

Mangrove and Mangrove Associated Snails and Clams in Sri Lanka

Malik Fernando

Page | 1

Introduction

Mangroves are important coastal and estuarine habitats. They are under threat in the course of development activities. Many studies have been done on them in Sri Lanka, essentially concentrating on mangrove flora and a few faunal species. The molluscan fauna has been poorly studied. The author has been able to collect a number of species of snails and clams from mangroves and associated habitats, such as salt marshes and brackish water ponds and lakes/lagoons that often fringe mangroves, in the course of his wanderings over many years. Not all brackish water forms have been included, only those associated with mangrove habitats. Identification has proved troublesome owing to the author's inability to compare specimens with named museum specimens, but with the development of the internet in recent years the situation has changed for the better.

Identification has been made possible by the availability on-line of numerous colour images of snails; literature to confirm these identifications has also come within reach. This article is more or less an identification guide to many mangrove and mangrove associated species of snails and bivalve clams in Sri Lanka. All names have been verified based on inclusion in the World Register of Marine Species (WoRMS). The named specimens are available in the author's collection and may be seen by anyone desiring to compare with their own collections. The locations given are of places where the specimens have been collected by the author. It is hoped that this compilation will be useful for other workers to expand on the distribution of these taxa within Sri Lanka.

Fourteen species of snails and six species of bivalves have been identified in mangroves and lagoonal and estuarine backwaters associated with mangroves. Two species of wood-boring bivalves that most likely originated from a mangrove habitat are included, as well as a mud-dwelling slug that was once seen on a mangrove mud-flat. The species are numbered sequentially in the list of species and identified by the same number in the illustrations.

Habits, habitats and distribution

GASTROPOD SNAILS

EAR SHELLS The members of the family Ellobiidae comprising the ear shells and the coffee bean shells are found on mangrove stems and leaves, or on the muddy ground amongst leaf litter. *Cassidula nucleus* is an ear shell that is fairly common. It has been found at Kalpitiya, Maggona and Kaluamodera—amongst leaf litter in dried-up mangrove and on the stems and leaves of mangrove vegetation standing in water. *Ellobium gangeticum*, on the other hand, appears to be uncommon. We found this species on low, straggling, terrestrial vegetation and amongst leaf litter at the border of a

mangrove at Vanathavillu. It was listed as being a member of the mangrove fauna at the 'Seacology - Sudeesa Mangrove Museum' in Chilaw.

COFFEE BEANS The coffee bean shell *Melampus ceylonicus* was first seen by us and observed for many years at the base of a grassy bank by the seashore at Mount Lavinia. It had no doubt reached that spot by hitching a ride on floating vegetation that washed up on the beach and thereafter established a colony. This is a southern species, having also been collected at Maggona, the somewhat similar *M. fasciatus* having been collected only from the eastern and western shores of the Puttalam lagoon. Also found on the mangrove vegetation on both sides of the Puttalam lagoon was the folded ear shell *Pythia plicata*. This is a widely distributed species having been collected from mangroves of the Maduganga, Koggala lake (Gan duwa), Akurala and the Lunama lagoon.

PERIWINKLES *Littoraria scabra* is one of a number of species of periwinkles in the country, mostly inhabiting the rocky sea shore. This species, however, is found exclusively on mangrove plants. It appears to be rare, with a restricted distribution, as we have only collected one specimen from a roadside mangrove at Cod Bay, in Trincomalee. Pinto (1986) reports it from Negombo, an area that we have not explored. Pinto also reports *Nerita polita* attached to mangrove roots. We have collected them only from the rocky shore at four sites in the Trincomalee area. They are variously patterned in black and white or light brown, sometimes with orange tints. Another snail with a seemingly restricted distribution reported by Pinto from Negombo mangroves but not found by us is *Cerithidea quoyii* (formerly *Cerithidea quadrata* or *obtusata*). Our only specimen is a weathered beach find collected at Kachchativu by Prof. Devaka Weerakoon and Arjan Rajasuriya. This is a horn shell in the family Potamididae, two other members of the family being very common and two uncommon. Horn shells of this family are also called mud creepers as they live on shallow muddy bottoms, sometimes even being exposed during low tides, but *C. quoyii* is said to be found on the stems and leaves of vegetation.

HORN SHELLS *Pirenella cingulata* (formerly *Cerithideopsis cingulata*) is perhaps the commonest, being found on the muddy bottoms of areas adjacent to mangroves as well as on the muddy shores of estuaries and lagoons. They are often exposed at low tide on mud flats. *Pirenella conica* is an uncommon horn shell, variably and strikingly patterned in black and white, sometimes with yellow or brown. It lives in shallow water, on mud bottoms. We have found it in a salt marsh pool at Vanathavillu as well as in the salt marsh at Mandaitivu, in Jaffna, and also in a pond in Mannar. *Telescopium telescopium* and *Terebralia palustris* are two large mud creepers. The former occurs on mud flats and the latter in the waterways of mangroves in large numbers. *T. telescopium* is not as widely distributed as *Terebralia*. Two sightings on mudflats in Trincomalee and Batticaloa have not been confirmed by collection but they were collected from the mud floor of a dried-up mangrove at Kayankerni, amongst leaf litter. They were numerous at this site.

MUD CREEPERS *Terebralia palustris* (*uri* in Sinhala) occurs in very large numbers in shallow water in mangroves and is collected by local lagoon fishermen who use the soft parts of the animal to bait their fishing hooks. They are brown or reddish-brown in colour, the colouring said to be influenced by organic substances in the decaying vegetation amongst which they live. A. C. M. Niyas, a shell enthusiast in Kalpitiya, has collected this species from a location with "white mud", as he described. The shells are off-white in colour with coloured bands (No. 12a in the plate). Immature shells are very attractive.



PLATE 1: MANGROVE GASTROPODS

1. *Cassidula nucleus*, 22 mm
 2. *Ellobium gangeticum* 23 mm
 3. *Melampus ceylonicus* 14 mm
 4. *Melampus fasciatus* 12 mm
 5. *Pythia plicata* 17 mm
 6. *Littoraria scabra* 10.2 mm
 7. *Nerita polita* 24 mm
 8. *Cerithidea quoyii* 23.4 mm
 9. *Pirenella cingulata* 25 mm
 10. *Pirenella conica* 19 mm
 11. *Telescopium telescopium* 98 mm
 12. *Terebralia palustris* 99 mm
 13. *Haminoea crocata* 15 mm
 14. *Faunus ater* 72 mm
- (Sizes of largest collected)

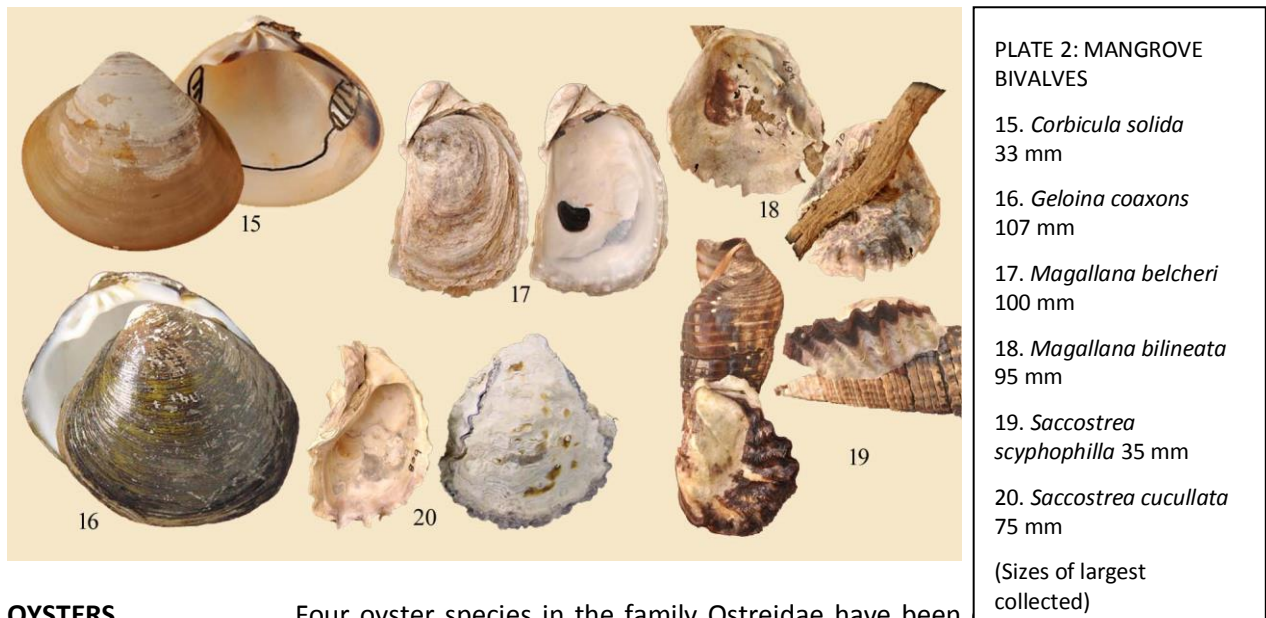
The shell is white in colour, covered by a translucent yellow-brown periostracum.

BLACK FAUNUS The black faunus, *Faunus ater*, is in the family Thiariidae that includes mostly freshwater species. Another mud dweller, it was first collected at Negombo close to the mangrove vegetation bordering the lagoon at Kadolkele. It is a very dark brown colour and dead shells can be found on the banks of other lagoons and estuaries too, such as at Chilaw, Batticaloa and Maggona.

BIVALVES

MANGROVE CLAMS Only a few species of bivalves have been identified in the brackish waters of mangrove associated environments. The large *Geloina coaxans*, called 'kadolmatti' in Sinhala, is large and heavy with a black periostracum that covers a white shell. It is found in the mud of waterways flowing through or around mangroves. The much smaller *Corbicula solida* has been collected from the Rekawa and Palatupana lagoons living on muddy bottoms. Old literature probably described this as a

freshwater species because it is described as such in the illustrated guide to freshwater mollusca of Sri Lanka by Amritha Peiris et al (2015). These are both free-living species in the family Cyrenidae.



OYSTERS

Four oyster species in the family Ostreidae have been fringing mangroves, all attached to hard substrates unlike the preceding species. The small oyster *Saccostrea scyphophilla* seems to like attaching itself to small objects. At Palameenmadu in Batticaloa, adjacent to mangrove vegetation we found this oyster attached to the shells of *Terebralia palustris* that were gliding along the muddy sand bottom in shallow water. At Chilaw they had attached to the shells of *Faunus ater*. They have also been found in sea water attached to a large bivalve at Kayankerni and attached to quartz pebbles at Mud Cove in Trincomalee where they were exposed on the mud at low tide. At the Koggala lake we found them clustered on mangrove stems, at the waterline. Here they looked different and were at first thought to be *Saccostrea cucullata*.

ROCK OYSTER

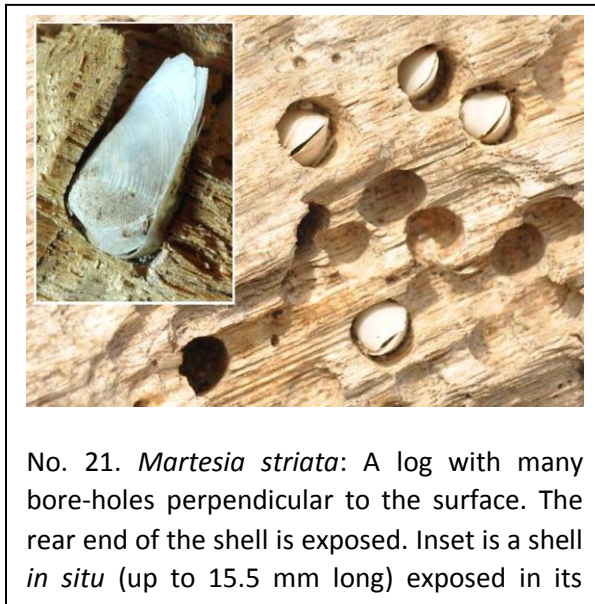
Saccostrea cucullata is a very common oyster found along the seashore on rocky coastlines exposed to heavy surf. The shells are thick and usually eroded. They also grow in brackish water lagoons where they attach themselves to mangrove roots (Pinto, 1986) and rocky substrates. In this environment the shells are thin and uneroded, growing in crowded clumps when they may be difficult to distinguish from the previous species. We have found a single valve in the Pottuvil lagoon tentatively identified as this species and a number of faded and damaged valves on the banks of a waterway off the southern end of the Negombo lagoon.

Pinto refers to *Saccostrea cucullata* and *Crassostrea madrasensis* (now re-named *Magallana bilineata*) as being common on mangrove roots. He also mentions that *Crassostrea* shells “are long and comparatively large,” a description that better describes *Magallana belcheri* (formerly *Crassostrea belcheri*). We have found *M. belcheri* at many brackish water bodies with fringing mangroves: Pottuvil lagoon attached on bottom rocks; Mundal lake on the mud bottom attached to other bivalve shells; Koggala lake at the water line of emergent rocks; Kalpitiya and Chilaw lagoons, empty on shore, probably collected for eating or use as bait for fishing; Batticaloa lagoon, clustered on rock, on the sand bottom in the vicinity of mangroves. This is the species that turns up at hotel buffets.

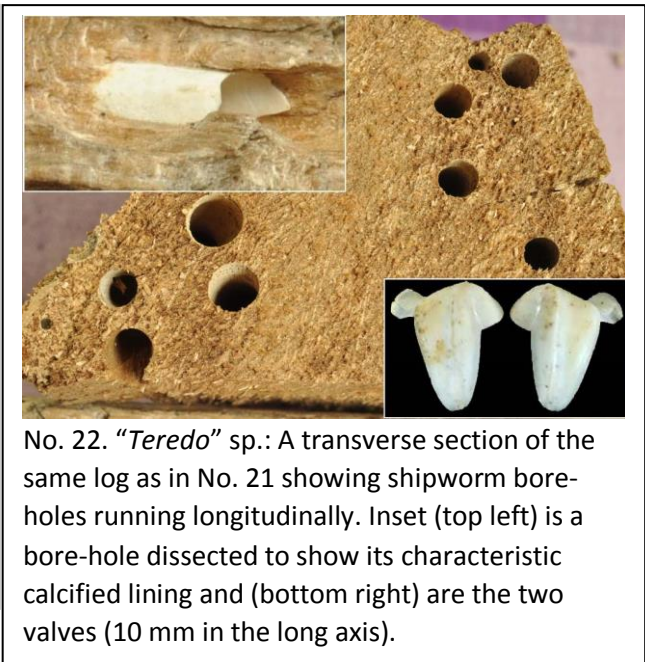
MADRAS OYSTER *Magallana bilineata* (formerly *Crassostrea madrasensis*) is mainly a brackish water species and has been collected attached to rocks at Palatupana lagoon. On the Mundal lake shore, they were found attached to the air roots of the mangrove plant *Avicennia*. We have also found it growing in the Trincomalee harbour attached to a pen shell (*Atrina vexillum*).

What more?

WOOD BORERS This is not an exhaustive list – there are more species of bivalves (and others) awaiting discovery. We have found two genera of bivalve wood-borers in beached drift wood logs, their origin unknown. Both genera are described from mangrove habitats, as well as occurring in other marine and brackish water habitats. A soft wood log on a Jaffna island (Analaitivu) beach yielded *Martesia striata* and a species of shipworm (family Teredinidae). The shipworm could not be identified as parts of the animal essential for identification were missing. Another species of shipworm was recovered from a hardwood log washed ashore at Erakkandy, north of Trincomalee. Many species in a number of genera have been identified in India—we just need to look for them.



No. 21. *Martesia striata*: A log with many bore-holes perpendicular to the surface. The rear end of the shell is exposed. Inset is a shell *in situ* (up to 15.5 mm long) exposed in its



No. 22. “*Teredo*” sp.: A transverse section of the same log as in No. 21 showing shipworm bore-holes running longitudinally. Inset (top left) is a bore-hole dissected to show its characteristic calcified lining and (bottom right) are the two valves (10 mm in the long axis).

MUD SLUGS One molluscan species we know of has eluded re-collection for many years. Mud-dwelling slugs of the genus *Onchidium* were seen on a mangrove mud-flat at Kalpitiya many years ago. When collection was attempted some years later the mud had dried up, only shells of *Haminoea crocata* were left, the mud slug having no shell to leave behind. Many species in the family Onchidiidae are described worldwide, three being reported from the Sundarbans (Dey, 2006).

List of species

Gastropods

1. *Cassidula nucleus* (Gmelin, 1791) [nucleus cassidula] Ellobiidae
2. *Ellobium gangeticum* (Pfeiffer, 1855) [Ganges ear shell] Ellobiidae
3. *Melampus ceylonicus* (Petit de la Saussaye, 1843) [Ceylon coffee bean shell] Ellobiidae
4. *Melampus fasciatus* (Deshayes, 1830) [striped coffee bean shell] Ellobiidae
5. *Pythia plicata* (Férussac, 1821) [folded ear shell] Ellobiidae
6. *Littoraria scabra* (Linnaeus, 1758) [rough periwinkle] Littorinidae
7. *Nerita polita* Linnaeus, 1758 [polished nerite] Neritidae
8. *Cerithidea quoyii* (Hombron & Jacquinot, 1848) Potamididae
9. *Pirenella cingulata* (Gmelin, 1791) [girdled horn shell] Potamididae
10. *Pirenella conica* (Blainville, 1829) [conical horn shell] Potamididae
11. *Telescopium telescopium* (Linnaeus, 1758) [telescope shell] Potamididae
12. *Terebralia palustris* (Linnaeus, 1767) [northern mud creeper] Potamididae
13. *Haminoea crocata* Pease, 1860 [Pease's paper bubble] Haminoeidae
14. *Faunus ater* (Born, 1778) [black faunus] Thiaridae

Bivalves

15. *Corbicula solida* Clessin, 1887 [solid marsh clam] Cyrenidae
16. *Geloina coaxans* (Gmelin, 1791) [common geloina] Cyrenidae
17. *Magallana belcheri* (G. B. Sowerby II, 1871) [Belcher's oyster] Ostreidae
18. *Magallana bilineata* (Röding, 1798) [Madras oyster] Ostreidae
19. *Saccostrea scyphophilla* (Peron & Lesueur, 1807) [piggy-back oyster] Ostreidae
20. *Saccostrea cucullata* (Born, 1778) [rock, hooded or Bombay oyster] Ostreidae

Wood-boring bivalves

21. *Martesia striata* (Linnaeus, 1758) [striate martesia] Pholadidae
22. "*Teredo*" spp. [shipworms] Teredinidae

Bibliography

Das, A.K. & M.K. Dev Roy (1980). On the Wood-Boring Molluscs of South Andamans, India, *Rec. zool. Surv. India*, 77: 179-187, 1980. <http://faunaofindia.nic.in/PDFVolumes/records/077/01-04/0179-0187.pdf>

Demas Bin Yahya @ Demas Lai (2004). *Species Diversity and Distribution of Marine Wood Borers in Blunjei Bay Mangrove Area, Lundu, Kuching, Sarawak*, Universiti Malaysia Sarawak. (BSc dissertation) [https://ir.unimas.my/17639/1/Species%20diversity%20and%20distribution%20of%20marine%20wood%20borers%20in%20Blunjei%20Bay%20Mangrove%20area..%20\(24%20pages\).pdf](https://ir.unimas.my/17639/1/Species%20diversity%20and%20distribution%20of%20marine%20wood%20borers%20in%20Blunjei%20Bay%20Mangrove%20area..%20(24%20pages).pdf)

Dey, Anirudha (2006). *Handbook on Mangrove Associated Molluscs of Sundarbans*, The Director, Zoological Survey of India, Kolkata.

Fernando, Malik (2009). *Shells of the Sri Lanka Seashore*, Biodiversity Secretariat, Ministry of Environment, Sri Lanka.

IUCN Information Brief on Mangroves in Sri Lanka. Available at:
http://cmsdata.iucn.org/downloads/sri_lanka_information_brief_of_mangroves.pdf, accessed 4.7.2018.

Kirtisinghe, Parakrama (1978). *Sea shells of Sri Lanka*, Tuttle, Tokyo.

Liyanage Sunil (1998). Conservation of Biodiversity in Mangrove Ecosystem in Sri Lanka, Abstract, *Proceedings of International Forestry and Environment Symposium*, Sri Lanka. Published by Department of Forestry and Environmental Science, University of Sri Jayewardenepura. Available at:<http://journals.sjp.ac.lk/index.php/fesympo/article/view/1417>, accessed 4.7.2018.

Mendis, A. S. and C. H. Fernando (1962). A Guide to the Freshwater Fauna of Ceylon, *Bulletin of the Fisheries Research Station, Ceylon*. Vol. 12, pp. 51 - 59 (Mollusca), Fisheries Research Station, Ceylon.

Museum, British (2013). pp. 22-3. *Catalogue of Auriculidae, Proserpinidae, and Truncatulidae in the Collection of the British Museum*. London: Forgotten Books. (Original work published 1857). Available at:http://www.forgottenbooks.com/readbook_text/Catalogue_of_Auriculidae_Proserpinidae_and_Truncatulidae_in_the_1000710784/27.

Peiris A, Naggs F, Preece RC, Taylor H and White TS (2015). *An illustrated guide to the freshwater Mollusca of Sri Lanka*. Joint Conchological Society / Malacological Society Publication, SRP Ltd, Exeter.

Pinto, Leonard (1986). *Mangroves of Sri Lanka*, Natural Resources, Energy and Science Authority of Sri Lanka, Colombo.

Petit de la Saussaye S (1843). Descriptions of New Species of Shells belonging to the Genus Auricula, collected by H. Cuming, Esq. *Proceedings of the Malacological Society of London* 10(119): 201-202.

Ranawana KB (2017). *Mangroves of Sri Lanka*, Publication of Seacology - Sudeesa Mangrove Museum 1(1) 2017: 25-28. Available at:
https://www.researchgate.net/publication/322924654_Mangroves_of_Sri_Lanka, accessed 4.7.2018.

Reid DG & Ozawa T (2016). The genus *Pirenella* Gray, 1847 (= *Cerithideopsis* Thiele, 1929) (Gastropoda: Potamididae) in the Indo-West Pacific region and Mediterranean Sea. *Zootaxa*. 4076(1): 1-91., available online at <https://doi.org/10.11646/zootaxa.4076.1.1>

Siddiqui KU, Islam MA, Kabir SMH, Ahmad M, Ahmed ATA, Rahman AKA, Haque EU, Ahmed ZU, Begum ZNT, Hassan MA, Khondker M and Rahman MM (eds.) (2007). *Encyclopedia of Flora and Fauna of Bangladesh, Vol. 17. Molluscs*. 415 pp, Asiatic Society of Bangladesh, Dhaka.

World Register of Marine Species. Available from <http://www.marinespecies.org> at VLIZ.