ANGEL WINGS, PIDDOCKS, WOOD BORERS

Pholadidae

Jouannetia cumingii (G. B. Sowerby II, 1849)

Martesia multistriata (G. B. Sowerby II, 1849)

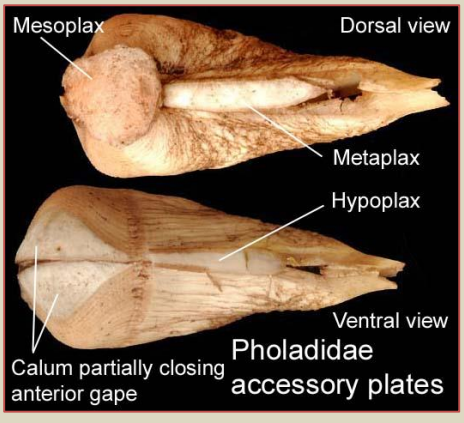
Martesia striata (Linnaeus, 1758)

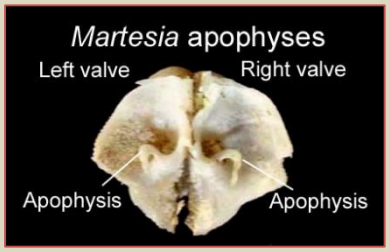
Pholas orientalis Gmelin, 1791

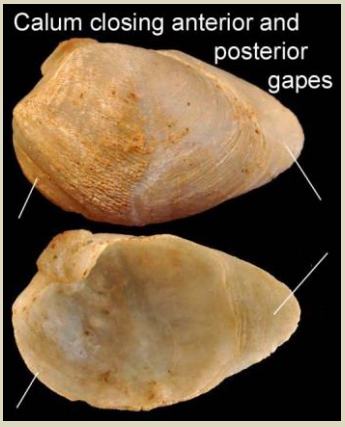
Shells thin or thick, usually much elongated and gaping at both ends. Accessory plates consisting of calcareous "calum" often present over the antero-dorsal (mesoplax – also protoplax), dorsal (metaplax) and antero-ventral (hypoplax) gapes—though all three are not present in all species. Calum may also close the anterior and posterior gapes once growth has ceased. The dorsal margin is usually turned up over the umbones ("umbonal reflection") that are situated well forward. Exterior with radial and concentric sculpture mostly over the anterior of the shell, often spiny where they cross. The periostracum is thin, often developed beyond the shell margin. The ligament is usually missing; if present is internal. The hinge has no teeth. The umbonal cavity often with a finger-like process ("apophysis") to which the foot muscles are attached. There are three adductor muscle scars: the anterior scar extends over the umbonal reflection; the additional scar is ventral. The pallial sinus is deep, between the posterior and ventral muscle scars.

The piddocks are highly specialised animals being adapted for burrowing into relatively hard substrates such as limestone, sandstone, stiff clay or wood. They are filter feeders.

Note: In life the shell valves are held together by the anterior adductor muscle that extends on to the umbonal reflection. As a result, the valves separate at death and unless found within their burrows only single valves may be seen. The accessory plates may also be lost.







Jouannetia

Pieces of three shells that were thick and solid were recovered by cracking a piece of coral rubble. The largest and most complete specimens consisted of two disjointed segments of a sphere that measured 13.52 x 9.12mm.

The pieces were identified by matching with images in the Natural History Museum Rotterdam picture pages and the Bishogai database. There are good images in the website of the Kerala Agricultural University (Marine Biodiversity Informatics for Kerala) as well. The images show a spherical shell with a slit opening on one side. The sphere appears to be formed of calum filling in the space between the “orange segment-shaped” valves on one side, leaving a narrow slit on the other side. The Bishogai database notes that shells "Bored into coral and calcareous rocks, intertidal zone. SL 15 mm." Appukuttan, 1973 reported *Jouannetia cumingii* from the Quilon coast (Kerala), "Burrowing in firm mud, clay or shale. The species is also listed by Kripa, 2005.

Jouannetia cumingii (G. B. Sowerby II, 1849)
[*Triomphalia cumingii* G. B. Sowerby II, 1849 – original name]

MF 712: Kalkudah, beach, in boreholes in coral rubble, fishing trash? 3 pairs: 13.52 x 9.12 mm; 11.2 mm, damaged; 9.66 mm, quite damaged. Coll. Ayesha Hettiarachchi and Eshan Fernando.

The upper extremity incurved, ending in a small pointed swelling, the lower end tapering to a point. External surface divided into 2 zones - one, broader, bearing fine toothed ribs, the narrower roughened by fine threads, the zones divided by a narrow band of lamellar ribs. The inner surface smooth and glossy with a rib-like partition extending from the upper end about one-third down. This underlies the row of lamellar ribs described above.

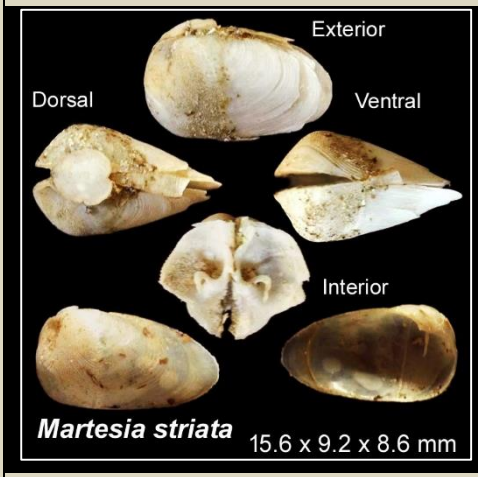
Martesia

Martesia multistriata (G. B. Sowerby II, 1849)
[*Pholas multistriata* G. B. Sowerby II, 1849 - original name]

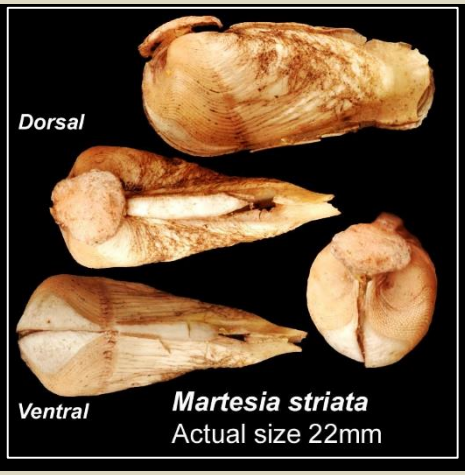
Shell thin, fragile. Pear-shaped with bulbous anterior, posterior tapering to a narrowly rounded angle. No teeth, wide anterior gape. No apophysis present (but described by Valentich-Scott & Tonkerd, 2008). Beaks low covered by an adherent mesoplax. External sculpture divided into four zones: an antero-ventral calum with faint striations, antero-medial zone of strong concentric ribs, a postero-medial zone of light striations separated from the previous zone by a radial groove, and a posterior smooth calum. (Description based on Valentich-Scott & Tonkerd, 2008.)

MF435: Colombo, 4 m, boring into large oyster. 21.5 x 13.4 x 14 mm (l x ht x w).

Note: See description and images in Valentich-Scott & Tongkerd, 2008 Fig. 9A-G. This species is placed in the genus *Aspidopholax* by these workers with the following explanation: "Placed in the wood-boring genus *Martesia* Sowerby, 1824, by Lamprell & Healy (1998), we find this coral-boring species to align much better with *Aspidopholax,* based on shell and siphonal characters (Fischer, 1887)." Has been found by those workers boring in living and dead coral as well as thick shells (*Spondylus* and *Hyotissa*). The WoRMS register accepts *Martesia multistriata* and makes no reference to the other genus, so this name is used here.



MF527: Jaffna, Analaitivu, mangrove log cast ashore, boring into soft wood log.
15.6 x 9.2 x 8.6 to 11.0 x 6.32 x 5.7 mm (l x ht x w).



MF 673: Trincomalee, Erakkandy lagoon mouth, log cast ashore, in boreholes.
22 x 10.4 x 9.35 mm.

Martesia striata (Linnaeus, 1758)
Pholas striata Linnaeus, 1758 - original combination; *Martesia* (*Martesia*) *striata* (Linnaeus, 1758) - accepted alternative.

Shells very fragile. Wedge-shaped, stubby: anterior blunt, sub-truncate, tapering to gaping rounded posterior. Anterior striate. Three accessory plates: sub-cordate anterior, linear dorsal (seen in dorsal view, at left), linear ventral (seen in ventral view, at right). Long curved finger-like apophysis each valve. Burrows at right angles to log surface, the shell fitting snugly into a burrow of similar size & shape.

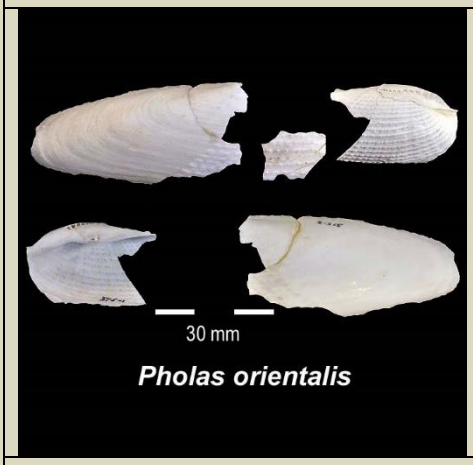
Martesia striata pictured in the log in which they were found at Analaitivu in Jaffna. A large, gregarious group, fairly closely spaced. The middle image is a close-up of one in its tight-fitting burrow and at right, a de-roofed burrow with its occupant. The same log contained numerous burrows of Teredo worms, boring in the long axis of the log, deep to the *Martesia*.

Pholas

Elongated shells gaping at both ends, ornamented by strong concentric and radial ridges. Three accessory plates present. The dorsal margin of the shell reflected over the umbones, with small transverse partitions. Usually boring by mechanical means into relatively hard substances like stiff clay, wood, limestone or sandstone. Filter feeders.

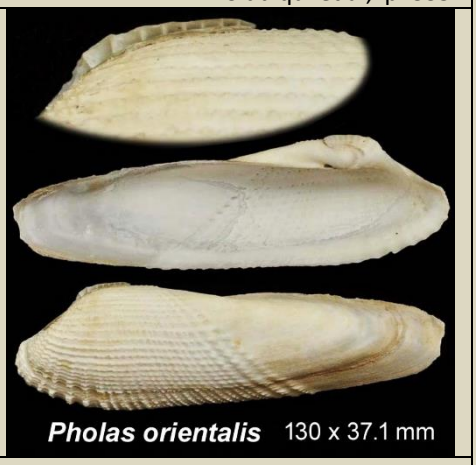
The similarly shaped genus *Barnea* distinguished by possessing only one accessory plate and absent partitions in the umbonal reflection.

- Siddiqui et al, p. 335.



Left - MF 375: Kalpitiya, beached, collected by Upali Mallikarachchi. Anterior fragment 32 mm; posterior 67 mm; third fragment 28 mm.

Right - Kalpitiya, beached single valve. Colombo Museum collection.



***Pholas orientalis* Gmelin, 1791** Oriental Angel Wing

[*Pholas siamensis* Spengler, 1792, *Scutus abnormis* G. & H. Nevill, 1874 – synonyms]

Shell elongate oval, umbo anterior, dorsal margin reflected over beak with small transverse partitions. Anterior narrowly rounded, posterior greatly prolonged, tapering, narrowly rounded. Anterior half of exterior with oblique ribs crossed by concentric grooves, the nodules so formed somewhat spiny antero-ventrally, the posterior smooth behind the last oblique rib.

Three fragments of a right valve that show the characteristic sculpturing collected by Upali Mallikarachchi in 2007 obtained. In 2012 an expedition from the Colombo Museum obtained a complete left valve. Both specimens were beached at Kalpitiya.

Exploited in Malaysia and Thailand as food (Poutiers, 1989).

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Valentich-Scott, Paul & Piyoros Tongkerd, 2008, Coral-boring bivalve molluscs of southeastern Thailand, with the description of a new species, *The Raffles Bulletin of Zoology* 2008 Supplement No. **18**: 191-216.

MF: 4.8.2016; 18.8.2020 – verified and updated.