(29,3%) of saddle sores (Stutterheim 1979). The degree of competition to feed at these sites indicates a strong preference for wound feeding, but an overall occurrence of 0,4% shows that it is an unimportant feeding method. However, this could also be due to an absence or low incidence of open wounds as oxpeckers cannot open sound skin.

Insect catching had a high occurrence (42,5%) on warthog. The tick species found on warthog are not readily utilized and association is due to the occurrence of tabanid species during the summer months (September to March) (Stutterheim 1979). Insect catching was also fairly high in buffalo (10,1%) because of concentrations of Simuliidae. Similarly the domestic donkey (5,1%) hosted flies that were feeding on saddle sores.

The present study indicates that the feeding methods used are determined by the covering of the skin, external morphology and the composition of food items. A factor which could also affect the feeding behaviour, is the intolerant behaviour of the symbiont species (Stutterheim 1979). A symbiont will not allow the utilization of a food resource if it occurs on a sensitive area or if a particular feeding method is not tolerated.

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Marine benthos near the Saldanha Bay iron-ore loading terminal

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The development of Saldanha Bay (33°S/18°E) for the export of iron-ore required the construction of a long breakwater, loading terminal and jetty. Associated dredging operations removed 25 million cubic metres of sediment and resulted in significant changes in the faunal structure of the bay (Moldan 1978). The present study investigated the marine benthos near the completed and functioning iron-ore loading terminal and the data may be useful in the long term monitoring of the effects of port development and industrialization of Saldanha Bay.

Five stations were occupied in Saldanha Bay (Figure 1) and SCUBA divers collected samples of macrofauna, meiofauna, bacteria and sediments from these stations during May and July 1978.

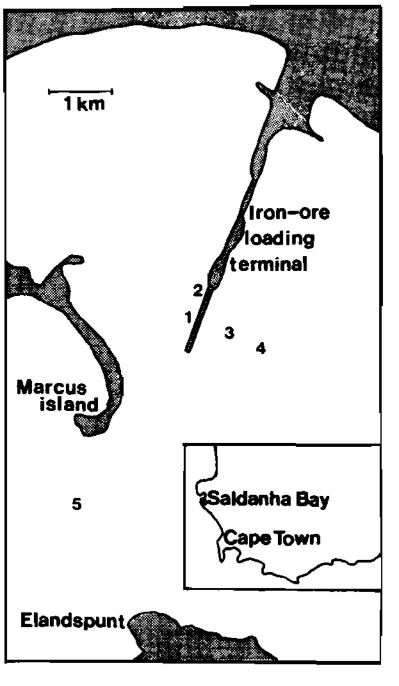

Figure 1 Saldanha Bay showing iron-ore loading terminal and sampling stations 1 – 5.

Macrofauna was collected using a diver-operated suction sampler with a cross-sectional area of 0,1 m^2 (Christie & Allen 1972). Replicate samples were taken to a depth of 30 cm at all stations except Station 2 where cables and other construction debris prevented penetration of the sampling cylinder. The samples were preserved in 10% formalin and, after identification, oven-dried at 60 °C for 48 h. Meiofauna was sampled using PVC tube corers with a cross-sectional area of 8 cm^2. Three cores were taken per station (except Station 2) and plugged with corks to prevent loss of sample. The 0 – 10-cm sections of the three cores were combined, preserved in 5% formalin, and later extracted using the saccharose centrifugation technique of Hiep, Smol & Hautekiet (1974). The meiofauna was then stained with Rose Bengal and counted in graduated perspex trays under a dissecting microscope.

Samples of bottom sediment and bottom water were collected in acid-cleaned 75 ml plastic containers and preserved with filtered formaldehyde. The bacteria were counted using acridine orange epifluorescent microscopy (Hobbie, Daley & Jasper 1977). Sediment cores were taken at the five stations using PVC tube corers and the 0 – 10-cm sections were oven-dried at 60 °C for 48 h. Particle size analysis was done using a series of Wentworth scale sieves. Samples of bottom sediment were collected in 75-ml plastic containers and frozen prior to the determination of free iron oxide (Fe_2O_3). The free iron oxide was extracted using the sodium bicarbonate buffered dithionite-citrate method (Mehra & Jackson 1960) and analysed using atomic absorption spectroscopy.

The macrobenthos at Station 1 under the loading jetty was dominated by the small polychaete, *Prionospio sexoculata*. Stomatopods, *Pterygosquilla armata*, errant polychaetes and nemerteans were also present. Station 3, 0,5 km east of the loading jetty, supported abundant macrobenthos dominated by prawns, *Upogebia capensis*, and tongue worms, *Ochaetostoma capense*. Gastropods, *Nassa speciosa*, and large errant polychaetes also occurred at the station. At Station 4, 1 km east of the loading jetty, no prawns were found and *O. capense* and *N. speciosa* dominated the macrobenthos. At Station 5, in the entrance to the bay, *N. speciosa*, errant polychaetes and sea-pens, *Virgularia schultzei*, were found.

Christie & Moldan (1977) found the small polychaete *P. sexoculata*, which was dominant at Station 1, to be tolerant of adverse conditions as it dominated the fauna occurring 25 m from the fish factory effluent outlet which they studied at Saldanha Bay. Further, though Stations 1 and 5 were at the same depth (28 m), the absence of *V. schultzei* at 1 is interesting particularly as Christie & Moldan (1977) found this species to be absent in the area of Saldanha Bay polluted by fish factory effluent.

Biomass figures (Table 1) indicate that less macrobenthos occurred beneath the loading jetty at Station 1 than at any of the other areas sampled. The high biomass of macrobenthos at Station 3 was due to the abundance of prawns (400 m^{-2}) and tongue worms (635 m^{-2}) present in this area.

Meiofauna numbers m^{-2} were highest at Station 1 under the loading jetty (Table 1) and nematodes were found to dominate the meiofauna of Saldanha Bay. McLachlan, Winter & Botha (1977) found sublittoral meiofauna numbers in Algoa Bay to range from $0,5 \times 10^5$ m^{-2} to $5,8 \times 10^5$ m^{-2} and the present figures compare well with these. Further, McLachlan (1977) has concluded, from studies on a sandy beach near an ore-loading terminal in Port Elizabeth, that iron-ore dust has no effects on meiofauna.

Bacteria numbers in the sediment were slightly higher under the jetty (Stations 1 and 2) than at the other stations (Table 1) while numbers in bottom water samples were lowest in the entrance to the bay. Mazure & Branch (1979) obtained numbers ranging from $1,2 \times 10^7$ to $4,5 \times 10^8$ bacteria cells g^{-1} wet sediment from intertidal samples in Saldanha Bay and Langebaan lagoon. In the surface water of Saldanha Bay they recorded $1,1 \times 10^6$ bacteria cells ml^{-1}.

Sediment cores revealed the sediments under the loading jetty (Stations 1 and 2) to be black in colour, foul-smelling and probably anoxic. Though mean particle size at Station 1 was slightly larger than at other stations (Table 1), stratification into fine surface mud and deeper grit was apparent. The higher meiofauna and bacteria numbers at this station can probably be explained by the presence of this surface mud.

The free iron oxide in the sediment was greatest at Station 1 beneath the loading jetty (Table 1) and clearly indicates a build-up of iron oxide in the sediment. Subsequent to the present study J.P. Willis (pers. comm. 1978) has found free iron oxide to be 0,8% under the jetty.

Table 1 Chemical, physical and biological features of five sampling stations in Saldanha Bay

Station	1	2	3	4	5
Depth	28 m	23 m	15 m	15 m	28 m
Macrofauna dry mass m^{-2}	35,6 g	–	306,6 g	67,3 g	46,3 g
Meiofauna numbers m^{-2}	$6,0 \times 10^5$	–	$1,3 \times 10^5$	$0,6 \times 10^5$	$1,8 \times 10^5$
Bacteria cells g^{-1} wet sediment	$1,03 \times 10^8$	$1,08 \times 10^8$	$8,50 \times 10^7$	$7,39 \times 10^7$	$6,67 \times 10^7$
Bacteria cells ml^{-1} water	$1,85 \times 10^6$	$1,53 \times 10^6$	$1,60 \times 10^6$	$1,51 \times 10^6$	$1,10 \times 10^6$
Mean particle size of sediment	2,4ϕ	2,5ϕ	3,1ϕ	3,7ϕ	2,8ϕ
Free iron oxide in sediment	0,341%	0,183%	0,069%	0,086%	0,010%

In conclusion, it appears that the benthos beneath the iron-ore loading jetty at Saldanha Bay differs from that of other areas in the bay. Macrofauna is dominated by *Prionospio sexoculata* which is tolerant of adverse conditions whilst meiofauna and bacteria numbers are higher under the jetty than elsewhere in Saldanha Bay.

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