No 3

RESULTS OF THE HUDSON BAY EXPEDITION, 1920
IV. THE ASCIDIACEA

BY

A. G. HUNTSMAN

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Material collected by Mr. Frits Johansen, Naturalist of the Department of Naval Service, on a trip to James and Hudson bays in the summer of 1920 under the auspices of the Biological Board of Canada, has formed the basis of this paper. In addition there has been available a number of specimens of Ascidians from the collections of the Victoria Memorial Museum and the former Canadian Fisheries Museum of Ottawa. These have been brought together by the assiduity of Mr. Johansen, whose untiring efforts to assemble material from the northern parts of Canada are much to be commended. The area from which material is here reported consists briefly of Hudson Bay and the salt waters connected with it, as far as the Arctic circle to the north, and the mouth of Hudson Strait to the east. Very few records of Ascidians from this region have hitherto been published, therefore the present report is a distinct contribution to our knowledge. The records are as yet too scattered to indicate peculiarities of distribution within the region.

Of the thirteen species listed, eight are definitely arctic circumpolar forms, and one other (*Cystingia retortiformis*) is probably so. Two (*Molgula septentrionalis* and *Lithonephrya tenax*) seem restricted to the Atlantic part of the arctic region. One (*Boltenia ovifera*) appears to be practically restricted to the American arctic and subarctic, and another (*Cnemidocarpa mollis*) is, so far as known, found only on the American side of the north Atlantic. The last species is the sole indication of the extension of a more southerly fauna into the region. It is clear, therefore, that although no part of this Hudson Bay region is within the arctic circle, being between 51° and the circle, the Ascidian fauna is, nevertheless, almost wholly arctic in character.

Of the three species reported by MacLeay (1825) from Winter Island, Fox Channel, which is just inside the northern limit of the region, one only (*Dendrodoa glandaria* which is the same as *D. aggregata*) has not appeared in the material that we have had, and should, therefore, be added to the list for this area.

Ascidiopsis prunum (Müller)

For synonymy and bibliography see Hartmeyer, 1903, p. 285 (*Ascidia prunum*), and Van Name, 1912, p. 599 (*Phallusia prunum*).

King George Sound, Hudson Strait; 40 fathoms; September 9, 1897; coll. Low and Wakeham, 4 specimens. Near mouth of Povŭngnitok River, east side of Hudson Bay; August, 1898; coll. A. P. Low, 1 specimen. Richmond Gulf (about 4 miles from entrance), east coast of Hudson Bay; in about 10 fathoms; stones and algae; August 24, 1920; coll. F. Johansen, 3 specimens.

It is worth while reiterating the distinguishing characteristics of this, the type species of the genus, a number of which have been overlooked.

The test is firm and cartilaginous. The surface is practically free from papillae (though irregularly grooved) except on the apertural lobes, which usually

number 7 (occasionally 6) for the oral, and 6 for the atrial. The dorsal lamina has teeth corresponding to the transverse ribs and vessels. The number of longitudinal bars is very constant in all but small specimens, there being from 15 to 20 on the left side and from 18 to 21 on the right. The bars are provided with both papillae corresponding to the transverse vessels and also intermediate papillae. The oviduct crosses slightly the last bend of the intestine.

A. prunum is a common arctic circumpolar form, and is found as well rather far into subarctic regions, as, for example, southern British Columbia in the Pacific, and the Gulf of Maine and southern North Sea in the Atlantic.

Chelyosoma macleayanum Brod. and Sowerby.

See Van Name, 1912, p. 591, for bibliography.

King George Sound; Hudson Strait; 40 fathoms; September 9, 1897; coll. Low and Wakeham, 2 sp.

An Arctic circumpolar form that extends its distribution into the subarctic (except for the Western Pacific) only on our Atlantic coast, where it occurs rarely and of small size as far south as the Gulf of Maine.

Genus MOLGULA, Forbes (sensu restricto)

Type species—*M. oculata*, Forbes.

This genus has been hitherto so broadly defined as to include many heterogeneous elements. It is proposed to restrict it to several species that may be grouped around the type species, *M. oculata* Forbes, such as *M. siphonalis*, Sars, *M. septentrionalis*, Traust., *M. pannosa*, Verr., *M. pugetiensis*, Herdman, *M. apopioa* (Hntsmn.), *M. hecateia* (Hntsmn.), *M. pacifica* (Hntsmn.), *M. citrina*, Ald. and Hanc., and *M. solenota*, Lac.-Duth. More information is required before the distinctness of these species can be made certain.

The characters possessed by the genus in the restricted sense are as follows:

A gonad on each side of the body, the left above the primary intestinal loop. Testicular lobes arranged along both margins of an elongated ovary and with one or more vasa deferentia opening separately on the inner side of the gonad (not accompanying oviduct). Pharynx with seven folds on each side, most of the folds with several longitudinal bars on each.

Molgula septentrionalis, Traustedt.

1912. *Caesira septentrionalis*, Van Name, p. 478 (with bibliography and synonymy).

1916. *Molgula septentrionalis*, Redikorzew, p. 94 (with bibliography and synonymy).

Richmond Gulf, east coast of Hudson Bay; 15-30 fathoms; soft mud; June, 1899; coll. A. P. Low, 3 sp. Manitouk Sound (bay inside boat opening), east coast of Hudson Bay; 5-7 fathoms; clay-mud, sand and stones; August 27, 1920; coll. F. Johansen, 3 sp. Sound between Paint Hills Islands, about lat. 53°N., James Bay; 10 fathoms; stones and sandy mud; September 10, 1920; coll. F. Johansen, 4 sp.

The largest specimen is 25 mm. long. In the larger specimens the siphons are withdrawn into a groove, which has well defined valve-like margins.

In an individual 20 mm. long and 12 mm. in diameter, the largest tentacles are bi-pinnate, and three series can be distinguished. Those of the largest number eight, of which three near the dorsal tubercle are poorly developed; those of the next series also number eight; the third series consists of very small tentacles, which number presumably sixteen. The pharyngeal folds end posteriorly in simple, pointed processes. The formula for the longitudinal bars on the left side is: Dors. 0 (9) 0 (10) 0 (11) 0 (11) 0 (10) 0 (9) 0 (6) 0 vent.

The dorsal tubercle is small and very high. Its aperture is slit-like with the anterior end bent toward the left. Both gonads have horizontal and ascending limbs, the latter continued into the upwardly directed oviduct which opens close to the base of the atrial siphon. The free portions of six distinct vasa deferentia were observed on the right side, near the upper margin of the gonad and on the inner surface of the horizontal limb. The ovary has both dorsal and ventral series of fairly distinct pouches, numbering 8 to 9 in each series.

The typical condition of the dorsal tubercle as hitherto described is a horseshoe-shaped aperture with the opening between the horns directed backwards and to the left. We have found this in small individuals, but in the large ones examined the aperture was relatively small and the shape not so much like a horseshoe, as if there had been some regression in its development.

The gonads have been well figured by Redikorzew (1916, p. 96). Van Name's (1912, p. 479) and Hartmeyer's (1903, pl. VII, and 1901, p. 54) figures show neither the lobulated condition of the ovary nor the ascending limb and oviduct, perhaps because they represent views from without through the mantle.

In all essential respects these specimens from Hudson Bay agree with the descriptions of this species by the authors mentioned above.

This species is distributed throughout the arctic seas adjacent to the north Atlantic. In the east it has been found as far as Novaya Zemlya and Franz Josef land. It occurs in northern Russia, Spitsbergen, Norway, Faroe Islands, Greenland, Newfoundland, and is now reported from Hudson Bay.

Genus LITHONEPHRYA Giard, 1872

Type species—*L. complanata* (Ald. and Hanc.).

A very distinct small group of species, hitherto included in *Molgula* or *Caesira*, includes, in addition to the one on which Giard based his genus *Lithonephrya*, the following species: *L. tenax* (Traust.) and *L. canadensis* (Hntsmn.). They are characterized by having a gonad on each side of the body and directed anteriorly, the left being above the primary intestinal loop; the testicular lobes are grouped semi-circularly around the posterior end of the short ovary, and the single vas deferens opens on the inner side of the latter; the pharynx has six or seven folds on each side and these are poorly developed, though most of them have two or more bars each.

Other characters are: lobes of apertures with 3 or 5 teeth; dorsal tubercle with opening between horns directed posteriorly or to right; dorsal lamina toothed posteriorly; and stigmata secondarily arranged in transverse rows, each stigma regularly corresponding to one-quarter of circumference of an infundibulum.

L. tenax (Traust.).

1883. *Molgula tenax*, Traustedt, p. 110.
1903. *Molgula tenax*, Hartmeyer, p. 137.
1916. *Molgula papillosa* (part), Redikorzew, p. 68.

King George Sound, Hudson Strait; 40 fathoms; September 9, 1897; coll. Low and Wakeham, 4 specimens.

Van Name (1912) has considered this species to be synonymous with *Molgula papillosa*, Verrill. I believe there are two errors here. In the first place, Verrill's species is not the one described and figured by Van Name, as a careful examination of Verrill's description and figure will show. The true *M. papillosa*, as I regard it, was not found by Van Name in the material from the Bay of Fundy at his disposal, but is nevertheless quite abundant there. It is nearly related to *Molgula manhattensis* (DeKay). Dr. Van Name has written me that Verrill's types had dried up and were not determinable with certainty.* *Caesira papillosa*, Van Name, 1912, p. 497, is, therefore, synonymous with *C. canadensis*, Huntsman, 1912, p. 140. This latter species belongs to the genus *Lithonephrya*, and appears to be distinct from both *L. tenax* and also *L. complanata*, chiefly in that it possesses 7 folds on each side of the pharynx, the other two species having only 6 folds on the left side, as I have been able to verify in specimens of *tenax* from the Gulf of St. Lawrence and Hudson Strait, and of *complanata* from Plymouth, England, and St. Andrews, Scotland.

L. tenax is an arctic form, occurring in the Atlantic part of the polar seas from the White Sea in the east to Hudson Strait in the west. It penetrates the subarctic, but in deep water, and is represented in shallow water farther south by the two other species mentioned above.

Genus CYSTINGIA MacLeay

Pera Stimpson, 1852, p. 232

Type species—*C. griffithsii*, MacLeay.

This genus, instituted by MacLeay in 1825, has been hitherto referred to the family Tethyidae (Cynthiidae). Since MacLeay's time the systematic position of this genus and species has been somewhat uncertain and no specimens of Ascidians have been referable to it. A reperusal of MacLeay's account, after we had worked over a collection of Ascidians from near the place whence MacLeay's specimens came, has made it certain that MacLeay's species is in reality the well-known form that has been going under the name of *Molgula* (seu *Pera*) *crystallina* (Möller). Certain inaccuracies in MacLeay's description are undoubtedly due to the bad state of preservation of his specimens.

We propose to redefine this genus in the following way, so as to fit a small group of species that includes the type of the genus.

A gonad on each side of the body, the left ovary being above the primary

*Dr. Van Name has re-examined the types (letter dated June 9, 1922) and finds that "the intestinal loop and the form and structure of the gonads are clearly distinguishable," and agree with the condition in *C canadensis*. We have, therefore, Verrill's original description of *M. papillosa* (external characters only) corresponding with one species, not represented in his material as examined by Van Name, and the specimens labelled as the types corresponding with another species.

intestinal loop; the testicular lobes are more or less separated from the ovary, being to some extent below the renal organ on the right side, and in the intestinal loop on the left. Several vasa deferentia opening separately into peripharyngeal cavity. Pharynx has from five to seven folds on each side, each fold when well developed having several longitudinal bars.

In addition to the two following species this genus includes *Molgula redikorzevi* Oka.

C. griffithsii, MacLeay.

1825. *Cystingia griffithsii*, MacLeay, p. 541.
1842. *Clavelina chrystallina*, Möller, p. 95.
1852. *Pera pellucida*, Stimpson, p. 232.
1872. *Pera crystallina*, Verrill, p. 213.
1903. *Molgula crystallina*, Hartmeyer, p. 137.
1909. *Caesira crystallina*, Hartmeyer, p. 1323.
1912. *Caesira crystallina*, Van Name, p. 494 (with bibliography).
1916. *Molgula crystallina*, Redikorzew, p. 58 (with bibliography).

Sound between Paint Hills Islands, east coast of James Bay, about lat. 53° N.; 10 fathoms; stones and sandy mud; September 10, 1920; coll. F. Johansen, 9 sp. Floating near surface, east coast of James Bay, about lat. 53½°N.; attached to red algae; September 9, 1920; coll. F. Johansen, 8 sp. Old Factory Bay, east coast of James Bay, about lat. 52½°N.; 5 fathoms; stones, sandy mud and algae; September 11, 1920; coll. F. Johansen, 12 sp.

This is an arctic circumpolar species, with a distribution similar to that of *Chelyosoma macleayanum*. It is found in the subarctic region to a very limited extent, but occurs on our Atlantic coast in small numbers as far south as the Gulf of Maine. MacLeay's, the original, record of this species, was from Winter Island, in Fox Channel, just inside the northern limit of the region we are considering.

C. retortiformis, Verrill.

1912. *Caesira retortiformis*, Van Name, p. 509 (with bibliography and synonymy).
1916. *Molgula retortiformis*, Redikorzew, p. 85 (with bibliography and synonymy).

Beach at Fort Churchill, Hudson Bay; October, 1910; coll. J. M. Macoun, 1 sp. Long Point Sound (between Long Island and Cape Jones), east coast of Hudson Bay (about 54½°N. lat.); 5 fathoms; stones, sand and algae; August 2, 1920; coll. F. Johansen, 2 sp. Sound between Paint Hills Islands, east coast of James Bay (about 53°N. lat.); 10 fathoms; stones and sandy mud; September 10, 1920; coll. F. Johansen; 15 sp. Old Factory Bay, east coast of James Bay (about 52½°N. lat.); 5 fathoms; stones, sandy mud and algae; September 11, 1920; coll. F. Johansen, 1 sp.

This species has a similar distribution to that of the preceding, but extends farther south than the latter on both coasts of America, and not so far south on the coasts of north-eastern Asia and north-western Europe. It has not been reported from the Canadian Arctic archipelago, which raises the question of whether or not it is truly circumpolar.

Rhizomolgula globularis (Pallas).

1916. Redikorzew, p. 128 (with bibliography).

Bay between Black Whale and Olaska harbours, east coast of Hudson Bay (about 55°N. lat.); 10 fathoms; sandy mud and algae; August 28, 1920; coll. F. Johansen, 47 sp. From stomach of *Cottus quadricornis*, east coast of Hudson Bay, about 55°N. lat.; August 30, 1920; coll. F. Johansen, 38 sp. Cape Hope Islands, east coast of James Bay, about 52½°N. lat.; washed up on beach; September 12-14, 1920; coll. F. Johansen, 16 sp.

This is an arctic circumpolar species. It is distinctly a shallow water form and invades the subarctic zone to a less extent than almost any other of our species. The above record is believed to constitute the southernmost limit of its distribution.

Goniocarpa lovenii (Koren et Daniel.).

1912. *Tethyum coriaceum*, Van Name, p. 560 (with bibliography and synonymy).

1915. *Styela lovenii*, Hartmeyer, p. 326.

1916. *Goniocarpa coriacea*, Redikorzew, p. 244 (with bibliography and synonymy).

King George Sound, Hudson Strait; 40 fathoms; September 9, 1897; coll. Low and Wakeham, 4 sp. Sound between Paint Hills Islands, east coast of James Bay (about 53°N. lat.); 10 fathoms; stones and sandy mud; September 10, 1920; coll. F. Johansen, 15 sp. Old Factory Bay, east coast of James Bay (about lat. 52½°N.); 5 fathoms; stones, sandy mud and algae; September 11, 1921; coll. F. Johansen, 2 sp.

I have followed Hartmeyer in using Koren and Danielssen's name for the species, as their article is not accessible to me. There is a strong tendency at present among Ascidiologists to lump species wherever practicable. Simplicity is achieved, but at the expense of neglect of many more or less distinct forms that undoubtedly exist. If we follow the authors listed under the synonymy we must consider as belonging to this species the following: *Cynthia coriacea*, Alder and Hancock, *Cynthia placenta* Packard, *Cynthia granulata* Alder, *Styela armata* Lac.-Duth. et Delage, *Styela northumbrica* Alder and Hancock, *Tethyum compressum*, Redikorzew, *Goniocarpa coccodes* Huntsman, and *Styela hemicaespitosa* Ritter. It is undoubtedly true that these are all closely related and that they are not all distinct, but among them are clearly different forms. Their satisfactory elucidation must be left to the future. These forms may best be considered as subspecies. A very distinct one is the *granulata* of Alder with which the *armata* of Lacaze-Duthiers et Delage is synonymous. This form has tapering, sharp spinules and very short gonads, the ducts of the latter falling far short of reaching the atrial velum.

The specimens from Hudson strait agree with what seems to be the usual condition in this species, but those from James bay differ from any Pacific, Atlantic or arctic specimens that have been available for examination. The gonoducts end close to the atrial velum as is usual. The outer surface of the test possesses granules that are considerably more prominent than is usual. The greatest peculiarity, however, consists in the character of the spinules.

These are not pen-shaped, but round, and they taper to a sharp point. They are from 0.016 to 0.024 mm. long. In the elongation of the spinules this form approaches the condition found in *Katatropa greeleyi* (see Huntsman, 1913, p. 495). It seems desirable to give this form a name. It may be called *Goniocarpa lovenii jacobaea*.

This species is circumpolar and extends well into the subarctic.

Goniocarpa rustica (L.).

1912. *Tethyum rusticum*, Van Name, p. 549 (with bibliography and synonymy).

1916. *Goniocarpa rustica*, Redikorzew, p. 229 (with bibliography and synonymy).

King George Sound, Hudson Strait; 40 fathoms; September 9, 1897; coll. Wakeham and Low, 1 sp. Fort Churchill, west side of Hudson Bay; on beach; October, 1910; coll. J. M. Macoun, 2 sp.

This species is circumpolar, and extends into the subarctic regions but not so far as does the preceding.

Cnemidocarpa rhizopus (Redikorzew).

1874. *Cynthia villosa*, Kupffer, p. 244.

1903. *Styela villosa*, Hartmeyer, p. 225.

1907. *Styela rhizopus*, Redikorzew, p. 523.

1909. *Tethyum kupfferi*, Hartmeyer, p. 1360.

1916. *Cnemidocarpa rhizopus*, Redikorzew, p. 271 (with bibliography and synonymy).

Richmond Gulf, east coast of Hudson Bay; 15-30 fathoms; soft mud; June, 1899; coll. A. P. Low, 1 sp. Manitouk Sound (bay inside boat opening), east coast of Hudson Bay; 5-7 fathoms; clay-mud, sand and stones; August 27, 1920; coll. F. Johansen, 17 sp.

This species has the following characters. The body is elongated, with the apertures on short contractile siphons at one end, and with from 1 to 8 branched radicoid filaments at the other end. The surface is usually coated with adherent sand grains and the anterior half of the body in the contracted state is thrown into transverse wrinkles. The pharyngeal folds are much reduced, having from one to seven longitudinal bars on each and none between the folds. The stomach is placed transversely and has from 16 to 20 folds in its wall. The intestinal loop is short. The rectum is long and ends close to the atrial velum in the anus, which has from 15 to 18 lobes on its margin. The gonads are transverse or nearly so, and number from 2 to 5 on each side.

The single specimen from Richmond Gulf is 11 mm. long and 8 mm. in diameter. There are about 40 oral tentacles, and the dorsal tubercle is horse-shoe-shaped, with the opening between the horns directed posteriorly and slightly to the left. The formula for the pharyngeal folds is:

Left —Dors. 0 (5) 0 (2) 0 (4) 0 (2) 0 vent.

Right—Dors. 0 (7) 0 (1) 0 (4) 0 (2) 0 vent.

The atrial velum varies in width from point to point, in some places being quite narrow. Its margin is undulating. The atrial tentacles are filiform or

somewhat clavate, and placed in a single row at the base of the velum. There are two gonads on each side.

The largest specimen from Manitouk Sound is 7 mm. long and 4½ mm. in diameter. The pharyngeal formula is:

Left —Dors. 0 (5) 0 (1) 0 (3) 0 (2) 0 vent.

Right—Dors. 0 (5) 0 (1) 0 (3) 0 (1) 0 vent.

There are four gonads on the right side and three on the left.

These specimens agree sufficiently well with the brief accounts by Kupffer and Hartmeyer of a specimen from Greenland. From Redikorzew's description of his species (and also of the variety *murmanense*) they differ in a somewhat smaller number of gonads, and in a somewhat larger number of bars on the pharyngeal folds. It is an interesting fact that so far as reported the numbers of bars on the various pharyngeal folds vary inversely with the number of gonads. Taking for simplicity the gonad of the right side and the most dorsal pharyngeal fold, we have the following:

	Gonads	*Longitudinal bars*
C. rhizopus (type)	6	3
C. rhizopus murmanense	5	4
Manitouk Sound specimen	4	5
Richmond Gulf specimen	2	7

It appears unlikely that these differences in numbers are important enough to warrant our considering these forms as distinct species. The uniformly lower number of gonads in the specimens from Greenland and Hudson Bay as compared with those described by Redikorzew from the Eurasian arctic is sufficient reason for provisionally considering the American specimens as belonging to a different subspecies, which we may call *C. rhizopus americana*.

This species is very definitely limited to arctic waters, as it has been found in Eurasia only within the Arctic circle (northernmost part of Siberia and Novaya Zemlya), and in America hitherto only from north-east Greenland. Its presence is indicative of the arctic character of the waters of Hudson Bay, even though they are not within the arctic circle.

Cnemidocarpa mollis (Stimpson).

1912. *Tethyum molle*, Van Name, p. 571 (with bibliography and synonymy).

1916. *Cnemidocarpa mollis*, Redikorzew, p. 265 (with bibliography and synonymy).

Manitouk Sound (bay inside boat opening), east coast of Hudson Bay; 5-7 fathoms; clay-mud, sand and stones; August 27, 1920; coll. F. Johansen, 13 sp.

The largest specimen is 11 mm. long and 9 mm. in diameter, with the oral and atrial apertures on the dorsal side and equidistant respectively from the anterior and posterior ends. The surface of the body is quite well covered with sand grains adhering to filaments of the test, which near the apertures are simple and scattered, and on the ventral surface arise in clusters from points on the test or from more or less distinct pedicels.

The formula for the bars on the pharyngeal folds is:

Left—Dors. 0 (14) 2 (6) 2 (14) 3 (14) 2 vent.

Right—Dors. 0 (16) 2 (8) 2 (15) 3 (9) 2 vent.

There are 8 gonads on the right side, and 5 on the left. There are 10 anal lobes.

The smallest specimen is 3 mm. in diameter and not definitely elongated in any direction. No gonads are discernible. The anal lobes are indistinct. There are about 20 longitudinal bars on each side of the pharynx, but the arrangement in folds is not clear.

A very exceptional specimen is 13 mm. long and 8 mm. in diameter, with the apertures close together at one end. At the opposite end the body is drawn out into a fleshy wrinkled root with only a few filaments. The remainder of the surface is thickly covered with simple filaments. There are 3 gonads on each side. In spite of the peculiar shape there can be little doubt that it belongs to the same species as the others, but it is an example of how deceptive form may be in Ascidians, in this case probably as the result of growth in a peculiar situation.

This species, known only from the east coast of North America, has not previously been reported from any point north of the Gulf of St. Lawrence. It occurs as far south as Long Island Sound. It is remarkable that the European form *Cnemidocarpa vestita* (Stanger), which is by some considered as identical with this species, is known only from the northern coasts of Great Britain.

Boltenia echinata (L.).

See for synonymy Van Name, 1912, p. 523, under the name *Pyura echinata*, and also Redikorzew, 1916, p. 154.

King George Sound, Hudson Strait; 40 fathoms; September 9, 1897; coll. Wakeham and Low, 6 sp.

These specimens are of the typical arctic type, with spines showing a whorl of branches and the stem continued far beyond the whorl. They differ, therefore, from the variety *hirsuta* (*Boltenia hirsuta*, Huntsman, 1912, p. 147) of the Bay of Fundy and Gulf of Maine.

This species is arctic and circumpolar. It is found far into the subarctic zone.

Boltenia ovifera (L.)

For synonymy and bibliography see Van Name, 1912, p. 527, and Redikorzew, 1916, p. 143.

King George Sound, Hudson Strait; 40 fathoms; September 9, 1897; coll. Wakeham and Low, 1 sp. Fort Churchill, west side of Hudson Bay; on beach; October, 1910; coll. J. M. Macoun, 2 sp.

MacLeay (1825, p. 536) recorded this species (as *B. reniformis*) from Winter Island, Fox Channel, which is in the northern part of the region we are considering. Halkett (1898, p. 83) recorded *Boltenia* from the south shore of Hudson Strait taken in the summer of 1897, and (1906, p. 368) has reported specimens of *Boltenia*, which, doubtless were of this species, from Port Burwell, Hudson Strait, and from Fullerton, N.W. part of Hudson Bay, obtained in 1903-04.

The distribution of this species is quite peculiar. It is found from the sea of Okhotsk and Kamchatka through arctic America to Greenland, and our Atlantic coast as far south as the Gulf of Maine. From Eurasia and the islands to the north (except as indicated above) it has not been reported.

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