

FISH ASSEMBLAGES IN THE SEAGRASS BEDS AT INHACA ISLAND (MOZAMBIQUE) - COLD SEASON

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With 2 figures and 7 tables

ABSTRACT. The fish communities in the seagrass beds at Inhaca Island (Mozambique) were sampled in three stations during the cold season (July-August 1993). On the whole, 66 species of fishes belonging to 34 families were collected by trawling. Cluster and factorial correspondence analyses showed that the fish community structure was different at the three stations. These structural differences were attributed to the type of seagrass association and to the proximity of mangrove and coral reef areas. Differences between day and night samples attest to the occurrence of marked circadian changes between nocturnal and diurnal components of this seagrass fish community. Carnivorous fishes were dominant both in number and biomass while herbivorous and omnivorous species were less represented in these assemblages.

RESUMO. As comunidades ictiológicas dos fundos de fanerogâmicas da Ilha da Inhaca (Moçambique) foram amostradas em 3 estações durante a estação a estação fria (Julha-Agosto de 1993). No total, 66 espécies de peixes pertencendo a 34 famílias foram colhidas com arrasto. A análise dos dados mostrou que as comunidades ictiológicas tinham estruturas diferentes nas 3 estações. Estas diferenças foram atribuídas ao tipo de associação vegetal e à distância às áreas de coral e de mangal. Diferenças entre as amostragens diurnas e nocturnas atectam a ocorrência de ciclos circadianos marcados e a sua influência nas comunidades. Espécies carnívoras foram dominantes, quer em número, quer em biomassa, em relação às herbívoras e omnívoras.

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INTRODUCTION

Seagrass beds are among the most productive marine ecosystems in the world and generally have an important role as nursery habitat (BAELDE, 1990; BLABER *et al.*, 1992; ALMEIDA, 1994).

There is a worldwide homogeneity in the occurrence of some fish families in seagrass beds. For example, the Syngnathidae and Gobiidae were present at 24 of 25 seagrass bed localities studied around the World and among the 10 more abundant families (HOWARD & KOEHN, 1985). Similarly, Monacanthidae, Sparidae, Labridae, Gerridae and Tetraodontidae were also recorded at 25 different localities around the world by BELL & POLLARD (1989).

The ichthyofauna of seagrasses at Inhaca Island is poorly known: 43 species were listed by MacNAE & KALK (1962) and only 10 species were recorded by SMITH (1969). In tropical areas, fish from seagrass beds have been studied in Madagascar (VIVIEN, 1974; HARMELIN-VIVIEN, 1983), the Caribbean region (WEINSTEIN & HECK, 1979; ROBBLEE & ZIEMAN, 1984; HECK & WEINSTEIN, 1989; BAELDE, 1990; BOUCHON-NAVARO *et al.*, 1992), Papua New Guinea (BROUNS & HEIJS, 1985), Australia (BLABER *et al.*, 1992), and isolated areas in the Pacific (JONES & CHASE, 1975). In Southern Africa, WHITFIELD (1989) also studied the ichthyofauna in *Zostera capensis* beds.

Study area

The island of Inhaca is located off the east coast of Africa, at about 32 km from Maputo (Mozambique); it forms part of the barrier between the bay of Maputo and the Indian Ocean (Fig. 1).

All sampling stations were located in high-density seagrass beds, which were exploited by local fishermen. Sampling was undertaken at three locations in order to study the fish fauna associated with two types of mixed seagrass beds: *Thalassodendron ciliatum* / *Cymodocea serrulata* and *Thalassia hemprichii* / *Halodule wrightii*. These different species and associations are distributed around Inhaca Island at about 5-6 m depth (high tide) and are geographically sorted (BANDEIRA, 1991) (Fig. 1).

MATERIAL AND METHODS

Fishes were collected in 1993 during the cold season (June-August) at three stations located in areas with different seagrass beds associations (Fig. 1). Station I and II were located in areas with the *Thalassodendron ciliatum* / *Cymodocea serrulata* association while Station III was characterised by the *Thalassia hemprichii* / *Halodule wrightii* association. Sampling was performed at high tide in the daytime on each of the moon phases by means of a beam trawl net (rectangular mouth of 50 x 150 cm and 1 cm

mesh aperture) towed during 10 minutes at a velocity of 1.5 knots (sixteen trawls in total). At station I sampling was also carried out at night. After identification, the collected individuals were measured to the nearest millimetre (total length), and weighted to the nearest milligram (total weight). The stomach contents were weighed and preserved in 5% formalin for later analysis.

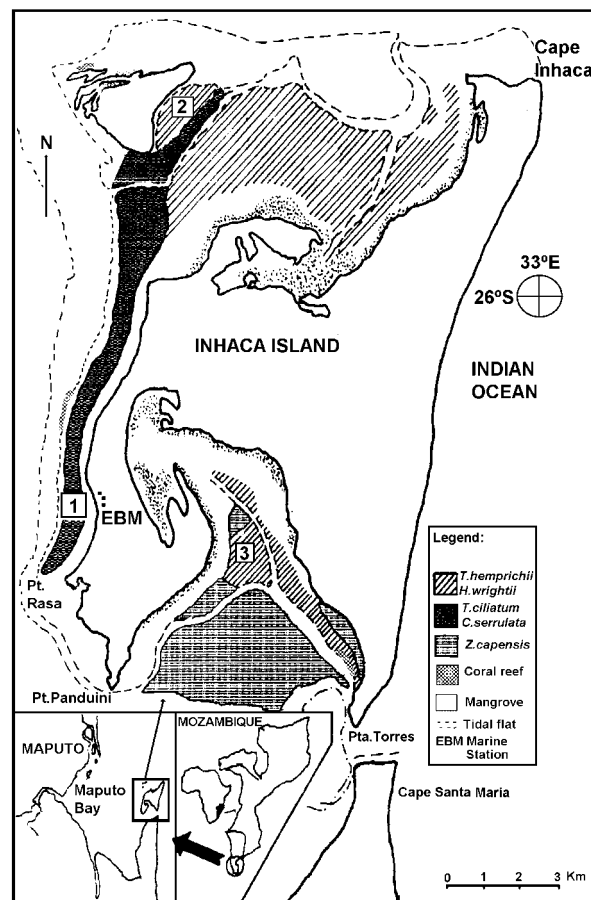


Fig. 1 - Sampling areas:

- 1 - Estação de Biologia Marinha - Station I
- 2 - Banco da Sangala - Station II
- 3 - Saco da Inhaca - Station III

Cluster analysis of the sixteen samples, based in the number of individuals of the 66 species was used with rough data to compute a Bravais-Pearson correlation coefficient symmetrical matrix. UPGMA was employed for the construction of the dendrogram and the software used for was NTSYS-PC v. s. 1.6 by JAMES F. ROHLF.

RESULTS

The sixteen samples supplied 1290 individuals representing 66 species and 34 families (Tables 1, 2, 3 and 4). The most speciose families were the Labridae (5 species), the Scorpaenidae (4 species) and the Syngnathidae (4 species). Only 17 species were found in the three stations. Species found exclusively in a single locality were relatively numerous: 15 species at station III (Saco), 8 species at station II (Banco da Sangala) and 11 at station I (Estação de Biologia Marinha).

At station I, the diurnal assemblage (Table 1) was characterised by the important contribution of two species: *Paramonocanthus barnardi* (22,1% of individual numbers, 17% of biomass) and *Apogon nigripinnis* (13,8% of individual numbers, 19,9% of biomass). *Aeoliscus punctulatus* was another important species in term of numbers (16,4%) but represented only 4,5% of the whole biomass. Conversely, *Leptoscarus vaigiensis* was represented by few individuals (3,9%), but which accounted for 26% of the whole biomass. Night trawls contributed with the double of individuals in comparison to day trawls and six species were caught only at night: *Parupneus cinnabarinus*, *Upeneus tragula*, *Plotosus nkunga*, *Scorpaenodes littoralis*, *Epinephelus andersoni* and a juvenile of *Sphyraena* sp. (only one individual of each species was captured). The most important species in the night samples (Table 2) were *Siganus sutor* (17,8% in numbers, 18,6% in biomass), *Pelates quadrilineatus* (21% in numbers, 11,4% in biomass), *P. barnardi* (16,1% in numbers, 8% in biomass), *A. nigripinnis* (10,1% in numbers, 9,5% in biomass), and *L. vaigiensis* (23,5% in biomass but only 3,4% in numbers).

At Station II (Table 3) two species were dominant in numbers and biomass: *P. barnardi* and *S. sutor*. At this station too, *L. vaigiensis* was dominant in biomass (14,5%). Eight species were captured exclusively at this station: *Antennarius pictus*, *Scorpaenopsis gilbosa*, *Hippocampus histrix*, *Hippocampus kuda*, *Arothron imaculatus* (with one individual each), *Lophodiondon calori* (two individuals), *Lethrinus hypselopterus* (8 individuals) and *Lethrinus rubrioperculatus* (four individuals).

Station III (Table 4) was characterised by the presence of 15 species that have not been collected at the other stations: *Foa brachygramma*, *Bothus pantherinus*, *Pseudorhombus arsius*, *Cynoglossus durbanensis*, *Amblyogobius albimaculatus*, *Amblyogobius sphynx*, *Vanderhostia delagoae*, *Stethojulis strigiventer*, *Parapercis xanthosoma*, *Nemipterus bipuntatus*, *Dascyllus trimaculatus*, *Dendrochirus brachypterus*, *Epinephelus marginatus*, *Solea bleekeri* and *Crenidens crenidens*.

The influence of the moon phases on the different distribution of fishes and therefore on their catchability (*i. e.* their apparent abundance) is attested by our results: during full moon the individuals were less abundant when compared to the numbers obtained during the new moon.

Cluster and factorial correspondence analyses based on species abundance data in the 16 samples showed that the structure of the fish community differed between the three localities and between day and night (Fig. 2).

The number of species, specimens and the total biomass as well as the diversity and evenness indices (in number and weight) obtained at each station are summarized in Table 5.

The number of young fishes (total length less than half of that of adults) represented almost 50% of the total catch (Table 6). However, some species occurred in the sampled seagrass beds as adults, such as *L. vaigiensis*, *P. barnardi*, *Novaculichthys macrolepidotus*, *Syngnathoides biaculeatus* and some sea horses (RANDALL, 1983).

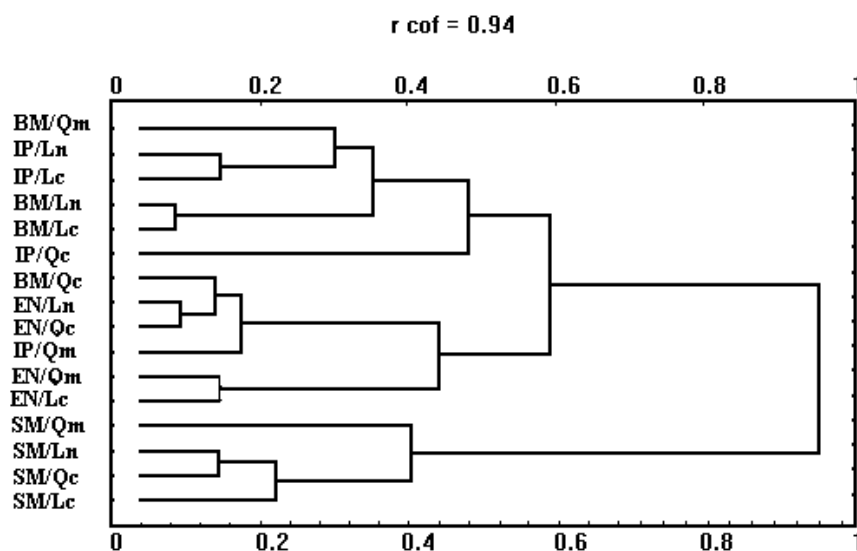


Fig. 2 - Cluster analysis of the different fish samples collected at Ilha da Inhaca. (**BM** - Estação de Biologia Marinha (day); **EN** - Estação de Biologia Marinha (night); **IP** - Banco da Sangala; **SM** - Saco; **Qm** - third quarter of the moon; **Ln** - new moon; **Qc** - first quarter of the moon; **Lc** - full moon).

Stomach contents

In a selected sub-sample of 10 species (387 stomach contents analysed) carnivorous fishes were dominant in species number (six species: *Parascorpaena mossambica*, *Platycephalus indicus*, *Sorsogona prionata*, *Apogon cooki*, *A. nigripinnis*,

F. brachygramma). Herbivores comprised three species (*Scarus tricolor*, *L. vaigiensis* and *S. sutor*) and one species, *P. barnardi*, was omnivorous.

The whole species pool (66 species) was classified according to three trophic categories (carnivorous, herbivorous, omnivorous) as indicated by our stomach content analyses and data available in the literature (VIVIEN, 1973; FOURMANOIR & LABOUE, 1976; RANDALL, 1983; Van Der ELST, 1988; FISHER *et al.*, 1990). Carnivorous fishes are the most important category (60,9% in abundance, 53,2% in biomass) (Table 7). The highest proportion of carnivorous fishes was found at station III (79,96% in number and 83,2% in biomass) as few omnivorous fishes were present and herbivorous fishes were represented by juveniles (Table 7).

DISCUSSION

The high number of species (66) found in the seagrass beds at Inhaca Island may result from the composite nature of these seagrass beds. At Tuléar (Madagascar), HARMELIN-VIVIEN (1983) also reported a higher richness of the fish fauna in mixed species seagrass beds than in single-species ones.

Station III (Saco) differs clearly from the other localities in terms of (i) species composition (15 species exclusive of this station, absence of several species that were abundant in the other stations, such as *P. quadrilineatus*, *N. macrolepidopus* and *Chrysiptera annulata*), (ii) abundance and biomass structure (due particularly to the contributions of *P. barnardi*, *S. prionata*, *P. mossambica*, *Lethrinus lentjan*, *Saurida gracilis*, *Aeoliscus punctulatus* and *Syngnathoides biaculeatus*), (iii) demographic structure (greater proportion of juveniles), (iv) habitat utilization (greater number of benthic fishes such as *Bothus pantherinus*, *Pseudorhombus arsius*, *Cynoglossus durbanensis*, *Papilloculiceps longiceps*, *P. indicus*, *S. prionata*, *Solea bleekeri*), and (v) trophic structure (almost absence of omnivorous species, low number of herbivorous species).

These differences can be explained by the habitat features resulting from the seagrass association *Thalassia hemprichii* / *Halodule wrightii* that occurred at Station III: the coverage of the bottom by these seagrasses was less complete and uniform than in areas covered by the *Thalassodendron ciliatum* / *Cymodocea serrulata* association and their leaves were less exuberant and less dense.

Other environmental features may induce the between-site differences observed among the ichthyological populations. The proximity of two other ecosystems, a vast mangrove and a small barrier of corals, may be responsible for these differences as already referred by other authors (KIKUCHI 1974; KIKUCHI & PÉRÈS, 1977; HARMELIN-VIVIEN, 1983; POLLARD, 1984; BAELDE, 1990). At low tide the water that had been warmed over the Saco platform is pushed offshore towards Ponta de Torres, where corals are abundant, while at high tide a cold stream of offshore waters covered

the Saco area. The fishes can use these streams for moving in search of better places for feeding or breeding.

The high number of young fishes observed in these localities is a characteristic of seagrass beds (BAELDE, 1990).

The differences observed at Station I between day and night samples (abundance and diversity greater at night) are in accordance with the results of other studies around the world (HARMELIN-VIVIEN, 1983; WEINSTEIN & HECK, 1979; ALMEIDA, 1988; BLADER, *et al.*, 1992).

TABLE 1 - List of species obtained during the day at Station I. **N** - number of individuals, **B** - biomass (g).
(☾ - first quarter of the moon; ● - full moon; ☾ - third quarter of the moon; ○ - new moon).

	Estação de Biologia Marinha (Day)								Ind/sp	Biom/sp
	11.7.93 ☾		20.7.92 ●		27.7.93 ☾		2.8.93 ○			
	N	B	N	B	N	B	N	B		
<i>Ptarmus jubatus</i>	0	0	0	0	0	0	1	3,18	1	3,18
<i>Apogon cooki</i>	0	0	1	5,87	0	0	2	15,6	3	21,47
<i>Apogon nigripinnis</i>	0	0	15	170,36	1	15,89	16	236,56	32	422,81
<i>Petroscirtes breviceps</i>	0	0	0	0	1	3,24	1	7,46	2	10,7
<i>Aeoliscus punctulatus</i>	5	12,21	14	46,22	7	22,87	12	12,71	38	94,01
<i>Novaculichthys macrolepidopus</i>	0	0	0	0	2	13,33	1	12,83	3	26,16
<i>Pteragogus flagellifer</i>	0	0	5	35,46	0	0	1	12,82	6	48,28
<i>Stethojulis interrupta</i>	1	5,3	0	0	1	1,88	2	8,18	4	15,36
<i>Lethrinus lentjan</i>	2	24,42	0	0	0	0	0	0	2	24,42
<i>Lethrinus nebulosus</i>	0	0	1	8,56	1	14,22	1	9,65	3	32,43
<i>Cantherrhines fronticinctus</i>	0	0	1	33,21	0	0	0	0	1	33,21
<i>Paramonocanthus barnardi</i>	7	54,78	21	155,88	9	52,8	14	96,95	51	360,41
<i>Parupeneus indicus</i>	0	0	0	0	0	0	1	14,38	1	14,38
<i>Sorsogona prionata</i>	1	27,98	0	0	1	12,51	0	0	2	40,49
<i>Chrysiptera annulata</i>	1	3,71	5	21,55	2	9,73	0	0	8	34,99
<i>Stegastes fasciolatus</i>	0	0	0	0	0	0	2	28,08	2	28,08
<i>Calotomus spinidens</i>	0	0	1	32,22	3	51,84	1	38,51	5	122,57
<i>Leptoscarus vaigiensis</i>	0	0	2	62,55	1	1,04	6	489,41	9	553
<i>Parascorpaena mossambica</i>	0	0	2	43,21	1	23,25	1	24,69	4	91,15
<i>Siganus sutor</i>	0	0	2	11,89	5	21,79	2	18,07	9	51,75
<i>Hippocampus camelopardalis</i>	0	0	2	7,02	0	0	0	0	2	7,02
<i>Syngnathoides biaculeatus</i>	4	25,67	1	7,31	3	10,89	2	12,97	10	56,84
<i>Saurida gracilis</i>	0	0	0	0	1	28,26	0	0	1	28,26
<i>Pelates quadrilineatus</i>	1	6,07	6	48,4	23	83,97	1	4,57	31	143,01
<i>Canthigaster solandri</i>	0	0	0	0	0	0	1	2,66	1	2,66
TOTAL	22	160,1	79	689,71	62	367,51	68	1049,3	231	2123,63

TABLE 2 - List of species obtained during the night at Station I. **N** - number of individuals, **B** - biomass (g).
(☾ - first quarter of the moon; ● - full moon; ☽ - third quarter of the moon; ○ - new moon).

	Estação de Biologia Marinha (Night)								Ind/sp	Biom/sp
	10.7.93 ☾		18.7.93 ●		26.7.93 ☽		3.8.93 ○			
	N	B	N	B	N	B	N	B		
<i>Ptarmus jubatus</i>	5	14,41	0	0	0	0	0	0	5	14,41
<i>Apogon cooki</i>	7	48,02	4	38,68	16	136,3	2	19,85	29	242,88
<i>Apogon nigripinnis</i>	30	350,1	8	88,72	16	169,3	3	43,6	57	651,72
<i>Petroscirtes breviceps</i>	2	71,82	0	0	2	7,12	0	0	4	78,94
<i>Aeoliscus punctulatus</i>	0	0	5	13,96	4	14,04	0	0	9	28
<i>Cynoglossus lachneri</i>	11	140,8	1	15,45	1	18,08	0	0	13	174,3
<i>Pletorhinchus flavomaculatus</i>	2	71,56	0	0	1	22,35	0	0	3	93,91
<i>Pteragogus flagellifer</i>	1	21,75	10	145	1	1,14	0	0	12	167,89
<i>Lethrinus lentjan</i>	6	39,89	7	70,8	6	64,1	1	6,9	20	181,69
<i>Lethrinus variegatus</i>	0	0	3	11,09	0	0	0	0	3	11,09
<i>Lutjanus fulviflamma</i>	3	46,82	3	75,25	1	16,84	0	0	7	138,91
<i>Paramonocanthus barnardi</i>	26	119,7	38	293	22	136,7	0	0	86	549,36
<i>Parupeneus cinnabarinus</i>	0	0	0	0	1	6,27	0	0	1	6,27
<i>Parupeneus indicus</i>	0	0	2	114,4	0	0	0	0	2	114,35
<i>Upeneus tragula</i>	0	0	1	12,79	0	0	0	0	1	12,79
<i>Lactoria cornuta</i>	1	7,52	0	0	0	0	0	0	1	7,52
<i>Sorsogona prionata</i>	6	52,4	2	43,65	2	34,36	1	7,11	11	137,52
<i>Plotosus lineatus</i>	2	22,74	4	50,42	1	19,81	0	0	7	92,97
<i>Plotosus nkunga</i>	0	0	0	0	1	22,82	0	0	1	22,82
<i>Chrysiptera annulata</i>	2	7,5	1	4,7	4	19,81	0	0	7	32,01
<i>Calotomus spinidens</i>	8	19,33	1	28,77	0	0	1	39,88	10	87,98
<i>Leptoscarus vaigiensis</i>	3	217,6	10	700,6	5	695,8	0	0	18	1614,08
<i>Scarus tricolor</i>	1	13,05	0	0	0	0	0	0	1	13,05
<i>Parascorpaena mossambica</i>	2	30,46	1	35,17	2	47,56	0	0	5	113,19
<i>Scorpaenodes littoralis</i>	1	2,72	0	0	0	0	0	0	1	2,72
<i>Epinephelus andersoni</i>	0	0	1	170	0	0	0	0	1	170
<i>Siganus sutor</i>	55	417,8	14	403,5	8	139,5	18	315,9	95	1276,7
<i>Sphyraena sp.</i>	1	0,24	0	0	0	0	0	0	1	0,24
<i>Hippocampus camelopardalis</i>	1	0,84	0	0	0	0	0	0	1	0,84
<i>Syngnathoides biaculeatus</i>	2	5,97	2	15,43	3	19,68	1	7,38	8	48,46
<i>Pelates quadrilineatus</i>	21	97,01	43	327,1	38	285,2	10	75,53	112	784,76
<i>Canthigaster solandri</i>	0	0	1	4,67	0	0	0	0	1	4,67
TOTAL	199	1820	162	2663	135	1877	37	516,1	533	6876,04

TABLE 3 - List of species obtained Station II. **N** - number of individuals, **B** - biomass (g).
(☾ - first quarter of the moon; ● - full moon; ☽ - third quarter of the moon; ○ - new moon).

	Banco da Sangala								Ind/sp	Biom/sp
	12.7.93 ☾		18.7.93 ●		28.7.93 ☽		31.7.93 ○			
	N	B	N	B	N	B	N	B		
<i>Antennarius pictus</i>	0	0	0	0	1	122	0	0	1	122
<i>Apogon nigripinnis</i>	0	0	2	23,7	0	0	0	0	2	23,7
<i>Aeoliscus punctulatus</i>	0	0	2	5,94	2	6	5	17,71	9	29,65
<i>Chaetodon auriga</i>	0	0	0	0	2	6	2	9,46	4	15,46
<i>Cynoglossus lachneri</i>	0	0	0	0	1	17,73	0	0	1	17,73
<i>Lophodiodon calori</i>	0	0	0	0	1	13,48	1	35,94	2	49,42
<i>Pletorhinchus flavomaculatus</i>	0	0	1	11,89	0	0	0	0	1	11,89
<i>Cheilio inermes</i>	0	0	1	150	0	0	0	0	1	150
<i>Novaculichthys macrolepidopus</i>	0	0	12	213,33	0	0	0	0	12	213,33
<i>Pteragogus flagellifer</i>	0	0	9	23,98	0	0	1	25,55	10	49,53
<i>Stethojulis interrupta</i>	1	3,06	0	0	13	45,89	0	0	14	48,95
<i>Lethrinus hypselopterus</i>	0	0	1	14,25	7	83,61	0	0	8	97,86
<i>Lethrinus rubrioperculatus</i>	0	0	0	0	4	13,93	0	0	4	13,93
<i>Lutjanus fulviflamma</i>	0	0	0	0	5	98	0	0	5	98
<i>Paramonocanthus barnardi</i>	3	10,19	39	323,18	13	97,47	25	255,42	80	686,26
<i>Lactoria cornuta</i>	0	0	0	0	0	0	1	25,99	1	25,99
<i>Papilloculiceps longiceps</i>	0	0	1	126	0	0	0	0	1	126
<i>Platycephalus indicus</i>	0	0	0	0	1	245	0	0	1	245
<i>Sorsogona prionata</i>	0	0	1	18,72	0	0	2	70,93	3	89,65
<i>Plotosus lineatus</i>	0	0	0	0	2	161,24	0	0	2	161,24
<i>Chrysiptera annulata</i>	1	10,19	1	3,69	1	3,71	1	1,89	4	19,48
<i>Calotomus spinidens</i>	0	0	1	20,54	1	28,6	4	88,95	6	138,09
<i>Leptoscarus vaigiensis</i>	3	93	9	254,78	5	156,03	1	32,78	18	536,59
<i>Scarus tricolor</i>	0	0	0	0	0	0	1	19,1	1	19,1
<i>Parascorpaena mossambica</i>	0	0	1	25,19	0	0	0	0	1	25,19
<i>Scorpaenopsis gibbosa</i>	0	0	1	8,51	0	0	0	0	1	8,51
<i>Siganus sutor</i>	2	59,31	15	222,12	8	118,28	5	81,01	30	480,72
<i>Hippocampus camelopardalis</i>	0	0	6	29,01	0	0	0	0	6	29,01
<i>Hippocampus histrix</i>	0	0	0	0	1	2,67	0	0	1	2,67
<i>Hippocampus kuda</i>	0	0	1	9,48	0	0	0	0	1	9,48
<i>Syngnathoides biaculeatus</i>	1	13,37	0	0	7	61,83	6	45,79	14	120,99
<i>Saurida gracilis</i>	0	0	0	0	1	24,24	0	0	1	24,24
<i>Pelates quadrilineatus</i>	4	23,82	1	12,76	0	0	1	34,04	6	70,62
<i>Arothron immaculatus</i>	1	18,2	0	0	0	0	0	0	1	18,2
<i>Ablabys binotatus</i>	0	0	0	0	0	0	3	74,42	3	74,42
TOTAL	16	231,14	105	1497,1	76	1305,7	59	818,98	256	3852,9

TABLE 4 - List of species obtained at Station III. **N** - number of individuals, **B** - biomass (g). (☾ - first quarter of the moon; ● - full moon; ☽ - third quarter of the moon; ○ - new moon).

	Saco da Inhaca									
	10.7.93 ☾		17.7.93 ●		25.7.93 ☽		31.7.93 ○		Ind/sp	Biom/sp
	N	B	N	B	N	B	N	B		
<i>Apogon nigripinnis</i>	5	69,06	0	0	4	55,31	0	0	9	124,37
<i>Foa brachygramma</i>	16	32,8	11	18,71	24	33,71	13	24,17	64	109,39
<i>Petroscirtes breviceps</i>	3	23,06	3	17,14	1	10,74	0	0	7	50,94
<i>Bothus pantherinus</i>	1	0,63	0	0	0	0	0	0	1	0,63
<i>Pseudorhombus arsius</i>	1	96	0	0	0	0	0	0	1	96
<i>Aeoliscus punctulatus</i>	0	0	3	11,41	0	0	0	0	3	11,41
<i>Chaetodon auriga</i>	0	0	0	0	3	22,41	0	0	3	22,41
<i>Cynoglossus durbanensis</i>	1	27,71	0	0	0	0	0	0	1	27,71
<i>Amblygobius albimaculatus</i>	0	0	0	0	1	31,28	0	0	1	31,28
<i>Amblygobius sphynx</i>	2	145,93	0	0	0	0	1	16,53	3	162,46
<i>Vanderhorstia delagoae</i>	1	-	0	0	0	0	0	0	1	-
<i>Pletorhinchus flavomaculatus</i>	0	0	0	0	1	23,94	0	0	1	23,94
<i>Cheilio inermes</i>	0	0	0	0	0	0	1	86,74	1	86,74
<i>Pteragogus flagellifer</i>	0	0	0	0	3	37,07	0	0	3	37,07
<i>Stethojulis interrupta</i>	1	3,52	1	2,33	3	6,52	3	11,93	8	24,3
<i>Stethojulis strigiventer</i>	1	3,44	0	0	0	0	0	0	1	3,44
<i>Lethrinus lentjan</i>	11	69,59	2	10,57	2	5,35	7	23,6	22	109,11
<i>Lethrinus nebulosus</i>	0	0	1	12,62	0	0	2	15,77	3	28,39
<i>Lethrinus variegatus</i>	1	7,01	0	0	3	13,6	6	11,77	10	32,38
<i>Lutjanus fulviflamma</i>	2	25,78	0	0	0	0	1	22,7	3	48,48
<i>Paramonocanthus barnardi</i>	1	6,44	0	0	1	9,56	0	0	2	16
<i>Parapercis xanthozona</i>	1	19,6	0	0	0	0	0	0	1	19,6
<i>Parupeneus indicus</i>	0	0	0	0	1	2,96	0	0	1	2,96
<i>Nemipterus bipuntatus</i>	13	-	0	0	0	0	0	0	13	-
<i>Papilloculiceps longiceps</i>	1	98	0	0	0	0	0	0	1	98
<i>Platycephalus indicus</i>	2	328,6	1	57,48	0	0	0	0	3	386,08
<i>Sorsogona prionata</i>	6	75,75	2	106,33	3	80,34	5	86,05	16	348,47
<i>Plotosus lineatus</i>	12	2,2	0	0	0	0	0	0	12	2,2
<i>Dascyllus trimaculatus</i>	0	0	0	0	0	0	1	5,97	1	5,97
<i>Calotomus spinidens</i>	1	-	0	0	0	0	3	35,55	4	35,55
<i>Leptoscarus vaigiensis</i>	6	1,29	2	1,27	1	2,16	5	72,81	14	77,53
<i>Scarus tricolor</i>	1	4,98	2	2,77	4	12,5	0	0	7	20,25
<i>Dendrochirus brachypterus</i>	0	0	0	0	2	7,94	0	0	2	7,94
<i>Parascorpaena mossambica</i>	9	103,03	2	22,74	0	0	3	18,98	14	144,75
<i>Epinephelus marginatus</i>	1	56,39	0	0	0	0	0	0	1	56,39
<i>Siganus sutor</i>	9	86,15	2	22,74	0	0	5	57,26	16	166,15
<i>Solea bleekeri</i>	1	21,23	0	0	0	0	0	0	1	21,23
<i>Crenidens crenidens</i>	2	25,76	1	12,47	0	0	0	0	3	38,23
<i>Hippocampus camelopardalis</i>	0	0	1	1,96	0	0	0	0	1	1,96
<i>Syngnathoides biaculeatus</i>	2	5,99	1	5,12	0	0	0	0	3	11,11
<i>Saurida gracilis</i>	4	36,36	1	10,12	0	0	2	33,77	7	80,25
<i>Ablabys binotatus</i>	0	0	0	0	0	0	1	7,97	1	7,97
TOTAL	118	1376,3	36	315,78	57	355,39	59	531,6	270	2579,04

TABLE 5 - Numbers of species and individuals, and corresponding biomass (in grammes) obtained in each sample (10 min trawl); values of diversity indice (H') and evenness calculated for species abundance and biomass.

	Est. Biologia		Sangala	Saco
	Day	Night		
N.º of species	25	32	35	42
N.º individuals	229	531	255	267
Biomass (g)	2247,4	5545,86	3740,7	2573,8
Diversity (H'n)	2,42	2,51	2,66	3,01
Diversity (H'w)	2,43	2,47	2,83	3,08
Evenness (En)	1,34	1,49	1,85	1,71
Evenness (Ew)	0,65	0,67	0,67	0,69

TABLE 6 - Proportion (%) of juveniles and adults at the three stations.

	Estação de Biologia Marinha (I)		Banco de Sangala (II)	Saco da Inhaca (III)	Total
	Day	Night			
Adults (%)	65.1	42.96	56.64	45.42	50.15
Juvenils (%)	34.9	57.04	43.36	54.58	49.85

TABLE 7 - Contribution of the three trophic categories in terms of species numbers (sp), relative abundance (% N) and relative biomass (% W) at the three sampled localities, and of three prominent species.

	Estação de Biologia (Station I)						Sangala (Station II)			Saco (Station III)			Total		
	Day			Night			sp	%N	%B	sp	%N	%B	sp	%N	%B
	sp	%N	%B	sp	%N	%B									
Carnivorous	16	62,9	43,6	21	58,4	46,7	27	45,1	50	42	79,6	83,2	49	60,9	53,2
Herbivorous	6	14,4	37,7	6	25,4	45,1	5	23	31	6	18,1	13,8	9	21,3	35,3
Omnivorous	3	23,1	18,7	3	16,6	8,2	3	31,9	19	3	2,2	2,9	7	17,7	11,4
<i>L. vaigiensis/Herbivorous</i>	-	27,3	69	-	13,3	52	-	30,5	44,9	-	28,6	21,7	-	21,4	51
<i>S. sutor/ Herbivorous</i>	-	27,3	6,5	-	70,4	41,1	-	50,8	40,3	-	32,6	46,6	-	53,6	36,2
<i>P. barnardi/Omnivorous</i>	-	96,2	90,9	-	97,7	97,8	-	97,6	94	-	33,3	21,7	-	95,6	91,5

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