



THE CONSTITUTION OF THE INTERTIDAL FAUNA OF ROCKY SHORES OF MOÇAMEDES, SOUTHERN ANGOLA

BRIAN KENSLEY

South African Museum, Cape Town

&

MARY-LOUISE PENRITH

State Museum, Windhoek

(With 5 plates and 1 figure)

(Manuscript received 27 July, 1972)

ABSTRACT

In order to relate the South West African intertidal fauna to the fauna north as well as south of the territory, an intertidal survey was made at Moçamedes in southern Angola. The transect made is described, the main affinities of the fauna analysed, and a full list of the invertebrate species recorded is given.

CONTENTS

I. Introduction	114
II. Description of the area	114
III. Description of the transect	114
IV. Fauna list and notes on the occurrence of particular groups	115
V. Discussion	115
VI. Summary	117
VII. Acknowledgements	117
VIII. References	117

I. INTRODUCTION

In 1969 a series of surveys of the rocky shore fauna of South West Africa was commenced, and it was planned to cover the coastline from Lüderitzbucht in the south to the Kunene River mouth in the north. Since this is a region of overlap between the cold west coast to the south and the tropical West African provinces to the north, an intermingling of the components from both cold and tropical waters is to be expected. The rocky intertidal fauna of the South African region is relatively well known owing to the work of Stephenson (1939; 1944; 1948). The West African region is also well known, but has not been summarised in such detail as has the South African region; rather, the information is available in reports on individual groups of animals. For this reason and also to gain firsthand knowledge of a more tropical rocky shore intertidal fauna, a survey was made at Moçamedes in southern Angola (15° 10' S., 12° 10' E.) during September 1969 by a combined South African Museum and State Museum team. Because only one visit could be paid to the area, the results of the survey can naturally be regarded as no more than a preliminary description. In addition to the usual transect being done (as described by Penrith & Kensley, 1970a), extensive collecting was carried out between the tide marks, so that as many of the faunal components as possible could be represented in the collection.

II. DESCRIPTION OF THE AREA

Moçamedes is situated in a shallow embayment on the southern coast of Angola, at the mouth of the Bero River, about 250 km north of the Kunene River mouth. The northern arm of the bay is formed by the rocky outcrop of the Punta de Giraul, south of the mouth of the Giraul River, with a lighthouse on its most westerly extension. The surrounding countryside is a dry stony desert, with rocky hills. Much of the coastline is formed by precipitous sandstone cliffs, and there is relatively little workable intertidal rock. The bay itself has mostly sandy shores. The transect was carried out just north of the lighthouse, at Praia das Conchas, over a gently sloping plateau of highly weathered quartzitic rock. This rock extended from well inland to just below the mark of low water of spring tides (L.W.S.), where it fell away in a cliff face to a depth of about 8—10 m. Scattered rocks and boulders together with the very weathered rock itself afforded much opportunity for the settlement of a rich sessile and cryptic fauna.

III. DESCRIPTION OF THE TRANSECT

On account of the apparently uniform nature of the rocky plateau and the short time available for collecting, only one transect was made. The high water of springs line (H.W.S.) could easily be detected, being marked by a continuous line of dead shells. The upper part of the transect was over the solid basal rock, while the lower portion, although relatively flat, was over a conglomeration of boulders, rocks, and concreting *Vermetus* tubes. The lowest station was situated at

L.W.S., some distance from the edge of the rocky plateau. The area of the transect is shown in plate 1, and the results figured graphically in figure 1.

At the top of the shore, in the region of H.W.S., *Littorina punctata* was present in crevices and cracks of the rock. Scattered individuals of this animal were found to about 16 m below H.W.S., at which level the oyster *Crassostrea cucullata* first appeared, along with *Oxysteles variegata*, which was fairly common in hollows and cracks. About 25 m below H.W.S. *Littorina*, *Oxysteles*, and *Crassostrea* were fairly common, and *Siphonaria* sp. and *Nerita senegalensis* were present. The barnacle *Chthamalus dentatus* first appeared at this level, becoming abundant about 20 m lower down (plate 2), and then tailing off towards L.W.S. The shallow pools in this portion of the shore invariably contained dead gastropod shells, many of which housed either *Clibanarius chapini* or *C. senegalensis*, both of these hermit crabs being common. The xanthid crab *Xantho faba* was also fairly common in these pools. At the upper levels of the shore the only obvious algal growth consisted of a low carpeting brown-coloured growth, with scattered *Ulva* plants.

At about 35 m below H.W.S. *Littorina* and *Crassostrea* were just present, *Oxysteles* was still fairly common, while *Siphonaria* was common. The first specimens of *Patella safiana* appeared at this level, along with the encrusting tubes of *Vermetus adansonii*. *Patella safiana* became common at the level of L.W.S. (plate 3) and obviously continued for some distance below this, while the *Vermetus* formed an almost continuous interwoven band at the level of L.W.S. This mass of tubes was further concreted by encrusting algae such as *Lithothamnion* and topped with tufts of algae. At this 35 m level the sea urchin *Echinometra lucunter* could be found in hollows and shallow pools, together with the whelk *Thais haemastoma* and a warty dark red sea anemone. Plate 4 shows the area in which *Echinometra lucunter* was common. The first specimens of the mussel *Perna perna* appeared at about 44 m below H.W.S. and became common at L.W.S., along with the smaller *Brachydontes puniceus*, which attaches itself to the byssus threads of the larger mussel.

At the lowest level of the intertidal region, where most of the rocks were almost covered by the encrusting *Vermetus* tubes, and provide numerous crannies for cryptic and clinging animals, the gastropods *Drupa* sp., *Tritonalia* sp., *Conus mediterraneus*, and *Thais haemastoma* were numerous, and the small chiton *Acanthochiton adansonii* and *Brachydontes puniceus* were abundant.

In the encrusting *Lithothamnion* the polychaete worm *Dodecaceria concharum* occurred, while in the hollows between the tubes occasional specimens of the cryptic mytilid *Lithophaga aristata* could be exposed, as well as cracker shrimps and xanthid crabs, especially *Globipilumnus africanus*. There were many species of molluscs, and the small and very active crab *Pachygrapsus transversus* was common. At this lowest level where *Chthamalus* was no longer abundant, a much larger barnacle, *Balanus amphitrite* var. *hawaiiensis*, could be found scattered amongst the *Vermetus* tubes.

IV. FAUNA LIST AND NOTES ON THE OCCURENCE OF PARTICULAR GROUPS

A full list of the invertebrate species and permanently intertidal fishes recorded from Moçamedes is given in table 1. Several groups of animals, such as the sea anemones and the pycnogonids, have yet to be identified, the lack of both literature and specialists in the groups making this difficult. Two species of sea anemone (A and B in figure 1) featured prominently in the transect. A was a large, warty, dark red anemone, and B a small red one with a weak sphincter.

Polychaeta

Of the 24 species identified, all except two, viz. *Leocrates claparedii* and *Streblasoma hesslei*, have not previously been recorded from the West African region. The species of *Eunice* which was plentiful at the lower levels of the shore seems to be undescribed (Prof. J. H. Day, pers. comm.). About 13 species have a pan-tropical or cosmopolitan distribution, while three species seem limited to the southern African region (South West Africa to Moçambique). It is interesting to note that in northern South West Africa the species of *Dodecaceria* is that of the South African west coast (*D. pulchra*), while *D. concharum*, the Mediterranean species, is present at Moçamedes.

Mollusca

Of the 41 species of molluscs identified from Moçamedes 33 (i.e. 80%) have been recorded from the African Coast north of Moçamedes, and seven species have been recorded south of the Kunene River, but four of these, *Modiolus carvalhoi*, *Thais haemastoma*, *Patella safiana*, and *Semimytilus algosus* are confined to the coast of South West Africa, and all but the last-mentioned species to the northern part of that coast. The remaining three species, *Littorina punctata*, *Patella granularis*, and *Perna perna* extend around Cape Point, the latter two species reaching Natal and Moçambique, and the Indo-Pacific, respectively. Eleven of the species recorded from Moçamedes have also been collected in the Mediterranean region. *Crassostrea cucullata*, known from Angola northwards (Nicklés, 1950), is also known from the east coast of South Africa from East London northwards into the Indo-Pacific region. Difficulty was experienced in identifying the species of *Drupa* and *Tritonalia*.

Decapoda

Of the 14 species recorded, only two, *Grapsus grapsus* and *Acanthonyx lunulatus*, are found south of the Kunene River mouth, and neither of these extend further south than the northern South West African coast. All are typically West African species, *Athanas nitescens* and a different form of *Grapsus grapsus* being the only species recorded from the Indian ocean. One species of hermit crab, *Pagurus dartevellei*, has previously been known only from a pair of detached chelipeds from Pointe Noire, French Congo (Forest, 1958). Prof. Forest (pers. comm.) has since seen complete animals of the species and confirmed that

they belong to the genus *Pagurus*, and not *Pylopagurus*, in which genus they were originally placed.

Amphipoda

Four of the eight species identified have a circum-tropical or cosmopolitan distribution. All except two, *Ampithoe pollex* and *Pleonexes macrocornutus*, have previously been recorded from the African coast north of Moçamedes. It is interesting to note that while at Moçamedes *Hyale media* was common amongst the algae at the bottom of the shore, *Hyale saldanha* was the common species at the rocks north of the Kunene River mouth, about 230 kilometres south.

Isopoda

While nine species of isopods were recorded from Rocky Point, South West Africa (Penrith & Kensley, 1970b), only two species of isopod were abundant at Moçamedes. These were *Cirolana cranchii* and *Dynamenopsis angolensis*, neither of which were recorded from the south. Apart from these, only one other species, a unidentifiable munnid, was collected.

Cirripedia

Chthamalus dentatus was abundant at the lower mid-tidal level of the shore, as it was further south at Rocky Point. This was to be expected, as it is a species characteristic of the tropical intertidal zone. At the lower levels of the shore, *Balanus amphitrite* var. *hawaiiensis* was fairly common. This species was not recorded from South West Africa.

Echinodermata

Of the eight species recorded, *Amphipholis squamata* (which has a cosmopolitan distribution), and *Asterina exigua* (known from Angola to the Indo-Pacific) have been recorded from the west coast, while *Ophiactis carnea* is known from Saldanha to Moçambique. The rest are typically West African species.

Pisces

Only the intertidal fishes of the families Gobiidae, Blenniidae, and Clinidae are listed in table 1. All of these are tropical species. *Ophioblennius atlanticus atlanticus* and *Labrisomus nuchipinnis* have a transatlantic distribution; *Blennius cristatus* is virtually circum-tropical; *Blennius fascigula* occurs on the eastern southern African coast, the Angolan coast, and in the Mediterranean (Penrith & Penrith, 1972), and *Blennius velifer* is known from the West African region only, just reaching the South West African coast south of the Kunene River mouth. *Gobius casamancus* is also a West African species and was previously not known south of Luanda. In addition to these species, a number of Serranidae and Pomacentridae were collected.

V. DISCUSSION

It has long been recognized that the northern South West African/southern Angolan area is one of overlap between the typical West African fauna and the typical cold west coast fauna of South Africa. The actual southern limit of the northern faunistic province has been variously fixed at Cape Frio (18°30'S.) (Postel, 1962, quoted by Da Franca, 1968, publication not seen by the authors) and at Moçamedes (15° S.) (Da Fran-

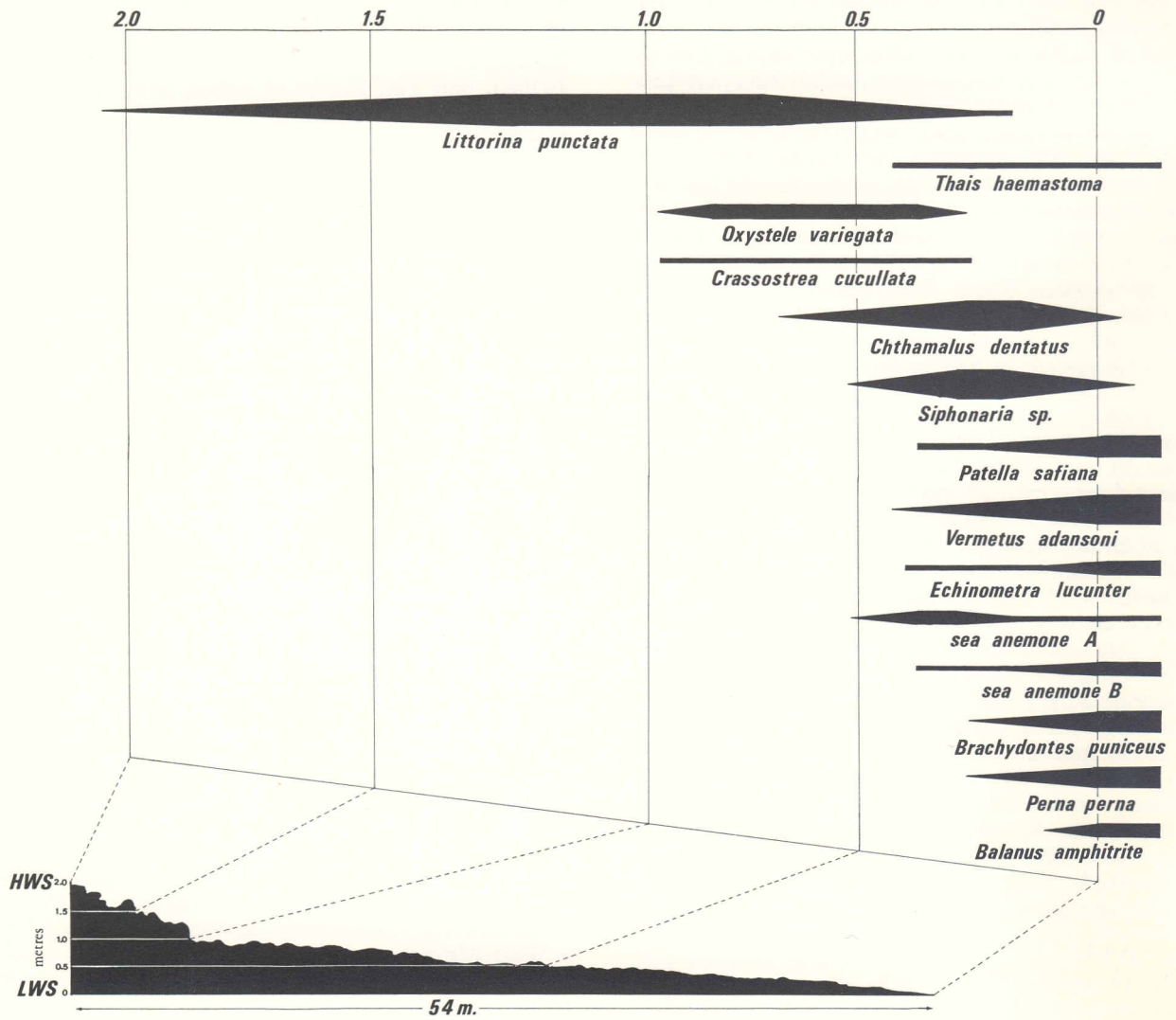


Figure 1. Transect at Praia das Conchas, Moçamedes.

ca, 1968). Da Franca, in his discussion of the faunistic provinces of West Africa and especially Angola, maintained that the coast of Angola as a whole is a region of encounter between the two faunal provinces. He based his conclusions on the 'littoral' fish fauna of the area (littoral being defined by Da Franca as the pelagic division plus the benthic division). Further, Da Franca maintained that the Angolan coast may be divided into three zones, northern, central and southern, with the Benguelan fauna (i.e. typical cold west coast fauna) predominating in the southern area. Unfortunately, in drawing these conclusions Da Franca made use of a faunal element that, being free-swimming and given to migratory movements, need not necessarily reflect its faunal affinities. It is recognized that relatively sessile faunal elements, especially those of the rocky intertidal zone, serve as better indicators of the affinities of an area than do mobile species; sessile animals are more closely dependent on environmental conditions, being unable to move appreciable distances in order to avoid temporarily unfavourable conditions. Odhner (1923: 18), in dealing with the Angolan molluscan fauna, gives a more balanced view, stating that the region Cape Verde to Moçamedes "coincides rather accurately with the West African faunistic province". From the fauna list it can be seen that seven of the amphipod species, both the isopods, 80% of the molluscs, and all the decapods are West African rather than southern African forms. Although many of the polychaetes do not seem to have previously been recorded from West Africa, many do seem to have a circumtropical or cosmopolitan distribution, while at least eight species are known from the Mediterranean. Thus Moçamedes would certainly seem to have closer faunistic affinities with the West African than with the southern African province, and the Benguelan fauna certainly does not predominate. While at Rocky Point, 450 kilometres south of Moçamedes, 60% of the invertebrates recorded were typical of the west coast of South Africa, at Moçamedes itself, only 22%, of which many were polychaetes, had southern African affinities. Disregarding the polychaetes, only 11% of the species have southern African affinities, a clear indication that this area is well within the tropical West African faunistic province.

VI. SUMMARY

A survey of the intertidal fauna of a rocky shore at Moçamedes, in southern Angola, indicated that Moçamedes lies well within the tropical West African faunal

province as far as the intertidal fauna, at least, is concerned, unlike the northern South West African coast, where a large number of coldwater species still occur.

VII. ACKNOWLEDGEMENTS

We are indebted to the Governor-General of Angola, the Governor of the Province of Moçamedes, and to the Instituto de Investigação Científica de Angola, for permission to carry out the survey at Moçamedes. Our thanks are due to Professor J. H. Day of the University of Cape Town for assistance with the identification of some of the Polychaeta; to Dr. N. A. H. Millard, of the South African Museum, for the identification of the hydroids; and to Dr. Maria de Lourdes Paes da Franca for providing mollusc material for comparative purposes.

We are grateful to Mr. C. G. Coetzee of the State Museum, Windhoek, and Mr. M. J. Penrith for providing transport and for assistance with the survey.

VIII. REFERENCES

- DA FRANCA, P. 1968. Breves comentários acerca da biogeográfica marinha Angolana. *Notas Centr. biol. aquat. trop.* 12: 1-22.
- FOREST, J. 1958. Les crustacés Anomoures du Musée royal du Congo belge. *Rev. Zool. Bot. afr.* 58: 144-168.
- NICKLÉS, M. 1950. *Manuels Ouest-Africains. Vol. II. Mollusques testacés marins de la côte occidentale d'Afrique.* Paris: Lechevalier.
- ODHNER, N. H. 1923. Contribution to the marine molluscan faunas of South and West Africa. *Medd. Göteborg. Mus. Zool. avd.* 23: 1-39.
- PENRITH, M. J. & PENRITH, M.-L. 1972. The Blenniidae of western southern Africa. *Cimbebasia* (A) 2: 65-90.
- PENRITH, M.-L. & KENSLEY, B. F. 1970a. The constitution of the intertidal fauna of rocky shores of South West Africa. Part I. Lüderitzbucht. *Cimbebasia* (A) 1: 191-239.
- PENRITH, M.-L. & KENSLEY, B. F. 1970b. The constitution of the fauna of rocky intertidal shores of South West Africa. Part II. Rocky Point. *Cimbebasia* (A) 1: 241-268.
- STEPHENSON, T. A. 1939. The constitution of the intertidal fauna and flora of South Africa. Part I. *J. Linn. Soc. Lond. (Zool.)* 40: 487-536.
- STEPHENSON, T. A. 1944. The constitution of the intertidal fauna and flora of South Africa. Part II. *Ann. Natal Mus.* 10: 261-358.
- STEPHENSON, T. A. 1948. The constitution of the intertidal fauna and flora of South Africa. Part III. *Ann. Natal Mus.* 11: 207-324.

Table 1. List of species recorded from Moçamedes during the survey.

Species	Abundance	African distribution	General distribution
Phylum: CNIDARIA			
Class: HYDROZOA			
<i>Campanularia integra</i> MacGillivray	P	S.W. Africa — Natal	Cosmopolitan
<i>Obelia cf. dichotoma</i> (Linnaeus)	P	S.W. Africa — Natal	Cosmopolitan
<i>Sertularella mediterranea</i> Hartläub	P	Knysna	Vema Seamount, S.W. Indian ocean
<i>Sertularia marginata</i> (Kirchenpauer)	P	Knysna	Vema Seamount
<i>Tubularia</i> sp.	P	—	—

Phylum: ANNELIDA

Class: POLYCHAETA

<i>Arabella iricolor</i> (Montagu)	P	S.W. Africa — Moçambique	Cosmopolitan
<i>Cirriformia tentaculata</i> (Montagu)	P	Morocco, tropical W. Africa, Cape, Natal, Moçambique	North Sea, Indo- Pacific, tropical eastern Atlantic Mediterranean
<i>Dodecaceria concharum</i> Oersted	A	—	—
<i>Eunice</i> sp.	A	—	—
<i>Eurythoe complanata</i> (Pallas)	C	Cape — Moçambique	Pan-tropical
<i>Exogone</i> sp.	P	—	—
<i>Hydroides dipoma</i> (Schmarda)	P	Senegal — Cape	Mediterranean
<i>Leocrates claparedii</i> (Costa)	P	Transkei — Moçambique	Mediterranean, Red Sea, Indo-West-Pacific
<i>Lepidonotus semitectus</i> Stimpson	A	S.W. Africa — Natal	—
<i>Lumbrineris cavifrons</i> (Grube)	FC	S.W. Africa — Moçambique	—
<i>Lumbrineris inflata</i> (Moore)	P	S.W. Africa — Moçambique	Circumtropical
<i>LySIDICE ninetta</i> Audouin & Milne Edwards	FC	Angola, S.W. Africa	Mediterranean, North Sea
<i>Marphysa</i> sp.	P	—	—
<i>Myrianida phyllocera</i> Augener	P	S.W. Africa — Cape	—
<i>Nereis (Nereis) falsa</i> Quatrefages	C	Morocco — Natal	Mediterranean, U.S.A.
<i>Opisthosyllis brunnea</i> Langerhans	FC	West Africa; Cape — Moçambique	Madeira
<i>Perinereis cf. nigropunctata</i> (Horst)	A	Moçambique, Malagasy	Red Sea and tropical Indo- West-Pacific
<i>Polycirrus aurantiacus</i> Grube	P	Angola	Mediterranean, North Sea, Madeira
<i>Polyophthalmus pictus</i> (Dujardin)	P	Natal, Moçambique	Cosmopolitan
<i>Protula tubularia</i> (Montagu)	P	Morocco, Senegal — Natal	North Sea, North Atlantic, Mediterranean
<i>Streblasoma hesslei</i> Day	P	Cape	—
<i>Syllis (Syllis) gracilis</i> Grube	P	S.W. Africa — Moçambique	Cosmopolitan
<i>Syllis (Typosyllis) armillaris</i> (Müller)	P	S.W. Africa — Moçambique	Cosmopolitan
<i>Syllis (Typosyllis) prolifera</i> Krohn	A	S.W. Africa — Moçambique	Mediterranean, North Sea, Indo-West-Pacific
<i>Syllis (Typosyllis) variegata</i> Grube	C	S.W. Africa — Moçambique	Cosmopolitan
<i>Syllis (Haplosyllis) spongicola</i> Grube	FC	Cape — Moçambique	Cosmopolitan

Phylum: MOLLUSCA

Class: LAMELLIBRANCHIATA

<i>Arca geissei</i> (Dunker)	P	Angola	—
<i>Begonia senegalensis</i> (Reeve)	C	Cape Verde, Mauretania — Senegal	—
<i>Brachydontes puniceus</i> Gmelin	A	Cape Verde, Sao Thomé — Angola	—
<i>Chama crenulata</i> Lamarck	P	Cape Verde, Mauretania, Gabon	—
<i>Crassostrea cucullata</i> (Born)	A	Cameroon — Angola, East London — Moçambique	Indo-West-Pacific
<i>Lithophaga aristata</i> (Solander)	FC	Morocco — Angola	Antilles, Mediterranean
<i>Modiolus carvalhoi</i> Klappenbach	P	Möwe Bay, Rocky Point, S.W. Africa	Brazil
<i>Pedalion perna</i> Linnaeus	P	Cape Verde, Dakar, French Congo	—
<i>Perna perna</i> (Linnaeus)	A	Morocco — Moçambique	Mediterranean, Red Sea, Brazil, Malagasy
<i>Semimytilus algosus</i> (Gould)	P	Swakopmund — Angra Fria, S.W. Africa	Ecquador, Chile, Juan Fernandez
Class: POLYPLACOPHORA			
<i>Acanthochiton adansonii</i> de Rochebrune	A	Cape Verde, Senegal — Angola	—
<i>Chiton canariensis</i> d'Orbigny	FC	Canaries, Senegal	—

Class: GASTROPODA

<i>Archidoris</i> sp.	FC	—	—
<i>Barleeia rubra</i> Montagu	A	Morocco, Dakar	Mediterranean, Great Britain
<i>Bursa pustulosa jabik</i> Fischer	P	Cape Verde, Senegal — Angola	St. Helena Isl., Ascension Isl.
<i>Calyptraea trochiformis</i> Gmelin	FC	Cape Verde — Angola	Pacific, Peru, Chile
<i>Cantharus viverratus</i> Kiener	FC	Cape Verde, Mauretania — Angola	—
<i>Conus mediterraneus</i> Hwass	FC	Cape Verde, Mauretania, Senegal, Canaries	Mediterranean
<i>Conus</i> sp.	C	—	—
<i>Coralliophila meyendorffi</i> Calcara	P	Morocco — Angola, Canaries	Mediterranean
<i>Diodora menkiana</i> Dunker	P	Mauretania — Angola	—
<i>Drupa</i> sp.	C	—	—
<i>Fissurella coarctata</i> King	FC	Cape Verde, Senegal	—
<i>Fossarus</i> sp.	P	—	—
<i>Gadinea afra</i> Gmelin	FC	Morocco, Senegal — French Congo	—
<i>Gibbula divaricata</i> (Linnaeus)	P	West Africa	Mediterranean
<i>Hydrobia ulvae</i> Pennant	C	Senegal	Mediterranean, Great Britain
<i>Marginella gemmula</i> Bavay	FC	West Africa	—
<i>Marginella monilis</i> Linnaeus	P	Mauretania, French Guinea	—
<i>Nerita senegalensis</i> Gmelin	C	Senegal — Angola	—
<i>Ocinebra</i> sp.	C	—	—
<i>Oxystele variegata</i> (Anton)	A	Gabon — Transkei	—
<i>Patella safiana</i> Lamarck	C	Morocco — northern S.W. Africa	Mediterranean
<i>Patella granularis</i> Linnaeus	FC	Angola — Zululand	—
<i>Persicula miliaria</i> Linnaeus	P	Morocco, Senegal, Sao Thomé	Mediterranean
<i>Scissurella</i> cf. <i>costata</i> d'Orbigny	P	Morocco — Senegal, Canaries	Mediterranean
<i>Siphonaria</i> sp.	A	—	—
<i>Thais haemastoma</i> (Linnaeus)	C	Morocco — northern S.W. Africa	Mediterranean, western Atlantic
<i>Trifora perversa</i> Linnaeus	P	Mauretania, French Guinea	Mediterranean, Norway
<i>Tritonalia</i> sp.	FC	—	—
<i>Vermetus adansoni</i> Daudin	A	Mauretania, Gabon	—
<i>Littorina punctata</i> Gmelin	A	Morocco — Knysna	Mediterranean, Cape Verde

Phylum: ARTHROPODA

Class: CRUSTACEA

Subclass: CIRRIPIEDIA

<i>Balanus amphitrite</i> var. <i>hawaiiensis</i> Broch	C	Gambia, Canaries	Mediterranean, Pacific
<i>Chthamalus dentatus</i> Krauss	A	Sierra Leone — Angola, Cape — Moçambique, northern S.W. Africa	—

Subclass: MALACOSTRACA

Order: PERACARIDA

Suborder: ISOPODA

<i>Cirolana cranchii</i> Leach	A	Morocco — Congo	—
<i>Dynamenopsis angolensis</i> Kensley	A	Angola	—

Suborder: AMPHIPODA

<i>Ampithoe pollex</i> Kunkel	A	—	Oregon, U.S.A.; Bermuda
<i>Elasmopus affinis</i> Della Valle	C	Congo, northern S.W. Africa	—
<i>Elasmopus rapax</i> Costa	A	West Africa	Cosmopolitan intertidal
<i>Hyale media</i> (Dana)	A	—	Cosmopolitan intertidal
<i>Jassa falcata</i> (Montagu)	FC	S.W. Africa — Cape	Cosmopolitan intertidal
<i>Maera inaequipes</i> (Costa)	P	Cape — Natal; Canaries	Mediterranean, Indo-Pacific

<i>Pleonexes macrocornutus</i> Kensley	C	Angola	—
<i>Stenothoe gallensis</i> Walker	FC	Gambia	Mediterranean, Caribbean, Indo-Pacific
Order: EUCARIDA			
Suborder: DECAPODA			
<i>Acanthonyx lunulatus</i> (Risso)	FC	Senegal — northern S.W. Africa	Mediterranean
<i>Alpheus malleator</i> Dana	FC	Cape Verde, Togo	Pacific, West Indies
<i>Alpheus sulcatus</i> Kingsley	FC	Congo, Sao Thomé	Eastern Pacific
<i>Athanas nitescens</i> (Leach)	P	Spanish W. Africa, Guinea	Mediterranean, Indian ocean
<i>Clibanarius chapini</i> Schmitt	A	Senegal — Angola	—
<i>Clibinarius senegalensis</i> Chevreux & Bouvier	FC	Senegal — Angola	—
<i>Globipilumnus africanus</i> (A. Milne Edwards)	FC	Senegal — Angola	—
<i>Grapsus grapsus</i> (Linnaeus)	FC	Mediterranean — Angola	Cosmopolitan intertidal
<i>Pachycheles bellus</i> (Osorio)	A	Luanda, Angola	—
<i>Pachygrapsus transversus</i> (Gibbes)	C	Mediterranean — Angola	Cosmopolitan intertidal
<i>Pagurus dartevellei</i> (Forest)	FC	French Congo	—
<i>Pinnotheres</i> sp.	P	—	—
<i>Plagusia depressa</i> (Fabricius)	FC	Mauretania — Angola	—
<i>Synalpheus senegambiensis</i> Coutière	FC	Senegal — Angola	—
<i>Xantho (Leptodius) inequalis</i> (Oliver)	C	Mauretania — Angola	Cape Verde Islands
Phylum: ECHINODERMATA			
<i>Amphipholis squamata</i> (Delle Chiaje)	P	S.W. Africa — Moçambique	Cosmopolitan
<i>Asterina exigua</i> (Lamarck)	C	S.W. Africa — Moçambique	Indo-Pacific
<i>Asterina stellifer</i> Moebius	P	Senegal, Ghana, Canaries	Brazil, Argentina
<i>Echinometra lucunter</i> (Linnaeus)	A	West Africa	West Indies, South America
<i>Ophiactis cf. carnea</i> Ljungman	A	Saldanha — Moçambique	—
<i>Ophiactis lymani</i> Ljungman	A	Senegal — Angola	Antilles, Cape Verde, St. Helena
<i>Ophioderma apressa</i> (Say)	P	Senegal — Angola	Antilles, Brazil
<i>Ophiolepis paucispina</i> (Say)	C	Sao Thomé, Guinea	Florida
Phylum: CHORDATA			
Class: PISCES			
<i>Blennius cristatus</i> Linnaeus	A	Cape Verde — northern S.W. Africa; Still Bay — Inhambane	Circumtropical
<i>Blennius fascigula</i> Barnard	FC	Angola — northern S.W. Africa; Knysna — Durban	South-western Mediterranean
<i>Blennius velifer</i> Norman	C	Cameroun — Kunene River mouth	—
<i>Gobius casamancus</i> Rochebrune	P	Tropical West Africa	—
<i>Labrisomus nuchipinnis</i> (Quoy & Gaimard)	P	Tropical West Africa	Atlantic coast of central America
<i>Ophioblennius atlanticus atlanticus</i> (Valenciennes)	C	Tropical West Africa — Angola	Madeira; Canary Islands; St. Helena; Brazil

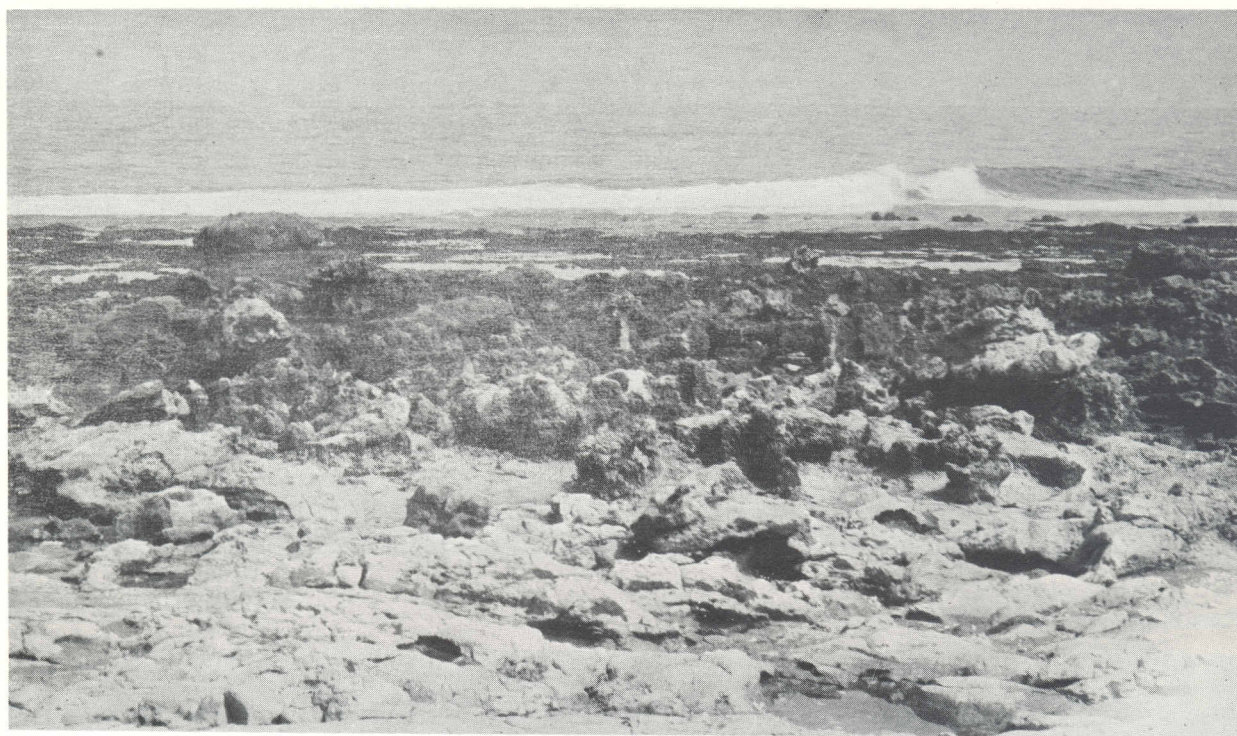


Plate 1. Area of the transect, Praia das Conchas, Moçamedes.



Plate 2. Balanoid zone (*Chthamalus dentatus*).

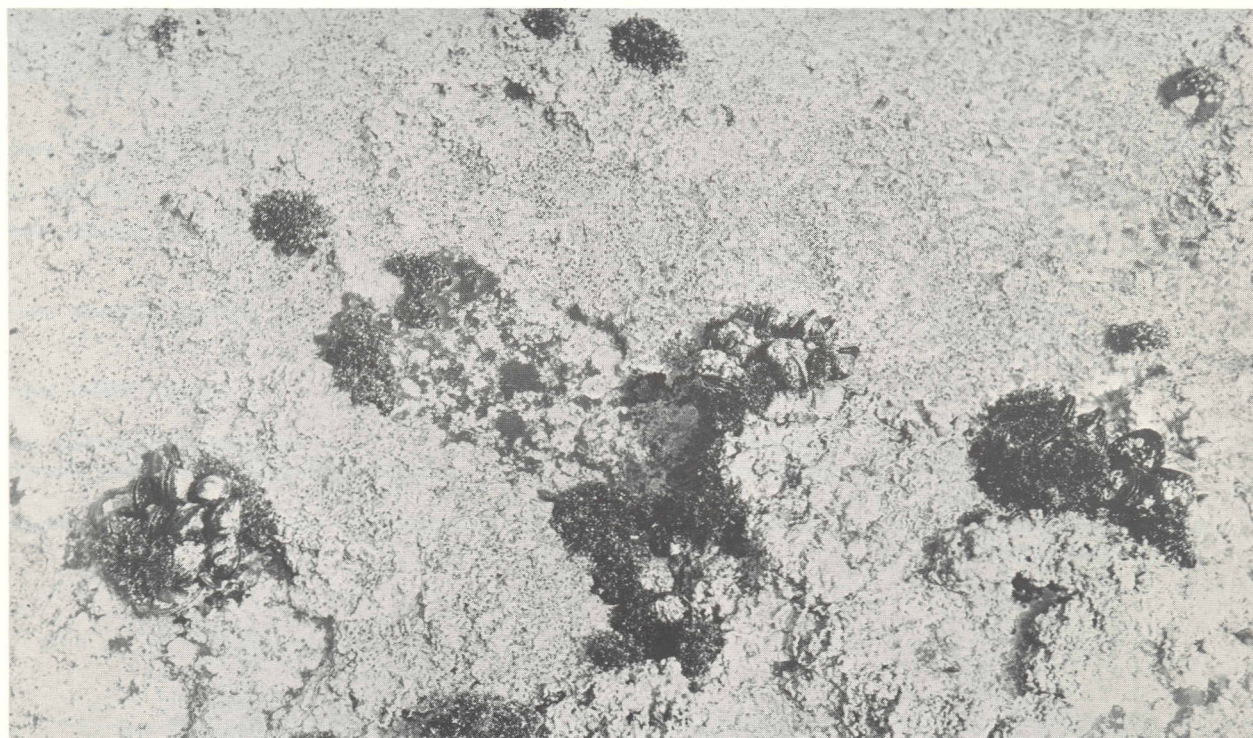


Plate 3. Level of L.W.S., with *Patella safiana* and *Perna perna*

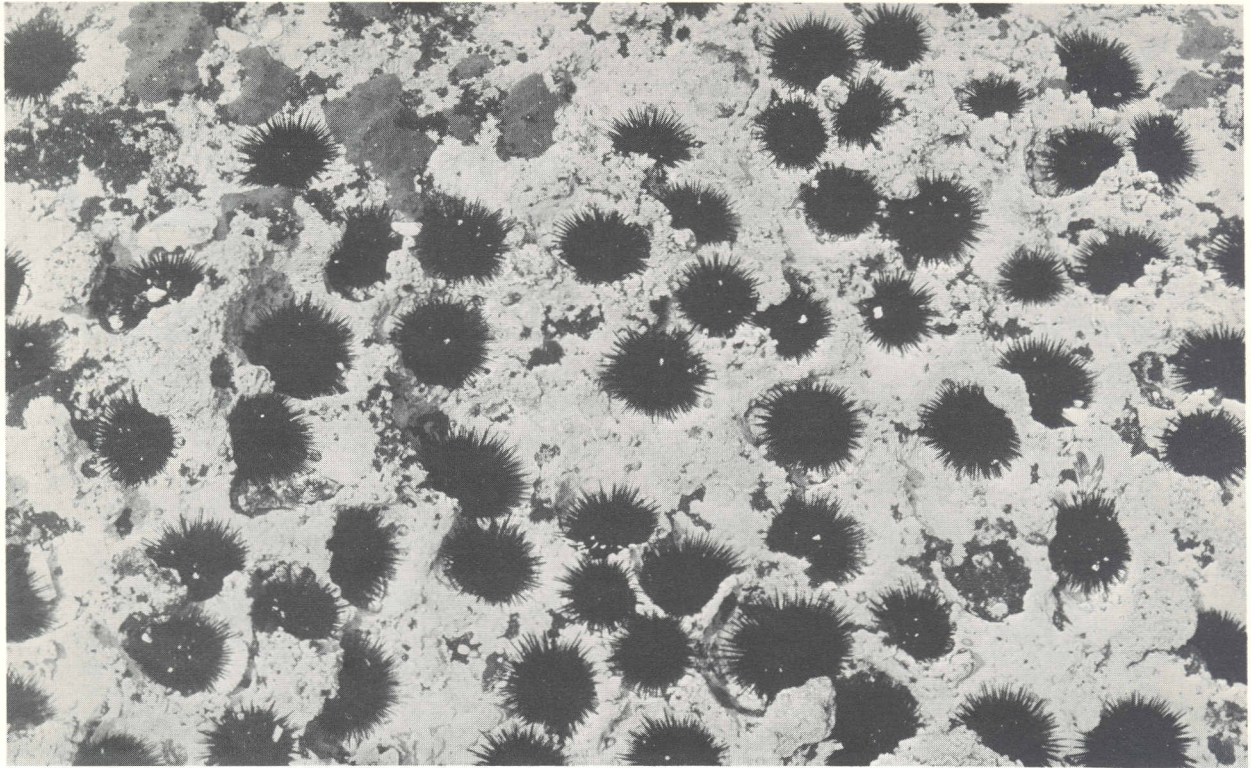


Plate 4. *Echinometra lucunter*.

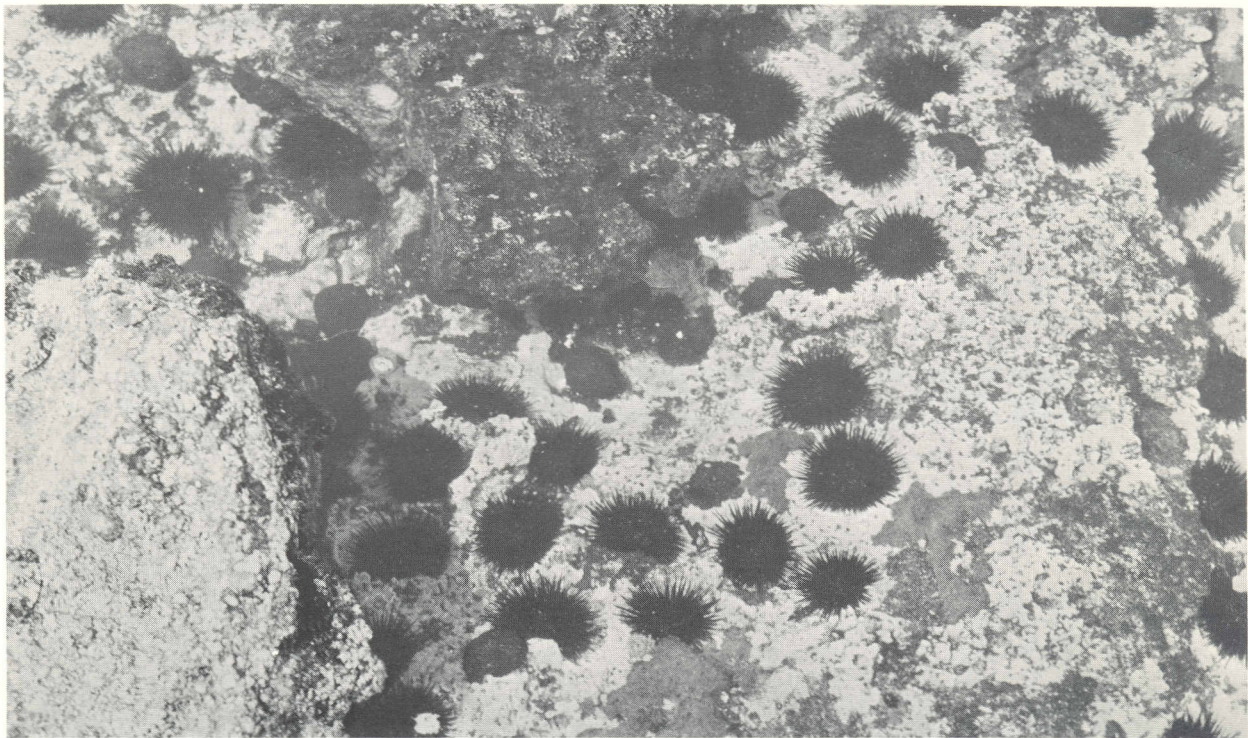


Plate 5. *Echinometra lucunter* and sea anemone A.