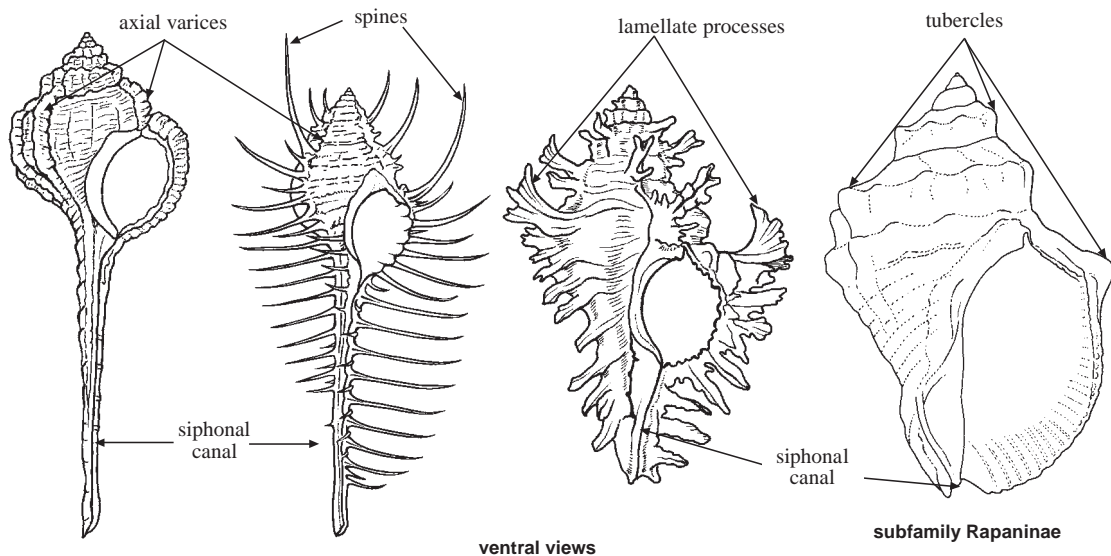


MURICIDAE

Purpuras, murex and rock shells

Diagnostic characters: Shell variably shaped, generally with a raised spire and strong sculpture with spiral ridges and often axial varices (3 or more in number on each whorl), frequently bearing spines, tubercles or blade-like processes. Periostracum absent. Aperture variable, ovate to more or less contracted, with a well-marked anterior siphonal canal that may be very long. Outer lip often denticulate inside, sometimes with a tooth-like process on margin. Columella smoothish to weakly ridged. Operculum corneous, thin to thick (reinforced by a heavy and polished internal rib in subfamily Rapaninae), with nucleus near the anterior end or at about midlength of outer margin. Head with a long, retractable snout and elongate, pointed tentacles bearing eyes at or slightly above their outer bases. Foot moderately long and somewhat truncated anteriorly. Fleishy siphon moderately short to very long.



examples showing diversity of shape and sculpture

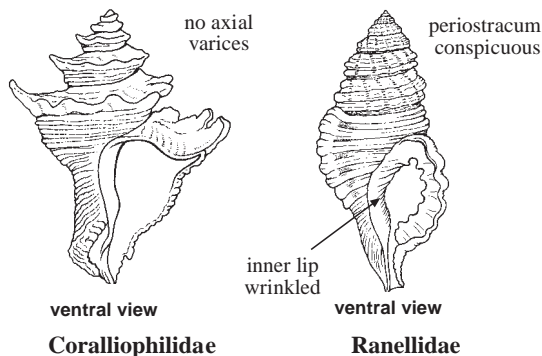
Habitat, biology, and fisheries: The Muricidae constitute a highly diverse group of species, most common in tropical and subtropical shallow waters. Active predators, generally feeding on other molluscs and barnacles. Typically, access to the soft parts of the prey is obtained by boring a hole through the shell by means of a softening secretion and the scraping action of the radula. In many species, the secretion, produced to anaesthetize the prey or for defense, turns to purple on exposure to light and air, and it has been used as a natural dye. Sexes separate, fertilization internal. Eggs laid in protective corneous capsules (the size and shape of which vary with species), hatching usually as crawling juveniles or more rarely as planktonic larvae. Muricidae are commonly collected in the area, for their edible flesh or for their beautiful shell which is used for shellcraft and is popular among shell collectors. Hand collected in shallow waters, especially by divers, or caught with fish traps and bottom trawls. Some species are frequent in local markets. Because of their carnivorous mode of life, a few species are considered pests, as they may cause substantial destruction in exploited natural beds and areas of culture of commercial bivalves.

Remarks: The family is here considered in a rather wide sense, and includes the less typical species (purpuras and rock shells) in the subfamily Rapaninae (=Thaidinae).

Similar families occurring in the area

Coralliophilidae: shell similar to Muricidae, but usually without axial varices and sculptured by spiral threads and sometimes lobe-like spines at the shoulder; differ essentially by a parasitic mode of life on corals and sea-anemones; no radula.

Ranellidae (= Cymatiidae): periostracum often conspicuous, thick and hairy; inner lip wrinkled.



Key to species of interest to fisheries occurring in the area

- 1a. Outer surface of shell with axial varices; siphonal canal medium sized to very long; operculum with subcentral to terminal nucleus (i.e., near or at the anterior end) (Fig. 1a). → 2
- 1b. Outer surface of shell without axial varices; siphonal canal generally short (rarely medium-sized); operculum with lateral nucleus (i.e., at the right side margin of its external surface) (Fig. 1b). (subfamily Rapaninae) → 10

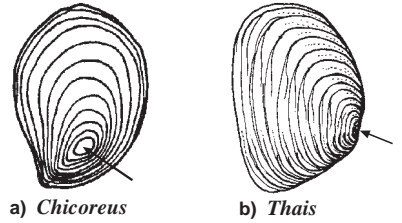


Fig. 1 operculum (external view)

- 2a. Siphonal canal elongate, as long as or longer than the length of the spire and aperture (Fig. 2a). → 3
- 2b. Siphonal canal medium sized, much shorter than the length of the spire and aperture (Fig. 2b). → 7
- 3a. Spines of axial varices usually well developed; margin of the outer lip with a prominent tooth-like process (Fig. 3a). → 4
- 3b. Spines of axial varices reduced to absent; margin of the outer lip without a tooth-like process (Figs 3b and 4). *Haustellum haustellum*

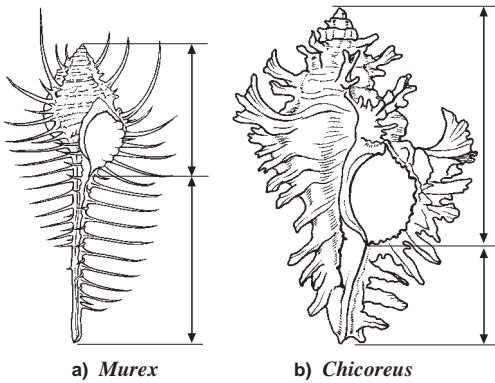


Fig. 2 ventral view

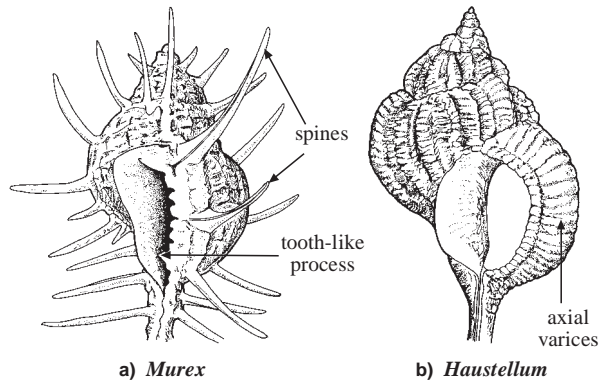


Fig. 3 lateroventral view

- 4a. Three to 4 short spines, restricted to the basal half of siphonal canal (Fig. 5). *Murex trapa*
- 4b. Several (at least 5) to many long spines developed on more than half of siphonal canal → 5
- 5a. Spines of siphonal canal disposed in single axial rows (Fig. 6). *Murex ternispina*
- 5b. Spines of siphonal canal disposed in double axial rows. → 6

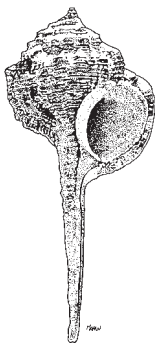


Fig. 4 *Haustellum haustellum* (ventral view)

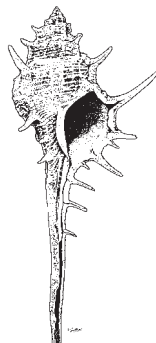


Fig. 5 *Murex trapa* (ventral view)

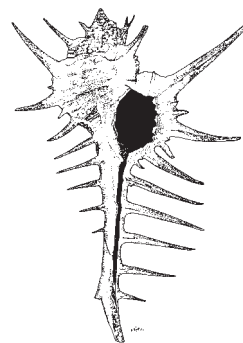


Fig. 6 *Murex ternispina* (ventral view)

- 6a. Primary spines of siphonal canal 6 or 7 in number; secondary spines progressively diverging in direction from primary spines from base to anterior end of canal; nucleus of operculum subterminal (Fig. 7) *Murex tribulus*
- 6b. Primary spines of siphonal canal about 12 in number; secondary spines at right angle to primary spines; nucleus of operculum subcentral (Fig. 8) *Murex pecten*
- 7a. Body whorl with 6 to 8 axial varices (Fig. 9) *Hexaplex cichoreus*
- 7b. Body whorl with about 3 axial varices → 8
- 8a. Shell large sized (up to 30 cm in length), whitish in colour; outer lip margin with a tooth-like process (Fig. 10) *Chicoreus ramosus*
- 8b. Shell medium sized (up to 12 cm in length), generally brownish in colour; outer lip margin without a tooth-like process → 9

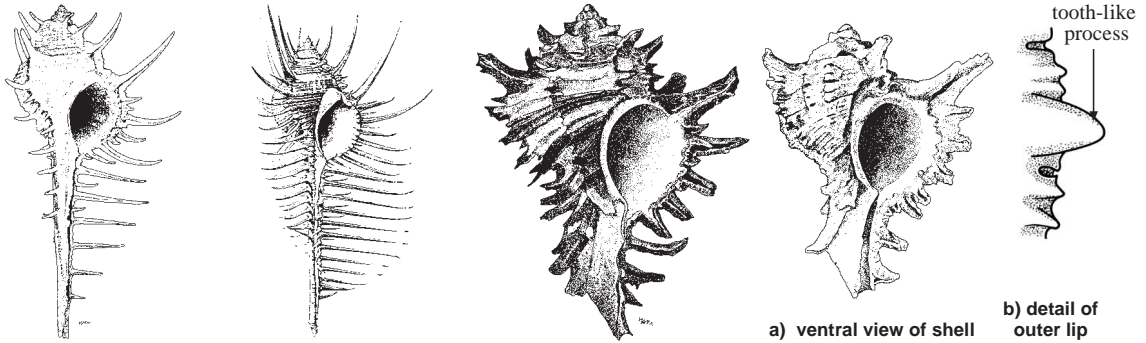


Fig. 7 *Murex tribulus* (ventral view) Fig. 8 *Murex pecten* (ventral view) Fig. 9 *Hexaplex cichoreus* (ventral view) Fig. 10 *Chicoreus ramosus* (ventral view) b) detail of outer lip

- 9a. Two or more nodes between axial varices of body whorl; apertural lips light yellow to orange in colour (Fig. 11) *Chicoreus torrefactus*
- 9b. A single node between axial varices of body whorl; apertural lips deep pink in colour (Fig. 12) *Chicoreus brunneus*
- 10a. Shell relatively large (up to 15 cm in length); siphonal canal rather long; umbilicus widely open (Fig. 13) *Rapana rapiformis*
- 10b. Shell relatively small (up to 9 cm in length); siphonal canal short, merely a broad notch of the anterior margin → 11
- 11a. Body whorl with spiral rows of stout conical tubercles → 17
- 11b. Body whorl without spiral rows of stout conical tubercles → 12

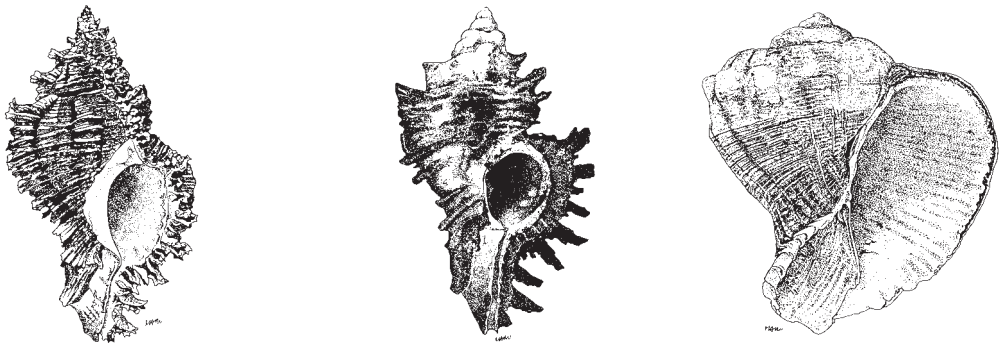


Fig. 11 *Chicoreus torrefactus* (ventral view) Fig. 12 *Chicoreus brunneus* (ventral view) Fig. 13 *Rapana rapiformis* (ventral view)

- 12a. Shell small, not exceeding 2.5 cm in length; outer surface with whitish spiral banding on a dark brown background (Fig. 14) *Vexilla vexillum*
- 12b. Shell comparatively large, widely exceeding 2.5 cm in length; outer surface differently coloured; whitish spiral banding, if present, of interrupted spots. → 13
- 13a. Shoulders of spire and body whorls with a strongly keeled spiral ridge; inner lip of the aperture more or less detached posteriorly from body whorl (Fig. 15) *Cymia lacera*
- 13b. Shoulders of spire and body whorls without a keeled ridge; inner lip of the aperture strongly adherent posteriorly to body whorl → 14
- 14a. Spire whorls with a wide, shallow, subsutural groove; posterior end of aperture constricted by prominent inner and outer lip denticles; outer lip smooth inside → 15
- 14b. Spire whorls without subsutural groove; posterior end of aperture not constricted by prominent denticles; outer lip liriate inside → 16
- 15a. Outer surface finely beaded (Fig. 16) *Nassa sarta*
- 15b. Outer surface not beaded (Fig. 17) *Nassa francolina*

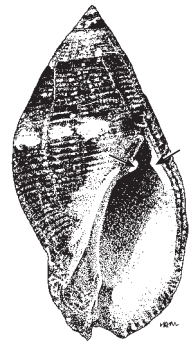
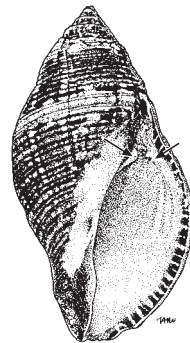
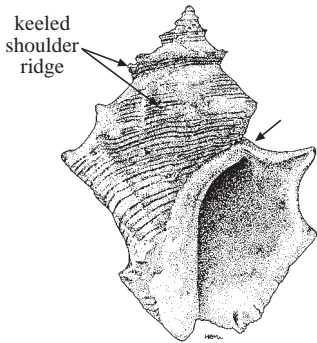
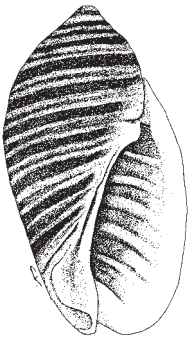


Fig. 14 *Vexilla vexillum* (ventral view)

Fig. 15 *Cymia lacera* (ventral view)

Fig. 16 *Nassa sarta* (ventral view)

Fig. 17 *Nassa francolina* (ventral view)

- 16a. Body whorl with 5 spiral rows of low nodules (Fig. 18) *Purpura panama*
- 16b. Body whorl without spiral rows of low nodules (Fig. 19) *Purpura persica*
- 17a. Tubercles of the most posterior row finger-shaped and very large (Fig. 20) *Thais armigera*
- 17b. Tubercles of the most posterior row not finger-shaped nor very large → 18
- 18a. Tubercles relatively low; outer lip of aperture smooth inside (Fig. 21) *Thais bufo*
- 18b. Tubercles relatively strong; outer lip of aperture liriate inside → 19

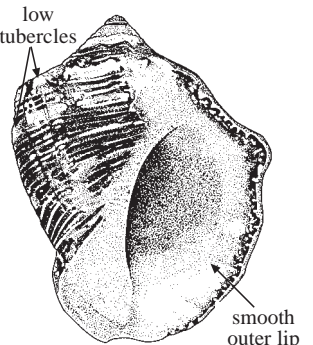
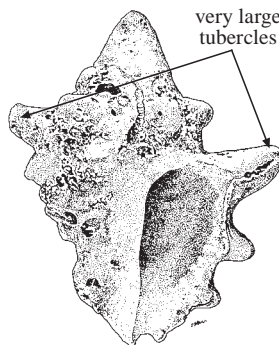
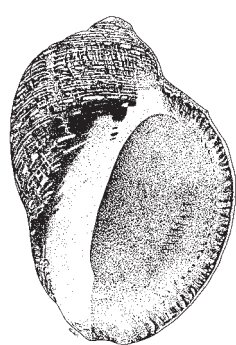
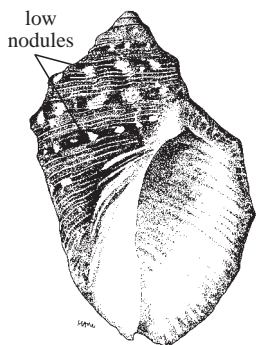


Fig. 18 *Purpura panama* (ventral view)

Fig. 19 *Purpura persica* (ventral view)

Fig. 20 *Thais armigera* (ventral view)

Fig. 21 *Thais bufo* (ventral view)

- 19a. Body whorl with 3 rows of tubercles (Fig. 22) *Thais tuberosa*
 19b. Body whorl with 4 rows of tubercles (Fig. 23) *Thais aculeata*
 19c. Body whorl with 5 rows of tubercles (Fig. 24) *Thais alouina*

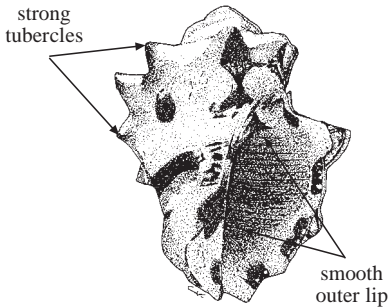


Fig. 22 *Thais tuberosa*
(ventral view)













Fig. 23 *Thais aculeata*
(ventral view)















Fig. 24 *Thais alouina*
(ventral view)

List of species of interest to fisheries occurring in the area

The symbol  is given when species accounts are included.

-  *Chicoreus brunneus* (Link, 1807)
-  *Chicoreus ramosus* (Linnaeus, 1758)
-  *Chicoreus torrefactus* (Sowerby, 1841)
-  *Haustellum haustellum* (Linnaeus, 1758)
-  *Hexaplex cichoreum* (Gmelin, 1791)
-  *Murex pecten* Lightfoot, 1786
-  *Murex ternispina* Lamarck, 1822
-  *Murex trapa* Röding, 1798
-  *Murex tribulus* Linnaeus, 1758

Subfamily Rapaninae

-  *Cymia lacera* (Born, 1778)
-  *Nassa francolina* (Bruguière, 1789)
-  *Nassa sarta* (Bruguière, 1789)
-  *Purpura panama* (Röding, 1798)
-  *Purpura persica* (Linnaeus, 1758)
-  *Rapana rapiformis* (Born, 1778)
-  *Thais aculeata* (Deshayes and Milne Edwards, 1844)
-  *Thais alouina* (Röding, 1798)
-  *Thais armigera* (Link, 1807)
-  *Thais bufo* (Lamarck, 1822)
-  *Thais tuberosa* Röding, 1798
-  *Vexilla vexillum* (Gmelin, 1791)

References

- Cernohorsky, W.O. 1967. The Muricidae of Fiji (Mollusca: Gastropoda). Part I. Subfamilies Muricinae and Tritonaliinae. *Veliger*, 10(2):111-132.
- Cernohorsky, W.O. 1969. The Muricidae of Fiji. Part II. Subfamily Thaidinae. *Veliger*, 11(4):293-315.
- Houart, R. 1992. The genus *Chicoreus* and related genera (Gastropoda: Muricidae) in the Indo-West Pacific. *Mém. Mus. Nat. Hist. Nat.*, (A)154:1-188.
- Kool, S.P. 1993. Phylogenetic analysis of the Rapaninae (Neogastropoda: Muricidae). *Malacologia*, 35(2):155-259.
- Ponder, W.F. and E.H. Vokes. 1988. A revision of the Indo-west Pacific fossil and recent species of *Murex* s.s. and *Haustellum* (Muricidae: Gastropoda: Mollusca). *Rec. Aust. Mus.*, (Suppl.):8:1-160.
- Radwin, G.E. and A. D'Attilio. 1976. *Murex shells of the world. An illustrated guide to the Muricidae*. Stanford, Stanford University, 284 p.

Chicoreus brunneus (Link, 1807)

Frequent synonyms / misidentifications: *Murex adustus* Lamarck, 1822; *M. brunneus* Link, 1807; *M. despectus* A. Adams, 1854 / None.

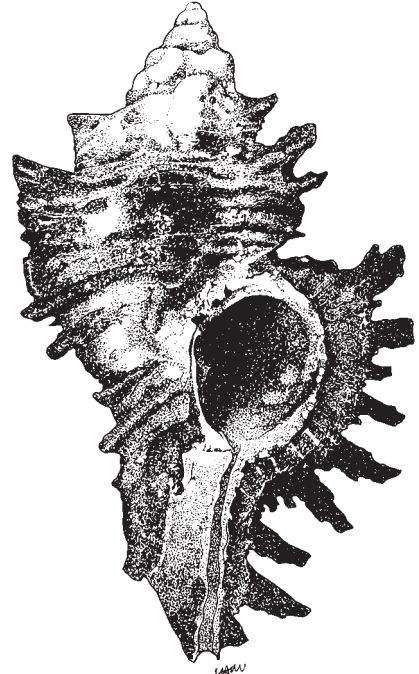
FAO names: En - *Adusta murex*; Fr - *Murex bruni*.

Diagnostic characters: Shell moderately large, stout and heavy, roughly rhomboidal in outline, with a tall conical spire and inflated body whorl. About 3 strong and prominent, spinose axial varices per whorl, with a single broad axial node between them, well-marked spiral cords (about 12 on body whorl) and many fine, intermediate spiral threads. Spines of varices thick, branched, leaf-like and close-set, about 6 in number on body whorl. Posteriormost 3 or 4 spines rather long, progressively more dorsally recurved towards the anterior end of shell, thus forming a gradual arc in that direction. Last 2 spines of body whorl straight. Aperture rounded ovate, with a deep and narrow notch at posterior end. Outer lip crenulate but without a tooth-like process, shortly lirate interiorly. Inner lip smooth, almost completely adherent. Anterior siphonal canal broad and relatively short, narrowly open, slightly recurved distally, with 3 or 4 straight spines of which the basal one is bent dorsally. **Colour:** outside of shell usually brown, with darker brown to almost black spiral cords and spines, sometimes orange. Aperture white or light pink, with deep pink lips.

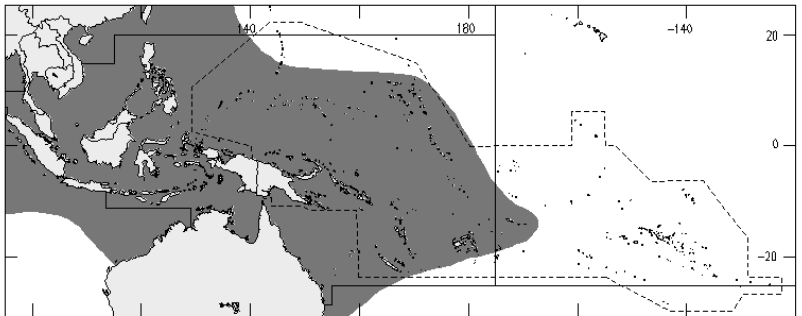
Size: Maximum shell length 11.5 cm, commonly to 7 cm.

Habitat, biology, and fisheries: Common in various shallow water habitats, rocks, coral reefs, or clean to muddy sand bottoms. Intertidal and sublittoral zones, to a depth of about 20 m. This common species is frequently collected by coastal people for food and shellcraft.

Distribution: Widespread in the Indo-West Pacific, from East Africa to western Polynesia; north to Japan and south to northern New South Wales and New Caledonia.



ventral view
(after Houart, 1992)



Chicoreus ramosus (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Murex ramosus* Linnaeus, 1758 / None.

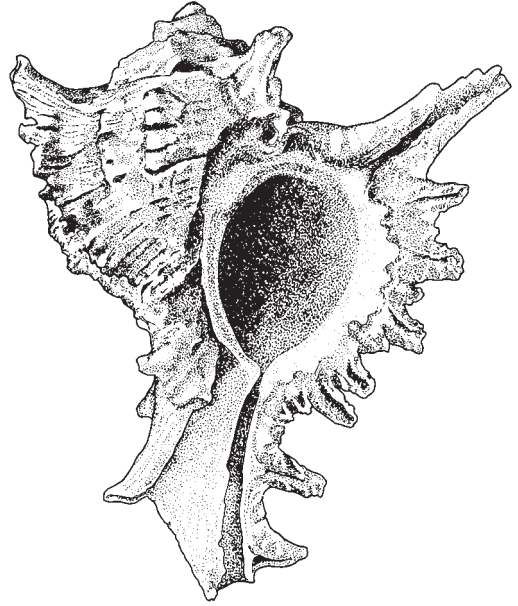
FAO names: En - Ramose murex; Fr - Murex rameux.

Diagnostic characters: Shell large, solid, globose-ovate with a moderately low spire and tumid body whorl. About 3 spinose axial varices per whorl, with 2 unequal, axially elongate nodes between them (one prominent and narrow to the right, one smaller to the left), weak spiral cords and numerous, fine intermediate spiral threads. Spines leaf-like, moderately short, open and recurved, strongest and often longest at shoulder. Aperture large, roundly ovate, with a moderately broad notch at posterior end. Outer lip crenulate and with a prominent tooth-like process anteriorly, smooth or shortly lirate inside. Inner lip with a small spiral ridge posteriorly, otherwise smooth, adherent or sometimes shortly erect anteriorly. Anterior siphonal canal moderately long, broad, narrowly open and slightly recurved dorsally, with 2 or 3 spines. **Colour:** outside of shell whitish, sometimes stained rusty pink near sutures and along spiral lines. Aperture white interiorly, with pink margins.

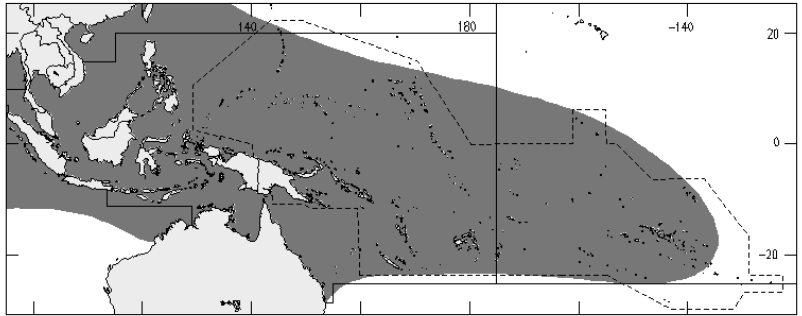
Size: Maximum shell length 33 cm, commonly to 20 cm.

Habitat, biology, and fisheries: Common on coral reef areas, often on clean coarse sand and rubble bottoms in which large individuals partially bury themselves. Preys on bivalves and other gastropods. Intertidal and shallow sublittoral zones to a depth of about 10 m. This large and common species is actively collected in many parts of the Indo-West Pacific realm. In India, it is an important commercial species.

Distribution: Widespread in the Indo-West Pacific, from East and South Africa, including Madagascar, the Red Sea and the Gulf of Oman, to eastern Polynesia; north to Japan and south to southern Queensland and New Caledonia.



ventral view
(after Lindner, 1976)



Chicoreus torrefactus (Sowerby, 1841)

Frequent synonyms / misidentifications: *Chicoreus kilburni* Houart and Pain, 1982; *C. rubiginosus* (Reeve, 1845); *Murex torrefactus* Sowerby, 1841 / *Chicoreus carneolus* (Röding, 1798); *C. maurus* (Broderip, 1833); *C. microphyllus* (Lamarck, 1816); *C. palmiferus* (Sowerby, 1841); *C. saulii* (Sowerby, 1834).

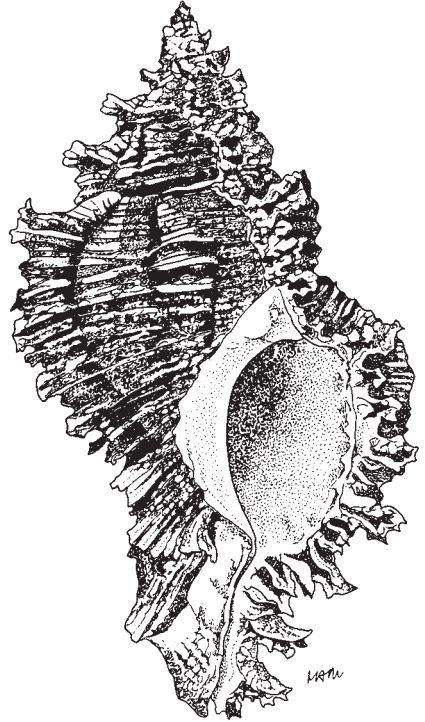
FAO names: En - Firebrand murex; Fr - Murex torréfié.

Diagnostic characters: Shell moderately large, solid, fusiform and moderately slender in outline, with a high, acute spire and large, elongate body whorl. Three spinose axial varices per whorl, with usually 2 or 3 axial nodes between them, and finely crenulated spiral cords interspersed with many fine spiral threads. Spines of varices short and branched, with smaller intermediate spines. About 5 major spines on body whorl, the shoulder spine and 2 anteriormost spines strongest. Aperture broadly ovate, with a large and deep notch at posterior end. Outer lip crenulate but without a tooth-like process, shortly lirate inside. Inner lip adherent, calloused posteriorly, usually smooth. Siphonal canal moderately short, broad, narrowly open and slightly recurved, with 3 or 4 spines which are separated from the body-whorl spines by a spineless space. **Colour:** outside of shell usually brown, with darker spiral cords and spines. Aperture white, often with yellow to orange lips.

Size: Maximum shell length 14 cm, commonly to 8 cm.

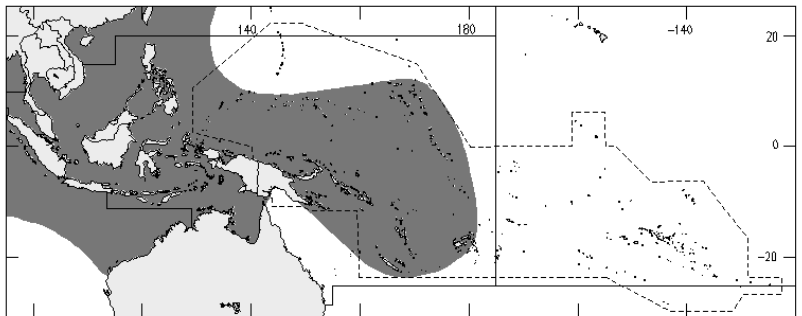
Habitat, biology, and fisheries: Among rocks or on muddy-sand bottoms, near rocks and under corals. Littoral and shallow subtidal waters. This common species is frequently collected for food and shellcraft. In some localities, populations have been greatly reduced because of overcollecting.

Distribution: Widespread in the Indo-West Pacific, from south-east Africa to Micronesia and Melanesia; north to Japan and south to New Caledonia and Fiji Islands.



ventral view

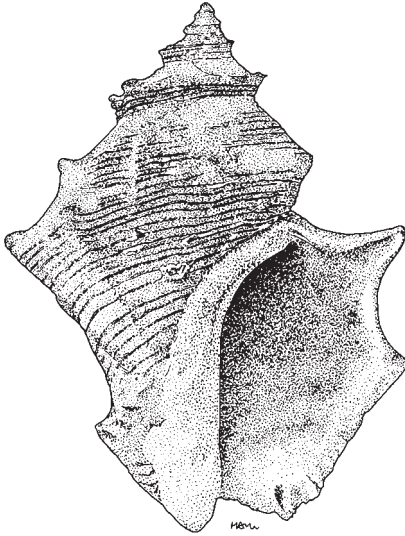
(after Kilburn and Rippey, 1982)



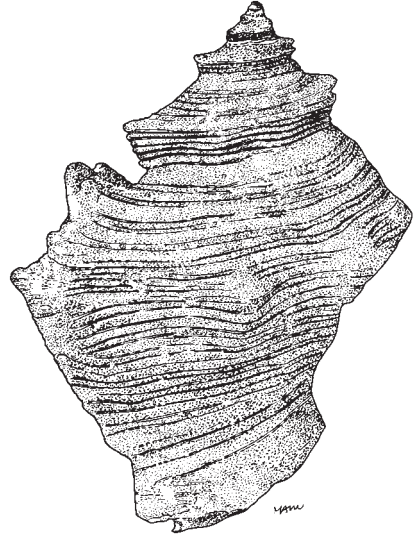
Cymia lacera (Born, 1778)

Frequent synonyms / misidentifications: *Cuma carinifera* (Lamarck, 1816); *C. lacera* (Born, 1778); *Purpura carinifera* Lamarck, 1816; *Thais carinifera* (Lamarck, 1816); *T. mutabilis* (Link, 1807) / None.

FAO names: En - Carinate rock shell; Fr - Pourpre carénée.



ventral view



dorsal view

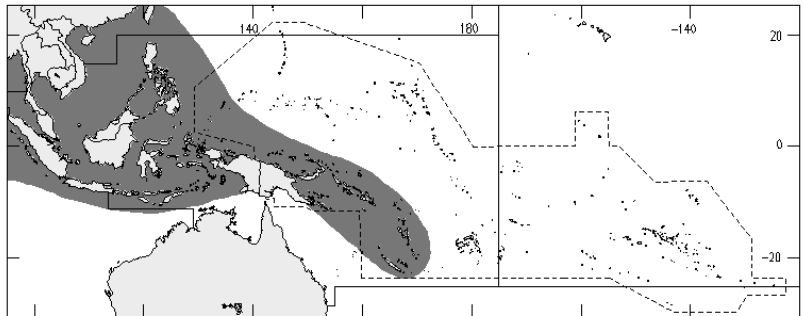
(after Dance, 1993)

Diagnostic characters: Shell thick and heavy for its size, almost biconical in outline, with a moderately tall, conical spire and large, strongly angulated body whorl. Surface of shell with many narrow, irregular spiral cords all over, and a sharply angular spiral ridge bearing spiny tubercles at periphery of each whorl. Some of the spiral cords may be stronger on body whorl and give rise to secondary spines on shoulder slope. Base of body whorl with a prominent spiral ridge bordering the umbilical excavation. Posterior part of aperture often almost free from the body whorl. Outer lip strongly dentate posteriorly. Columella smooth and straight. Anterior siphonal canal short and deep, widely open. **Colour:** outside of shell pale grey, cream or yellowish brown, often with quadrangular brown mottling. Aperture flesh-coloured inside, becoming pale cream to orange on margins.

Size: Maximum shell length 5 cm, commonly to 4 cm.

Habitat, biology, and fisheries: On muddy littoral rocks. Collected for food in various parts of the Indo-West Pacific, notably in Indonesia, Indo-China, and India.

Distribution: Indo-West Pacific, from India to Melanesia; north to Taiwan Province of China and south to southern Indonesia and New Caledonia.



Hexaplex cichoreum (Gmelin, 1791)

Frequent synonyms / misidentifications: *Chicoreus cichoreum* (Gmelin, 1791); *Hexaplex foliata* Perry, 1811; *Murex cichoreus* Gmelin, 1791; *M. endivia* Lamarck, 1822 / None.

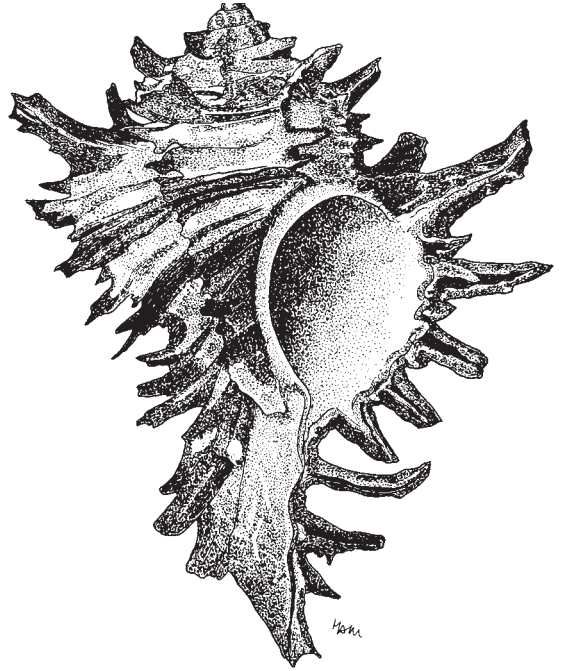
FAO names: En - Endive murex; Fr - Murex endive.

Diagnostic characters: **Shell large** and stout, **globose-ovate** with a **broad conical spire** and wide body whorl. **Six to 8 strongly spinose axial varices on body whorl**, alternating with a low axial ridge, and **crossed by unequal spiral ridges**. **Spines** of varices also developed along the siphonal canal, open, **branched and crimped**, the major ones long and **strongly recurved backward** with respect to the direction of growth. **Aperture subcircular, with a small posterior canal and a broad, moderately developed, anterior siphonal canal**, which is narrowly open along its right side and slightly bent to the right and dorsally. Umbilicus deep and rounded. **Outer lip of aperture strongly crenulate** and with a tooth-like process toward the base. Inner lip with a narrow, somewhat detached anteriorly, columellar callus and a small tubercle at posterior end. **Colour: outside of shell dull white, with 3 spiral bands of brown on body whorl**, one on shoulder slope, another on mid-body, and a third on the base and siphonal canal. Spines dark brown to almost black. **Aperture porcelainous white, narrowly rimmed with pink-orange on margins.**

Size: Maximum shell length 15 cm, commonly to 10 cm.

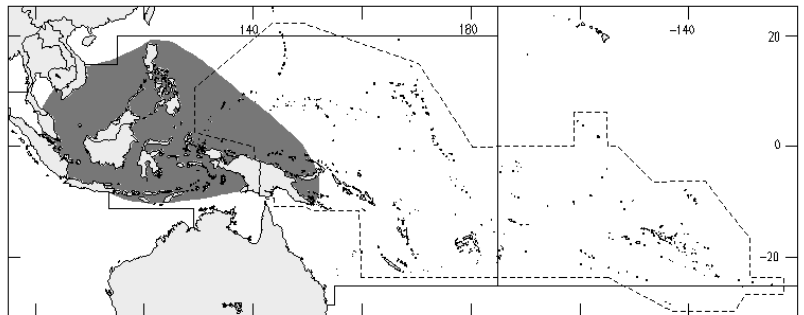
Habitat, biology, and fisheries: Abundant in rocky to muddy areas. Low tide and sublittoral zone. Collected for food in the Philippines. Shell used in local shellcraft.

Distribution: Restricted to the tropical West Pacific, from Indonesia to Papua New Guinea and the Philippines.



ventral view

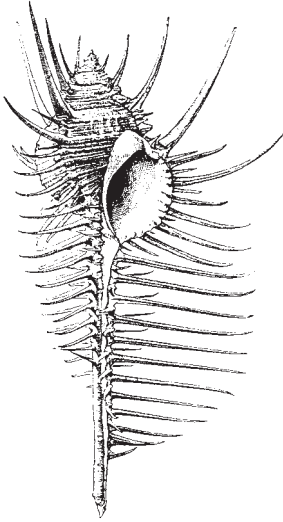
(after Abbott, 1962)



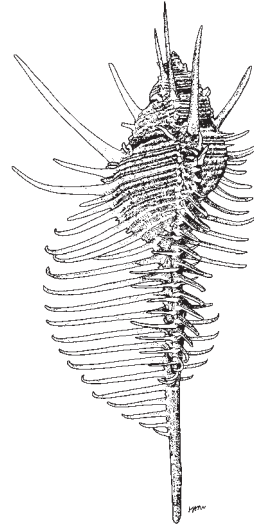
Murex pecten Lightfoot, 1786

Frequent synonyms / misidentifications: *Acupurpura triremis* (Perry, 1811); *Murex pecten* Montfort, 1810; *M. tenuispina* Lamarck, 1822; *M. triremis* Perry, 1811 / None.

FAO names: En - Venus comb murex; Fr - Murex peigne-de-Vénus.



ventral view
(after Grassé, 1968)



dorsal view
(after Ponder and Vokes, 1988)

Diagnostic characters: Shell fairly thin but solid, highly spinose, club-shaped with a moderately tall conical spire, an inflated body whorl and an almost straight, elongate siphonal canal which is longer than the length of the spire and aperture. Main sculpture of 3 axial varices per whorl and many, slightly beaded, unequal spiral ridges which form a complicated arrangement of acute, long, curved spines on varices. Major spines strongest at shoulder and inclined toward the apex, those at periphery almost as strong, not quite so inclined. Intervarical axial sculpture reduced to minute threads on later whorls. Aperture ovate, outer lip crenulated, with a tooth-like process anteriorly. Inner lip adherent and calloused posteriorly, detached and erect anteriorly. Siphonal canal tubular, almost closed, with 3 double rows of spines which diminish in size anteriorly. Primary (major) spines about 12 in number, ventrally curved and perpendicular to coiling axis. Secondary (minor) spines much smaller, at right angle to primary spines. Anterior 1/4 of siphonal canal devoid of spines. Colour: outside of shell creamy white to tan. Aperture porcelainous white, often with red-brown spots in marginal notches of the outer lip.

Size: Maximum shell length 15 cm, commonly to 10 cm.

Habitat, biology, and fisheries: On sandy to muddy bottoms of coral reef areas and on the continental shelf. Littoral, sublittoral and offshore, to a maximum depth of about 340 m. The numerous and long spines provide an efficient protection against predators. Collected for the edible flesh and the elegant shell which is much favoured among collectors.

Distribution: Widespread in the Indo-West Pacific, from East Africa, including Madagascar and the Mascarene Islands, to eastern Melanesia; north to Japan and south to Queensland and New Caledonia. In Western Australia, there is a distinct subspecies *Murex pecten soelae* Ponder and Vokes, 1988.

