

# Decapod crustacean species of Aride Island, Seychelles

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## Abstract

A survey of the decapod crustacea of Aride Island during 1993 revealed at least 28 crab species in twelve families, all of which have now been identified to at least genus level. Here I present the results of the survey which includes other information such as observed habits, known ecology and global distributions.

## Introduction

Between July and November 1993, I carried out a survey of the decapod crustacea on, and around, Aride Island, Seychelles. A previous study had been carried out by Richardson (1990) who found a total of ten different crab species none of which were confidently identified. I attempted to rectify this by carrying out a more intensive study over a longer period. Searches were made of the rocky shore (both above the high water mark and in the rock pools), the beach and further inland. Searches were also made for washed up remains on the beach and records were made of incidental crab sightings. An attempt was made to photograph and take field-notes for all species. However, small specimens which were abundant were preserved in alcohol. These included crabs that were brought in with the fish from the cazier (fish-trap) moored just off the island.

## The island

Aride is the most northerly of the granitic inner islands of Seychelles. The coast of the southern side of the island is dominated by an approximately 600m long stretch of fine coral-sand beach. Towards the western and eastern ends of the island are a mixture of granite and coral boulders and reef-rock. The reef rock which is mostly submerged forms water filled pools at low tide. High quality coral reef surrounds the island.

The island is one of the most important sites for breeding seabirds in the Indian Ocean. Over a million breed there each year providing much food for scavenging terrestrial crabs in the form of regurgitated fish remains, seabird chicks fallen out of their nests and older birds weakened and thus unable to fly due to the presence of sticky *Pisonia grandis* seeds in their feathers. Piles of fallen palm leaves provide protection during the day.

The island thus provides a range of habitats for terrestrial, inter-tidal and marine crabs. However, it must be noted that there are no freshwater streams on the island and no areas of mangrove. Figure 1. shows a map of the island and its different habitats in which crabs were surveyed.

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**Table 1.:** Decapod crustacean species list for Aride Island, Seychelles

<b>Anomura</b>		
<b>Coenobitiidae</b>		
1.		<i>Coenobita rugosus</i> (H. Milne Edwards, 1837)
2.		<i>Coenobita brevipennis</i> (Dana, 1852)
3.		<i>Coenobita perlatus</i> (H. Milne Edwards, 1837)
<b>Diogenidae</b>		
4.		<i>Calcinus laevimanus</i> (Randall, 1839)
<b>Galatheididae</b>		
5.		Galtheid - <i>Galathea</i> ? sp.
<b>Porcellanidae</b>		
6.		<i>Petrolisthes lamarckii</i> (Leach, 1820).
<b>Brachyura</b>		
<b>Grapsidae</b>		
7.		<i>Grapsus tenuicrustatus</i> (Herbst, 1783)
8.		<i>Geograpsus stormi</i> (De Man, 1895)
9.		<i>Geograpsus crinipes</i> (Dana, 1851)
10.		<i>Geograpsus grayi</i> (H. Milne Edwards, 1853)
11.		<i>Metopograpsus messor</i> (Forskål, 1775)
12.		<i>Percnon planissimum</i> (Herbst, 1804)
<b>Portunidae</b>		
13.		<i>Thalamita picta</i> (Stimpson, 1858)
14.		<i>Thalamita admete</i> (Herbst 1903)
15.		<i>Charybdis (Goniosupradens) obtusifrons</i> (Leene, 1936)
16.		<i>Charybdis (Charybdis) natator</i> (Leene, 1938)
<b>Gecarcinidae</b>		
17.		<i>Cardisoma carnifex</i> (Herbst, 1784)
<b>Ocypodidae</b>		
18.		<i>Ocypode ceratophthalmus</i> (Pallus, 1772)
19.		<i>Ocypode cordimana</i> (Desmarest, 1825)
<b>Xanthoidea</b>		
<b>Xanthidae</b>		
20.		<i>Zosimus aeneus</i> (Linnaeus, 1758)
21.		<i>Macromedaeus nudipes</i> (A. Milne Edwards, 1852)
22.		<i>Pilodius areolatus</i> (H. Milne Edwards 1834)
23.		<i>Daira perlata</i> (Herbst, 1790)
24.		<i>Chlorodiella laevis</i> (Dana, 1852)
<b>Carpiliidae</b>		
25.		<i>Carpilius maculatus</i> (Linnaeus, 1758)
<b>Pilumnidae</b>		
26.		<i>Pilumnus</i> sp.
<b>Menippidae</b>		
27.		<i>Eriphia scabricula</i> (Dana, 1852)
28.		<i>Eriphia sebana</i> (Shaw and Nodder 1803)

*Phelsuma* 2 (1994); 35-47

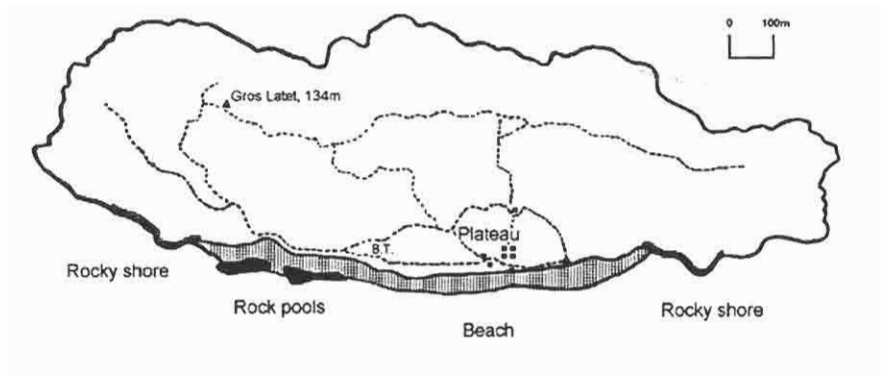


Fig. 1. Aride Island - showing habitats mentioned in the text

## Results

In total 28 different species in twelve different families have been identified down to at least genus level. Table one shows the results of the survey.

One particular species, *Carpilius maculatus* was found washed up on the beach and it cannot be proven definitely that it originated from the reef immediately surrounding the island (although that is likely). The position of the fish trap is assumed to be part of the island.

Eight species are common to those found on Mahé by Taylor (1968). They are: *Ocypode ceratophthalmus*, *O. cordimana*, *Cardisoma carnifex*, *Thalamita admete*, *Percnon planissimum*, *Coenobita rugosus*, *Metopograpsus messor* and *Petrolisthes lamarckii*.

## ANOMURA

### The Coenobitiidae - terrestrial hermit crabs

#### *Coenobita rugosus*

Global distribution : East coast of Africa to Line Islands and Tuamotu Archipelago (Haig 1984).

These small hermit crabs occupied shells with openings up to 40mm across. They are a largely terrestrial species generally found foraging above the high tide mark. They were numerous and were particularly common along the beach crest congregating mostly in the cooler conditions amongst fallen palm leaves by day. Their bodies are whitish with some greyish tingeing over the periopods (legs). Large numbers were found in damp hollows such as those underneath the puzzle-nut tree (*Xylocarpus sp.*) in the B.T. area of the plateau. Also locally common on the beach at night. Surprisingly adept at climbing up/down granite, reef rock areas between beach and beach crest. See Plate I.

### *Coenobita brevimanus*

Global distribution : East coast of Africa to Line Islands and Tuamotu Archipelago (Haig 1984).

Large and heavy dull purple individuals (shell to 80mm across opening). Very powerful chelipeds (pincers) up to 40mm long. The left-hand cheliped is usually the larger of the two. Found in the depths of fallen palm leaves during the day. Mainly nocturnal. When picked up they the habit of reaching forward and when they find that they cannot reach the ground, they rapidly extricate themselves from their shells and scurry off. Mostly occupy turban shells (*Turbo sp.*) but are known to utilise coconuts.

### *Coenobita perlatus*

Global distribution : Aldabra and Madagascar to Line Islands and Gambier Islands (Haig 1984).

White individuals with medium to heavy orange tingeing. Shell opening to 60mm. Often seen at night although occasionally by day, almost exclusively on the beach. Appear to travel long distances over the beach scavenging for food. See Plate I

## **The Diogenidae - shallow water hermit crabs**

### *Calcinus laevimanus*

Global distribution : Widely distributed in Indo-West Pacific, from East Africa, Madagascar, Seychelles to Japan and Hawaii (Lewinsohn 1982).

Marine hermit crabs. Shell openings to 10mm. Inhabit variety of shells (including *Nerita spp.* and *Cerithium spp.*, pers. obs.) often of a size that appear to dwarf the occupant. Extremely common in rock pools such as those exposed at low tide near western beach. They have a very striking colouration and are unlikely to be confused.

Eyes - rounded light blue eyes with black cornea set on eye peduncle (eye-stalk) of which the upper 2/3 is orange and the last 1/3 blue.

Antennae - two sets, inner set blue with orange joint and orange antennule flagella, outer set fine, long, orange flagellae

Shield - grey/green colouration.

Chelipeds - all individuals with larger left cheliped. - approximately 50/50 chocolate brown and white with a wavy demarcation line between the two colours. Other periopods brown.

## **The Galatheidae - 'squat lobsters'**

Galatheid - probably *Galathea sp.*

Small species recovered from the fish-trap. Some members of this genus are known to be associated with coral. Specimen found was lobster shaped with an elongated shield compared to all of the other crab specimens found on Aride (shield length 4mm, shield width 2mm). The first periopod was also relatively elongated (7mm) with many forward pointing spines. Last pair of periopods were

vestigial. Eyes were relatively large and were flat on the forward pointing face. Between the eyes was a symmetric series of nine flat, large spines increasing in size to the central spine.

### **The Porcellanidae - porcelain crabs**

#### *Petrolisthes lamarckii*.

Global distribution : Indian Ocean. Mainland from S. Natal to E. coast of India including Red Sea and Persian Gulf, Aldabra, Cosmoledo, Glorioso Is., Comoro, Madagascar, Amirantes, Seychelles, Coetivy, Mauritius, Chagos Archipelago, Nicobar Is. and Mergui Archipelago. Malay Peninsula and Palau Is.; Indonesia S. to Queensland; Ogasawara and Palau Is. E. to Line and Gambier Is. (Haig 1983).

Small specimen (shield width approximately 5mm) recovered from the fish-trap. It is a littoral and shallow sub-littoral species occurring under rocks and on coral. They are filter/deposit feeders. On Mahé, *Petrolisthes lamarckii* is extremely common on coral boulders (Taylor 1968). See **Plate II**.

### **BRACHYURA** (True crabs)

#### **The Grapsidae**

#### *Grapsus tenuicrustatus*

Global distribution : Red Sea and East Africa to Japan and Hawaii (Crosnier 1965).

Extremely conspicuous and common diurnal crab. Shield width is up to 100mm which can be black and dark green to black and yellow. They are dorso-ventrally flattened and are very capable of scurrying across rocks at high speed and even leaping between them. They are very wary of humans and appear to have good eyesight - at least well able to detect movement of large objects at a distance. Only found on rocky shore areas such as that found at either end of the beach and retreat into rocky clefts when endangered or leap into sea. They are micro-algae feeders and have specially adapted chelipeds for scraping off their food from the surface of rocks in areas of wave action. Dead specimens often seen above high tide mark, usually bleached white and red by sun. Colloquially known as 'Rocher' or 'Swift-footed' crab. See **Plate I**.

#### *Geograpsus stormi*

Global distribution : East coast of Africa to Japan and Polynesia (Haig 1984)

Shield to approximately 50mm across - dorso-ventrally flattened. Appeared to be present on Aride in two distinct morphs. In the first, the shield is dark/brown to maroon with lighter brown and hairy periopods. The second which appears to be the more common (although this could be a product of their greater conspicuousness) has bright blood red/orange periopods. Both have rounded black eyes and chelipeds of equal size which appear adapted for predation. Seen on rocky shore above water mark. See **Plate I**.

#### *Geograpsus crinipes*

Global distribution : Red Sea and east coast of Africa to Hawaiian Islands and Easter Island (Haig 1984).

This is a large terrestrial carnivorous crab. It is of camel/beige colouration with equally sized predatorily adapted chelipeds. It was often seen on the path near the beach crest feeding on medium to small ghost crabs (*O. ceratophthalmus*). However, Alexander (1979) reports that on Aldabra, *Coenobita rugosus* is heavily preyed upon by this species. It is mostly crepuscular and nocturnal. Several were often seen together congregating on piles of coral on western beach. Several were also regularly seen along the beach path. Lives in burrows inland. See Plate I.

#### *Geograpsus grayi*

Global distribution : East coast of Africa to Japan and Society Islands (Haig 1984). A species that in appearance is very similar to above. Individuals are an off-white with the uppermost area of the shield (width 50mm) being a dark brown/black. Only two individuals were seen on the island. The first was approximately 50m up the hill whilst the second was on the front beach path. Both incidents were at night. Little is known about its habits although this may be the species that Richardson (1990) reports as eating mice.

#### *Metopograpsus messor*

Global distribution : Red Sea, East Africa and Seychelles to Japan and Hawaii (Titgen 1982)

Found on loose rocky shores although are usually mangrove species (P. Hogarth pers. comm.). Haig (1984) classifies *M. messor* as occurring in rocky littoral fringe. Shield width is approximately 7mm, the shape of which is trapezoid. It has rounded black eyes set on peduncles at the anterior corners of the shield. Chelipeds are equally sized and a few large coarse brown hairs are to be found on the last pairs of pereopods.

#### *Percnon planissimum*

Global distribution : Red Sea and East Africa to Australia, Japan and Hawaii (Crosnier 1965).

Dorso-ventrally flattened individuals. Shield to approximately 20mm across. Black/dark brown with green markings. Small round black eyes. Projections coming out of shield between eyes. Row of short spines on anterior pair of pereopods. Both pincers are equally sized and appear to be adapted for algal feeding. Found in rock pools at low tide. It is an inter-tidal species usually found on rock platforms or reef flat (Crosnier 1965). It is rarely seen exposed to air but can be observed active under water to depths of several metres (Hartnoll 1992). Taylor (1968) describes it as having long legs and long pointed dactyls, being very fast moving and found on cast up boulders on the algal ridge area of the reef. See Plate I.

### The Portunidae - swimming crabs

*Thalamita picta*

Global distribution : Red Sea and East Africa to Japan, Australia and Hawaii (Stephenson 1972)

An inter-tidal species that is found under dead coral (Crosnier 1962). Shield width is approximately 20mm and the shape is similar to that of *Charybdis (Goniosupradens) obtusifrons*. The last set of pereopods are dorso-ventrally flattened so as to facilitate swimming. Colouration is a cryptic pattern of green and beige and the ends of the chelipeds a reddish brown. The appearance of this species varies with size and apparently with wear (Stephenson 1972). See **Plate II**.

*Thalamita admete*

Global distribution : Red Sea and East Africa to Australia and Hawaii (Stephenson 1972).

Small species recovered from the fish trap. Known to occur under stones (Crosnier 1962). It is inter-tidal to 13m found on mainland coast and coral reef areas, under stones and amongst mussel clamps (Stephenson 1972). It is a carnivorous swimming crab occurring on Mahé, where it is common, and seen to feed upon other xanthid crabs; they are active at rising tide (Taylor 1968). Last pair of pereopods is adapted as paddles for swimming. The shape of the shield is similar to the two charybdid specimens found. However, the rostrum (part of shield between eyes) was relatively flat and devoid of spines or projections. Pereopods were relatively long and slender and the 1st pereopod contained some large spines particularly on carpus (second major segment of 1st pereopod). There were four large projections on each side of the shield (shield width 9mm). Dactyls were relatively long, crossed over at the tips and had interlocking cutting edges.

*Charybdis (Goniosupradens) obtusifrons*

Global distribution : Red Sea and Madagascar to Japan and Australia (Stephenson 1972).

Two shields were washed up on the beach. Both had a series of triangular projections on the anterior margin of shield. Colouration was of a lightly speckled brown overlaid with short, fine, light-brown hairs. Shield width of one specimen was 65mm. It is an inter-tidal species to a depth of 9m (Stephenson 1972) but also occurs on muddy bottoms (Crosnier 1962).

*Charybdis (Charybdis) natator*.

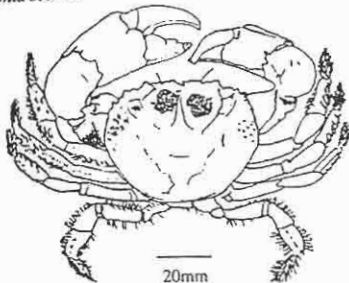
Global distribution : S.E. Africa to Japan including Australia and Lord Howe Islands (Stephenson 1972). Recorded as occurring in the Seychelles by Crosnier (1984).

Marine species trawled to 60m and found in sand, mud and weeds and also lives on coral (Stephenson 1972). Shield width approximately 20mm. Last pair of pereopods adapted as paddles for swimming. Forward pointing projections are to be found on both chelipeds. There is a series of triangular projections on the anterior margin of the shield. See **Plate II**.

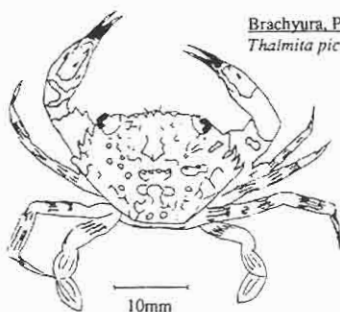
PLATE II

Some of the other decapod crustaceans to be seen on Aride

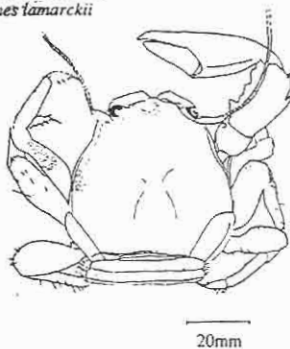
Brachyura, Xanthidae  
*Eriphia sebana*



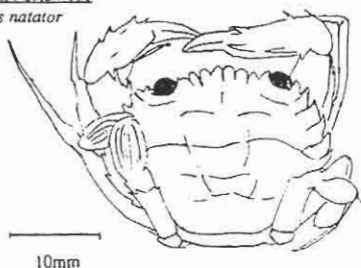
Brachyura, Portunidae  
*Thalmita picta*



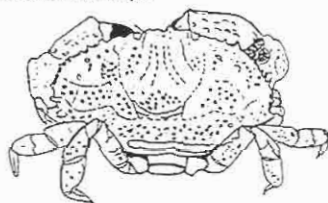
Anomura, Porcellanidae  
*Petrolisthes tamarckii*



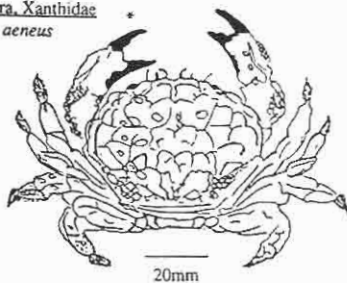
Brachyura, Portunidae  
*Charybdis natator*



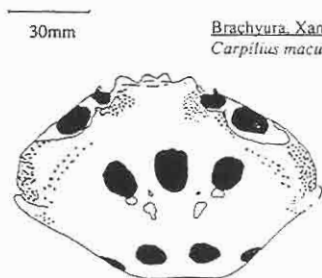
Brachyura, Xanthidae  
*Macromedaeus nudipes*



Brachyura, Xanthidae  
*Zosimus aeneus*



Brachyura, Xanthidae  
*Carpilius maculatus*



\* Redrawn from Garth and Alcalá (1977)



## The Gecarcinidae

### *Cardisoma carnifex*

Global distribution : Red Sea and east coast of Africa to Line Islands and Tuamotu Archipelago (Haig 1984).

'Land' or 'coconut' crab. An extremely common nocturnal species. Shields to approximately 45mm across. Colouration of crab varies between mid purple and pale green/dark purple. One of the chelipeds is larger than the other. Eyes are black on short broad peduncles. Found on plateau area digging burrows into the soil. It is semi-terrestrial. Alexander (1979) states *C. carnifex* as herbivorous and detritivorous with an important role in leaf litter turnover. Common on Mahé in mangrove and supra-littoral environment (Taylor 1968).

## The Ocypodidae

### *Ocypode ceratophthalmus* - Ghost crab

Global distribution : East coast of Africa to Clipperton Island (Haig 1984).

A very common and conspicuous species of sandy beaches. Shield width (between lateral projections) is to at least 44mm. Colouration is usually of a pale green but can vary from dark green to green/purple. Chelipeds are dissimilar and those with larger left or right-hand chelipeds are present in approximately equal proportions in the population on Aride (pers. data). The most striking feature are their elongated pale orange eyestalks. They are macrophagous and active both by day and night scavenging for food along the strand line. During the *Pisonia grandis* fruiting season (October) many crabs were seen fighting over and feeding off the dead seabirds on the beach. The males build complex spiral-pyramid copulation burrows on a lunar cycle with the greatest density of burrows at new moon (pers. obs.). They get their name from the ghostly appearance of their colourless young and they way that when they half dig themselves into the sand to avoid danger, they appear to 'melt' into the surroundings. See Plate I.

### *Ocypode cordimana*

Global distribution : Red Sea and east coast of Africa to Japan and Society Islands (Haig 1984).

Another species to be found in large numbers on sandy beaches. Of a similar size to *O. ceratophthalmus*, they have a more rounded shield and robust appearance. Eyes are black and rounded. Chelipeds are dissimilar. On Aride, burrows were built on the upper third of the beach where the gradient was greater. They were horizontal or sloped downwards and were usually straight but could be slightly curved (direction depending upon handedness of occupant - pers. data.). They were seen scavenging on the beach and even dragging dead seabirds down into their burrows. See Plate I.

## **XANTHOIDEA** (A superfamily)

### **The Xanthidae**

#### *Zosimus aeneus*

Global distribution : Widely distributed in Indo-West Pacific, from Red Sea and Cape to Japan, Hawaii and Australia (Serène 1984)

These are squat looking individuals with shield to 80mm across. They have small rounded eyes and chelipeds of equal size. A bilaterally symmetric reticulate pattern of grooves over the shield gives rise to 'knobbles'. Colloquially known as the 'knobbly sea-crab'. Colouration of individual is mainly white with orange markings although on shield, the knobbles show a variety of brown/orange, blue/purple and white colouration also in a roughly bilateral symmetric pattern. Live specimens were seen in rock pools but shields of dead specimens were very frequently washed up onto the shore. The crabs are covered in a mass of short hairs increasing the cryptic effect of the colouration although washed up specimens rarely show this having been worn smooth by wave action. The flesh of this species is highly toxic (Garth and Alcalá 1977). See **Plate II**.

#### *Macromedaeus nudipes*

Global distribution : Widespread in Indo-West Pacific, from Seychelles, Mauritius and Madagascar to Tahiti and New Caledonia (Serène 1984).

Found in rock pools at low tide near western beach. Similar looking to *Zosimus aeneus* but shield width only 28mm and it is less hairy. See **Plate II**.

#### *Pilodius areolatus*

Global distribution : Widely distributed in Indo-West Pacific, from Red Sea, Seychelles and East Africa to Philippines, Japan and Hawaii (Clark and Galil 1993, Serène 1984).

Similar to *Zosimus aeneus* but of a medium brown colouration and smaller (shield width is approximately 20mm). It is an inter-tidal species and the chelipeds appear to be adapted for feeding on algae. Left cheliped of specimen found was approximately 50% larger than the right (i.e. 9mm and 6mm height respectively).

#### *Daira perlata*

Global distribution : Indo-West Pacific distribution, including Laccadives, Mauritius and Seychelles (Titgen 1982).

A similar looking crab to *Zosimus aeneus* but smaller (approximately 48mm across shield). The only individual found was dark brown. However, a left first periopod was washed up on the beach and was of a mauvish colouration.

#### *Chlorodiella laevis*

Global distribution : Widely distributed in Indo-West Pacific, including Red Sea, East Africa, Mauritius and Seychelles (Titgen 1982).

Small species recovered from the fish trap. There is considerable intraspecific variation, with several more or less distinctive forms (Serène 1984). Specimen found was male with a smooth scalloped shaped shield (width 5mm). Chelipeds appeared to be adapted for algal grazing and the left one was approximately 50% larger than the right. Eyes were rounded on short peduncles. There were many short forward pointing spines and relatively long, widely spaced hairs, on pereopods 2 - 5. There were three short spines on each side of the shield.

### **The Carpilidae**

#### *Carpilius maculatus*

Global distribution : Widely distributed, including Kenya, Mauritius and Madagascar (Titgen 1982)

'Red spotted' or 'eleven spotted' crab or 'crab onze taches' A specimen was washed up on the western beach measuring 110 mm across shield. It has close set eyes and a huge right cheliped. It is a pale yellow in colouration although the dorsal area of the shield is mainly a light brown with a symmetric pattern of eleven maroon spots (or part spots). A specimen is exhibited in the National Museum in Victoria and the information reads "It is an inhabitant of open reef areas where there is a considerable surge from the outer sea. Although not abundant, it is most commonly observed crawling around rocks and corals in shallow water. It seems that very little is known about its habits. It is listed in Mauritius as toxic". Another member of this genus (*C. convexus* Forskål 1775) is described as being highly poisonous by Garth and Galil (1977). See Plate II.

### **The Pilumnidae**

#### *Pilumnus* sp.

Small species recovered from the fish trap. Shows a degree of similarity to *Pilodius areolatus*.

### **The Menippidae**

#### *Eriphia scabricula*

Global distribution : Red Sea, East Africa, Madagascar, Mauritius, Seychelles, Maldives (Serène 1984, Titgen 1982).

A similar looking crab to *Eriphia sebana* and was found in rock pools at low tide. The specimen was a female with shield width of 18mm. It has powerful crushing chelipeds, the right one of which was larger than the left (i.e. 8mm and 6mm cheliped heights respectively). The overall colouration was of a dark brown and the dorsal area of the crab was covered in short coarse hairs (unlike *E. sebana*). The 1st pereopods were studded with many small protrusions.

#### *Eriphia sebana*

Global distribution : occurs in western Indian Ocean (Serène 1984).

Very stocky looking crab with shield to 100mm. Overall, it has a light brown colouration with huge identical general purpose chelipeds which are speckled a

lighter brown than that of the shield. Its most distinctive feature are its bright red bulbous eyes. It appeared to be more common towards late October/November when a few smaller individuals were seen in rocky clefts in the inter-tidal zone. The flesh of this crab is highly toxic (fatally so) to man and other animals (Garth and Alcalá 1977). See Plate II.

### Acknowledgements

I would like to thank the B.M.T.A. Education and Welfare Trust who generously sponsored my visit to the Seychelles and to all of the staff of Aride Island Nature Reserve. Many thanks also go to Paul Clark, Dr. C.H.J.M. Fransen who identified the material, Dr P. Hogarth who provided much additional information and help and to Dom. and Al. Read who helped with the fieldwork. Finally, I would like to thank the Department of Biological Sciences, University of Durham, U.K. who provided facilities for writing up.

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