Valid as *Pseudotrematomus nicolai*" [3].

**References:**
Sharp-spined notothen *Trematomus pennellii*

*Trematomus pennellii* is found in Antarctica, the Antarctic Peninsula, South Shetland Islands, and South Orkney Islands, at depths from the 0 to 732 meters [1].

*Trematomus pennellii* has distinctive white flecks, and grows up to 25.5 centimeters long [1,3].
Trematomus pennellii lives on the seafloor (benthic) where it is primarily a benthic feeder eating fish eggs, polychaetes (particularly Amithas membranifera, Barrukia cristata, Aglaophamus trissophyllus, and including Ophelina gymnogice, Scoloplos marginatus), amphipods, pycnogonids/sea spiders, and molluscs [1,2,3].

Trematomus pennellii spawns in summer [1].

The species name pennellii honors Harry LL Pennell, Captain of the ship Terra Nova of Scott's British Antarctic Expedition of 1910.
Taxonomic Note: *T. centronotus* was synonymized under *T. pennellii* in 1987 with some disagreement [4]. In 1982, Balushkin split the *Trematomus* species into two genera, *Trematomus* and *Pseudotrematomus*, with the species *T. newnesi* retained in *Trematomus*, and all other species placed in *Pseudotrematomus* [6]. Balushkin based division on pectoral fin morphology [6]. Molecular studies don't support this division, so all species are in the older name *Trematomus* [5]. Eschmeyer’s Catalog of Fishes says its current status is "Valid as *Pseudotrematomus pennellii*" [7].

DeVries' Paraliparis

*Paraliparis devriesi*

*Paraliparis devriesi* has been found in the Ross Sea at 500-900 meters depth, where it lives on the seafloor (epibenthic) \[1,2,3,4\].

Specimens of *Paraliparis devriesi* have been collected up to nineteen centimeters long \[1,3\].

*Paraliparis devriesi* is pale pink or whitish with translucent skin, with color more intense in the snout and tail, has pale pinkish dorsal and anal fins, a blueish abdomen, and shows a black peritoneum visible through the body wall \[3,4\].
Spawning of *Paraliparis devriesi* probably occurs in summer [4].

*Paraliparis devriesi* lacks a swim bladder, and maintains its neutral buoyancy through reduced skeletal ossification and a gelatinous subdermal material [2].
Antarctic toothfish
*Dissostichus mawsoni*

*Dissostichus mawsoni* is found throughout Antarctica from 12 to 2,210 meters depth [1,2,6]. *D. mawsoni* have been collected up to 210 centimeters long, and up to eighty kilograms in weight [1,2,8]. *D. mawsoni* is usually found near the bottom [2].

*Dissostichus mawsoni* is an opportunistic feeder, eating zooplankton and other pelagic invertebrates as juveniles, and shifting to various mid- to deep-water fish and squid by their third year [1]. The species of fish and crustaceans found in *D. mawsoni* stomachs in McMurdo Sound indicates that they feed deep and in the open sea, and close under the sea ice [1]. In the Ross Sea region, sub-adult *D. mawsoni* eat benthic fish and cephalopods, and more small prey than eaten by adults, including small fish and prawns [5]. One study determined that grenadiers were the most important fish and overall prey [5]. Icefish and eel cods were important fish prey on the continental slope, as well as the squid *Psychroteuthis glacialis* [5].

Prey items of *Dissostichus mawsoni* include Whitson’s grenadier *Macrourus whitsoni*, spotted barracudina *Arctozenus risso*, rattails *Macrourus* spp., the rays *Bathyraja maccaini* and *Bathyraja eatonii*, squid, and the dragonfishes *Cygnodraco mawsoni* and *Gymnodraco acuticeps* [7].

Predators of *D. mawsoni* include Weddell seals, sperm whales, and orcas [1,2,4].

*Dissostichus mawsoni* has no swim bladder, and relies on reduced calcification of its skeleton, and lipid production in adipose tissue cells, to maintain neutral buoyancy [2].
*Dissostichus mawsoni* is greyish in color, sometimes with large darker saddles dorsally, and scattered, irregular darker markings [2]. *D. mawsoni* is sexually mature at eight years of age and one meter in length [2]. A well-regulated and enforced commercial fishing for Antarctic toothfish would factor in their slow growth and long lifespan. Such fish cannot be harvested in great quantities, or it will be pushed towards extinction.

*Dissostichus mawsoni* is related to the Patagonian toothfish, or Chilean sea bass. Large, unreported catches from illegal fishing of Patagonian toothfish, or Chilean sea bass, has made effective fisheries management difficult, and it is being overfished in some areas [3]. Overfishing of long-lived fish pushes them towards extinction. A fate similar to that of the Patagonian toothfish, or Chilean sea bass, may await the Antarctic toothfish. Effective fisheries management in the remote waters of Antarctica is nearly impossible.

*Dissostichus mawsoni* is named after Douglas Mawson, the leader of early Australian Antarctic exploration.

**References:**
Eaton's skate
*Bathyraja eatonii*

Eaton's skate *Bathyraja eatonii* is found in Antarctica, Antarctic Peninsula, South Shetland Islands, South Orkney Islands, Kerguelen Island, and Heard Island, at depths from 15 to 1,100 meters [1,2,4,6]. *B. eatonii* can be over 120 centimeters in length [1,4]. This photo was shot in a Crary Lab tank.

The dorsal surface of *Bathyraja eatonii* is in shades from pale through dark ochre to greyish-brown, with its semi-transparent rostral triangle usually lighter [6]. It may show a patterning of dark and light light spots or a marbling [6].

*B. eatonii* can be distinguished from *B. maccaini* by the absence of thorns around its eyes [1]. One predator of *B. eatonii* is the sleeper shark *Somniosus cf. microcephalus* [3].

A predator on *Bathyraja eatonii* is the Antarctic toothfish *Dissostichus mawsoni* [5].

Antarctic silverfish *Pleuragramma antarctica*

*Pleuragramma antarctica* is found in Antarctica, Antarctic Peninsula, South Shetland Islands, and South Orkney Islands, at depths from 0 to 1,000 meters [1,6,9,19]. *P. antarctica* is slow-growing with a maximum estimated age of 14 years, and maximum length of 27 centimeters [13,18].

All developmental stages of *Pleuragramma antarctica* live throughout the water column, in both open water and pack ice, in the shelf waters around Antarctica [1,6,9]. An acoustic survey with trawling in the Ross Sea found adult *Pleuragramma antarctica* in layers at 100-400 meters depth, and were sometimes present close to the bottom; a weak layer at about 80 meters depth was associated with juveniles [12]. Spawning occurs in later winter [6].

The unhappy fish in both photos came from the stomach of a freshly caught Antarctic toothfish *Dissostichus mawsoni*. *Pleuragramma antarctica* is the most abundant pelagic fish in the Ross Sea, and is a keystone species in Antarctic coastal ecosystems [6]. *P. antarctica* is a prey species of Antarctic toothfish *Dissostichus mawsoni*, Weddell seals, Antarctic fur seals, Adelie penguins, and most upper-trophic-level predators [2,3,5,7,8,10,11]. Along with krill, *P. antarctica* is a key mid-trophic level species in the Ross Sea, connecting primary production by photosynthetic organisms to upper trophic levels [4].

**Taxonomic Note:** Boulenger named it *Pleuragramma antarcticum* in 1902 [14]. Boulenger combined the words "pleur" ('side of body') with "agramma" ("absence of line") to create the compound genus name of *Pleuragramma* [15,17]. *Pleuragramma antarctica* lacks a lateral line, as can be seen. Agramma is feminine, and the root word Antarctic is an adjective, so the species names should be feminine *antarctica* and not the neuter *antarcticum* [15,16].

Hagfish, family Myxinidae

Photographed at 30 meters depth in Salmon Bay, this hagfish is burrowing down after a *Laternula ellipitica* clam which is releasing a white cloud of sperm, seen in this photo [1]. This small hagfish resembles the New Zealand slender hagfish *Neomyxine* spp. [1].

Within the Southern Ocean, a single specimen of *Myxine australis* has been collected at the South Shetland Islands, with *M. australis* being more frequent in Tierra del Fuego and the Magellan region of Chile, with a depth range of 10 to 105 meters [2,3]. *M. australis* has been collected farther north in Chile, Argentina, and southern Brazil [4,5]. Other *Myxine* species have been found in the straits of Magellan and further north [5].