

SMITHSONIAN MISCELLANEOUS COLLECTIONS

VOLUME 104, NUMBER 11

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OF THE GENUS *MARTESIA*

(WITH THREE PLATES)

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(PUBLICATION 3804)

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The Lord Baltimore Press
BALTIMORE, MD., U. S. A.

THE WEST ATLANTIC BORING MOLLUSKS OF THE GENUS *MARTESIA*

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INTRODUCTION

Martesias are boring mollusks that excavate a cavity little longer than the shell for protective purposes. Compared with those of shipworms, their cavities are shallow and confined to the outer fringe of the sheltering material. The members of two of the subgenera, *Martesia* and *Particoma*, appear to confine their attack to wood and are exceedingly destructive to piles and docks as well as to the boards and planks of skiffs, scows, and unsheathed wooden vessels. Creosoting or other impregnation does not appear to stop their drilling, nor do felt layers between boards offer an impediment to their boring. All of this would indicate that unlike shipworms these organisms do not use the rasped-off wood material for food but that the wood serves merely for housing. This conclusion seems also to find confirmation in the habits of the members of the subgenus *Diplothyra* which seek protection in burrows that they make in the shells of mollusks and in rocks.

The fourth subgenus here discussed seems rather heterodox in its habits, drilling wood, floating nuts, and even the lead-covered submarine cables of power lines.

This genus and its included species have probably endured a greater mix-up and misunderstanding than any other small group.

Leach, it would appear, recognized that some "Pholads" had the anterior gap closed and believed that a sufficient character for a new genus. He probably broadcasted this information in letters to his conchological friends, for no published record by Leach has been discovered.

Sowerby¹ used the name *Martesia* as of Leach and mentions with it on page 2 *Pholas clavata* Lamarck, which makes this the genotype. On page 4, however, he states that *Pholas clavata* Lamarck = *Pholas striata* Linné. In his description of *Pholas clavata*, Lamarck² recognizes: (a) *P. c. major*, (b) *P. c. media*, and (c) *P. c. minima*, and states that (a) *Pholas clavata major* = *Pholas striata* Linné. Unfortunately Linné's description³ is so brief, "Ph. testa ovata multifariam striata," that little help is gained from it for the identification of the species. His reference to Gualtieri's description and figure is of some help, but his reference to habitat "among rocks on the shores of southern Europe" adds more confusion than aid.

Gualtieri's description of his figure "F" which reads, "*Pholas* with thin shell, variously marked by small striations, cancellated and banded, white," helps very little. His four figures "F" probably illustrate two species but fail to show the protoplax. It is therefore impossible to refer them to even the proper subgenus.

Lamy⁴ in his revision of the Pholadidae, under *Martesia*, calls attention to the fact that in the National Museum of Paris are two specimens which he considers to represent Lamarck's *Pholas clavata*. One of these he says bears Lamarck's label *Pholas clavata* (b). The other one, which he considers synonymous, comes from Brazil and he believes this is probably *Pholas clavata* (a) *major*, which Lamarck stated equaled *Pholas striata* Linné.

It would seem from Lamy's paper that Lamarck's *Pholas clavata major* represents the large *Martesia* of the Caribbean and Gulf, and we feel, since Lamarck considered this synonymous with Linné's *Pholas striata*, that we should so construe it here, which is in accord with Lamy's conclusion. We shall therefore consider *Martesia striata* Linné the type of *Martesia*, and bestow that name upon the large West Indian species with large rectangular protoplax.

Genus *MARTESIA* (Leach) Sowerby

1824. *Martesia* (Leach) SOWERBY, Gen. Rec. and Foss. Shells, pt. 23, *Pholas*, pp. 2, 4.

Small bivalve mollusks of ovate or elongate-ovate outline, broadly gaping at the anterior ventral end in the young stages, the gap usually closing in adult life. The valves are divided by an oblique line

¹ Gen. Rec. and Foss. Shells, pt. 23, pp. 2, 4, 1824.

² Hist. Nat. Anim. s. Vert., vol. 5, p. 446, 1818.

³ Syst. Nat., ed. 10, p. 669, 1758.

⁴ Journ. Conchyl., vol. 69, No. 4, p. 198, 1926.

into an anterior and posterior portion. The anterior part of the valves is marked by oblique, more or less sigmoid, denticulated ridges which are absent on the part covering the gap in the adult shell. The posterior portion is marked by curved, low ridges which are not denticulated. The umbonal portion is outward reflected. The shell is also provided with three accessory pieces = (a) a protoplax which is a rather large shield covering the umbones, which differs in shape and sculpture in the different groups; (b) a metaplax, a single, narrow, elongated piece posterior to the protoplax; and (c) a hypoplax which is a narrow, elongated piece stretching over the ventral margin of the two valves posterior to the smooth filled-in portion that covers the anterior gap. In some species the posterior end of the valves is prolonged almost to form a tube. The interior of the shell shows a thickening at the junction of the anterior and posterior portions, also a sickle-shaped hypophysis which extends ventrally from the inside of the umbone.

Type.—*Martesia striata* (Linné).

KEY TO THE SUBGENERA OF MARTESIA BASED ON THE PROTOPLAX

- Shelf forming the posterior part of the inside of the protoplax very broad *Martesia*
 Shelf forming the posterior part of the inside of the protoplax narrow.
 Protoplax consisting of one piece.
 Sculpture of the outside of the protoplax with an impressed longitudinal median line from which oblique threads extend to the lateral margin *Particoma*
 Sculpture of the outside of the protoplax without an impressed longitudinal median line or oblique threads..... *Diplothyra*
 Protoplax consisting of two pieces⁵..... *Diploplax*

Subgenus MARTESIA (Leach) Sowerby

1824. *Martesia* (Leach) SOWERBY, Gen. Rec. and Foss. Shells, pt. 23, *Pholas*, pp. 2, 4.

The members of this subgenus have a large, more or less rectangular protoplax the outside of which is coarsely variously wrinkled. The inside is concave, the anterior end bearing a small incurved hook, while the cavity of the posterior half is covered by a shelf which bears two median hooks which are anteriorly directed. The posterior of these hooks bears a deep median groove which almost splits the points into two fanglike projections. The anterior hook is

⁵ The two pieces touch each other for part of the median line and are here sometimes slightly fused.

much larger than the posterior and is laterally compressed. The outside surface of the shelf is marked by closely spaced, concentric threadlike lines of growth. Metaplast and hypoplast narrow.

Type.—*Martesia striata* (L.) = *Pholas striatus* L.

MARTESIA (MARTESIA) STRIATA (Linné)

Plate 1, figs. 1, 2; plate 3, figs. 19, 20

1758. *Pholas striata* LINNÉ, Syst. Nat., ed. 10, p. 669.
 1758. *Pholas pusillus* LINNÉ, Syst. Nat., ed. 10, p. 670.
 1818. *Pholas clavata* LAMARCK, Hist. Nat. Anim. s. Vert., vol. 5, p. 446.
 1826. *Pholas tenuistriata* BLAINVILLE, Dict. Sci. Nat., vol. 39, pp. 531-532.
 1827. *Pholas decussata* VALENCIENNES, Tab. Ency. Meth., livr. 98, p. 145.
 1827. *Pholas atomus* VALENCIENNES, Tab. Ency. Meth., livr. 98, p. 145.
 1828. *Pholas conoides* FLEMING, Hist. Brit. Anim., p. 457.
 1847. *Pholas corticaria* SOWERBY, Thes. Conch., vol. 3, pp. 494-495.
 1898. *Pholas (Martesiella) fragilis* VERRILL and BUSH, Proc. U. S. Nat. Mus., vol. 20, p. 777, pl. 79, fig. 10.

Shell large for the genus, wedge-shaped, yellowish white. The posterior portion is covered with a much wrinkled, thin periostracum which is yellowish in color. The anterior portion of the shell is hemispherical with the umbones covered by a reflection of the inner margin of the hinge which forms a moderately broad callus over the umbonal region and also a slightly shelflike projection. The anterior portion of the shell is developed into a filelike surface which consists of numerous sigmoid ridges that slant from the umbonal region obliquely backward and downward. These ridges are cut into numerous sharp denticles whose dorsal margin slopes abruptly, while anteriorly they become gradually diminished. The ridges are separated by well-impressed grooves. In the specimen figured 40 are apparent below the protoplast. The ventral one of these carries more than 85 denticles. Young shells have the anterior ventral margin gaping. This gap is filled in the adult stage (probably when the organism ceases burrowing) by a rather thick shelly deposit which bears wrinkles only. The posterior portion of the shell is about three times as long as the anterior and, at the junction of the two parts, shows a moderately strong lamellated structure, the lamellae corresponding to the denticulated ridges on the anterior part. There are here, however, no denticulations. The protoplast is broad and more or less rectangular. Sometimes its outline is almost circular. These variations may occur in the same pieces of timber, so they have no specific significance. The margin of the protoplast, too, may be entire or slightly sinuous, or even notched. The interior of the protoplast has been described

under the subgenus. The metaplast is narrow and long and marked on the outside by a wrinkled periostracum. The hypoplast is narrow and long and marked by transverse growth lines only. It likewise is covered by a thin periostracum. Sometimes the shell is variously twisted, evidently depending upon its association with fellow borers. Sometimes the posterior portion is much more prolonged than in the specimen shown in our illustration, which is an unusually perfect specimen—one of a series, U.S.N.M. No. 573520, collected by the senior author in Guantanamo Bay, Cuba. This specimen measures: Length, 30.8 mm.; height, 14.5 mm.; diameter, 14 mm.

This species is a wood borer and as a rule is collected from ships' timbers and pilings. Our collection contains a large series of specimens from localities ranging from Florida through the West Indies. We have 1 lot from Bermuda, 14 from Florida, 1 from Louisiana, 5 from Texas, 3 from Cuba, 6 from Jamaica, 10 from Haiti, 1 from Puerto Rico, 1 from St. Thomas, 1 from Trinidad, and 1 from Nicaragua. These lots vary materially in the number of specimens; some lots are very large, while others have only one or a very few individuals.

U.S.N.M. No. 52543 contains a lot of specimens which were taken at U. S. Bureau of Fisheries Station 2566 off Martha's Vineyard in a piece of driftwood. These specimens represent the material upon which Verrill and Bush's *Martesia* (*Martesiella*) *fragilis* was based.

The distribution of *Martesia striata* agrees beautifully with the currents in the Caribbean and the Gulf as well as with those passing through the Florida Straits which undoubtedly carried the New York and Bermuda specimens in the current of the Gulf stream.

Martesia (*Martesiella*) *fragilis* Verrill and Bush proves to be a thin stenomorph of this species, that is, it was prevented by its limited habitat from assuming the typical form. Its thin shell was probably likewise due to the unfavorable habitat as well as to the environment to which the little mollusks were subjected in their northward journey from the tropical regions.

PARTICOMA, new subgenus

Shell as in *Martesia* sensu stricto. Protoplast roughly diamond-shaped, the anterior sides forming a somewhat broader angle than the posterior. The outside of the protoplast is marked by an impressed median line from which oblique lateral lines slope backward to the lateral margin. On the inside the anterior point is slightly beaked, while the posterior fourth is covered by an arched shelf whose

anterior median portion terminates in a sharp spine. Metaplast and hypoplast narrow.

Type.—*Martesia (Particoma) cuneiformis* (Say) = *Pholas cuneiformis* Say.

KEY TO THE SPECIES OF PARTICOMA

Protoplast shield-shaped	<i>cuneiformis</i>
Protoplast lance-shaped	<i>caribaea</i>
Dental ridges and denticles closely crowded.....	<i>caribaea</i>
Dental ridges and denticles not closely crowded.....	<i>cuneiformis</i>

MARTESIA (PARTICOMA) CUNEIFORMIS (Say)

Plate 1, figs. 3, 4; plate 3, figs. 11, 12

1822. *Pholas cuneiformis* SAY, Journ. Acad. Nat. Sci. Philadelphia, vol. 2, p. 322.
1851. *Martesia cuneiformis* GRAY, Ann. Mag. Nat. Hist., ser. 2, vol. 8, p. 384.

Shell moderately large, wedge-shaped, yellowish white, the posterior part covered by a yellowish periostracum. The young during its boring stage with a broad anterior ventral gap which becomes closed in the adult stage by a strong, somewhat wrinkled shelly deposit. The anterior end is hemispherically rounded and bears the strong, rather distantly spaced, sigmoid, dental ridges which are strongly denticulated. Twenty of these ridges are present in the specimen figured. The denticulated ridges terminate at the oblique groove that marks the junction of the anterior and posterior parts. The posterior part is attenuated and marked by broad folds which in reality are the continuations of the dental ridges of the anterior part. The edge of the shell is reflected in the umbonal region to form a heavy callus. The inside of the shell shows the junction of the anterior and posterior parts as a broad low thread. Hypophysis slender, extending about one-third of the distance from under the umbones toward the basal margin. Protoplast shield-shaped, the anterior portion forming almost a right triangle, while the posterior part forms a more acute angle. It bears a median impressed line on the outside from which fairly regularly spaced, oblique, lateral lines radiate. The inside of the protoplast shows a weak median beak anteriorly and a narrow arched shelf posteriorly that decks over about one-fourth of the posterior end. It is beaked on both its anterior and posterior median line. Metaplast and hypoplast long and slender.

The specimen figured is one of three, U.S.N.M. No. 27407, collected in Georgia by Postell. It measures: Length, 17.5 mm.; height, 9.7 mm.; diameter, 9.2 mm.

We have chosen this for our description and figure because we believe it to represent the type locality as near as it is possible to fix this. Say in 1818 made a cruise along the Sea Islands of Georgia; the locality cited by Say was "Southern Coasts."

This species may readily be distinguished from *M. (P.) caribaea* by its heavier denticulated ridges and the lesser number thereof, also by the difference in the shape of the protooplax.

The U. S. National Museum collection has 62 lots, of which 3 come from North Carolina, 12 from South Carolina, 2 from Georgia, 5 from the east coast of Florida, 24 from the west coast of Florida, 3 from Alabama, 3 from Mississippi, 3 from Louisiana, 2 from Texas, 1 from Jamaica, 1 from Haiti, and 3 from Puerto Rico.

It will be noted that the West Indian lots overlap in their distribution the next species, *M. (P.) caribaea*.

MARTESIA (PARTICOMA) CARIBAEA (Orbigny)

Plate 2, figs. 5, 6; plate 3, figs. 5, 6

1847. *Pholas caribaca* ORBIGNY, Moll. Sagra Hist. Cuba, vol. 2, p. 216, pl. 25, figs. 20-22.
1864. *Pholas krebsii* [C. B. Adams ms.] KREBS, West Indian Marine Shells, p. 113. Nomen nudum.
1872. *Pholas falcata* SOWERBY, Reeve's Conch. Iconica, vol. 18, *Pholas*, pl. 12, sp. 51, not *Pholas falcata* Wood 1815, Gen. Conch., p. 84.
1905. *Martesia caribaca* JOHNSON, Nautilus, vol. 18, pp. 102-103.

Shell moderately small, wedge-shaped, white with the cutting surface stained a little darker. The posterior portion is covered with a thin, horn-colored periostracum. The anterior end is hemispherical and marked by numerous slender, sigmoid, closely crowded, denticulated ridges of which about 60 occur between the umbone and the ventral margin. The spaces separating these ridges are narrower than the ridges. These ridges become somewhat broader and less pronouncedly denticulated at their posterior termination. In the adult shell the anterior ventral gap is closed by a heavy wrinkled shelly deposit. The anterior portion of the shell is separated from the posterior by a strongly impressed oblique groove. The posterior portion, which is about one and one-half times as long as the anterior, is marked by the low, flattened ridges which in reality are the continuation of the denticulated ridges of the anterior part, but here no trace of denticulation is present. The umbonal region is covered by a heavy callus which is the reflection of the edge of shell at this part. The interior of the shell is bluish white. The junction of the anterior and posterior ends is marked by a rather broad, moderately elevated,

oblique cord. The hypophysis is slender and extends from under the umbones to about one-third of the distance across the cavity. The protoplax is lance-shaped with the anterior part forming a little more than a right triangle. Posteriorly it tapers into a curved point. The outside of the protoplax bears a median impressed line from which lateral, obliquely posteriorly slanting lines radiate. The interior of the protoplax shows a weak anterior beak, while the posterior two-thirds is strongly decked over, forming a curved hook. The anterior portion of the deck also bears a median beak. Metaplax and hypoplax long and narrow.

The specimen figured is one of several, U.S.N.M. No. 569148, and comes from Puerto Rico. It measures: Length, 12 mm.; height, 7.8 mm.; diameter, 7 mm.

The much more closely crowded, denticulated ridges of the anterior part and the difference in the shape of the protoplax will readily differentiate this species from *M. (P.) cuneiformis*.

We have also seen the following additional lots: 1 from Cuba, 5 from Jamaica, 2 from Panama, and 1 from Mexico.

Subgenus *DIPLOTHYRA* Tryon

1862. *Diplothyra* TRYON, Proc. Acad. Nat. Sci. Philadelphia, vol. 14, p. 449.

Shell small, ovate, with the shell structure of typical *Martesia* but with the protoplax hastate with the anterior half narrower than the posterior and pointed at the end, and with the sides somewhat contracted, while the posterior end is broad and almost truncated. The sculpture on the outside is roughly wrinkled except the posterior half which has the aspect of an impressed fingernail and is marked by concentric, closely spaced hair lines. The inside of the protoplax shows a thin, slightly inward-reflected edge which posteriorly develops into the narrow shelf, the median portion of which bears a pronounced, forward-pointing spine. A slender point is also present at the anterior extremity.

The shells also can be readily distinguished from those of the other subgenera by the very heavy lunate umbonal callus bordering the protoplax. This here reaches its maximum development.

Type.—*Martesia (Diplothyra) smithii* (Tryon) = *Diplothyra smithii* Tryon.

The members of this subgenus are shell borers, particularly favoring oyster shells but not restricted to them. One lot of our specimens, U.S.N.M. No. 47223, from Lake Worth, Fla., contains many specimens that have drilled into very dense, coarsely granular limestone.

MARTESIA (DIPLOTHYRA) SMITHII (Tryon)

Plate 2, figs. 7, 8; plate 3, figs. 9, 10

1862. *Diplothyra smithii* TRYON, Proc. Acad. Nat. Sci. Philadelphia, vol. 14, p. 450, text figure.

Shell small, ovate, yellowish white. The posterior end covered with a thin periostracum. The anterior end is strongly rounded with the callus at the umbone lunate and very strongly developed. In adult shells the large gap at the anterior ventral margin is closed by a rather thin shelly arch which is wrinkled on the outside. The anterior end of the shell occupies about two-fifths of the entire length of the shell and is marked by numerous, closely spaced, slender, curved ridges which are feebly denticulated. These denticles are elongate, their long axis corresponding with the axis of the threads. They are arranged in radiating series which gives to this part of the shell a wavy aspect. The junction of the anterior and posterior end is marked by a rather broad, well-impressed groove. The posterior part is marked by the continuation of the ridges of the anterior part, but here they have lost their wavelike denticulation and have become much enfeebled, broader, and low. The protox is described under the subgeneric definition. The metaplex is long and bears a median groove on the outside. It terminates anteriorly in a slender hook. The hypoplex is also slender, elongate, and thin, being composed chiefly of chitinous material. The interior of the shell shows the junction of the anterior and median part as a moderately well-raised thread. A slender, somewhat flattened hypophysis is present which extends one-third of the way across the inside of the shell.

The specimen figured is one of a series, U.S.N.M. No. 465274, from Keller Bay, Calhoun County, Tex., collected by J. D. Mitchell. It measures: Length, 13.9 mm.; height, 9.5 mm.; diameter, 10 mm.

The species ranges along the coast from New York to Texas. We have seen the following specimens: 3 lots from New York (2 of them topotypes from the original collector), 1 lot from Pennsylvania (Philadelphia, probably from the oyster market), 2 lots from Maryland, 5 lots from North Carolina, 4 lots from South Carolina, 2 lots from the east coast of Florida, 6 lots from the west coast of Florida, 4 lots from Louisiana, 4 lots from Texas.

One lot from South Carolina presents a marked modification in having the denticles of the anterior part arranged in very pronounced radiating rows, much heavier than in all the other specimens examined; however, this seems to be merely an extreme variation of the species and does not require a name. We call attention to it here

to prevent anyone having such a specimen from yielding to the temptation of bestowing upon it a specific or subspecific designation.

DIPLOPLAX, new subgenus

Shell similar to *Martesia* but shorter; it would also appear that the anterior basal gap is not closed in the adult. The chief distinguishing characters of this subgenus, however, center in the protoplax which here consists of two pieces medially longitudinally approximated for part of their length. When the two are approximated a deep, wide, V-shaped sinus is present at the anterior end. The rest of the anterior margin is well rounded. The posterior end shows a slight emargination in the median area. The anterior half is convex, while the posterior half is concave, the deepest portion of the concavity trending toward the anterior termination of the approximated portion. The outside of the protoplax is slightly rough and wrinkled. The inside of the protoplax is a negative of the outer conformation. It is marked by a series of wavelike, concentric, low ridges. The right half has a slight projection, while the equivalent left portion has a depression, the two forming in effect a ball-and-socket joint. Metaplax and hypoplax very small and poorly developed.

Type.—*Martesia (Diploplax) americana*, new species.

This subgenus ranges through the West Indies and the American border of the Gulf. Most of the species are wood borers; one, however, chose the electric conduit cable in Lake Worth, at West Palm Beach, Fla., for its habitat, drilling through the outer protected lead coat and the subjacent insulation and producing a blow-out which seriously interrupted electric service.

KEY TO THE SPECIES OF DIPLOPLAX

Denticles arranged in both longitudinal and radial series.

Denticulated ridges very fine.....*exquisita*

Denticulated ridges not very fine.....*bahamensis*

Denticles not arranged in both longitudinal and radial series.

Adult shell more than 10 mm.

Dental ridges fine.....*hornbeckii*

Dental ridges coarse.....*americana*

Adult shell less than 5 mm.....*funisicola*

MARTESIA (DIPLOPLAX) EXQUISITA, new species

Plate 3, figs. 17, 18

Shell small, heart-shaped, with the anterior ventral margin decidedly gaping, thin, yellowish white. The anterior part consists of

two-fifths of the length of the shell and is marked by decidedly sigmoid slender denticulated ridges. The denticles on these ridges are also arranged in radial alignment which gives to the surface of this part of the shell a very distinctive pattern, differing materially from that of the other members of the group. Of the dental ridges, 53 are present in the type. The last one of these ridges bears 53 denticles. The posterior part is marked by very poorly developed threads which are most strongly expressed on the early part of the shell, and which fade out toward the posterior extremity. The dorsal margin of the shell at the umbone is reflected outward as a rather strong callus. The inside of the shell shows a strong, somewhat vertebrated cord at the junction of the anterior and posterior parts. The hypophysis is slender and slightly spatulate at the free extremity. The protoplax is slightly emarginated at the middle of the posterior end, the rest being rounded. The anterior part forms a wide, open V-shaped angle. There is a pit or concavity near the limit of the anterior approximation of the two parts which on the inside of the shell forms a slight tooth in the right half and an equivalent socket in the left half. The inside of the protoplax is marked by weak concentric growth lines.

The type, U.S.N.M. No. 573548, was collected by C. R. Orcutt at Stony Cove, St. Mary's Parish, Jamaica. It measures: Length, 5.3 mm.; height, 4.4 mm.; diameter, 4 mm.

U.S.N.M. No. 440739 contains an additional lot of specimens as well as pieces of the wood from which they were extracted.

U.S.N.M. No. 537881 contains a lot from Guantanamo Bay, Cuba.

U.S.N.M. No. 537876 contains another lot from Guantanamo Bay, Cuba.

This species is readily distinguished from all the other members of the subgenus by the peculiar, equally strong disposition of the denticles into radiating as well as longitudinal series.

MARTESIA (DIPLOPLAX) BAHAMENSIS, new species

Plate 3, figs. 15, 16

Shell small, subglobular, thin, yellowish white with the anterior ventral margin decidedly gaping. The anterior part almost equals the posterior in length and is marked by sigmoid, longitudinal denticulated ridges. Of these 38 are present in the type. The last of these ridges bears 52 denticles. The posterior part is marked by low, broad, wavelike, feebly developed ridges. The inside shows a slender vertebrated cord joining the anterior and posterior parts. The

hypophysis is slender and flattened. The protoplax is emarginated in the posterior median line, the sides being well rounded. The anterior portion of the protoplax forms a deep V-shaped angle. The posterior portion is concave and the anterior is well rounded. The anterior limit of the median line in the right part forms a beak which fits into a depression in the left part on the inside. The inside of the protoplax is marked by feeble concentric ridges.

The type, U.S.N.M. No. 573549, was collected by Bartsch on the beach near the lighthouse on the eastern end of South Bight, Andros Island, Bahamas, buried in a floating nut, probably a nutmeg. It measures: Length, 4 mm.; height, 3.6 mm.; diameter, 3.4 mm.

U.S.N.M. No. 471534 contains a lot of specimens taken from the same nut, as well as the nut itself, in which more specimens are buried.

This species most nearly resembles *M. (D.) exquisita*, but the dental ridges and denticles are much coarser.

MARTESIA (DIPLOPLAX) HORNBECKII (Orbigny)

Plate 2, figs. 3, 4; plate 3, figs. 7, 8

1847. *Pholas hornbeckii* ORBIGNY, Moll. Sagra Hist. Cuba, vol. 2, p. 217, pl. 25, figs. 23-25.

Shell rather large, heart-shaped, partly gaping at the anterior ventral margin, white. The anterior part is about two-fifths of the length of the shell and is marked by sigmoid, denticulated dental ridges, the denticles being arranged in radiating series, that is, passing from the umbones to the ventral margin. Of these dental ridges 34 are present in the specimen figured. The last of these dental ridges bears 50 denticles. The posterior part of the shell tapers gently and is marked by a low, weak, rounded continuation of the denticulated ridges, but here they are without denticles. The anterior dorsal edge of the shell is reflected over the umbone as a shield, which bears a median longitudinal ridge upon which the protoplax rests. The interior of the shell is white and shows a strong vertebrated cord connecting the anterior and posterior parts. The hypophysis extends across half of the shell with the dorsal margin spatulate. The protoplax has the posterior margin slightly incised in the middle. The rest of the posterior and lateral edge is well rounded. The anterior half of the protoplax bears a big V-shaped sinus whose outer edge is outward reflected. The middle of the anterior half has a deep pit and therefore is concave, while the anterior half is convex. The inside of the protoplax is the negative equivalent as far as form is concerned, but the pit of the posterior part here develops into a slight beak which

bends forward partly over the V-shaped anterior sinus. The inside of the protoplax is marked by poorly developed wavy concentric lines.

The specimen figured, U.S.N.M. No. 537877, was collected in Guantanamo Bay, Cuba. It measures: Length, 11.1 mm.; height, 9 mm.; diameter, 8.5 mm.

The U. S. National Museum contains 8 additional lots from Guantanamo Bay, 1 from San Juan, Puerto Rico, and a young specimen which we are referring to this species from Caracas Harbor, Venezuela.

This species most nearly resembles *M. (D.) americana*, but can readily be distinguished from this by the much finer sculpture of the anterior portion.

MARTESIA (DIPOPLAX) AMERICANA, new species

Plate 2, figs. 1, 2; plate 3, figs. 3, 4

Shell heart-shaped with the anterior ventral margin widely gaping, yellowish white. The anterior portion bears very strongly developed, sigmoid, denticulated ridges, of which 22 are present in the type. The last one of these bordering the gaping edge bears 46 denticles. The posterior part is about one and one-half times as long as the anterior and is marked by low, broad ridges which correspond to the dental ridges of the anterior part, but are much wider and gradually fade out posteriorly. The dorsal edge of the anterior part is reflected to form a broad earlike lobe over which the protoplax is placed. The protoplax of this species is described under the generic definition. The metaplax is small and narrow and so is the hypoplax. The interior of the shell shows the junction of the anterior and basal parts arched over by a heavy cord which bears weak nodules that correspond in number and position to the ribs on the outside. The hypophysis is almost spatulate at its termination. It extends almost half across the cavity.

The type, U.S.N.M. No. 573550, comes from Fort Dade, Fla. It measures: Length, 10.5 mm.; height, 8.1 mm.; diameter, 8 mm.

The shell of this species differs from *M. (D.) hornbeckii* which it most nearly resembles, by its much more strongly developed ribs and denticulation.

The collection of the U. S. National Museum contains, in addition to the type, 7 lots from the west coast of Florida, 1 lot from Pascagoula, Miss., and 2 lots from Aransas Pass, Tex.

This species is a wood borer.

MARTESIA (DIPLOPLAX) FUNISICOLA, new species

Plate 3, figs. 1, 2, 13, 14

Shell small, globular, white. The anterior part is as long as the posterior. The anterior part on its anterior ventral margin is deeply gaping. It bears moderately strong, sigmoid, dental ridges of which 21 are present in the type. The last of these dental ridges bears 30 denticles. The posterior part of the shell bears low, rounded, flattened cords which are the continuation of the dental ridges but here they are not denticulated. The inner margin of the dorsal portion of the anterior part is reflected over the umbone as a shield. The interior of the shell bears a strong, rounded cord which is somewhat vertebrated and connects the anterior with the posterior portion. The hypophysis is slender and extends almost half across the width of the cavity. The protoplax is thin and chitinous. The posterior margin is slightly incised in the middle, the rest being well rounded, while the anterior margin is deeply incised. The two parts of the protoplax are deeply concave in the middle and become rounded anteriorly. The inside of the protoplax is a negative of the outside as far as the shape is concerned. The portion concave on the outside here forms a beak; its surface is marked by concentric threads.

The type, U.S.N.M. No. 573551, was taken from a section of the electric power cable that crosses Lake Worth, Fla., at West Palm Beach. These mollusks, by drilling holes through the lead casing and other insulation, occasioned an interruption of current due to blow-outs produced by sea water reaching the copper wire. The type measures: Length, 4 mm.; height, 3.5 mm.; diameter, 3.5 mm.

U.S.N.M. No. 573552 contains a lot of paratypes from the same source.

SEDIS INCERTAE

The following three species described from the West Atlantic we have been unable to identify.

MARTESIA (subgenus?) BEAUIANA Recluz

1853. *Pholas beauiana* RECLUZ, Journ. de Conch., vol. 4, pp. 49-50, pl. 2, figs. 1-3.

We have seen nothing that satisfies the following description which has been translated from the French.

Shell ovate-cuneate, strongly gaping anteriorly, posteriorly somewhat attenuate; valves anteriorly ventricose and obliquely and finely cancellate, pos-

teriorly sulcate; valves with a free linear callus on the hinge, another lower callus consolidated with the valve, dorsal plate transversely elongate, irregular.

Shell oval, nearly cuneiform, strongly gaping anteriorly, closed posteriorly, and nearly attenuated in an obtuse beak. Valves anteriorly ventricose and sculptured with oblique, sinuous striae, which are trellised by other finer longitudinal striae, posteriorly depressed and ornamented with concentric furrows. The dentiform cardinal callus on each valve resembles a small linear bone; it is arched on the inner side. Each anterior part of the valves shows within and in the lower middle also another callosity equally linear, in relief, but becoming thicker toward the base. No accessory piece closing the anterior opening. Dorsal plate shield-shaped, extended transversely, with irregular edges and sinuate.

Length, 22-24 mm.; height, 14-15 mm.

This pholad, which we have nowhere found described, has some resemblance in form to *Ph. crispata*, from which it differs essentially, however, by its dorsal shield, by the nature and disposition of its fine and irregular striae, as well as by its thinness.

It was found at Guadeloupe, in wood coming from old wharves.

We dedicate this species to M. le commandant Beau, who first discovered it at Guadeloupe, and who has sent several specimens to M. Petit de la Saussaye.

MARTESIA (subgenus?) TEREDINAEFORMIS (Sowerby)

1849. *Pholas teredinaeformis* SOWERBY, Thes. Conch., vol. 2, p. 490, pl. 108, figs. 97-98.

1862. *Martesia teredinaeformis* TRYON, Proc. Acad. Nat. Sci. Philadelphia, vol. 14, p. 220.

We have seen nothing in our extensive collections that satisfies Sowerby's description and figure. We produce both.

His terse Latin diagnosis may be translated as follows:

Pholas with globose gaping shell divided in the middle; anterior ventral margin subangulate, ornamented with concentric fluted ribs; the posterior end is short and smooth. Protoplax single, subquadrate, placed on the reflected upper margin of the shell.

To this Sowerby adds:

A small, globose species, in some degree resembling the young of *Ph. clavata*, etc., but differently sculptured; and although it has the appearance of a mature shell, it is quite possible that it may belong to that group, and its being in so soft a substance as wax may be the reason for the enclosing laminae not being formed. This and the next species (*Ph. aperta*) were at first thought to belong to the genus *Xylophaga*; but, on examination, were found to possess the curved processes in the hinge, which are characteristic of the genus *Pholas*, and are not found in *Xylophaga*.

Found in cakes of floating wax on the coast of Cuba.

MARTESIA (subgenus?) FALCATA Wood

1815. *Pholas falcata* WOOD, Gen. Conch., p. 84, pl. 10, figs. 5-7.

1905. *Martesia falcata* JOHNSON, Nautilus, vol. 18, p. 100.

Johnson (loc. cit.) refers this species to *Martesia striata* Linné. Wood's figure and description depict a hypophysis of a very peculiar shape, i.e., bent back upon itself for almost half its length to form a hook. If this should prove to be a constant character, not merely an individual freak expression, then the species will require subgeneric separation from all the other groups known to us.

Wood cites no locality for his species. We have nothing like it in our collection.

EXPLANATION OF PLATES

PLATE I

Figs. 1, 2. *Martesia (Martesia) striata* (Linné).

Figs. 3, 4. *Martesia (Particoma) cuneiformis* (Say).

PLATE 2

Figs. 1, 2. *Martesia (Diploplax) americana* Bartsch and Rehder, type.

Figs. 3, 4. *Martesia (Diploplax) hornbeckii* (Orbigny).

Figs. 5, 6. *Martesia (Particoma) caribaea* (Orbigny).

Figs. 7, 8. *Martesia (Diplothyra) smithii* (Tryon).

PLATE 3

Figs. 1, 2. *Martesia (Diploplax) funisicola* Bartsch and Rehder, protoplax.

Figs. 3, 4. *Martesia (Diploplax) americana* Bartsch and Rehder, protoplax.

Figs. 5, 6. *Martesia (Particoma) caribaea* (Orbigny), protoplax.

Figs. 7, 8. *Martesia (Diploplax) hornbeckii* (Orbigny), protoplax.

Figs. 9, 10. *Martesia (Diplothyra) smithii* (Tryon), protoplax.

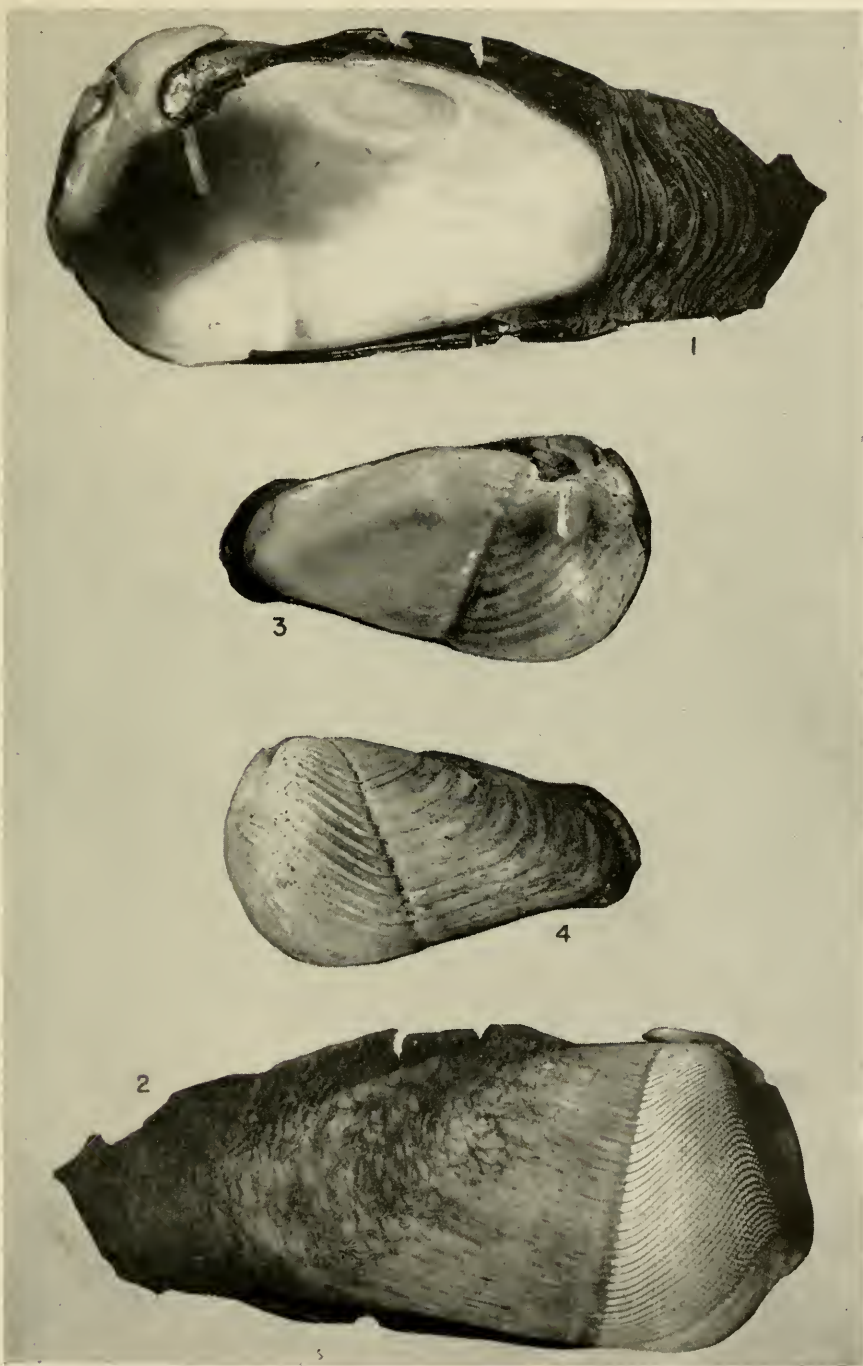
Figs. 11, 12. *Martesia (Particoma) cuneiformis* (Say), protoplax.

Figs. 13, 14. *Martesia (Diploplax) funisicola* Bartsch and Rehder, type.

Figs. 15, 16. *Martesia (Diploplax) bahamensis* Bartsch and Rehder, type.

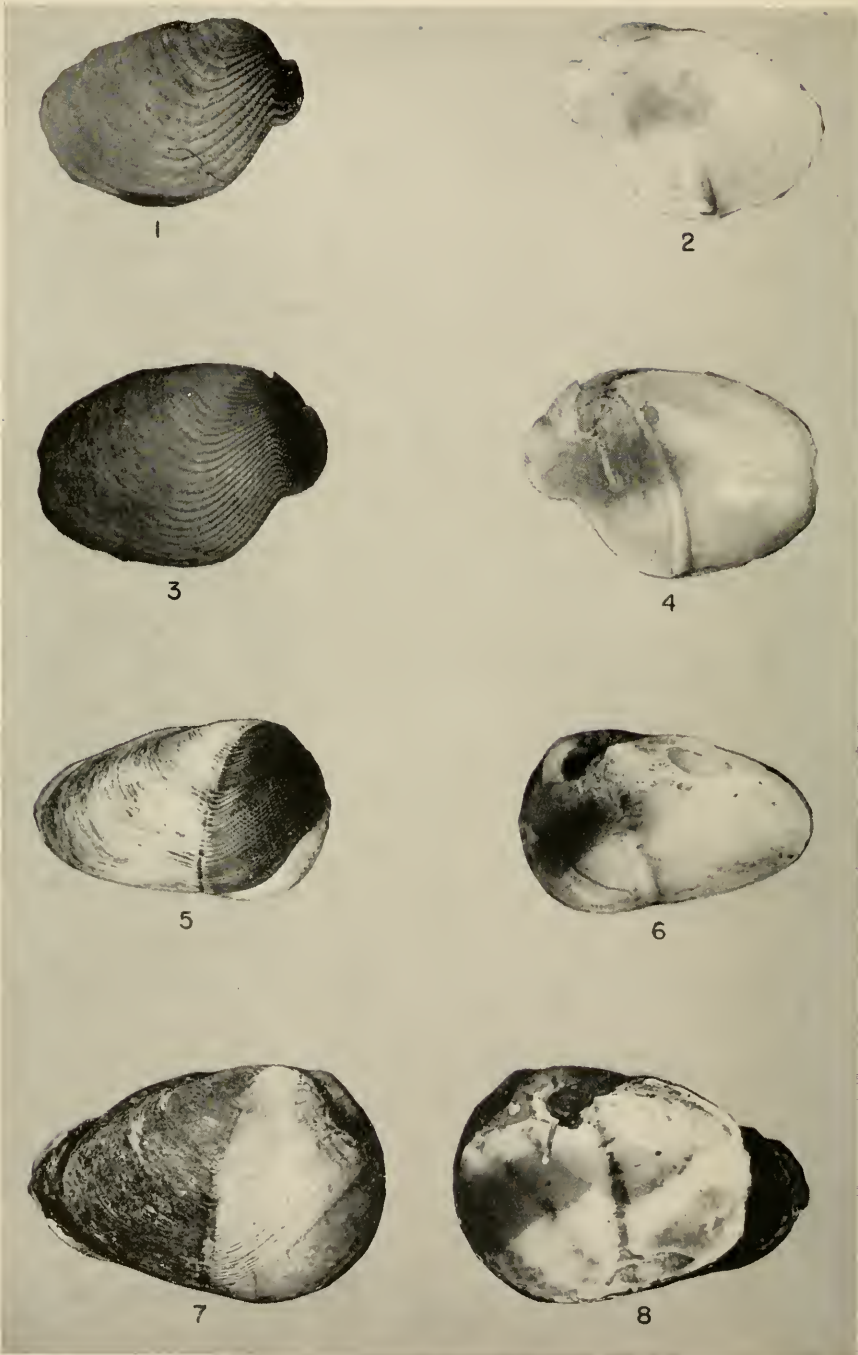
Figs. 17, 18. *Martesia (Diploplax) exquisita* Bartsch and Rehder, type.

Figs. 19, 20. *Martesia (Martesia) striata* (Linné), protoplax.



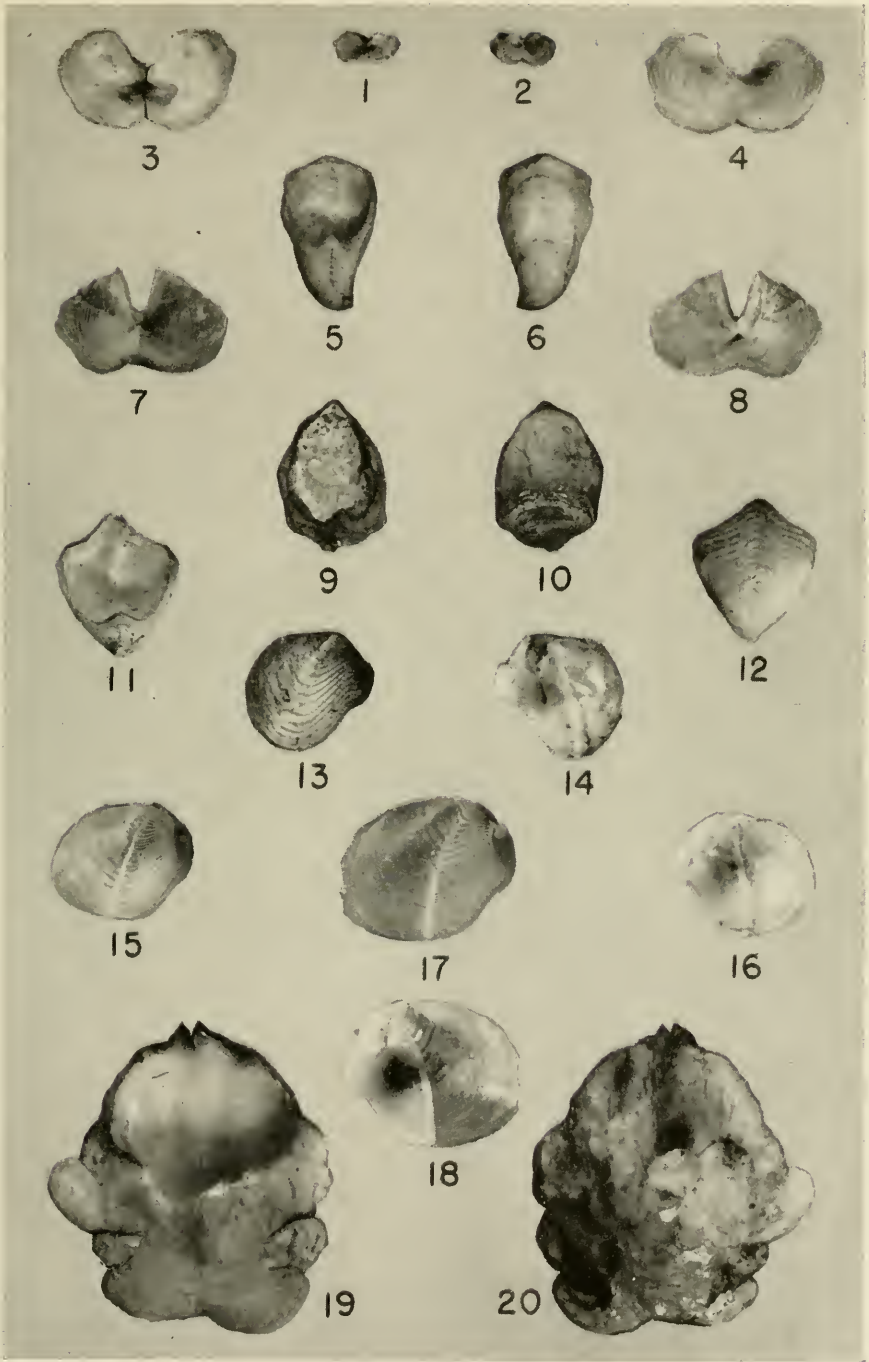
MARTESIA

(For explanation, see p. 16.)



MARTESIA

(For explanation, see p. 16.)



MARTESIA

(For explanation, see p. 16.)