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## THE CONSTITUTION OF THE FAUNA OF ROCKY INTERTIDAL SHORES OF SOUTH WEST AFRICA. PART III. THE NORTH COAST FROM FALSE CAPE FRIO TO THE KUNENE RIVER

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(With 4 figures and 6 plates)

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### ABSTRACT

Surveys were made of the intertidal fauna at four localities where intertidal rock occurs on the coast between Rocky Point and Moçamedes, three south of the Kunene River and one just north of it on the Angolan coast. The results of the surveys are described and the species collected are listed.

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## I. INTRODUCTION

Surveys of the intertidal fauna of rocky shores made at Lüderitzbucht and Rocky Point in South West Africa and at Moçamedes in southern Angola (Penrith & Kensley, 1970a, 1970b, Kensley & Penrith, 1973) showed a transition from a coldwater fauna at Lüderitzbucht to a tropical one at Moçamedes. At Rocky Point a large number of coldwater species were present but most of the dominant intertidal species were tropical. Several of the tropical species forming a dominant element in the fauna at Moçamedes were, however, absent from Rocky Point. We decided in the light of these findings to survey as many rocky areas as possible on the coast between the three areas already surveyed, in order to obtain a clearer picture of the faunal transition. In this paper surveys made at three localities on the northern coast of South West Africa and one on the extreme southern coast of Angola approximately 30 km north of the Kunene River mouth are presented. The location of the areas is shown in figure 1. Those marked A and B refer to the rocks north and south of the Kunene River mouth respectively. The remaining two surveys were made at Angra Fria and at False Cape Frio. Detailed transects were made at False Cape Frio and at the rocks south of the Kunene River mouth, and general surveys at Angra Fria and the rocks to the north of the Kunene River mouth.

The frequently mentioned area of Cape Frio (see Brown & Jarman, 1978) was examined but was found unsuitable for shore surveys. Both Cape Frio itself and the outcrop to the south of it are basalt outcrops that fall steeply away to the seaward side so that at all but the highest level the intertidal fauna are inaccessible even when exposed. Furthermore, the area is occupied by a colony of Cape Fur Seals.

## II. DESCRIPTION OF THE AREA

The northern coast of South West Africa and the Angolan coast south of Baía dos Tigres are bounded to landward by the northern Namib desert, an area consisting in the main of gravel plains and large white shifting dunes, with *Salsola* hummocks near the coast. The coastline is relatively poorly endowed with intertidal rock, small outcrops alternating with long stretches of sandy shore. The main outcrops north of Rocky Point are False Cape Frio, which consists of three main outcrops connected by low rocks exposed only at low water of spring tides (LWS); a small outcrop between False Cape Frio and Cape Frio; Cape Frio itself; and Angra Fria. North of Angra Fria the shore is

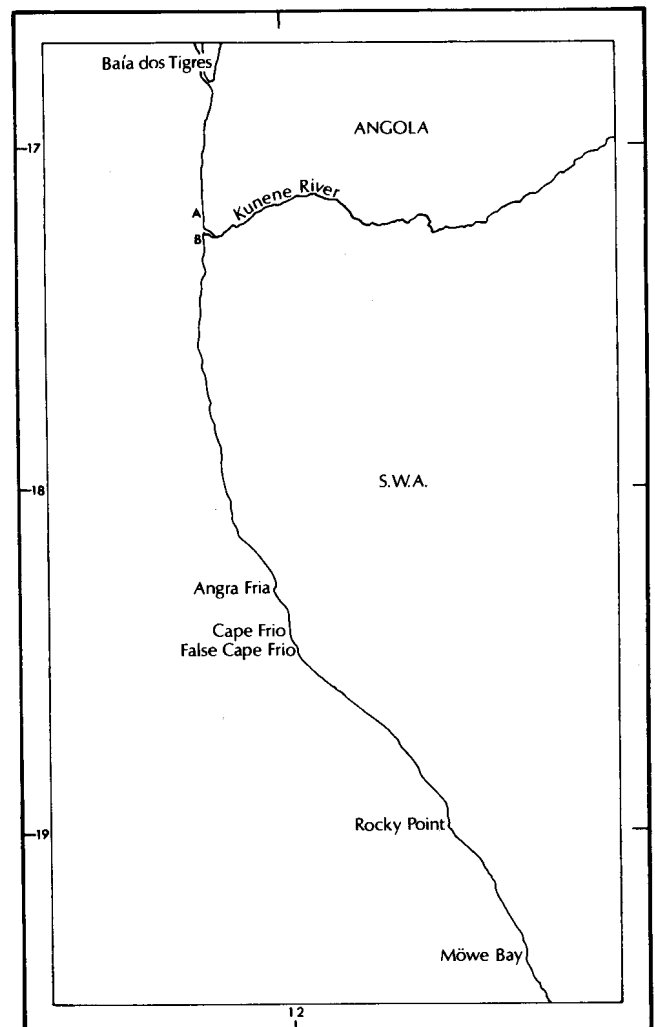


Figure 1. Map showing the localities at which surveys were carried out. A = rocks approximately 30 km north of the Kunene River mouth; B = rocks approximately 5 km south of the Kunene River mouth.

mainly sandy to the Kunene River; there are numerous, but very small rocky clusters at neap tide level, the rocks surveyed to the south of the Kunene River mouth being one of the most extensive of these. North of the Kunene River, intertidal rock appears to be even scarcer. Work at Baía dos Tigres and along the coast north to Porto Alexandre was unfortunately impracticable owing to the inaccessibility of the area by road. From Porto Alexandre to Moçamedes the coastline consists mainly of sheer sandstone cliffs interspersed with sandy bays.

False Cape Frio consists mainly of red basalt with a small amount of granite. The intertidal rocks are scored with deep gullies, but pools are few and there are no loose rocks to shelter cryptofauna, which are thus confined to algal tufts and mussel clumps.

Angra Fria consists of a number of granite outcrops interspersed with sand. There are no pools or loose rocks. Most of the rock is above high water of spring tides (HWS). One fairly high rocky ridge runs more or less continuously from above HWS into the sea, but does not extend much below high water of neap tides; the remaining intertidal rock consists mainly of large flat boulders at about the level of neap tides and below.

Area B (fig. 1) consists of a low group of flat red siltstone rocks visible at low water of neap tides. There are no pools of any size and no loose rocks. Area A consists of a few large red siltstone boulders at or a little below low water of neap tides. At both areas strong wave action made work difficult, as the rocks were only intermittently exposed.

### III. DESCRIPTION OF THE SURVEYS

#### FALSE CAPE FRIO

In the region of False Cape Frio there are three major basalt outcrops, the shore between them being fringed by rocks which are covered at low water of neap tides. Transects were made over two of the main outcrops; the vertical distribution of the dominant algae and the relative abundance and vertical distribution of the main components of the fauna are shown in figures 2 and 3.

The first transect lay over a high red basalt slope (plate 1), intersected in the upper part by deep gullies. High water of spring tides was marked by a line of drift matter on the sand just above the beginning of the rocky slope. The first life occurred about 15 m distant from and 48 cm below HWS, and consisted of scattered specimens of the barnacle *Chthamalus dentatus* and a black encrusting blue-green alga.

At the second station of the transect, 16 m from and 50 cm below the first station (at HWS), *Chthamalus* was fairly common, *Littorina punctata* was present in crevices, and *Siphonaria (Patellopsis) capensis* occurred in depressions. The encrusting blue-green alga was fairly common. At the next station, 10 m from the second and 60 cm below HWS, *Chthamalus* was still fairly common, *Littorina* common, and *Siphonaria* present. Between this and the fourth station *Patella granularis* and the fine green alga *Cladophora mirabilis* appeared, about 1,6 m from the third station. At the fourth station, 7,3 m from the third station and 85 cm below HWS, the rock was covered with *Chthamalus*, amongst which *Littorina* was abundant. *Patella granularis* was fairly common, and the mussels *Perna perna* and *Semimytilus algosus* appeared for the

first time. The only alga present was *Cladophora mirabilis*.

At the fifth station (plate 2), 7,7 m from the fourth and 1,8 m below HWS, *Chthamalus* was still abundant, covering the rocks. *Perna* and *Semimytilus* were also abundant, forming dense clusters; *Patella granularis* was common, and the large sea anemone *Bunodactis reynaudi* was common in crevices. As at the previous station the only alga represented was *Cladophora mirabilis*.

The sixth station, 4,7 m from the previous station and 2,2 m below HWS, had a rich algal growth, consisting of *Cladophora mirabilis*, *Chondria* sp., *Chordariopsis capensis*, *Orcasia pulla*, and *Aeodes orbitosa*. *Aeodes* forms a distinct band at about this level, and *Orcasia* carpeted the rocks thickly from this level downwards. The fauna consisted of dense masses of *Perna* and *Semimytilus*, with *Chthamalus* and *Bunodactis* common, *Patella granularis* fairly common, and *Balanus amphitrite* present. Between this and the final station the large whelk *Thais haemastoma* appeared. At the final station, 5,3 m from the previous one and 2,8 m below HWS, the rocks were carpeted with *Orcasia*, *Pachymenia carnosus* was fairly common, and other algae including *Chondria*, *Chordariopsis*, and *Rhodymenia* were present. *Perna* and *Semimytilus* were present, *Balanus* was common, and *Patella safiana* appeared for the first time.

The second transect (plate 3 and figure 3) was made over a flat plateau of rock with a very gradual slope. The rock was separated from HWS by a 30 m stretch of sand. The first rocks, about 10 cm below HWS, were covered with *Porphyra capensis*, with *Enteromorpha* sp. appearing shortly below. Some of the rocks at this level were covered by a slime-like blue-green alga. *Littorina* was not collected on the second transect; the dense algal growth on the uppermost rocks probably made settling difficult. The first animal species to appear was *Siphonaria*, which was present in crevices and depressions from just below the first *Enteromorpha*. About 0,6 m below HWS and 40 m distant from it, *Porphyra* and *Enteromorpha* covered the rocks, and *Siphonaria* and *Patella granularis* occurred in crevices and amongst the algae. About 15 m further down and 1 m below HWS the algal growth became more varied, the most common species being *Enteromorpha*, *Cladophora mirabilis*, and *Orcasia pulla*. *Porphyra* did not occur below about 0,8 m below HWS. At the 1 m level *Chthamalus dentatus*, *Perna perna* and *Semimytilus algosus* were very common, the former covering the rocks and the two species of mussels occurring in dense clusters; *Patella granularis* was fairly common, and a few *Siphonaria* still present. *Aeodes orbitosa* and *Patella safiana* appeared

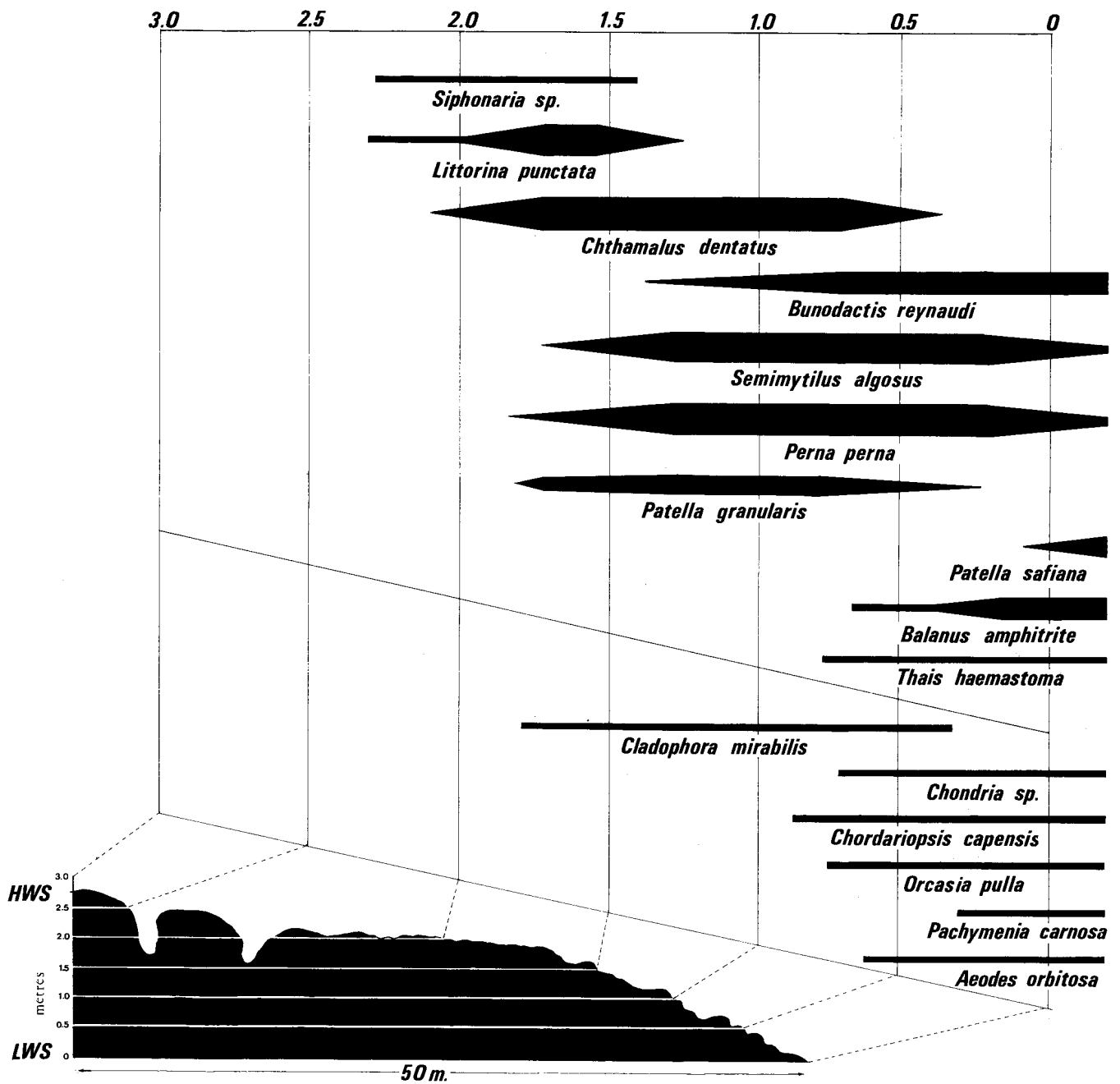


Figure 2. First transect at False Cape Frio.

just below this level, about 2,2 m below HWS, and *Perna* was not found much below this level. At LWS, about 1,6 m below HWS and some 80 m from it, the algae *Orcasia pulla*, *Aeodes orbitosa*, *Chondria* sp., and *Pachymenia carnosa* were common, *Semimytilus* was still present, and *Patella safiana* was fairly common; the whelk *Thais haemastoma* was present from just above this level. *Balanus* was not collected on the second transect.

#### ANGRA FRIA

As the rocks at Angra Fria could, at the time of the survey, be reached only by a three-mile walk across a salt pan, the equipment necessary for a detailed survey was not taken there, but a general survey was made. The intertidal rock consists of smooth granite boulders exposed to very strong wave action and offering no shelter for cryptofauna (plate 4). Apart from the out-

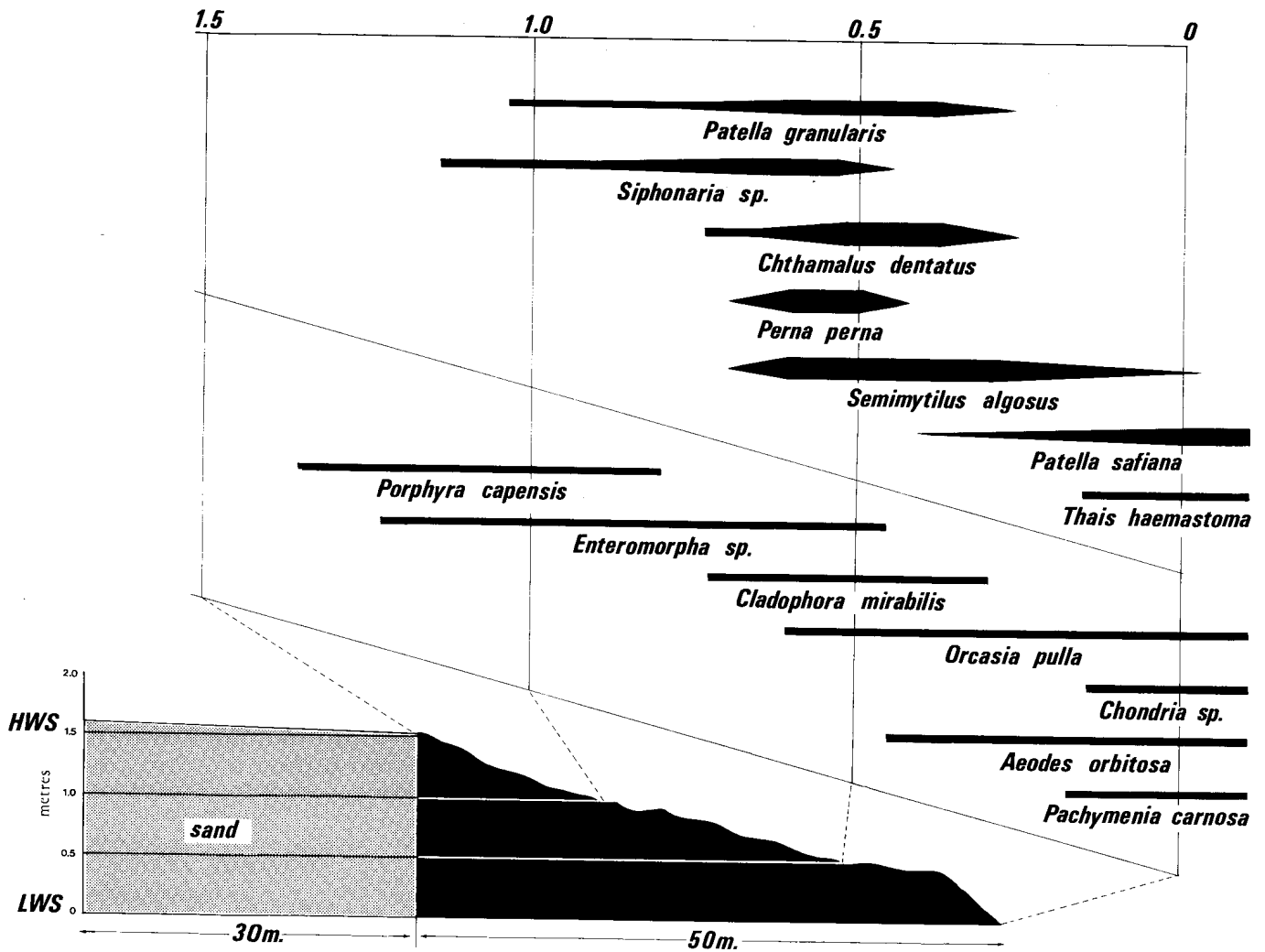


Figure 3. Second transect at False Cape Frio.

crop mentioned above that does not continue far below the high water mark, the first rock appears about 25 m below HWS and has a sparse growth of *Porphyra capensis* and *Enteromorpha*. *Patella granularis* was fairly common amongst the algal tufts, while *Chthamalus dentatus* was present in crevices, together with very small specimens of *Littorina punctata* and *Siphonaria (Patellopsis) capensis*. *Littorina* was present in larger numbers and reached a fair size on the higher rocky outcrop. About 6 m down *Chthamalus* was abundant, almost completely covering the rocks, and *Patella granularis* was very common; *Perna perna* appeared for the first time at this level. A little below this the algal carpet increased, being composed mainly of *Aeodes orbitosa*, *Orcasia pulla*, and *Pachymenia carnosa*. *Bunodactis reynaudi* was fairly common in crevices where sand accumulated. A single specimen of *Patella granatina* was collected at this level on the

sheltered side of a rock. At the level of LWS, *Patella safiana* and *Thais haemastoma* were present, the former becoming more common lower down. The specimens of *Patella safiana* were particularly large at Angra Fria, with well-developed algal gardens, consisting mainly of *Gymnogongrus glomeratus*. *Perna perna* and *Semimytilus algosus* were both abundant at LWS, forming dense clusters. The rock between the mussel clumps was covered with a brown encrusting alga, *Ralfsia* sp.

#### AREA B – THE ROCKS 5 KM SOUTH OF THE KUNENE RIVER MOUTH

This area was visited by the second author in 1968, by both authors in 1969, when a short transect was carried out (fig. 4), and again in 1978 and 1979 by the second and first authors respectively.

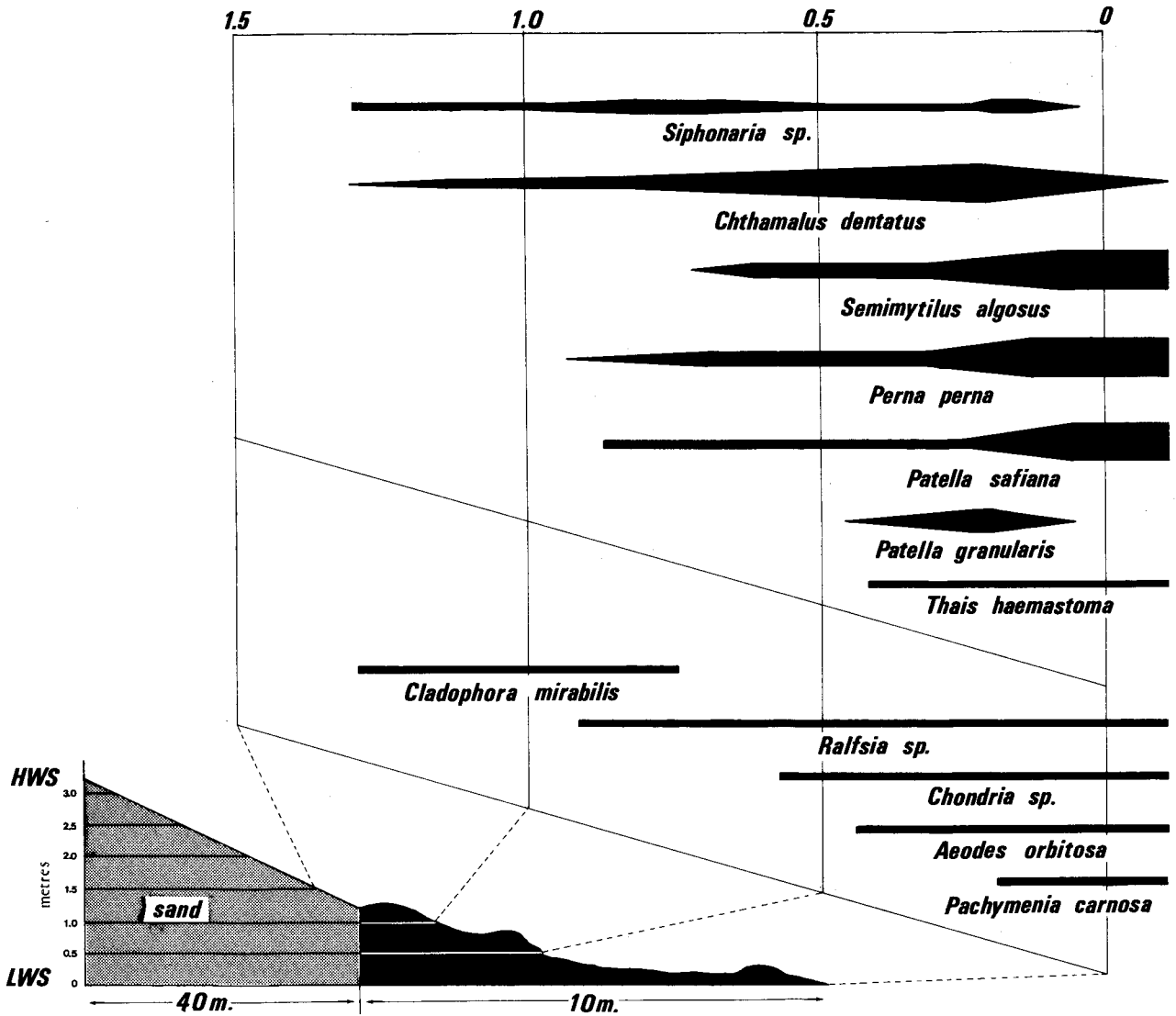


Figure 4. Transect at area B (rocks south of the Kunene River mouth). Note compression of sand (40 m) and expansion of rock (10 m).

The outcrop consists of ridges of rock running parallel to the coast (plate 5), and starts 40 m from HWS, which is marked by a line of drift shells and algae. On the first rocks, approximately 2 m below HWS, *Chthamalus dentatus* and *Siphonaria (Patellopsis) capensis* are present, as well as a stunted growth of *Cladophora mirabilis*. At the next station, 2 m from the previous one, both *Siphonaria* and *Chthamalus* were fairly common, and the first specimens of *Perna perna* and *Patella safiana* appeared. Much of the smooth rock between the sessile animals was covered with the brown encrusting *Ralfsia sp.* Five metres further seaward, at about the level of LWS, this alga

was still common, and *Orcasia pulla* appeared as well. In the gullies from the midshore to LWS, *Modiolus carvalhoi* was fairly common, growing at the bases of clumps of *Hypnea spicifera*. Single specimens of the brachiopod *Kraussina rubra* also occurred here. Just above LWS *Patella granularis* was common, but disappeared before LWS; *Patella safiana* was present but became common only from about LWS downwards. *Perna*, *Semimytilus algosus*, *Siphonaria*, and *Chthamalus* were still common or abundant (plate 6), *Siphonaria*, however, not reaching LWS and *Chthamalus* becoming much less common at that level. *Thais haemastoma* was present. The algal carpet was

very thick, with *Aeodes orbitosa*, *Pachymenia carnosa*, *Orcasia pulla*, and *Chondria* sp. being the dominant species.

The southern area of the rocks is bounded by a broad expanse of rubble formed by broken clumps of reef worm tubes (*Gunnarea capensis*). Many of the tubes still house live worms, but empty tubes give temporary shelter to the errant polychaete *Pseudonereis variegata*, and to the small grapsid crab *Pachygrapsus transversus*. Clumps of *Perna* are attached to the worm reefs.

#### AREA A — THE ROCKS 30 KM NORTH OF THE KUNENE RIVER MOUTH

The rocky outcrops where the survey was made consist of a smoothly worn reddish, very hard siltstone. They are separated from HWS by a 60 m stretch of white sand. The rocks extend for some 30 m below this, with a vertical drop from top to LWS of about 0,7 m. Almost the entire length of the rocks had a scattering of the fine red alga *Orcasia pulla*. Solitary plants of the large red alga *Pachymenia carnosa* also occur over the whole area. As the rocks are very smooth and there are no rock pools, only clinging animals occur there. *Chthamalus dentatus* was abundant, and *Patella safiana*, *Perna perna* and *Semimytilus algosus* occur lower down.

#### IV. NOTES ON THE OCCURRENCE OF PARTICULAR GROUPS

A list of the species collected at the four localities is given at the end of the paper (X, fauna list).

Far fewer species were recorded from this area than from either Moçamedes or Rocky Point. This may be explained in part by the paucity of the rock and the lack of habitats for cryptofauna, but it seems probable that the average temperatures in the area may be such as to discourage both tropical and coldwater species. This is borne out by a comparison of the fauna lists of Moçamedes and Rocky Point (Kensley & Penrith, 1973; Penrith & Kensley, 1970b). With the exception of one fish, one crab, and possibly one hydroid, this area has no species in common with Moçamedes that do not also occur at Rocky Point, indicating that the temperatures are probably unsuitable for the more tropical forms. On the other hand, most of the species listed in the fauna list occurred at Rocky Point or further south, and several were recorded from both Moçamedes and areas to the south.

#### ANTHOZOA

*Bunodactis reynaudi* was recorded only at the two southern localities, False Cape Frio and Angra Fria; it is an endemic species characteristic of the colder waters of the southern African coast.

#### POLYCHAETA

The majority of the polychaetes were recorded from False Cape Frio and the rocks south of the Kunene River mouth; these two localities had a more luxuriant algal growth than the others and therefore offered more shelter. The majority of the species recorded occur in general mainly in algal tufts; the abundance of *Pseudonereis variegata* at all the localities is to be explained by its preference for living in mussel clumps.

#### ISOPODA AND AMPHIPODA

All the species of these groups recorded are algal dwellers.

#### DECAPODA

All the species recorded, apart from *Plagusia chabrus*, are West African tropical forms. *Pachygrapsus transversus* was not recorded further south but occurred at Moçamedes. *Hippolyte palliola* was described from the South West African coast (Kensley, 1970) but has subsequently been recorded from Pointe Noire in the Congo (Crosnier & Forest, 1973). Fresh dead specimens of *Maja squinado* were fairly commonly washed ashore at the rocks south of the Kunene River mouth and Angra Fria.

#### MOLLUSCA

The identity of the specimens of *Siphonaria* collected has been established as *Siphonaria (Patellopsis) capensis*, but the specimens are extremely variable. *Littorina punctata* was absent from the two northern localities, owing to the absence of rock from the zone in which it usually predominates. The species has, however, been recorded from Angola (Kensley & Penrith, 1973) and from West Africa further north (Nicklés, 1950). The other species of mollusca predominating in the area are the same as those at Rocky Point, with the exception of *Oxysteles variegata*, which does not normally occur in areas exposed to very strong wave action.

#### BRACHIPODA

*Discinisca tenuis*, which is very characteristic of the South West African coast, was not recorded alive from any of the localities surveyed (although washing ashore in great numbers), but was collected alive at Cape Frio.

Large clumps of *Kraussina rubra* washed ashore about 15 km south of the Kunene River mouth, while a few live specimens were collected at area B.

## PISCES

Fishes could be collected from intertidal pools only at False Cape Frio; two small specimens were taken in algal tufts at the rocks south of the Kunene River mouth. The permanent intertidal fish species at False Cape Frio were *Blennius cornutus*, *Blennius cristatus*, and *Blennius pilicornis*, the former two species being numerous. At the rocks south of the Kunene River mouth the two juveniles collected were *Blennius cristatus* and *Blennius velifer*. The latter is an interesting record, as this species was collected in large numbers at Moçamedes and is a West African tropical species (Penrith & Penrith, 1972).

## V. DISCUSSION

The most striking difference between Rocky Point and the areas from False Cape Frio northwards was the apparent absence of kelp from the latter region. Isolated fronds were found washed up on the beach but there was no living material attached and they might have come from further afield; no living kelp was observed either intertidally or below LWS at any of the areas examined. The predominant faunal elements were the same as at Rocky Point: *Littorina punctata*, *Siphonaria (Patellopsis) capensis*, *Chthamalus dentatus*, *Patella granularis*, *Perna perna*, *Thais haemastoma*, *Semimytilus algosus*, and *Patella safiana*, with the addition of *Balanus amphitrite* at False Cape Frio. Only two (possibly three) of the tropical species found at Moçamedes but not at Rocky Point appeared at any of the localities surveyed for the present paper, and apart from the disappearance of the kelp there was no difference in the major faunal elements at Rocky Point and on the South West African coast further north. The introduction of the other tropical elements characteristic of the intertidal fauna of Moçamedes (Kensley & Penrith, 1973) apparently occurs north of area A. It was unfortunate that it was not possible to visit Baía dos Tigres. At Cabo Negro, north of Porto Alexandre, a sample of mytilids was taken from an underhang in the sandstone cliffs that form most of the coastline in that area, and *Perna perna* and *Gregariella barbatella* were recorded, but the cliffs do not favour the development of an extensive intertidal fauna. *Gregariella barbatella*, which occurs in the Mediterranean and on the southern African coast from South West Africa to Zululand, is a temperate rather

than a tropical species and was not recorded from Moçamedes.

## VI. SUMMARY

Surveys of four areas on the northern South West African coast and the southern Angolan coast in the region of Cape Frio to the Kunene River were made in order to determine the composition of the fauna of the intertidal rocks. The fauna was found to be relatively poor. This is thought to be partly due to the limited and exposed nature of the rocks and partly due to the temperature régime. Most of the dominant intertidal species were tropical forms, but several of the tropical intertidal dominants characteristic of the coast at Moçamedes in Angola were absent, while many of the coldwater species found further south were also absent.

## VII. ACKNOWLEDGEMENTS

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## VIII. GAZETTEER

Angra Fria	18°17'S., 11°57'E.
Area A	± 16°58'S., 11°46'E.
Area B	± 17°17'S., 11°44'E.
Cape Frio	18°27'S., 12°01'E.
False Cape Frio	18°29'S., 12°01'E.
Kunene River mth.	17°15'S., 11°45'E.
Moçamedes	15°10'S., 12°10'E.
Porto Alexandre	15°48'S., 11°50'E.
Rocky Point	18°59'S., 12°29'E.



## IX. REFERENCES

- BROWN, A. C. & JARMAN, N. 1978. Coastal marine habitats. In Werger, M.J.A. (ed.). *Biogeography and ecology of southern Africa*. The Hague: Dr. W. Junk.
- CROSNIER, A. & FOREST, J. 1973. Les crevettes profondes de l'Atlantique orientale tropical. *Faune trop.* 19: 1 — 409.
- KENSLEY, B. F. 1970. Some decapod Crustacea from northern South West Africa, including a new species of *Hippolyte*. *Cimbebasia* (A) 1: 180 — 188.
- KENSLEY, B. F. & PENRITH, M.-L. 1970. The status of *Gregariella simplicifilis* Barnard, with records of Mytilidae from southern Angola. *Ann. S. Afr. Mus.* 57: 123 — 130.
- KENSLEY, B. F. & PENRITH, M.-L. 1973. The constitution of the intertidal fauna of rocky shores of Moçamedes, southern Angola. *Cimbebasia* (A) 2: 113 — 123.
- NICKLÉS, M. 1950. *Mollusques testacés marins de la côte occidentale d'Afrique*. Paris: Le Chevalier.
- 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: 243 — 268.
- PENRITH, M. J. & PENRITH, M.-L. 1972. The Blenniidae of western southern Africa. *Cimbebasia* (A) 2: 66 — 90.

## X. FAUNA LIST

AF — Angra Fria; FCF — False Cape Frio; RN (A) — rocks north of the Kunene River mouth; RS (B) — rocks south of the Kunene River mouth.

Species	FCF	AF	RS (B)	RN (A)	South African distribution	General distribution
Phylum: CNIDARIA						
Class: HYDROZOA						
<i>Obelia dichotoma</i> (Linnaeus)	C	—	—	—	Rocky Point to Natal	Cosmopolitan
<i>Tubularia larynx</i> Ellis & Solander	C	—	—	—		
Class: ANTHOZOA						
<i>Bunodactis reynaudi</i> (Milne Edwards)	C	FC	—	—	Rocky Point to Durban	Endemic
Phylum: ANNELIDA						
Class: POLYCHAETA						
<i>Boccardia polybranchia</i> (Haswell)	C	—	A	C	Rocky Point to Cape	Mediterranean, Atlantic, New Zealand, Subantarctic islands
<i>Cirriformia tentaculata</i> (Montagu)	P	—	—	—	Rocky Point to Moçambique	North Atlantic, tropical eastern Atlantic, Indo-Pacific
<i>Dodecaceria pulchra</i> Day	P	—	—	—	Lüderitzbucht to Kei River	Endemic
<i>Gunnarea capensis</i> (Schmarda)	—	—	A	—	Swakopmund to St. Lucia, Natal	Endemic
<i>Lanice conchilega</i> (Pallas)	—	—	P	—	Rocky Point to Moçambique	Mediterranean, West Africa, Indo-Pacific
<i>Lumbrineris cavifrons</i> (Grube)	—	—	P	—	S. W. Africa to Moçambique	Endemic
<i>Naineris laevigata</i> (Grube)	—	—	P	—	Rocky Point to Moçambique	Mediterranean, circum-tropical
<i>Nereis (Nereis) falsa</i> Quatrefages	C	—	FC	C	Rocky Point to Natal	Mediterranean, West Africa, Malagasy
<i>Platynereis dumerilii</i> (Audouin & Milne Edwards)	A	—	FC	P	Rocky Point to Natal	Cosmopolitan
<i>Polyophthalmus pictus</i> (Dejardin)	P	—	—	—	Natal, Moçambique	Cosmopolitan
<i>Pseudonereis variegata</i> (Grube)	A	A	A	A	Rocky Point to Moçambique	Circumtropical

<i>Sabellaria spinulosa fucicola</i> (Augener)	C	—	—	—	S. W. Africa	Endemic
<i>Syllis (Syllis) gracilis</i> Grube	—	—	FC	—	Lüderitzbucht to Moçambique	Cosmopolitan
<i>Syllis (Typosyllis) armillaris</i> (Müller)	—	—	FC	—	Walvis Bay to Moçambique	Cosmopolitan
Phylum: ARTHROPODA						
Class: CRUSTACEA						
Subclass: CIRRIPIEDIA						
<i>Balanus amphitrite</i> Darwin	C	—	—	—	St. Helena Bay to Moçambique	—
<i>Chthamalus dentatus</i> Krauss	A	A	A	A	Rocky Point to Natal	West Africa, Malagasy, Aden
Subclass: MALACOSTRACA						
Order: PERACARIDA						
Suborder: TANAIIDACEA						
<i>Tanais</i> sp.	—	—	P	—	—	—
Suborder: ISOPODA						
<i>Engidotea lobata</i> (Miers)	—	—	P	—	Rocky Point to Port Elizabeth	Endemic
<i>Paridotea rubra</i> Barnard	—	—	P	—	Lüderitzbucht to East London	Endemic
Suborder: AMPHIPODA						
<i>Ampithoe</i> sp.	—	—	P	—	—	—
<i>Caprella penantis</i> Leach	FC	—	P	—	Rocky Point to Natal	Cosmopolitan
<i>Hyale hirtipalma</i> (Dana)	C	—	—	—	Rocky Point to False Bay	Chile, Peru, New Zealand, subantarctic islands
<i>Hyale saldanha</i> Chilton	C	—	C	P	Rocky Point to False Bay	Endemic
<i>Ischyrocerus anguipes</i> Krøyer	—	—	P	—	Rocky Point to Natal	North Atlantic
<i>Jassa falcata</i> (Montagu)	P	—	—	—	Rocky Point to False Bay	Cosmopolitan
<i>Paramoera capensis</i> (Dana)	—	—	P	—	Rocky Point to Natal	New Zealand, Falklands
Order: EUCARIDA						
Suborder: DECAPODA						
<i>Acanthonyx lunulatus</i> (Risso)	—	—	FC	P	Rocky Point to Kunene River	Mediterranean, West Africa to Angola
<i>Hippolyte palliola</i> Kensley	—	—	C	—	Rocky Point to Kunene River	Congo
<i>Ocypode cursor</i> (Linnaeus)	C	C	C	C	Rocky Point to Kunene River	Mediterranean, West Africa to Angola
<i>Pachygrapsus transversus</i> (Gibbes)	P	—	C	—	—	Circumtropical
<i>Plagusia chabrus</i> (Linnaeus)	—	—	P	—	Kunene River to Natal	Chile, New Zealand, Australia
<i>Xaiva biguttata</i> (Risso)	—	P	—	—	Kunene River to Möwe Bay	West Africa to Angola
Phylum: MOLLUSCA						
Class: LAMELLIBRANCHIATA						
<i>Aulacomya ater</i> (Molina)	—	—	P	—	Swakopmund to Natal	South America, Falkland & Kerguelen islands

<i>Gregariella barbatella</i> (Cantraine) (= <i>G. simplicifilis</i> Barnard: Kensley & Penrith, 1970)	—	—	P	—	Kunene River to Zululand	Mediterranean, West Africa
<i>Modiolus carvalhoi</i> Klappenbach	—	—	FC	P	Moçamedes to Torra Bay	Chile, Peru
<i>Perna perna</i> (Linnaeus)	A	A	A	A	Kunene River to Delagoa Bay	Circumtropical
<i>Semimytilus algosus</i> (Gould)	A	A	A	A	Moçamedes to Swakopmund	Chile, Peru
Class: GASTROPODA						
<i>Littorina punctata</i> Philippi	A	A	—	—	Rocky Point to Knysna	West Africa
<i>Patella granatina</i> Linnaeus	—	P	—	—	Rocky Point to Agulhas	Endemic
<i>Patella granularis</i> Linnaeus	C	C	FC	C	Rocky Point to Zululand	Endemic
<i>Patella miniata</i> Born	—	—	FC	—	Rocky Point to Zululand	Endemic
<i>Patella saftiana</i> Lamarck	C	FC	C	C	Rocky Point	Algeria to southern Angola
<i>Pyrene kraussi</i> (Sowerby)	—	—	FC	—	Rocky Point to Natal	Endemic
<i>Siphonaria (Patellopsis) capensis</i> Quoy & Gaimard	FC	FC	C	FC	Rocky Point to Zululand	Inhaca Island
<i>Thais haemastoma</i> (Linnaeus)	P	P	FC	FC	Rocky Point to Sandwich Harbour	Mediterranean, Atlantic, West Africa
<i>Tricolia capensis</i> (Dunker)	—	FC	P	—	Rocky Point to East London	Mauritius
Phylum: BRYOZOA						
<i>Electra verticillata</i> (Lamouroux)	—	—	A	C	Rocky Point to East London	English Channel to Angola, New Zealand
<i>Membranipora tuberculata</i> (Bosc)	C	—	—	—	Rocky Point to False Bay	Circumtropical, south Atlantic
Phylum: BRACHIOPODA						
<i>Kraussina rubra</i> (Pallas)	—	—	P	—	Lüderitzbucht to Transkei	Endemic
Phylum: ECHINODERMATA						
Class: HOLOTHUROIDEA						
<i>Cucumaria frauenfeldii</i> Ludwig	—	—	FC	—	Lüderitzbucht to East London	? Java
Phylum: CHORDATA						
Class: PISCES						
<i>Blennius cornutus</i> Linnaeus	C	—	—	—	False Cape Frio to Swakopmund, Doring Bay to Natal	Endemic
<i>Blennius cristatus</i> Linnaeus	C	—	P	—	Kunene River mouth to Toscanini	Mediterranean, tropical West Africa
<i>Blennius pilicornis</i> Cuvier = <i>Blennius vandervekeni</i> Poll: Penrith & Penrith, 1972	P	—	—	—	False Cape Frio to Möwe Bay	Eastern Mediterranean, Lobito to Moçamedes; Brazil
<i>Blennius velifer</i> Norman	—	—	P	—	Kunene River	West Africa to Angola



Plate 1. False Cape Frio, view of first transect.



Plate 2. False Cape Frio, rocks at level of fifth station, first transect.



Plate 3. False Cape Frio, view of second transect.



Plate 4. Rocks at LWS, Angra Fria.



Plate 5. Rocks south of Kunene River mouth (area B).

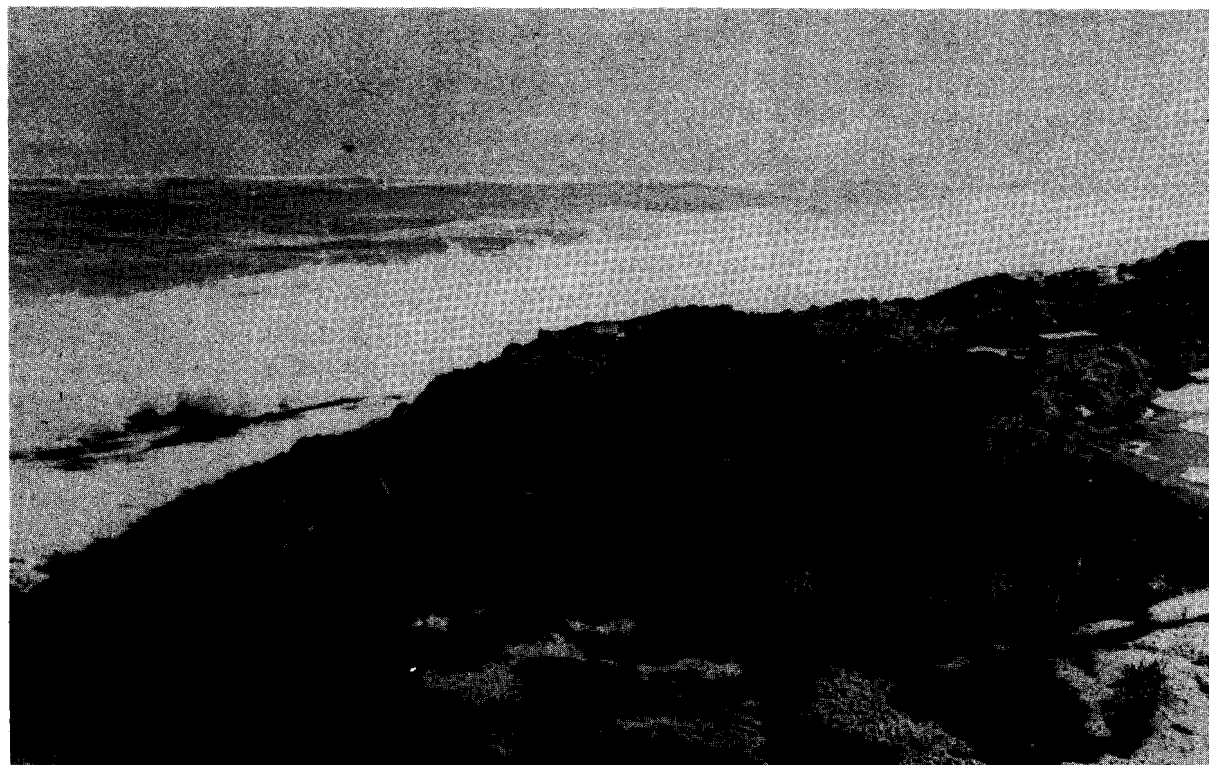


Plate 6. Rocks south of Kunene River mouth, 0 – 0,5 m above LWS.