A SYSTEMATIC ACCOUNT OF THE MOLLUSCAN WOOD BORERS OF VISAKHAPATNAM HARBOUR

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(Plate I)

INTRODUCTION

The first piece of life work on Teredinidae was that of Godfrey Sellius[1] who wrote a treatise on the anatomy and habits of the shipworm. Since then several accounts of these specialised molluscs have appeared and a multitude of species have been described differing in minor morphological characters. Among others reference may be made to the important memoirs of Quatrefages[2]; to the series of reports issued by a commission of the Royal Academy of Sciences in Amsterdam; to Hatschek's[3] account of early development; and Sigerfoos's[4] elaborate monograph on the structure and life-history of the Teredinidae. In recent years the ravages of shipworms caused great disaster in unsuspected localities, and at once their economic importance was realised. Paul Bartsch[5], a very well-known authority on Mollusca, proposed a new system of classification of the shipworms which has become the basis of all recent works. He published an elaborate monograph on American shipworms (1922). In England, Dr. Calman[6] of the British Museum, reported on molluscan wood borers. Lamy[7] described the species of molluscan borers present in Paris museum and Roch[8] and Moll those of the Berlin museum, Hamburg museum, British and other museums. Sivickis[9] gave a detailed account of the philippine shipworms and Edmondson[10] from Hawaii described 15 species of Teredinidae. From Australia, as long ago as 1894 Charles Hedley[11] began an inquiry into the wood boring pests, especialiy the molluscan ones, and a complete account of these forms was published in 1901. Later Tom Iredale[12] *et al* gave an elaborate account of the Teredinidae of Port Jackson (1932).

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[1] Sellius, G., *Historia naturalis teredinis seu Xylophagi marini, tubulo-conchoidis speciatim* Belgici (*Trajecti ad Rhenum*, Besseling) (1733).

[2] Quatrefages, A. de, *Ann. Sci. nat.* (3), XI (1849).

[3] Hatschek, B., *Arb. Zool. Inst., Univ.* Wien, III (1881).

[4] Sigerfoos, C., *Bull. U. S. Bur. Fish* [1907] (1908).

[5] Bartsch, Paul., *Bull. U. S. nat. Mus.* CXXII (1922).

[6] Calman, W. T., *Proc. Zool. Soc. Lond.* (1920).

[7] Lamy, E., *J. Conchyliol.* LXXI (1927).

[8] Roch, F., and Moll, F., *Mitt. Zool. Mus. Hamb.* XLIV (1929).

[9] Sivickis, P. B., *Philip. J. Sci.* XXXVII (1928).

[10] Edmondson, C. H., *Occ. Pap. Bishop. Mus.* XVII (1942).

[11] Hedley, C., The marine wood borers of Australisia and their work. *Asstt. Assoc. Adv. Sci.*, Rept. 8th Meeting [1900] (1901).

[12] Tom Iredale, Johnson, R.A. and McNeill, F. A., *Sidney Harbour Trust.* (1932).

From the above account it is clear that though considerable work has been done on the systematics of marine borers in different parts of the world, in India this problem has received only scant attention in spite of the economic interest attached to such studies. The only work on this subject is that of Erlanson[1] (1936) who published a preliminary note on the common wood-boring organisms from Cochin harbour. The details about the systematics of marine borers in India, therefore, remain unexplored.

The present work was undertaken with a view to make a systematic study of the molluscan borers attacking wooden piles at Visakhapatnam harbour. In the course of my work I have come across ten species of *Teredo*, one species of *Bactronophorus*, two species of *Bankia* and two species of *Martesia*. The classification adopted for the molluscan borers is after Paul Bartsch (1922).

Visakhapatnam Harbour

This work was carried out in Visakhapatnam harbour (Lat. 17′ 41″ N ; Long. 83′ 17·35″ E) situated in a typical tropical coast. It is one of the major ports of India located midway between the ports of Madras in the south and Calcutta in the north. This is an artificial land-locked harbour, approached by a dredged channel 300′ wide, and designed to admit ships drawing upto 28′ 6″ and 550′ in length, at all times of the year. The Vizag harbour receives the fullest benefit of the southwest monsoons as well as some precipitation from the northeast monsoons. The annual rainfall is about 45″, more than half of which falls in the four months, from July to October.

Material and methods

The wood-boring organisms were collected only during low tides when all the timbr jetties were fully exposed. Collections were started as soon as the tide began to recede. Weekly collections were made throughout the one year of study. Small bits of wood from the jetty logs were opened with the help of chisel and hammer and the wood borers transferred into the collection bottles. It was found very difficult to collect entire specimens of *Teredo* and *Bankia* except from logs of dismantled jetties. It was, however, comparatively easy to collect *Martesia* as they attack the surface layers of wood.

Organisms Boring into submerged Timber.

Family Teredinidae

Wood boring bivalve molluscs with elongate bodies, only the anterior portion of which is protected by the shell. Siphons furnished with two posterior calcareous structures, called pallets.

Genus **Teredo** Linnaeus

1758. *Teredo*, Linnaeus, *Syst. Nat.* 10th ed., p. 651.

1922. *Teredo*, Bartsch, *Bull. U. S. nat. Mus.* CXXII, p. 17.

Pallets are either paddle- or spoon-shaped. They may be distally cupped or not.

[1] Erlanson, E. W., *Curr. Sci.* IV (7), pp. 726-732.(1936).

Subgenus **Teredo** Linnaeus

1758. *Teredo*, Linnaeus, *Syst. Nat.* 10th ed., p. 651.
1922. *Teredo*, Bartsch, *Bull. U.S. nat. Mus.* CXXII, p. 17.

Pallets paddle-shaped with the blade cupped distally terminating laterally in sharp points. Four species of this subgenus occur in Vizag harbour.

Teredo (Teredo) navalis Linnaeus

(Text-fig. 1. *a*, *b*.)

1767. *Teredo navalis*, Linnaeus, *Syst. Nat.* 12th ed., p. 1267.
1853. *Teredo navalis*, Forbes & Hanley, *Brit. Moll.* I, p. 74.
1915. *Teredo navalis*, Gatliff & Gabriel, *Proc. Roy. Soc. Victoria* (n.s.) XXVIII, p. 117.

Shell sub-globular and white ; auricle small, sub-triangular, anterior median area large in this type.

The basal portion of the blade of the pallet is calcareous, while the distal portion is covered by a brown chitinous epidermis. Stalk is of medium length and cylindrical.

Measurements.—Shell : length 4 mm. Pallets : total length 2·2 mm. of which 1 mm. belongs to the stalk.

Distribution.—Europe, from North Cape of Mediterranean ; South Africa ; Atlantic coast of North America ; San Francisco Bay ; Australia. In India it was previously recorded from Cochin harbour. Very common in Vizag harbour.

Teredo (Teredo) parksi Bartsch

(Text-fig. 1. *c*, *d*.)

1921. *Teredo (Teredo) parksi*, Bartsch, *Proc. biol. Soc. Wash.* XXXIV, p. 28.
1942. *Teredo (Teredo) parksi*, Edmondson, *Occ. Pap. Bishop. Mus.* XVII, No. 10, p. 106.

The pallets are paddle-shaped with long slender stalk which is slightly curved. Blade short, broad and excavated at the distal end, more deeply on the convex outer surface than on the flattened inner face. Dark brown epidermis covers the blade nearly to its base.

Measurements.—Pallets : total length 4·9 mm. out of which 3.8 mm. belongs to the stalk.

Distribution.—Hawaii, Samoa, Philippine Island ; very rare in Vizag harbour.

Remarks.—Unfortunately I have not been able to get entire specimens of this species and only the posterior end with the pallets have been examined.

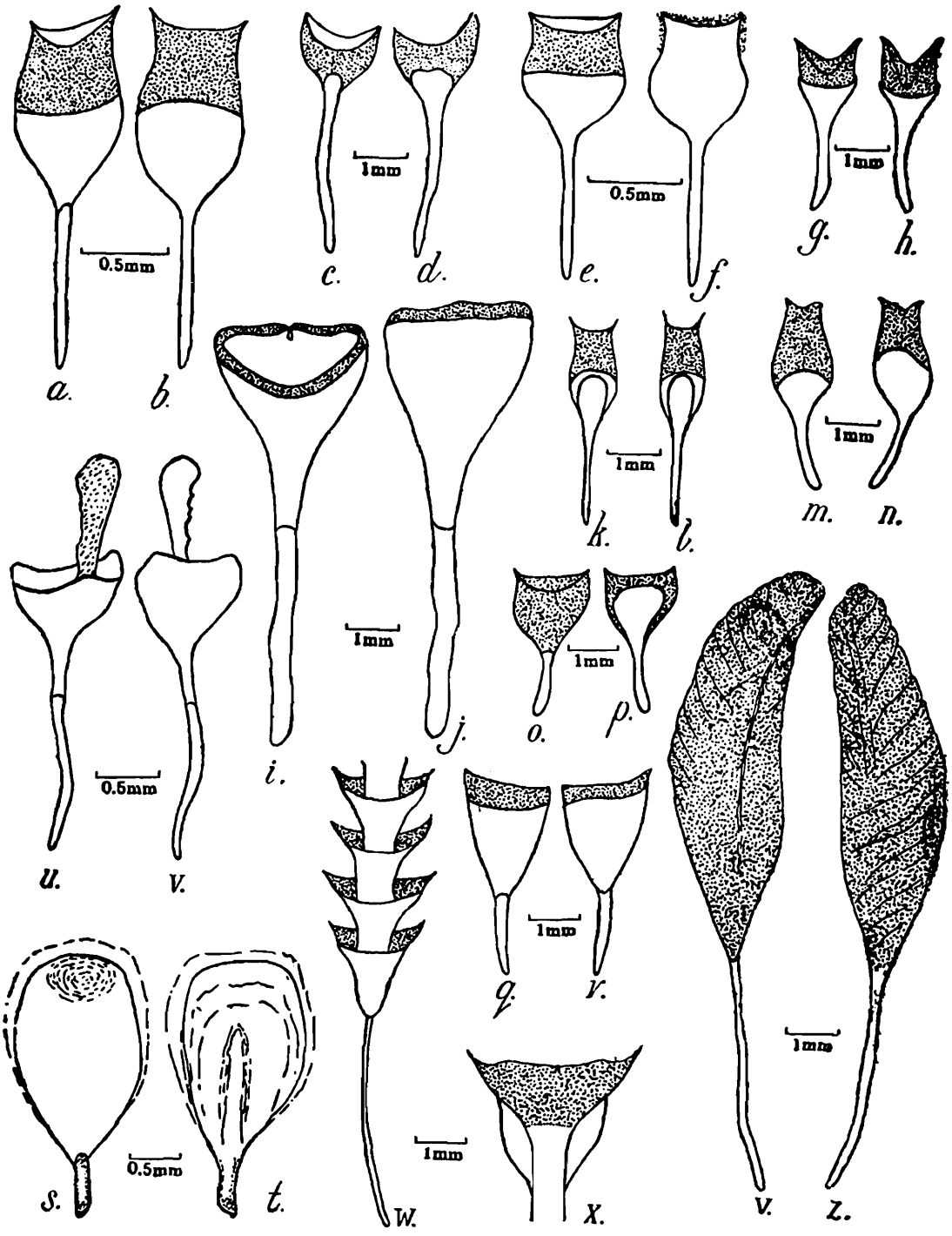
Teredo (Teredo) bartschi Clapp

(Text-fig. 1. *e*, *f*.)

1923. *Teredo (Teredo) bartschi*, Clapp, *Proc. Boston Soc. nat. Hist.* [XXXVII, p. 33.
1942. *Teredo (Teredo) bartschi*, Edmondson, *Occ. Pap. Bishop. Mus.* XVII, No. 10, p. 108.

Pallets spatulate in form, stalk slightly longer than blade and straight. blade cup-shaped at extremity, distal two-thirds of the blade is covered by brown epidermis. Calcareous portion of the blade dumb-bell shaped.

Measurements.—Pallets: length of the stalk 0·8 mm. and length of the blade 0·6 mm.



Text-fig. 1.—*Teredo (Teredo) navalis:* outer face of the pallet; *b.* Pallet of same, inner view. *c. Teredo (Teredo) parksi:* Pallet outer face; *d.* Pallet of same, inner face. *e. T. (Teredo) bartschi:* outer face of the pallet; *f.* Pallet of same, inner face. *g. T. (Teredo) furcillatus:* outer face of the pallet; *h.* Pallet of same, inner face. *i. T. (Teredothyra) mannii:* outer face of the pallet; *j.* Pallet of same, inner face. *k. T. (Teredops) diegensis:* outer face of the pallet; *l.* Pallet of same, inner face. *m. T. (Teredops) samoaensis:* outer view of the pallet; *n.* Pallet of same, inner view. *o. p. T. (Zopoteredo) trulliformis:* outer face of the pallet; *p.* Pallet of same, inner face. *q. R. T. (Zopoteredo) triangularis:* outer face of the pallet; *r.* Pallet of same, inner face. *s. T. (Teredora) thomosoni:* outer view of the pallet; *t.* Pallet of same, inner view. *u. Bactronophorus thoracites:* outer face of the pallet. *v.* Pallet of same, inner view. *w. Bankia (Bankia) setacea:* outer face of the pallet; *x.* Single cone enlarged. *y. B. (Nausitora) excolpa:* outer face of the pallet; *z.* Pallet of same, inner face.

Distribution.—Nawiliwii, Hawaii, Atlantic and Gulf coasts, from South Carolina to Texas with the exception of southern tip of Florida; San Diego Bay; rarely found in Vizag harbour.

Teredo (Teredo) furcillatus Miller

(Text-fig. 1. *g. h.*)

1924. *Teredo furcillatus,* Miller, *Univ. Calif. Pub. Zool.* XXVI, p. 149.

1942. *Teredo (Teredo) furcillatus,* Edmondson, *Occ. Pap. Bishop. Mus.* XVII, No. 10., p. 113.

Pallets with long stem and small blade, the distal portion of the blade is deeply excavated on the outer and also on the inner face. The important feature of the pallets is the absence of the dark periostracum which is present in *T parksi.* Stalk slightly curved and cylindrical.

Measurements.—Pallets : stalk 2 mm. blade 1·3 mm.

Distribution.—Samoa and Hawaii (Honolulu harbour) ; very rare in Vizag harbour.

Subgenus **Teredothyra** Bartsch

1921. *Teredothyra,* Bartsch, *Proc. biol. Soc. Wash.* XXXIV , p. 26.

1922. *Teredothyra,* Bartsch, *Bull. U.S. nat. Mus.* CXXII, p. 22.

In this subgenus the pallets are doubly cupped at the terminal portion.

Teredo (Teredothyra) mannii (Wright)

(Text-fig. 1. *i. j.*)

1865. *Kuphus? mannii,* Wright, *Trans. Linn. Soc.* XXV, p. 565.

1901. *Nausitoria mannii,* Hedley, *Aust. Assoc. Adv. Sci.* I.

Shell rather large, the extreme anterior portion being covered by a thick callus, median portion of the shell is wide ; the posterior part forms a conspicuous auricle which fuses with the median portion so intimately that the line of fusion is not seen externally.

The pallets with a long stalk which is larger than the blade and is somewhat stout and a little bit twisted. The stalk expands into a broad blade-like portion which is deeply cupped. The cavity of the cup is divided indistinctly into two portions ; it is flat on one side and convex on the outer portion.

The siphons are long and free for most of their length.

Measurements.—Shell : length 8·5 mm. Pallets : total length 17·5 mm. stalk 9·5 mm.

Distribution.—Queensland, Australia ; very common in Vizag harbour.

Subgenus **Teredops** Bartsch

1921. *Teredops,* Bartsch, *Proc. biol. Soc. Wash.* XXXIV, p. 26.

Pallets not deeply cupped, calcareous portion of the blade elongate-oval, partly covered by a heavy periostracum.

Teredo (Teredops) diegensis Bartsch

(Text-fig. 1. *k, l.*)

1916. *Teredo diegensis,* Bartsch, *Nautilus.* XXX, p. 48.

1922. *Teredo (Teredops) diegensis,* Bartsch, *Bull. U.S. nat. Mus.* CXXII, p. 29.

1942. *Teredo (Teredops) diegensis,* Edmondson, *Occ. Pap. Bishop. Mus.* XVII, No. 10, p. 130.

Shell with numerous, fine closely spaced denticulated ridges on anterior lobe. Auricle varies considerably in size.

Pallet with slender stalk which is slightly longer than blade. Stalk cylindrical and somewhat tapering towards the base. Blade consists of an oval calcareous portion, capped by an elongate periostracum; black in colour and typically excavated at the extremity. The two elements of the blade can be easily separated without injury.

Mesurements.—Pallets: length 3·8 mm. out of which 2 mm. go to form the stalk.

Distribution.—San Francisco Bay, Hawaiian Islands, Los Angeles harbour, San Diego Bay. In India Erlanson reported this species as occurring in Cochin harbour; common in Vizag harbour.

Teredo (Teredops) samoaensis Miller

(Text-fig. 1. *m*, *n*.)

1924. *Teredo samoaensis*, Miller, *Univ. Calif. Publ. Zool.* XXVI, p. 149.

Pallets with a small stalk and broad blade. The stalk is cylindrical and slightly curved. Blade distinguished into two portions just as in *T diegensis*. The basal portion comprising about one half of the length of the blade; the blade is broadly ovate and calcareous; the distal portion is narrower and nearly straight sided. The blade is flattened in the inner face. At the junction of the two elements of the blade the pallet is encircled by a band of brown epidermis, which in some cases envelops the distal portion.

Measurements.—Pallets: length of blade 1·8 mm. and length of stalk 1·2 mm.

Distribution.—Samoa; Cochin harbour and very rarely seen in Vizag harbour.

Subgenus **Zopoteredo** Bartsch

1923. *Zopoterodo*, Bartsch, *Proc. biol. Soc. Wash.* XXXVI, p. 26.

Calcareous portion of the blade semi-disc shaped or elongate terminal border slightly concave.

Teredo (Zopoteredo) trulliformis Miller

(Text-fig. 1. *o*, *p*.)

1924. *Teredo trulliformis*, Miller, *Unvi Calif. Publ. Zool.* XXVI, p. 150.

Pallets with stalk of medium size, which instead of tapering towards the end, becomes gradually expanded like the handle of a trowel. The distal portion of the blade is covered with a dark epidermis and the terminal border is slightly cupped.

Measurements.—Pallets: length of the blade 1·7 mm. and length of the stalk 1·4 mm.

Distribution.—Hawaiian islands; very common in Vizag harbour.

Teredo (Zopoteredo) triangularis Edmondson

(Text-fig. 1. *q*, *r*.)

1942. *Teredo (Zopoteredo) triangularis*, Edmondson, *Occ. Pap. Bishop. Mus.* XVII, No. 10, p. 126.

Shell with anterior median area occupying $\frac{1}{4}$ of the median area ; auricle short, height about twice its length ; internally the auricle overlaps the posterior median area in the upper part of the union ; in the lower part the junction is marked only by a raised ridge.

Pallets with stout stalk, tapering near the proximal end. Blade flattened on the inner face, slightly convex on the outer surface merging gradually into the stalk proximally and broadening distally. The blade almost looks like a triangle and hence the name.

Measurments.—Shell : length 4 mm. Pallets : length of the blade 2·2 mm. length of the stalk 1·8 mm.

Distribution.—Hawaiian islands ; only one specimen was collected in Vizag harbour.

Subgenus **Teredora** Bartsch

1921. *Teredora*, Bartsch, *Proc. biol. Soc. Wash.* XXXIV, p. 26.

In this subgenus the auricle is so placed upon posterior median portion that half of it projects as a shelf inwardly and the other half outwardly. Pallets spoon-shaped.

Teredo (Teredora) thomsoni Tryon

(Text-fig. 1. *s*, *t*.)

1863. *Teredo thomsoni*, Tryon, *Proc. Acad. nat. Sci. Philad.* p. 280.

Shell large, slightly black in colour on the outside. The anterior part is separated from the posterior median part by a straight line. The anterior part bears the dental ridges which in this type exceeds 50 in number. The posterior part forms a small auricle which is obliquely placed. The auricle projects as a shelf over the posterior median portion.

Pallets with short stalk which is subcylindrical ; blade convex on the outer side and concave on the inner side. Inside of the blade is smooth and shows a rib running through its centre very much as if the stalk portion extends towards the tip through the pallet. At the tip of the blade on the convex side there is a small depression.

Measurements.—Shell : 9 mm. Pallets : length of the blade 8 mm. length of the stalk 1·5 mm.

Distribution.—American waters. Very common in Vizag harbour.

Remarks.—This species occurs in large numbers in this harbour. Every log of wood is attacked by this form. The largest form so far collected measured about 131 mm. in length.

Genus **Bactronophorus** Tapparone-Canefri

1877. *Bactronophorus*, Tapparone-Canefri, *Ann. Mus. Stor. Nat. Genoa.* IX.

1928. *Bactronophorus*, Sivickis, *Philipp. J. Sci.* XXXVII, No. 3, p. 289.

Pallets large, stilt-like, from the distal end of the pallet springs a long flat blade-like style.

Bactronophorus thoracites (Gould)

(Text-fig. 1. *u*, *v*.)

1856. *Teredo thoracites*, Gould, *Proc. Boston Soc. nat. Hist.* VI, p. 15.

1865. *Calobates thoracites*, Wright, *Trans. Linn. Soc.* XXV, p. 564.

1877. *Bactronophorus thoracites*, Tapparone-Canefri, *Ann. Mus. Stor. Nat, Genoa.* IX, p. 290.

Shell comparatively large, sub-globular and somewhat black in colour. The anterior part is wider than the posterior and bears the usual denticulated ridges, of which 120 can be counted in the type; the umbone is hidden from view, as it is covered by the shelf. Projecting downwards from the umbone is a well-developed flattened blade which extends to 1/3 of the distance towards ventral knob; the ventral knob is large.

Pallets stilt-like, long and stout; the style which is projecting from the distal end of the blade is flat and smooth on the inner surface and slightly convex on the outer. The outer surface is warty.

The two siphons are united throughout their length except at the terminal portion where they are separated. The tips of the siphons are black in colour and from their surface project small papillae-like structures.

Measurements.—Shell: length 17 mm. Pallets: length of blade 17 mm. and length of stalk 11 mm.

Distribution.—Burma, Singapore, Western Australia, Dutch New Guinea, Elphinstone Island; only found in fisherman's boats at Vizag.

Remarks.—It is interesting to observe that this form was found only attacking the logs of the catamaran (country craft of fishermen) and were not found in the wooden piles of the jetties. The largest specimen collected measured 28 cm. in length.

Genus **Bankia** Gray.

1840. *Bankia*, Gray, *Synop. Brit. Mus.* p. 76.
1922. *Bankia*, Bartsch, *Bull. U.S. nat. Mus.* CXXII, p. 7.

The pallets consisting of a series of cone-in-cone structures which give them the appearance of the ear of wheat.

Subgenus **Bankia** Gray.

1840. *Bankia*, Gray, *Synop. Brit. Mus.* p. 76.
1922. *Bankia*, Bartsch, *Bull. U.S. nat. Mus.* CXXII, p. 7.

The distal ends of the cones terminate in a thin membrane which is fimbriated at the free margin.

Bankia (Bankia) setacea Tryon

(Text-fig. 1. *w*, *x*.)

1863. *Xylotrya setacea*, Tryon, *Proc. Acad. nat. Sci. Philad.*, p. 144.
1922. *Bankia (Bankia) setacea*, Bartsch, *Bull. U.S. nat. Mus.* CXXII., p. 7.
1927. *Bankia (Bankia) setacea*, Hill & Kofoid, *San Frans. Bay Mar. Pll. Comm. Final Report.*

Anterior lobe of the shell is relatively small. It bears the usual dental ridges which expand slightly fan-shaped from the anterior margin to the posterior termination: auricle is of medium size.

The pallets form plume-like elements composed of a series of cup-in-cup structures which project at the lateral margin in the form of strong arms. Each cup is covered by a thin brown periostracum which is faintly fimbriated. Since all the specimens collected are small in size the pallets are slender with thin stalks.

Measurements.—Pallets : length of blade 5·4 mm. and length of stalk 4·8 mm.

Distribution.—Pacific coast : Cochin harbour, very common in Vizag harbour.

Subgenus **Nausitora** Wright

1864. *Nausitora*, Wright, *Trans. Linn. Soc. Lond.* XXIV, p. 51, pl. 46.
1922. *Nausitora*, Bartsch, *Bull. U.S. nat. Mus.* CXXII, p. 12.
1932. *Nausitora*, Iredale, *Sydney Harbour Trust.*

Pallets consisting of a series of cone-in-cone elements which are not entirely free at their ends, but fused on the exterior surface.

Bankia (Nausitora) excolpa Bartsch

(Text-fig. 1. *y*, *z*.)

1922. *Bankia* (*Nausitora*) *excolpa*, Bartsch, *Bull. U.S. nat. Mus.* CXXII. p. 13.
1927. *Bankia* (*Nausitora*) *excolpa*, Hill & Kofoid, *San Fran. Bay Mar. Pil. Final Report.*

Pallets asymetrical, the stalk being inserted to one side of the median line. Cones almost fused on the outerside where they are covered by a thin periostracum. On the inside the blade shows a series of transverse laminae, each alternating with a dark cord of periostracum.

Measurements.—Pallets : length of blade 8 mm. and length of stalk 5 mm.

Distribution.—Gulf of California ; rare at Vizag.

Remarks.—It is curious to record this species only from the catamarans used by the local fishermen and not even a single form has been collected from jetty logs.

Family PHOLADIDAE

Wood boring and rock boring bivalves ; the body is completely enclosed by the shell ; there are no pallets.

Genus **Martesia** (Leach) Sowerby

1824. *Martesia* (Leach), Sowerby, *Gen. Rec. & Foss. Shell*, Pt. 23. Pholas, pp. 2, 4.

Small bivalve molluscs of ovate or elongate-ovate outline broadly gaping at anterior ventral end in the young stages, the gap usually closing in the adult life. The shell is provided with three accessory pieces : protoplax, metaplax and hypoplax.

Subgenus **Martesia** (Leach) Sowerby

1824 *Martesia*, Sowerby, *Genera of Recent and Fossil Shells*, Part 23 Pholas, pp. 2, 4.

The members of this subgenus have a large more or less rectangular protoplax, the outline of which is coarse and variously wrinkled.

Martesia (Martesia) striata (Linnaeus)

(Text-fig. 2. *a*, *b*.)

1758. *Pholas strita*, Linnaeus, *Syst. Nat.* 10 ed., p. 669.

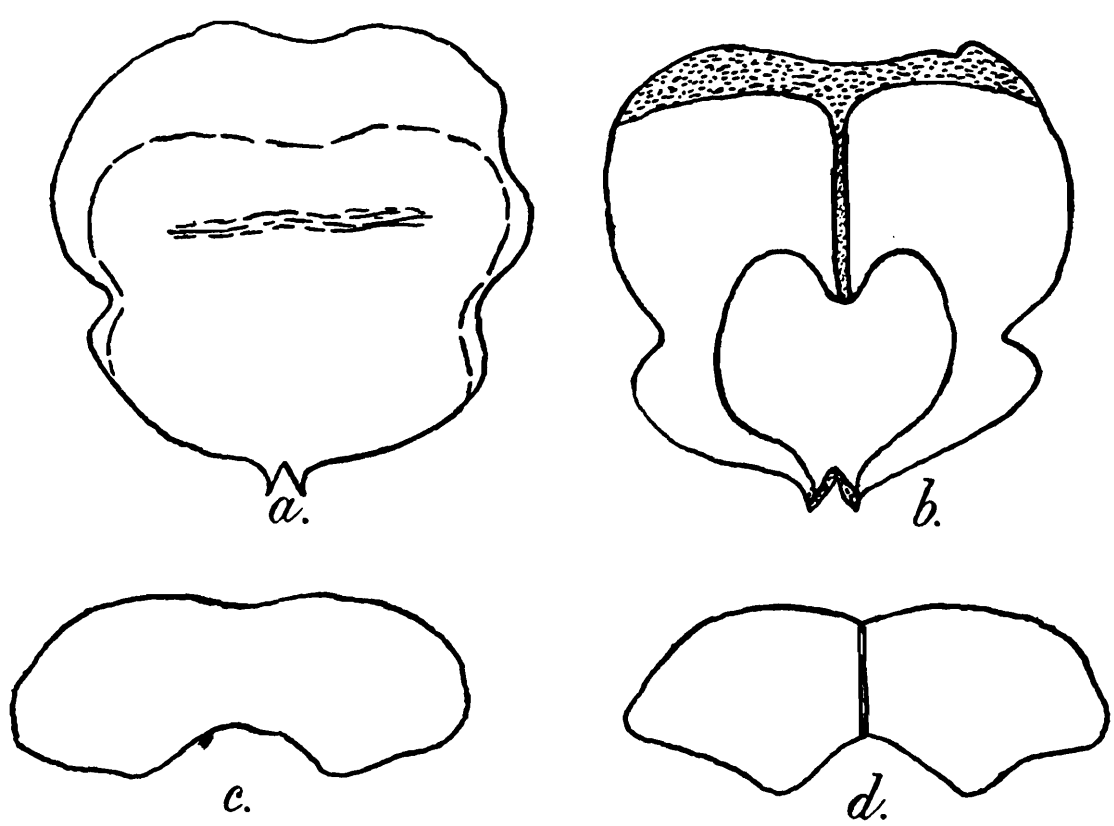
1818. *Pholas calvata*, Lamarck, *Hist. Nat. Anim. S. Vert.* V, p 446.

1945. *Martesia (Martesia) striata*, Bartsch and Rehder, *Smithson. Mis. Coll.* CIV, No. 11, p. 4.

Shelf forming the posterior part of the inside of the protoplax is very broad. The protoplax is broad and its outer surface wrinkled. The inside, is concave, the anterior portion bearing a small incurved hook while the cavity of the posterior half is covered by a shelf. The margin of the protoplax is notched. The metaplax is narrow and long and marked on the outer side by a wrinkled periostracum. The hypoplax is also narrow and long and marked by transverse growth lines. Sometimes the shell is variously twisted depending upon its association with fellow borers. Sometimes the posterior portion is much more prolonged.

The largest specimen collected measured 42·1 mm. in length, breadth at the base 16·4 mm.

Distribution.—Cosmopolitan.



TEXT FIG. 2.—*a. Martesia (Martesia) striata :* outer view of the protopla x; *b.* Protoplax of same, inner face ; c. *M. (Diploplax) americana :* outer view of the protoplax ; *d.* Protoplax of same, inner view.

Subgenus DIPLOPLAX Bartsch

1945. *Diploplax*, Bartsch and Rehder, *Smithson. Misc. Coll.* CIV, No. 11, p. 10.

Shelf forming the posterior part of the inside of the protoplax narrow. Protoplax consists of two pieces.

Martesia (Diploplax) americana Bartsch
(Text-fig. 2. *c*, *d*.)

Shell similar to *M. striata* but smaller ; the anterior basal gap is not closed in the adult ; this gap being wide in this species. The protoplax consists of two pieces and when the two pieces are approximated a deep, wide V-shaped sinus is formed at the anterior end. The rest of the protoplax is slightly rough and wrinkled. Metaplax and hypoplax are very small and poorly developed ; in some forms the metaplax appears to be absent.

The largest specimen collected measured 23 mm. in length and 12 mm. in breadth at the base.

Distribution.—West coast of Florida ; very common in Vizag harbour.

SUMMARY

The observations on the molluscan wood boring organisms were based on specimens collected at Visakhapatnam harbour for a period of one year (1952-53). According to pallet morphology, ten species of *Teredo*, one species of *Bactronophorus*, two species of *Bankia* and two species of *Martesia* are recorded. Out of ten species of *Teredo*, only four species, viz., *Teredo* (*Teredo*) *navalis*, *Teredo* (*Teredothyra*) *mannii*, *Teredo Zopoteredo*) *trulliformis* and *Teredo* (*Teredora*) *thomsoni*, appear to be very common. *Bankia* (*Bankia*) *setacea* and *Martesia* (*Martesia*) *striata* and *Martesia* (*Diploplax*) *americana* are also of common occurrence.

In general it may be stated that the marine structures in Visakhapatnam harbour are subjected to great destruction by these borers.

ACKNOWLEDGEMENTS

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