

THE COMMON SHALLOW-WATER MUSSELS OF TRINIDAD: (MOLLUSCA: MYTILIDAE)

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The coasts of Trinidad are very rich in marine life. Sea shells are collected easily from all the varied habitats, such as sand beaches, rocks, coral reefs, mudflats and mangrove swamps. These molluscs include sea cockroaches or pachro (Class Amphineura), snails and conchs (Gastropoda), oysters and chip-chip (Class Bivalvia) and occasional octopus and squid (Class Cephalopoda). No catalogue or handbook of the Trinidad molluscs exists and many of the local shells are not described in available texts such as 'Caribbean Seashells' by Warmke & Abbott (1961). There is need, therefore, for accounts of the Trinidad seashells, as indeed for all groups of marine animals found on our shores, to aid the naturalist and teacher in identifying species and learning something of their natural history.

This article is concerned with one group of bivalve molluscs, the Mytilidae or mussels, and describes eight common species. Although there may be several other species in Trinidad, and in Tobago which was not investigated, the eight described can be found easily in dense populations in a number of localities. Furthermore, they all occur in the inter-tidal region and are thus available to the collector without recourse to skin diving or SCUBA. The specimens examined were collected over the past four years by the author and a number of other persons. Thanks are due particularly to Mr. Peter Percharde, Trinmar Ltd., for making specimens and information available to the author, to Professor J. S. Kenny and Mr. S. Allick, Department of Biological Sciences, University of the West Indies, for specimens collected on the north and south west coasts. Mussels were present also in a small collection from a sea-water cooling system kindly made available to the University of the West Indies by the Trinidad and Tobago Electricity Commission, Port-of Spain. All the specimens described are housed in the collections of the Department of Biological Sciences, University of the West Indies.

THE FAMILY MYTILIDAE

Mussels are characteristically found attached by the byssus to a solid substratum which may be a rock, mangrove root or some man-made structure such as an oil rig or pier piling. Others are adapted to life in burrows in mud, soft rock, coral or other sea shells. Whether on surf-

beaten rock or in sheltered mangrove swamp mussels feed by filtering small particles from the water. They compete with other sessile organisms for space and their sedentary life habitat leaves them vulnerable to a variety of predators such as crabs, conchs, shore birds and fish. Man is also a predator on the local swamp mussel which has found its way onto the menus of several hotels.

The mytilids show the following characters which are illustrated in Fig. 1. Shell valves of equal size, elongated from the umbonal region to the opposite margin. Umbones sharp and near the anterior end which may be prolonged as a distinct beak. Hinge ligament linear. Shell material dense in the outer layer, commonly covered by an epidermis or periostracum which may be brown, black and sometimes hairy. The interior of the valves is somewhat pearly, often with a purple colour, shows several muscle scars which are usually distinct, except for the large posterior adductor. The anterior adductor muscle scar is small. Teeth may be present at the anterior end of the hinge margin. These may be few in number, poorly developed or absent. The shell is normally anchored by a mass of threads termed a byssus.

Separation of the few species described is most easily accomplished by reference to the illustrations and text descriptions. Some difficulty may be experienced with juveniles or from the fact that the shell form may vary with the conditions of habitat and crowding. The following simple key to these eight species may prove useful, although it may not distinguish species which are not included in this article.

KEY TO THE COMMON TRINIDAD MYTILIDS

- | | |
|---|------------------------------|
| 1. Anterior teeth present | 2 |
| Anterior teeth absent | 6 |
| 2. One anterior tooth | Perna perna |
| More than one anterior tooth | 3 |
| 3. Four anterior teeth, shell yellowish | Brachidontes citrinus |
| Two anterior teeth | 4 |
| 4. Distinct radial striation | 5 |
| Radial striation absent | Mytella falcata |

5. Posterior byssal retractor muscle scar elongated,
 about 1/3rd as long as shell, posterior mantle papillae
 numerous and branched **Brachidontes exustus**
- Posterior retractor muscle scar short,
 about 1/6th as long as shell, papillae
 few and simple **Brachidontes domingensis**
6. Periostracum hairy, distinct beaks anterior
 to the umbones **Modiolus americanus**
- Periostracum smooth, umbones near anterior end 7
7. Shell almost cylindrical, with chalky encrustations,
 posterior prolongations present **Lithophaga aristata**
- Shell wedge-shaped, dark brown, without encrustations
 or posterior prolongations **Mytella guyanensis**

SPECIES DESCRIPTION

A general description and some ecological data are given for each species. Taxonomic synonymies and other details are not discussed, as these are of little interest to field naturalists, but may be found in the reference works cited below. Measurements refer to the maximum sizes of individuals collected in Trinidad and may thus differ from those in other countries. Although some of the species have wide distributions in many parts of the world, only their known distribution on the western Atlantic coasts is given below. Local distribution records refer to specimens in the collections examined and are not meant to indicate that the species occur only in these localities.

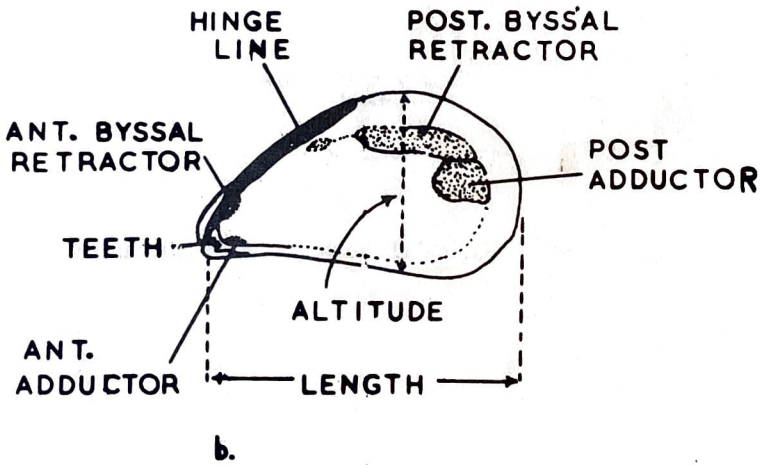
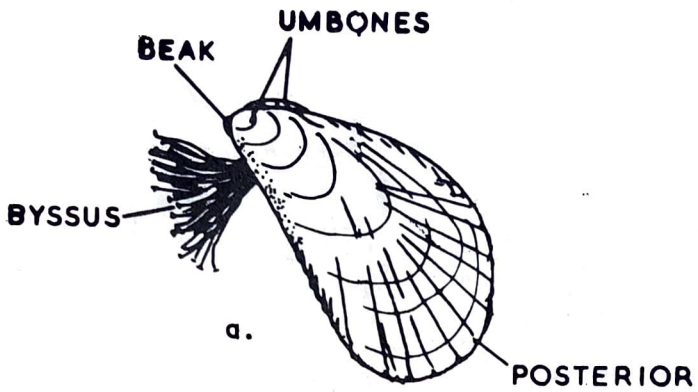


Fig. 1: Diagrams showing characteristic features of mussels; a—external features; b— parameters of shell form and internal features;

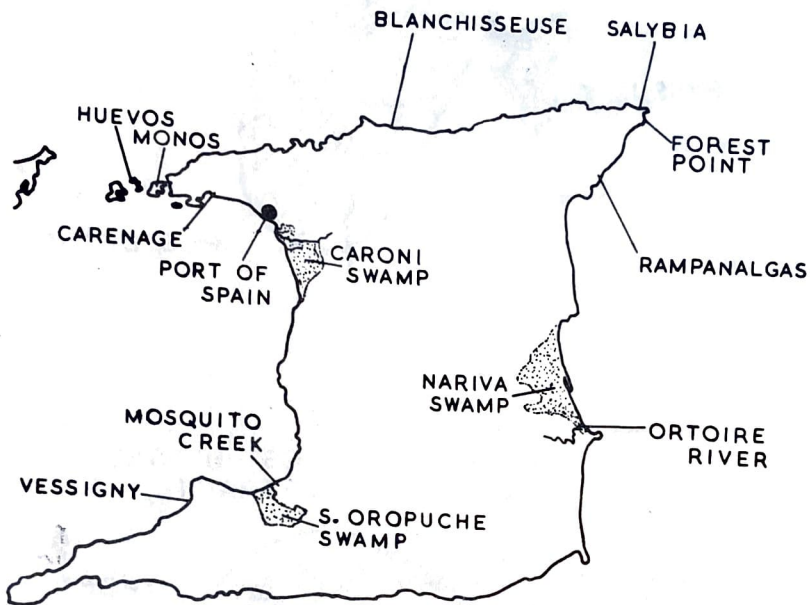


Fig. 2: Map of Trinidad showing collection localities.

1. Genus **PERNA** Retzius, 1788.

Perna perna (Linnaeus, 1758). Fig. 3a.

The Rock Mussel

Length 70 mm; altitude 25 mm. External shell colour brown with white anterior, shape variable. Most commonly an elongated shell, smooth with nearly straight sides, anterior end pointed, concentric ornamentation only. Small specimens may have an almost triangular shape. Ventral side frequently curved, particularly when individuals crowded together. Interior white with violet on the margins, muscle scars frequently indistinct. Anterior end normally with single large tooth on one valve fitting a deep channel on the other valve. One specimen collected by P. Percharde at Blanchisseuse had two teeth on each valve. Beaupterthuy (1967) has found that some populations of *P. perna* in Venezuela have more than one anterior tooth. Further collecting of this species in Trinidad is required before any conclusions can be drawn about the variability of tooth number.

Habitat: It is attached by a strong byssus to wave-washed surfaces on exposed rocky shores. Frequently associated with seaweeds and barnacles. Commonly covered with encrusting organisms such as calcareous algae, barnacles, hydroids and seaweeds.

Range: Eastern coast of South America from Argentina to Venezuela.

Trinidad localities: Tyrico Bay; Blanchisseuse; North side of Huevos; Rampanalgas; Point Sable.

2. Genus **MODIOLUS** Lamarck, 1799.

Modiolus americanus (Leach, 1815). Fig. 3b.

The tulip mussel.

Length 80 mm; altitude 40 mm. Thick, hairy brown periostracum, particularly on the posterior half. Shell beneath light brown, smooth except for concentric lines. Shell inflated, umbones incurved and not terminal. Interior of shell dull white, sometimes stained with pink or blue.

Habitat: Trinidad habitat not well known. The few specimens examined were attached by the byssus to rocks or stones on sandy bottoms, among *Thalassia* or in shell gravels.

Range: North Carolina to Brazil and the West Indies.

Trinidad localities: Carenage Bay; Mouth of the Ortoire River. One specimen was dredged in over 100 fathoms off the north coast by the USS Discoverer in 1972.



Fig. 3: The larger Trinidad mytilids: a— *Perna perna*, b— *Modiolus americanus*; c— *Mytella guyanensis*; d— *Mytella falcata*. Scale in cms.

3. Genus MYTELLA Soot-Ryen, 1955

Mytella guyanensis (Lamarck, 1819). Figs. 3c; 4a—c.

The swamp mussel or Mok.

Length 85 mm; altitude 42 mm. Elongated, wedge-shaped shell, with sub-terminal umbones. External surface smooth, except for fine, concentric lines, dark brown. Shell thin, brittle. Interior white with violet colour on muscle scars. No teeth at anterior end. Anterior adductor muscle scar high up along the anterior margin. Anterior retractor scar in the umbonal cavity, with a small scar half way between this and the anterior adductor. Posterior mantle edge with dense papillae.

Habitat: Completely buried in mud below mangrove trees in swamps. Animal is surrounded by a "nest" of fine byssal threads (Fig. 4b & c).

Range: Rio de Janeiro to Gulf of Paria. The only previous record from the Caribbean is for Puerto Rico. (Soot-Ryen, 1955).

Trinidad localities: Very common in the Caroni Swamp, at the Gulf of Paria side. A few specimens in the South Oropuche Swamp and at Mosquito Creek. This species is collected for food from the Caroni Swamp. It is incorrectly listed as *Modiolus americanus* by Bacon (1970).

4. *Mytella falcata* (Orbigny, 1846). Figs. 3d; 4d.

Length 50 mm; altitude 24 mm. Elongated, wedge-shaped shell, narrower anteriorly than *M. guyanensis*, with nearly terminal umbones. Colour variable from light grey-brown to dark brown, frequently with a greenish tinge or dark zig-zag bands on the posterior end. Interior dark purple. Anterior margin with two small white teeth. Anterior adductor muscle scar more ventral than *M. guyanensis*, anterior retractor behind the umbones.

Habitat: Attached by a normal byssus to mangrove roots in swamps, to small stones or beach drift on inter-tidal mudflats and muddy-sand beaches. Does not develop a byssal "nest" like *M. guyanensis*.

Range: Argentina to the Gulf of Paria.

Trinidad localities: Caroni Swamp; Vessigny; Point Sable; South Trunk Road sea wall.

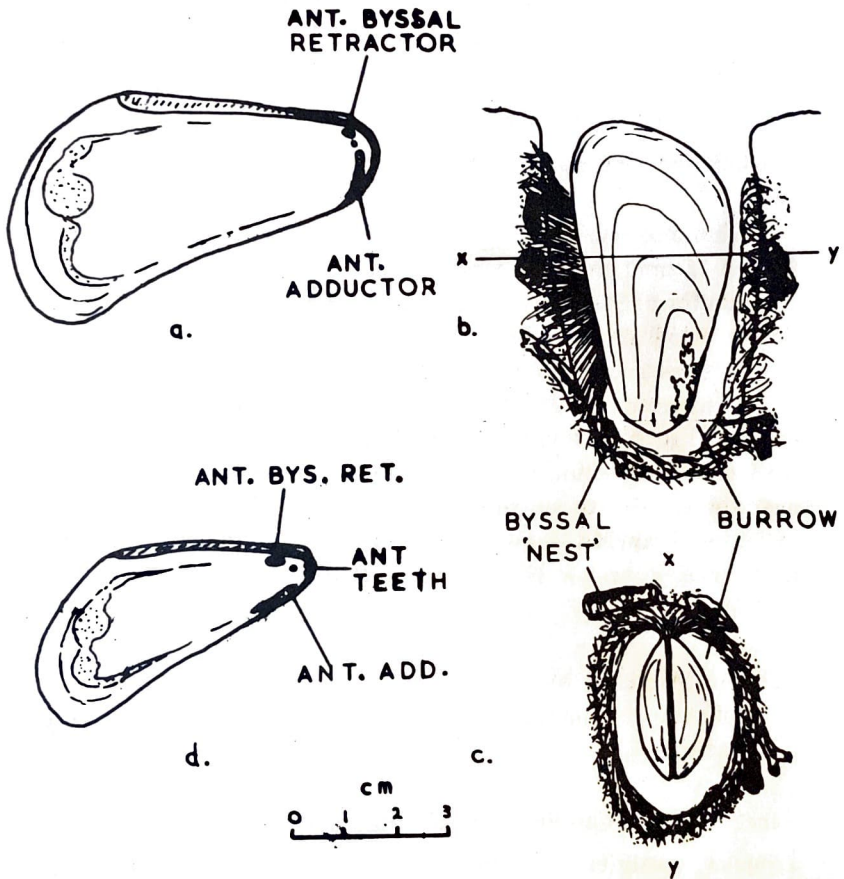


Fig. 4: Drawings of *Mytella*; *Mytella guyanensis*, a— interior of shell; b— vertical section through byssal "nest"; c— transverse section *Mytella falcata*; d— interior of shell.

5. Genus **BRACHIDONTES** Swainson, 1840

Sub genus **BRACHIDONTES** Swainson, 1840.

Brachidontes (Brachidontes) citrinus Roding, 1798. Figs. 5d; 6c.
Yellow Mussel.

The three species of **Brachidontes** collected in Trinidad are difficult to separate on external shell form and colour alone.

B. citrinus is 25 mm long, 12 mm in altitude. Frequently narrow and elongated. Yellowish periostracum. Interior white or purple. Anterior end with four small white teeth. Along the ligament side there are more than ten small, blunt teeth.

Habitat: Attaches to hard substrata. Found on man-made marine structures. Probably more common in deeper water.

Range: Southern Florida to Venezuela and the West Indies.

Trinidad localities: Seawater cooling system culverts of the T & TEC power station, Port-of-Spain.

6. Sub genus **HORMOMYA** Morch, 1853

Brachidontes (Harmomya) exustus (Linnaeus, 1758). Figs. 5a & b; 6a.

The scorched mussel.

Length 25 mm; altitude 14 mm. Somewhat similar to **B. citrinus** in external form. Shell grey to dark brown, normally almost triangular. Widest below the straight hinge margin. Surface showing few concentric lines and many fine, distinct radial striations. Some small specimens from crevices or crowded habitats may be elongated and narrow (Fig. 5b). Interior purple with pale border. Anterior end with two small rounded purple or white teeth. Posterior to the ligament are five to six tiny teeth. The posterior mantle edge has numerous branched papillae which appear to the naked eye as a thick, ragged brown line. Posterior byssal retractor muscle scar elongated.

Habitat: Attached by strong byssus to wave-washed rock surfaces or in crevices among seaweed. Common on man-made marine structures.

Range: North Carolina to Venezuela and the West Indies.

Trinidad localities: Vessigny; Mosquito Creek; Monos Island; Soldado Rock.



Fig. 5: The smaller Trinidad mytilids: a & b— *Brachidontes exustus*; c— *B. domingensis*; d— *B. citrinus*; e— *Lithophaga aristata*. Scale in cms.

7. *Brachidontes (Hormomya) domingensis* (Lamarck, 1819). Figs. 5c; 6b.

Length 25 mm; altitude 15 mm. Closely similar to *B. exustus* in external shell form. It can be distinguished by internal characters such as the much shorter posterior byssal retractor muscle scar and the presence of few, simple papillae on the posterior mantle edge, which appear to the naked eye as a thin, yellowish line (Fig. 6b).

Habitat: Most commonly found attached by a strong byssus in crevices on rocky shores. Also on wave-washed rock faces and among seaweeds. Appears to be more common than *B. exustus* on the east and north-east coasts.

Range: Florida; Lesser Antilles and Venezuela.

Trinidad localities: Salybia; Toco; Forest Point; Rampanalgas.

Genus LITHOPHAGA Roding, 1798.

Sub genus MYOFORCEPS Fischer, 1886.

Lithophaga (Myoforceps) aristata Dillwyn, 1817.

Rock mussel, date mussel.

Length 25 mm; altitude 10 mm. Almost cylindrical shell, cream or light brown. Epidermis shining, with calcereous encrustations, par-

ticularly near the posterior end. Posterior prolongations on the valves which cross like scissor blades (Fig. 6d).

Habitat: A boring species which lives in holes in rock, coral and other shelled marine animals.

Range: North Carolina to Venezuela and the West Indies.

Trinidad localities: Monos Island, in rock and dead coral—*Favia fragum*; Cyril's Bay, in shell of *Trochus* sp.; Damien Bay in broken mollusc shells; Drilling rig, Gulf of Paria in barnacles—*Balanus tintinabulum*; North Manzanilla Bay, in rocks.

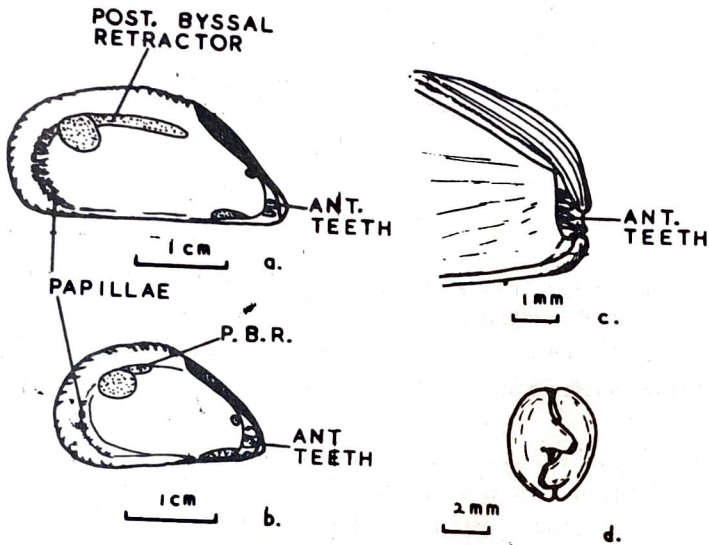


Fig. 6: Drawings of the smaller mytilids; a— internal features of *Brachidontes exustus*; b—internal features of *B. domingensis*; c— anterior teeth of *B. citrinus*; d— posterior prolongations of the shell of *Lithophaga aristata*.

The False Mussel

One species which is easily confused with small individuals of *Mytella* and with *Brachidontes* is the false mussel, *Mytilopsis domingensis* Recluz, 1852. This species belongs to a different family, the Dreissenidae, and attaches to mangroves and tree roots by a short byssus. It is found in brackish or freshwater conditions, is 10 to 20 mm long, mussel-like, greyish white or light brown with coarse concentric growth lines. The interior is white or grey, without teeth at the anterior end. It has been collected at the mouths of the Caroni and Blue Rivers in Caroni Swamp, at Vessigny among *B. exustus* and at the

Trinidad Point sluice gates in the Southern Oropuche Swamp among *M. Falcata*. This species is shown in Figure 7.



Fig. 7: External features of *Mytilopsis domingensis*, showing the similarity to the true mussels.

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