

JOHNSONIA

Published by
THE DEPARTMENT OF MOLLUSKS
Museum of Comparative Zoölogy, Harvard University
Cambridge, Massachusetts

MAY 11, 1946

MYIDAE

VOL. 2, NO. 20

THE GENUS *MYA* IN THE WESTERN ATLANTIC

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The members of the genus *Mya* are widespread and abundant in northern waters. This genus is remarkable in that all its species are used for food by man. Of the few forms which have been described, both recent and fossil, all are very closely related to the two species found in the Western Atlantic.

Mya Linné

Mya Linné 1758, Syst. Nat., ed. 10, p. 670.

Arenomya Winckworth 1930, Proc. Malac. Soc. London, **19**, p. 15 (Genotype, *M. arenaria* Linné).

Genotype, *Mya truncata* Linné (subsequent designation, Children 1823, Quart. Journ. Sci., Lit. and Arts, **14**, p. 85. Placed on the Official List of Generic Names by Opinion 94 of the International Commission on Zoological Nomenclature).

Shell inequivalve, the right valve being slightly larger than the left, variable in shape, rounded anteriorly, gaping posteriorly. Sculpture restricted to concentric growth lines and radial irregularities. Ligament extending on either side of the depressed umbones. Left valve provided with a well-developed projecting chondrophore which bears a broad, heavy resilium or internal ligament. The right valve has a corresponding excavated chondrophore under the beak. Teeth obsolete; hinge strengthened by nymphs or rounded lamellae. Pallial sinus extends to the middle of the shell. Long siphons united and covered by a tough epidermal layer which is contiguous with the mantle. Mantle edges fused except for an anterior slit for the extension of the foot.



Plate 17. *Mya truncata* Linné
Belgium. Siphons extended (natural size).

Mya truncata Linné, Plates 17-19

Mya truncata Linné 1758, Syst. Nat., ed. 10, p. 670 (O. Europaeo).

Mya ovalis Turton 1822, Shells of the British Islands, p. 33, pl. 3, fig. 1-2 (Dublin Bay, at Clontarf [Ireland]).

Sphenia scainsoni Turton 1822, Shells of the British Islands, p. 37, pl. 19, fig. 2 (rocks in Torbay [England]).

Mya pullus Sowerby 1826, Mineral Conch. Great Britain, 6, p. 58, pl. 531, fig. 6-8 (Crag at Butley, Suffolk [England]).

Mya truncata var. *Uddevalensis* Forbes 1846, Mem. Geol. Survey of Great Britain, 1, p. 407 (fossil: Clyde Beds [England], Scandinavia, Russia, Canada; living: Gulf of St. Lawrence [Canada]).

Mya praecisa Gould 1850, Proc. Boston Soc. Nat. Hist., 3, p. 215; 1852, United States Exploring Expedition, 12, p. 384, fig. 498-498b (Puget Sound [Washington]).

Mya truncata var. *abbreviata* Jeffreys 1865, British Conchology, 3, p. 67 (no locality cited [Great Britain]).

Description. Shell 25 to 75 mm. (1 to 3 inches) in length, valves widely gaping at the truncated posterior end, chalky white with traces of cream and flesh color on the inner surface. Umbones subcentral. Sculpture consists of coarse concentric growth lines. Ligament well-developed. Chondrophore of the left valve short, broad, trigonal, and connected anteriorly to the hinge line by a broad ledge. Anterior ridge uniformly elevated and recurved. Distal margin straight to slightly curved. The evenly worn posterior tooth never projects beyond the edge. Behind this is a shallow sulcus and the deep, symmetrically-excavated pit. Right valve chondrophore deeply excavated, its lower margin free. The surmounting tooth is often poorly developed. Subcircular posterior adductor muscle scar situated in the upper sixth of the shell near the umbo; swollen base of the lanceolate anterior muscle scar lies near the lower third. Depth of the pallial sinus equal to its width or much less. The upper margin slopes sharply downward while the lower edge may be parallel to the hinge line. Periostracum heavy, ranging from straw yellow to chocolate brown.

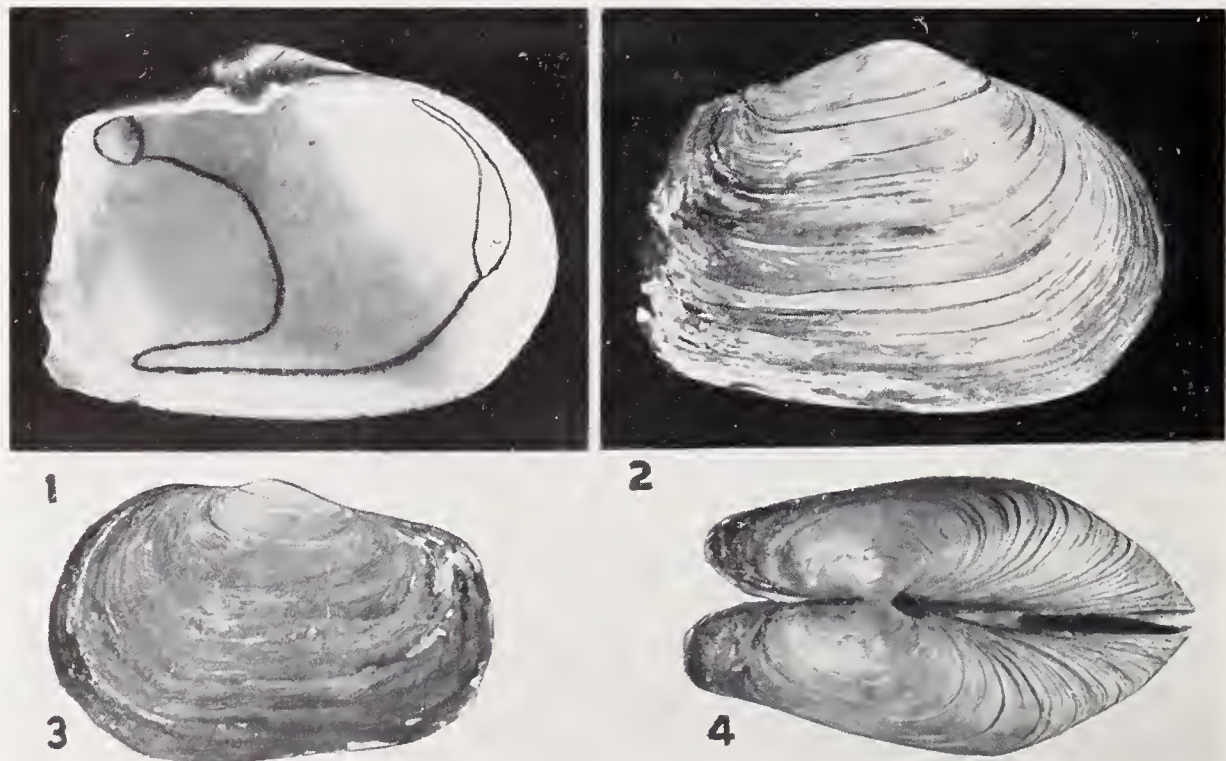


Plate 18. *Mya truncata* Linné

Figs. 1-2, 4. Boone Island, Maine. Fig. 3. Perry, Maine (all natural size).

In figure 1 the pallial complex has been inked in.

	length	height	width	maximum gape	
(large)	70.2	49.7	31.8	18.5 mm.	Eastport, Maine
(average)	52.8	39.5	29	17	Boone Id., Maine
	38.3	26.4	18.3	10.2	Revere, Massachusetts
	26	19.7	11.2	7.3	Grand Manan, New Brunswick
	28.5	23.6	17 est.	—	Hebron, Labrador (form <i>uddevalensis</i> Forbes)

Types. We here select Linné's reference to Lister 1678, *Hist. Anim. Angliae*, pl. 5, fig. 36, as the type figure and Liverpool, England as the type locality.

Common name. Gaper.

Remarks. *M. truncata* Linné is quite variable in the degree of truncation and the angle which the posterior margin forms with the axis. Forbes applied the name *uddevalensis* (= *abbreviata* Jeffreys) to a shell that he considered to be a variety of this species characterized by having a very obliquely truncated posterior margin which sloped anteriorly toward the base to a point almost under the umbones. Naturally the pallial sinus was much reduced. Our largest series, collected by Captain von Paulson, USCG, at Dove Bay, Danmark Haven, northeast Greenland, shows a nearly complete intergradation between typical and shortened forms. To our knowledge, the examples from the Gulf of St. Lawrence cited by Forbes constitute the southernmost living record for the form *uddevalensis*. We believe it to be only an extreme variant of the typical *truncata*.

Jeffreys (1865, p. 69) states that this species is eaten by the king eider duck of Greenland and the arctic fox and that large quantities have been obtained from the stomachs of Spitzbergen walrus which presumably rake them out of the mud with their long tusks, crush the shells with their molars and spit out the fragments and siphonal cuticles. He gives the vernacular names (all apparently derived from the Danish "smør," meaning

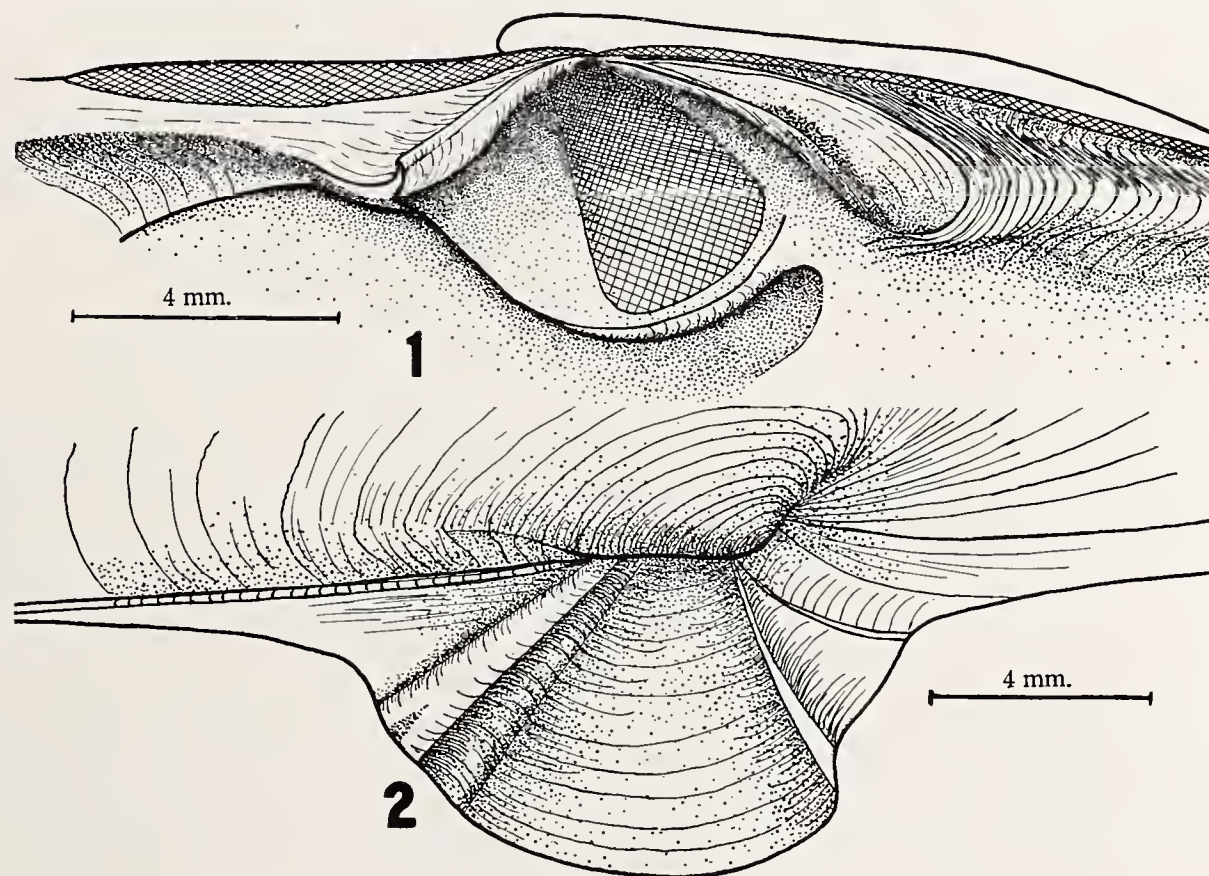


Plate 19. *Mya truncata* Linné

Fig. 1. Chondrophore of right valve. Fig. 2. Chondrophore of left valve.

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butter) which are used for this clam in Iceland, the Faroe Islands, Shetland and western Scotland where it is considered quite a delicacy. Ganong (1889, p. 104) states that it forms an important source of food for the cod on the Newfoundland Banks.

Range. Circumpolar in Arctic waters. EASTERN ATLANTIC: south to La Rochelle, France, (Lamy 1927, p. 167). WESTERN PACIFIC: south to Hakodate, Japan (Lamy 1927, p. 166). EASTERN PACIFIC: south to Port Orchard, Washington (MCZ). WESTERN ATLANTIC: south to Nahant, Massachusetts.

Records. LABRADOR: Cape Mumford to Hebron (60 fathoms); Nain (7 fathoms)*. NEWFOUNDLAND: St. Lawrence Harbor (53 fathoms);* St. Anthony.* QUEBEC: Little Metis. NOVA SCOTIA: Banquereau (35-40 fathoms). NEW BRUNSWICK: Grand Manan. MAINE: Eastport; Boone Island. MASSACHUSETTS: Middle Bank (35 fathoms); Nahant; Revere Beach; Plymouth* (all MCZ); Nantucket* (USNM).

Mya arenaria Linné, Plates 20-21

Mya arenaria Linné 1758, Systema Naturae, ed. 10, p. 670 (O. Europae septentrionalis).

Mya commnis Megerlé v. Mühlfeld 1811, Mag. Ges. naturf. Fr. Berlin, 5, p. 46 (based on Chemnitz 1782, Conch. Cab. (1) 6, pl. 1, fig. 3-4).

Mya lata Sowerby 1815, Mineral Conch. Great Britain, 1, p. 185, pl. 81 (the Crags of Norfolk and Suffolk Counties [England]); Smith 1816, Strata Identified by Organized Fossils, London, pl. 2, fig. 9 [typical *M. arenaria* chondrophore].

Mya acuta Say 1822, Journ. Acad. Nat. Sci. Philadelphia, 2, p. 313 (southern coast [United States]).

Mya mercenaria Say 1822, Journ. Acad. Nat. Sci. Philadelphia, 2, p. 313 (the coast of the United States).

Mya alba Agassiz 1839, Mém. Soc. Sc. Nat. Neuchâtel, 2: Mém. Moules de Mollusques, p. 40, pl. 3, fig. 1-6 and Notice sur le *Mya alba*, p. 1, pl. 1, fig. 2-8 (Porto Rico) [locality data erroneous].

Mya corpulenta Conrad 1845, Fossils of the Medial Tertiary, Philadelphia, p. 68, pl. 39, fig. 1 (Petersburg, Virginia [Tertiary]).

Mya japonica Jay 1856, [in] M.C. Perry's Report on the United States Expedition to Japan, 2, p. 292, pl. 1, fig. 7, 10 (Volcano Bay, Island of Yeddo [Japan]); *non japonica* Grant and Gale 1931.

Mya hemphilli Newcomb 1874, Proc. Acad. Nat. Sci. Philadelphia, 5, p. 415 (Bay of San Francisco [California]).

Mya elongata Locard 1886, Prodrome de Malac. française, pp. 383 and 586 (Dunkerque, La Rochelle, Arcachon [France]).

Description. Shell 25-150 mm. (1 to 6 inches) in length, elongately to roundly ovate, valves slightly gaping at the acute to rounded posterior. Color chalky-white with traces of cream and flesh color on inner surface. Umbones subcentral to central. Sculpture consists of concentric growth lines and obscure radiating surface irregularities. Ligament poorly developed. Chondrophore of the left valve long, spoon-shaped and shallow. Its anterior edge projecting sharply from the hinge line at an angle of 90-100° has an elevated recurved ridge particularly well-developed at the extremity. The figured chondrophore shows an unusually pronounced connecting ledge. Distal margin broadly rounded. Projecting end of posterior tooth prominent, its proximal portion often badly worn. Margin sulcate on either side of tooth. The adjacent narrow ledge is flat and the pit slopes gradually anteriorly. Chondrophore right valve shallow, unevenly excavated, its lower portion flattened where ventral margin fuses with shell. Surmounting tooth never well-developed. Subcircular posterior adductor muscle scar situated in upper third of shell. Swollen base of lanceolate anterior scar lies about on the midline. Pallial sinus long

* Dead valves with periostracum badly worn.

and narrow, its length usually about twice its width. Upper and lower margins slope at the same angle. Periostracum thin, light gray to straw-yellow.

	length	height	width	
(large)	110	85.4	53.5 mm.	Chelsea Beach, Massachusetts
	98.3	58.5	37	Brooklyn, New York
(average)	60	34.3	21.2	Little Choptank River, Maryland
	64.8	48.8	35.2	Cohasset, Massachusetts (distorted, living among rocks)

Types. We here select Baster 1762, *Opuscula Subseciva*, 2, pl. 7, fig. 1 as the type figure. Linné gave this reference in his 12th edition of the *Systema Naturae*. We designate the mouth of the Scheldt River, Netherlands as the type locality since this was mentioned by Baster.

Common names. Soft-shelled clam, soft clam, long-necked clam, nanny nose (derived from the Indian name "maninose").

Remarks. *Mya arenaria* is so variable in shape that this character alone is often of little value in distinguishing badly distorted specimens of this species from *M. truncata* and more particularly the arctic and West Coast forms. The least inconsistent characters are

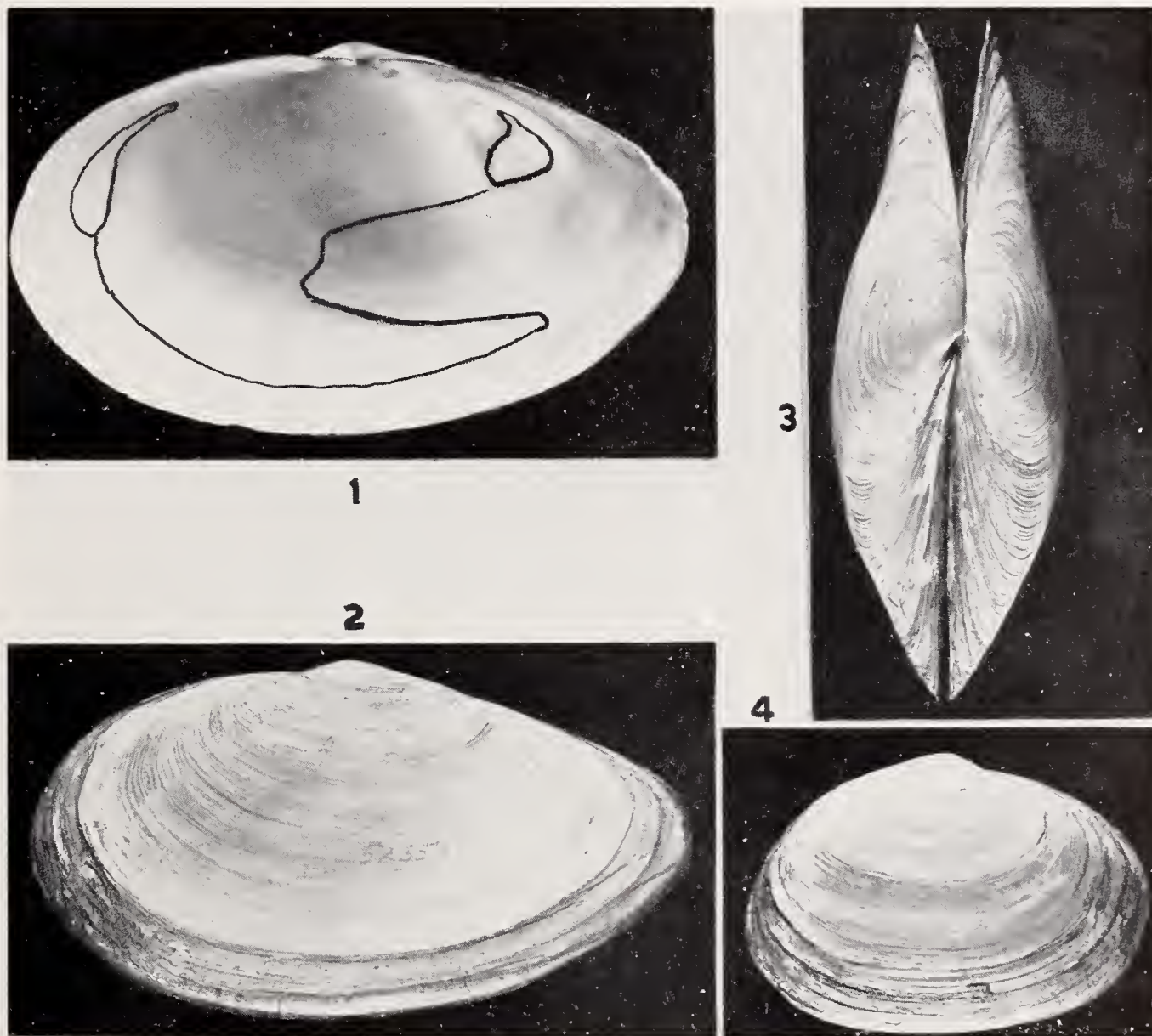


Plate 20. *Mya arenaria* Linné

Figs. 1-3. Little Choptank River, Dorchester Co., Maryland. Fig. 4. Nantasket Beach, Massachusetts (all natural size). In figure 1 the pallial complex has been inked in.

the form of the pallial sinus and the proportions of the chondrophores. Rocky and gravelly bottoms as well as waters of low salinity produce a large quota of deformed and dwarfed individuals. As one advances up the St. Lawrence River, the clams become progressively smaller.

About 1870 young clams were accidentally introduced into San Francisco Bay, California with shipments of seed oysters and spread rapidly northward to Puget Sound and south to Monterey (Stearns 1881). Just prior to this time the coasts of northern California and Washington were unique among all North Temperate shores in supporting no representatives of this species.

For a long time it has been generally thought that *M. arenaria* was circumpolar in the Arctic. However, such is not the case. The arctic counterpart of this species in Greenland, Iceland, Spitzbergen and northern Siberia is *Mya pseudoarenaria* Schlesch (1931, p. 136, syn.: *M. truncata ovata* Jensen 1900, p. 139; *non ovata* Donovan 1802). Hesseland (1946) in his very complete account of the geological history and spread of *M. arenaria* in European waters shows that, unlike the cold water *M. truncata*, it was exterminated there during the Pleistocene Ice Age. It was evidently reintroduced some time during the 16th or 17th century from our American coast and has only recently spread to northern Scandinavia. It was probably either imported for food or bait or the larvae were accidentally transported in the leaky bilges of ships.

Economy. In 1935, 11,635,000 pounds of soft-shelled clams valued at \$704,000 were harvested on the East Coast (Fiedler 1938, p. 42). In New England the quantities of

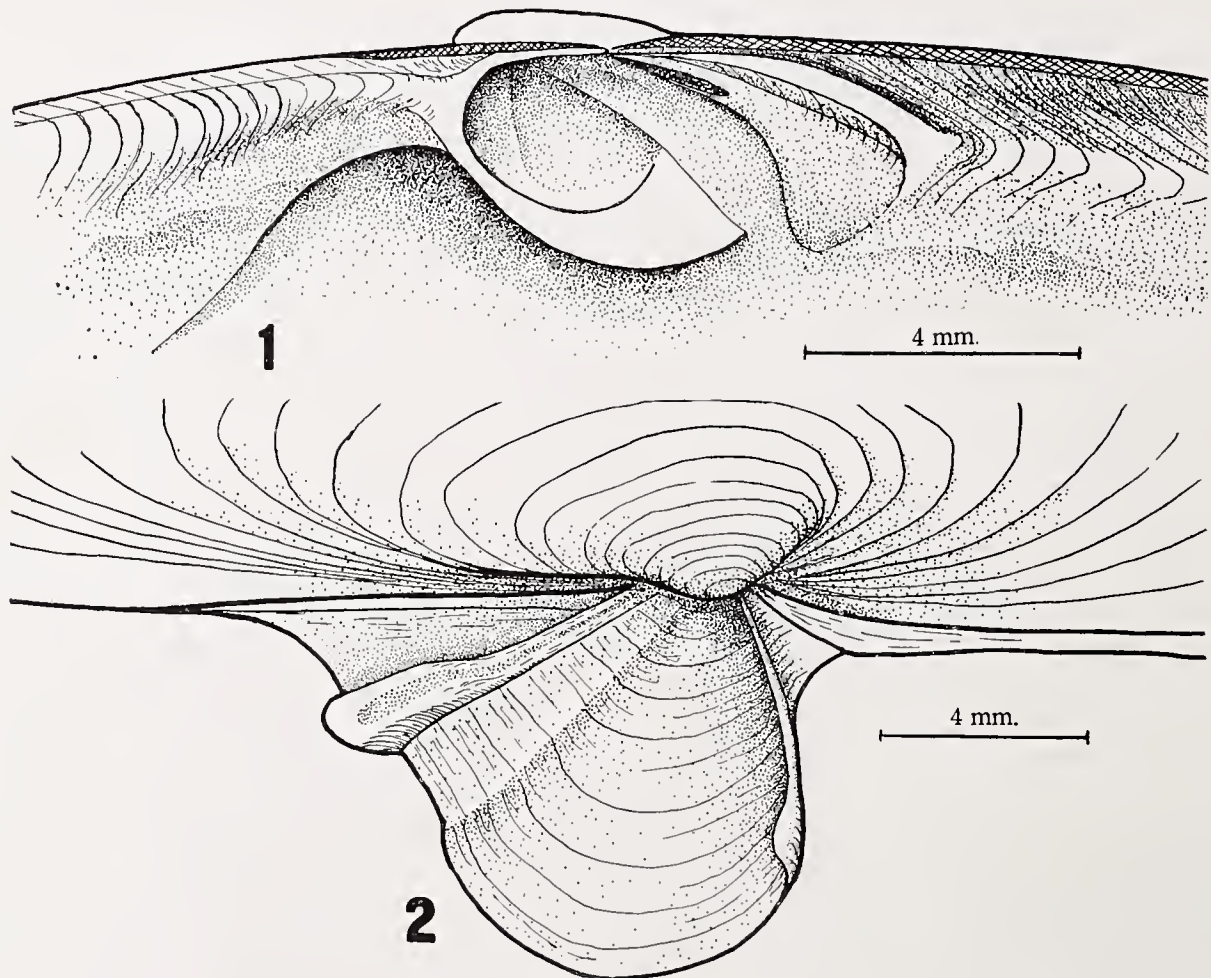


Plate 21. *Mya arenaria* Linné

Fig. 1. Chondrophore of the right valve. Fig. 2. Chondrophore of the left valve.

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clams and oysters produced were about equal. Living as they do on readily accessible flats, it is natural that they should have been overfished. Attempts at seeding barren but well-situated areas with young clams sifted from overpopulated flats have been very successful. The "farmers'" investments have been protected by state legislation. The interest derived from an undertaking involving so little work is quite large when one considers that an acre may produce over a million clams in about two years. Furthermore, a hundred pounds of clams furnishes thirty-five pounds of food while the equivalent weight of oysters would give only thirteen pounds.

In the past, several outbreaks of typhoid fever have been traced to the consumption of polluted clams from sewage-contaminated waters. Nowadays clams from such areas cannot be sold unless they are first cleansed in tanks of chlorinated seawater.

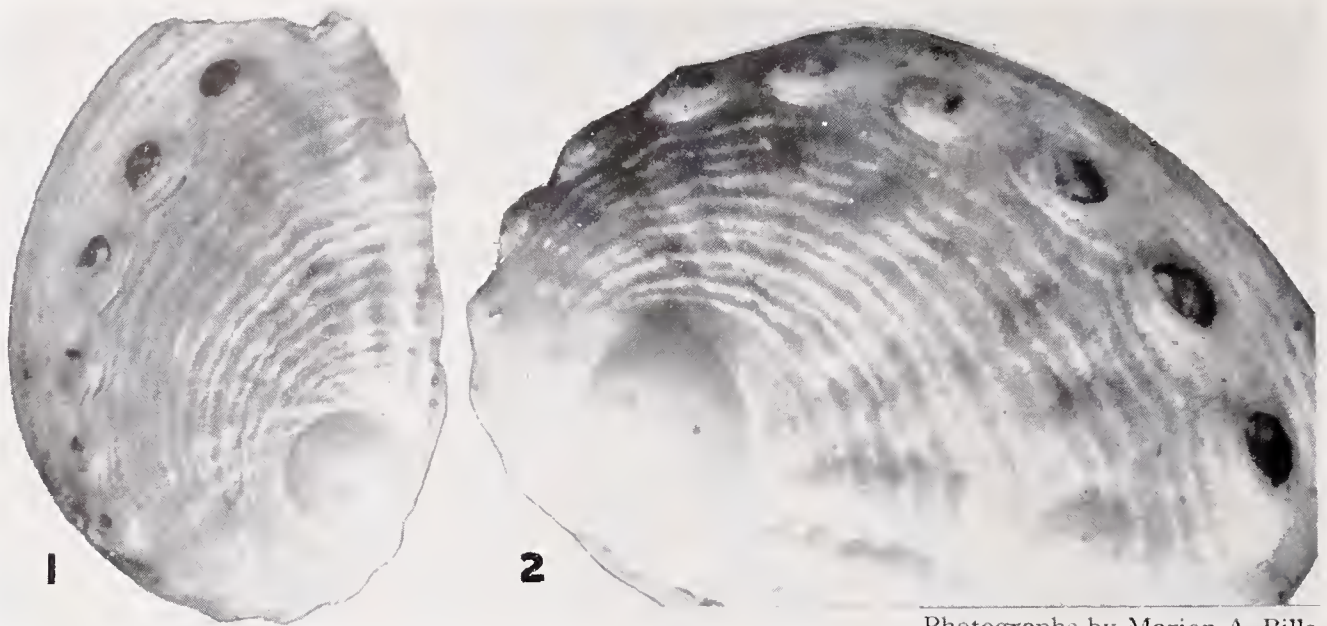
Range. EASTERN ATLANTIC: Northern Norway (Hessland 1946, p. 1) to Arcachon, France (Lamy 1927, p. 162). WESTERN PACIFIC: Kamchatka Peninsula¹ to Iyo, Japan (MCZ). EASTERN PACIFIC: Akutan Id., Alaska and Puget Sound, Washington (both MCZ) to Monterey, California (Stearns 1881, p. 366). WESTERN ATLANTIC: Labrador to Cape Hatteras, North Carolina. The southernmost living examples we have seen were from Virginia Beach. The National Museum has three worn valves from Beaufort, N.C., which may be Pleistocene. Neither Jacot (1921, p. 137) nor any of the papers on the Beaufort fauna to which he refers record finding living *arenaria*. All records south of Cape Hatteras may well be based on fossil material.

Records. LABRADOR: Nain. NEWFOUNDLAND: Cape Norman; Pilley's Id.; St. Pierre (5 fathoms). QUEBEC: Seven Islands, Saguenay Co.; Little Metis (all MCZ). PRINCE EDWARD ISLAND: Ellerslie (J. C. Medcof). NEW BRUNSWICK: St. John; Grand Manan. MAINE: Eastport; Isle au Haut; Kennebunkport. NEW HAMPSHIRE: Hampton Beach. MASSACHUSETTS: Ipswich; Atlantic; Duxbury; Provincetown; Dennisport; Nantucket. RHODE ISLAND: Westerly. CONNECTICUT: Stonington; Branford. NEW YORK: Glen-cove; Staten Island. NEW JERSEY: Atlantic City. MARYLAND: Little Choptank River, Dorchester Co. VIRGINIA: Virginia Beach (all MCZ). NORTH CAROLINA: Beaufort (USNM, dead valves).

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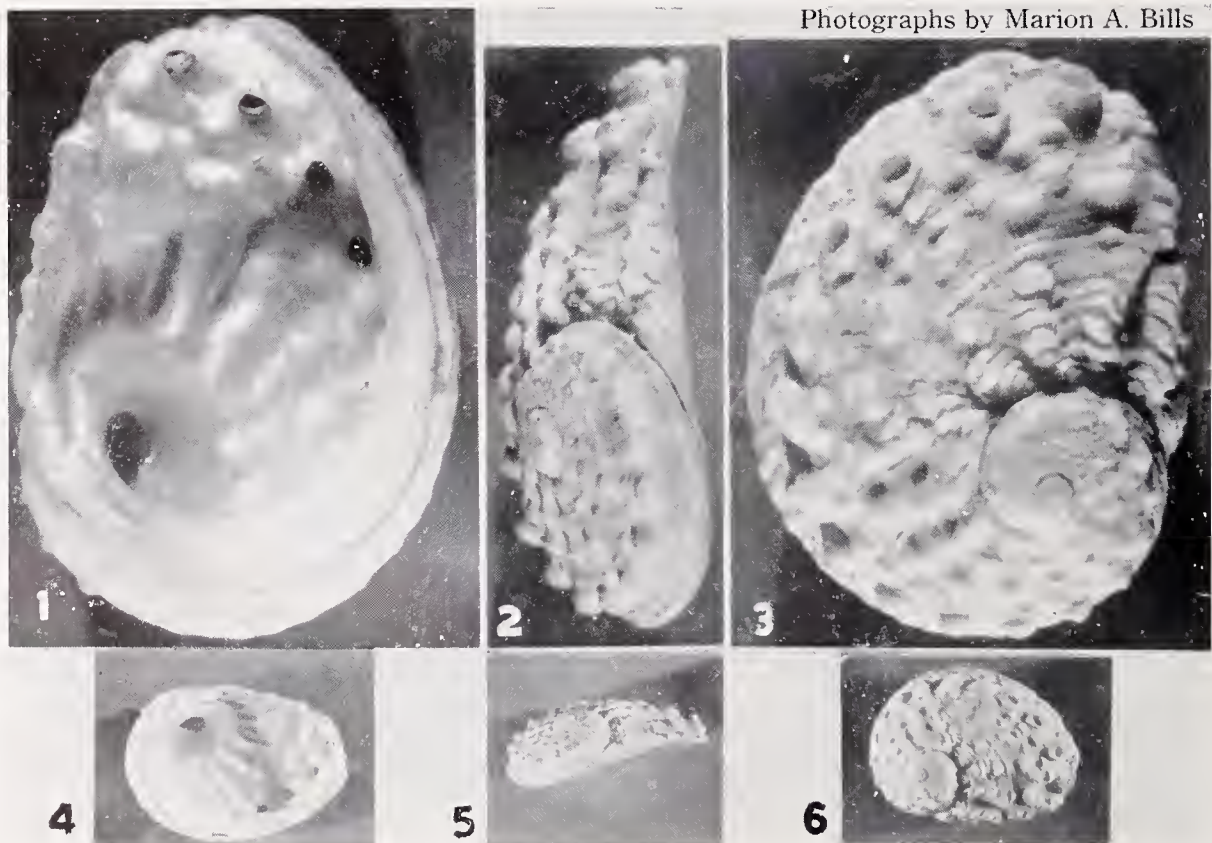
¹ Lamy 1927, p. 162; possibly *M. profundior* Grant and Gale.



Photographs by Marion A. Bills

Plate 22. *Haliotis pourtalesii* Dall

Off the Elbow, Key Largo, Florida, in 90-100 fathoms (fig. 1, 7×; fig. 2, 10×).



Photographs by Marion A. Bills

Plate 23. *Haliotis barbouri* Foster

Praia de Copacabana, Brasil, Holotype (figs. 1-3, about 3×; figs. 4-6, natural size).