

5.4.4 The result of zooplankton analysis

(ind./m³)

No	Species	No.2	No.3	No.6	No.7	No.10	No.14	No.15	No.18	No.22	No.25
1	Pleurobranchia sp.	108.3	1.5	17.9		0.7					
2	Larva of Gastropoda	2.1									
3	Veliger larvae								2.1		
4	Larva of Balanus										
5	Polychaeta				0.8						
6	Evadne tergestina						2.8	5.0		7.1	58.3
7	Evadne nordmanni									1.2	
8	Penilia schmackeri										
9	Canthocalanus pauper							15.0			
10	Acrocalanus gibber			14.3			41.7	27.5	2.1	8.3	
11	Eucalanus subcrassus						16.7	27.5		10.7	
12	Eucalanus crassus						2.8	5.0			
13	Paracalanus parvus									2.4	16.7
14	Paracalanus crassirostris	4.2						32.5	2.1		
15	Paracalanus aculeatus			3.6			83.3	67.5		13.1	
16	Clausocalanus furcatus									4.8	
17	Scolecithrix sp.							2.5			
18	Metacalanus aurivili							2.5			
19	Centropages furcatus							2.5			
20	Temora turbinata			3.6			9.7	2.5		1.2	
21	Labidocera euchaeta							5.0		2.4	8.3
22	Labidocera bipinna						1.4				
23	Labidocera pavo										4.2
24	Labidocera minuta										33.3
25	Acartia erythraea	8.3						2.5		6.0	8.3
26	Acartia clausi							22.5		1.2	4.2
27	Acartia pacifica		0.5	114.3	5.0		12.5	10.0			137.5
28	Acartiella sinensis	6.3		10.7	2.5				4.2		
29	Tortanus gracilis			3.6			1.4	1.4	2.5		11.9
30	Schmackeria gordioides										
31	Pseudodiaptomus incisus						1.4				
32	Oithona flumifera					0.7		2.5	4.2		
33	Corycaeus andrewsi						1.4			0.0	
34	Chlorotocella sp.		1.5	17.9	1.7			7.5		3.6	12.5
35	Post larva Penaeidae						5.6	2.5		6.0	4.2
36	Megalopa									0.0	
37	Zoea brachyura	2.1		3.6	2.5		6.9	2.5		14.3	33.3
38	Copepodid		0.5							2.4	
39	Pisidia sp.						1.4	2.5			
40	Lucifer typus							2.5			
41	Lucifer hasenii	4.2		10.7	6.7		2.8	5.0			
42	Alpheidae	10.4	5.5	3.6	0.8	1.4	5.6	2.5		2.4	58.3
43	Sagitta enflata									1.2	
44	Sagitta delicata					1.4	1.4	2.5	2.1	2.4	29.2
45	Oikopleura russecens						2.8	5.0	2.1	1.2	16.7
46	Gobiidae	2.1			0.8						4.2
	Total	148.0	9.5	203.8	20.8	5.6	201.6	267.5	18.9	103.8	429.2
	Number of species	9	5	11	8	5	18	26	7	22	15

5.5 ZOOBENTHOS

5.5.1 List of zoobenthos

5.5.1a. List of zoobenthos in mangrove swamps

No	Taxon	Sites	1	2	3	4	5	6	7	8	9
	Phylum Annelida										
	Class Polychaeta										
	Aphroditidae										
1	<i>Eupanthalis tubifex</i> (Ehlers)						+				
2	<i>Eupanthalis</i> sp.	*									
3	<i>Hololepidella</i> sp.						+				
4	<i>Iphione muricata</i> Savigny	*									
5	<i>Leanira japonica</i> McIntosh	*									
6	<i>Lepidonotus</i> sp.	*									
	Fam. Eunicidae										
7	<i>Onuphis holobranchiata</i> Mar.	*									
8	<i>O. eremita</i> Aud. & M. Edw.	*									
9	<i>Eunice</i> sp.				+						
	Fam. Nereidae										
10	<i>Neanthes capensis</i> Willey		+		+						
11	<i>Tylothynchus heterochaetus</i> Q.				+						
	Fam. Amphinomididae										
12	<i>Paramphinome indica</i> Fauvel	*									
13	<i>Chloecia parva</i> Baird	*									
14	<i>Amphinome indica</i> Fauvel	*									
15	<i>Furythoe parvecarunculata</i> Horst			+	+			+			
	Fam. Chrysopetalidae										
16	<i>Bhawmia cryptocephala</i> Gravier	*									
	Fam. Nephthydidae										
17	<i>Nephtys inermis</i> Ehlers	*									
18	<i>N. dibranchis</i> Gruber	*									
	Fam. Hesionidae										
19	<i>Leocrates diplognathus</i> Mouro	*									
	Fam. Glyceridae										
20	<i>Glycera rouxii</i> Aud. & Edw.					+					
	Fam. Ampharetidae										
21	<i>Amage biloculata</i> (Moore)	*									
22	<i>Amage</i> sp.	*									
23	<i>Melilopsis</i> sp.	*									
	Fam. Maldanidae										
24	<i>Axiothella</i> sp.	*									
	Fam. Spionidae										
25	<i>Scoelepis</i> sp.	*									
	Fam. Ophellidae										
26	<i>Polyopthalmus pictus</i> (Dujardin)	*									
27	<i>Armandia leptochiris</i> Grube	*									
	Fam. Aricidae										
28	<i>Aricia exaramata</i> Fauvel	*									
29	<i>Scoloplos marsupialis</i> Southern	*									
	Order Sedentaria										
	Fam. Terebellidae										

No	Taxon	Sites	1	2	3	4	5	6	7	8	9
30	<i>Loimia medusa</i> (Savigny)	*									
31	<i>Polycirus</i> sp.	*									
32	<i>Terebellides stroemi</i> Sars	*									
	Fam. Owenidae										
33	<i>Owenia fusiformis</i> D.- Chiaje						+				
	Fam. Sabellidae										
34	<i>Sabellastarte indica</i> Savigny	*									
	Fam. Capitellidae										
35	<i>Capitellethus</i> sp.			+							
36	<i>Heteromastides</i> sp.					+					
	Fam. Chloracmida										
37	<i>Stylaroides</i> sp.	*									
	Fam. Sternaspidae										
38	<i>Sternaspis scutata</i> Ranzani	*									
	Class Sipunculoidea										
	Fam. Sipunculidae										
39	<i>Sipunculus</i> sp.		+	+		+					
40	<i>Phascolosoma</i> sp.			+			+	+			
	Phylum Arthropoda										
	Class Crustacea										
	Order Cirripedia										
	Fam. Balanidae										
41	<i>Balanus amphitritae</i> Darwin			+	+	+			+	+	+
42	<i>Balanus</i> sp.	*									
	Fam. Chthamalidae										
43	<i>Chthamalus</i> sp.	*									
	Order Decapoda										
	Suborder Macrura										
	Fam. Penaeidae										
44	<i>Penaeus merguensis</i> de Man		+	+							
45	<i>P. monodou</i> Fabricius		+	+							
46	<i>Metapenaeus ensis</i> (de Haan)		+	+							
	Fam. Alpheidae										
47	<i>Alpheus</i> sp.		+	+							
	Fam. Portunidae										
48	<i>Chrybdis helleri</i> (A. M. Edw.)	*									
49	<i>Scylla serrata</i> Forskal			+							
	Fam. Xanthidae										
50	<i>Lydia annulipes</i> (H.M. - Edw.)	*									
	Fam. Ocypodidae										
51	<i>Heteropanope glabra</i> Stimpson	*									
52	<i>Camptandrium sexdentatum</i> St.			+							
53	<i>Hyoplax deschampsii</i> (Rathbun)			+	+			+			
54	<i>H. Formosensis</i> Rathbun	*									
55	<i>H. serrata</i> Shen	*									
56	<i>H. Tansuensis</i> Sakai	*									
57	<i>Cleistostoma dilatatum</i> de Haan			+							
58	<i>Paracleistostoma</i> sp.	*									
59	<i>Macrophthalmus erato</i> de Man	*									

No	Taxon	Sites	1	2	3	4	5	6	7	8	9
60	<i>Macrophthabius</i> sp.					+	+				
61	<i>Uca marionis</i> Desmarest	*									
62	<i>Uca arcuata</i> de Haan	*									
63	<i>Uca dussumieri</i> H.M.- Edw.	*									
64	<i>Uca</i> sp.		+								
65	<i>Dotilla witchmani</i> de Man				+						
	Fam. Mictyridae										
66	<i>Mictyris longicarpus</i> Latreille				+						
	Fam. Grapsidae										
67	<i>Gaetice depressus</i> (de Haan)	*									
68	<i>Hemigrapsus</i> sp.	*									
69	<i>Metoplax sheni</i> Gordon								+		
70	<i>M. longipes</i> Stimpson			+			+	+			
71	<i>Metopograpsus messor</i> (Forsk.)	*									
72	<i>M. quadridentatus</i> Stimpson		+		+					+	
73	<i>Varuna litterata</i> (Fabricius)	*									
74	<i>Sesarma (P.) plicata</i> (Latreille)								+		
75	<i>S. (P.) bideus</i> (de Haan)		+								
76	<i>Helice tridens</i> Shen	*									
	Pinnotheridae										
77	<i>Xenophtamus</i> sp.	*									
78	<i>Pinixa tumida</i> Stimpson	*									
	Suborder Anomura										
	Fam. Paguridae										
79	<i>Pagurus</i> sp.			+				+			
	Order Stomatopoda										
	Fam. Squillidae										
80	<i>Squilla</i> sp.	*									
	Phylum Mollusca										
	Class Gastropoda										
	Order Archegastropoda										
	Fam. Trochidae										
81	<i>Clanculus denticulatus</i> (Gray)	*									
	Fam. Turbinidae										
82	<i>Lunella coronata granulata</i> (Gm.)	*									
	Fam. Neretidae										+
83	<i>Nerita (Theiosylla) albicilla</i> Linne	*									
84	<i>N. (Ritena) yoldi</i> Recluz.	*									
85	<i>N. (R.) striata</i> Burrow.	*									
86	<i>N. planospira</i> Anton	*									
87	<i>N. polita</i> Linne	*									
88	<i>Clithon sowerbianus</i> Recluz	*									
89	<i>C. retropictus</i> (V. Martens)	*									
90	<i>C. oualaniensis</i> (Lesson)					+					
	Order Mesogastropoda										
	Fam. Viviparidae										
91	<i>Bellamyia</i> sp.	*									
92	<i>Cipangopaludina chinensis</i> (Gray)						+				
	Fam. Littorinidae										

No	Taxon	Sites	1	2	3	4	5	6	7	8	9
93	<i>Littorinopsis intermedia</i> (Ph.)		+								
94	<i>L. scabra</i> (L.)	*									
95	<i>L. coccinea</i> (Gmelin)	*									
96	<i>L. undulata</i> Gray	*									
	Fam. Hydrobiidae										
97	<i>Bithynia ussuriensis</i> But. et Th.	*									
98	<i>Alocinma longicornis</i> (Beuson)	*									
	Fam. Turritellidae										
99	<i>Turritella terebra</i> (L.)	*									
	Fam. Architectonicidae										
100	<i>Architectonica</i> sp.	*									
	Fam. Potamididae										
101	<i>Cerithidea microptera</i> (Kiener)					+					
102	<i>C. cingulata</i> (Gmelin)		+	+	+		+		+		
103	<i>C. ornata</i> (A. Adams)	*									
104	<i>C. rhizophorarum</i> A. Adams	*									
105	<i>C. sinensis</i> Philippi				+						
106	<i>Batillaria zonalis</i> (Brugiere)	*									
107	<i>Terebraria sulcata</i> (Born)	*									
108	<i>Cerithidea</i> sp.	*									
	Fam. Planaxidae										
109	<i>Planaxis sulcatus</i> (Born)									+	
	Fam. Cerithiidae										
110	<i>Clypeomorus trailli</i> (Sowerby)	*									
111	<i>Cl. bifasciatus</i> (Sowerby)								+		
112	<i>Cl. pellucida</i> H. & J.	*									
113	<i>Cerithium minutum</i> Sowerby	*									
114	<i>C. sinense</i> (Gmelin)	*									
	Fam. Melanidae										
115	<i>Melanoides tuberculata</i> (Müller)			+							
	Fam. Strombidae										
116	<i>Strombus isabella</i> Lam.	*									
	Cancellariidae										
117	<i>Cancellaria</i> sp.	*									
	Fam. Solaridae										
118	<i>Solarium</i> sp.	*									
	Fam. Nassariidae										
119	<i>Nassarius pullus</i> L.	*									
120	<i>N. gaudiosus</i> (Hinds)				+						
121	<i>N. olivaceus</i> Brug.	*									
122	<i>N. margaritiferus</i> Dunker	*									
	Fam. Mitridae										
123	<i>Mitra retusa</i> Lamarck				+						
	Order Neogastropoda										
	Fam. Nassidae										
124	<i>Nassa succincta</i> Adams	*									
	Fam. Muricidae										
125	<i>Murex trapa</i> Roding	*									
126	<i>Thais trigona</i> (Reeve)	*									

No	Taxon	Sites	1	2	3	4	5	6	7	8	9
		Fam. Costellariidae									
127	<i>Vexillum aureolatum</i> (Reeve)				+						
		Fam. Fasciolaridae									
128	<i>Peristernia incarnata</i> (Kiener)	*									
		Fam. Volutidae									
129	<i>Fulgoraria rupestris</i> (Gmelin)	*									
		Order Opisthobranchia									
		Fam. Umbraculidae									
130	<i>Umbraculum</i> sp.	*									
		Class Bivalvia									
		Order Filibranchia									
		Fam. Arcidae									
131	<i>Anadra subcrenata</i> Lischke	*									
132	<i>A. inflata</i> (Reeve)	*									
133	<i>Arca (Barbatia) fusca</i> Bruguiere.									+	
		Fam. Mytilidae									
134	<i>Brachydontes curvatus</i> (Dunker)	*									
135	<i>Br. emarginatus</i> (Benson)	*									
136	<i>Br. senhousei</i> (Benson)					+					
137	<i>Br. japonicus</i> (Dunker)					+					
138	<i>Modiolus atrata</i> (Lischke)	*									
139	<i>Septifer bilocularis</i> (Linne)									+	
		Fam. Pteriidae									
140	<i>Pteria martensii</i> (Dunker)	*									
		Fam. Lucinidae									
141	<i>Lucina edentula</i> Linne			+							
		Fam. Anomyidae									
142	<i>Placuna sella</i> (L.)	*									
143	<i>Pl. placenta</i> (L.)	*									
		Fam. Ostreidae									
144	<i>Ostrea echinata</i> Q. & G.	*									
145	<i>O. glomerata</i> Gould									+	
146	<i>O. cucullata</i> Born					+					
147	<i>O. delslamellosa</i> Lischke	*									
148	<i>Ostrea mordax</i> Gould					+					
		Order Eulamellibranchia									
		Fam. Cardidae									
149	<i>Cardium</i> sp.	*									
		Fam. Psammobidae									
150	<i>Asaphis dichotoma</i> Anton	*									
151	<i>Sanguinolaria</i> sp.	*									
		Fam. Veneridae									
152	<i>Anomalodiscus squamosa</i> (L.)					+					
153	<i>Anomalocardia flexuosa</i> (Linne)					+					
154	<i>Paphia malabarica</i> (Chemnitz)	*									
155	<i>Gafrarium divaricatum</i> (Cb.)	*									
156	<i>Katelysia rimularis</i> (Lam.)	*									
157	<i>Venus (Clausinella) isabellina</i> Philippi					+					
158	<i>Gonphina aequilatera</i> (Sowerby)						+				

No	Taxon	Sites	1	2	3	4	5	6	7	8	9
159	<i>Dosinia laminata</i> (Reeve)				+						
160	<i>Dosinia japonica</i> Reeve										
		Fam. Semellidae									
161	<i>Semele crenulata</i> (Sowerby)										
		Fam. Donacidae									
162	<i>Donax faba</i> Gmelin				+						
		Fam. Tellinidae									
163	<i>Tellina</i> sp.										
164	<i>Arcopagia</i> sp.										
		Fam. Glaucomyidae									
165	<i>Glaucomya chinensis</i> (Gray)										
		Fam. Mactridae									
166	<i>Mactra antiquata</i> Spengler							+			
		Fam. Teredinidae									
167	<i>Bankia saulii</i> (Wright)										
168	<i>Teredo manni</i> (Wright)										
		Fam. Laternulidae									
169	<i>Laternula truncata</i> (Lamarck)		+	+		+					

Note: Numbers of sites 1.....9 equal with the points of I... IX
 - With mark + : Recorded species in JICA project survey
 - With mark * : Past recorded species

5.5.1b. List of zoobenthos in coral reefs

No	Taxon	Sites	3	4	5	6	7	8	10	11	12	15
	Phylum Annelida											
	Class Polychaeta											
	Fam. Aphroditidae											
1	<i>Lepidonotus carinulatus</i> Grube		+	+	+	+			+	+		+
2	<i>L. melanogrammus</i> Haswell						+					
	Fam. Nereidae											
3	<i>Nereis onychophora</i> Horst		+									
4	<i>Nereis jacksoni</i> Kinberg							+				
5	<i>N. longilingulis</i> Monro					+				+		
6	<i>Perinereis nigropunctata</i> Horst			+							+	
	Fam. Eunicidae											
7	<i>Eunice antennata</i> Savigny		+									+
8	<i>Eunice siciliensis</i> Grube		+		+					+		+
9	<i>E. gracilis</i> Crossland								+			
10	<i>Drilonereis filum</i> Claparedi							+				
11	<i>Drilonereis</i> sp.								+			
12	<i>Lysidice collaris</i> Grube			+	+					+		+
13	<i>Eunice</i> sp.			+								
14	<i>Marphysa fallax</i> Mar & Bobr.				+					+		
15	<i>M. stragulum</i> Grube									+		
	Fam. Hesionidae											
16	<i>Leocrates claparedii</i> (Costa)							+				+
	Fam. Syllidae											
17	<i>Syllis (Haplosyllis) spongicola</i> Grube		+									
	Fam. Chrysopetalidae											
18	<i>Chrysopetalum ehlersi</i> Gravier			+							+	
	Fam. Sabellidae											
19	<i>Branchionma cingulata</i> (Grube)		+			+						
20	<i>Ditrupa arietina</i> O.F. Muller			+								

No	Taxon	Sites	3	4	5	6	7	8	10	11	12	15
21	<i>Dasychone cingulata</i> Grube			+								
22	<i>Laonome indica</i> Southern				+							
23	<i>Hipsiconus phaeotaenia</i> (Schmarda)				+							
24	<i>Potamilla leptochaeta</i> Southern									+		
25	<i>Sabella</i> sp. Fam. Chloraemidae									+		
26	<i>Stylaroides parmatus</i> Grube Fam. Terebellidae			+	+			+			+	
27	<i>Pista</i> sp. Fam. Serpulidae								+			
28	<i>Spirobranchus giganteus</i> (Pallas)				+				+			
29	<i>Protula</i> sp.						+					
30	<i>Serpula vermicularis</i> Linnaeus Phylum SIPUNCULIA Sipunculoida Fam. Sipunculidae										+	
31	<i>Sipunculus</i> sp. Phylum ARTHROPODA Class Crustacea Order Isopoda Order Decapoda Suborder Anomura					+				+		
32	<i>Galathea</i> sp. Suborder Macrura Fam. Alpheidae		+	+				+				
33	<i>Alpheus</i> sp.		+	+							+	
34	<i>Synalpheus</i> sp. Fam. Hippolitidae		+	+		+		+	+	+		
35	<i>Hippolyte</i> sp. Fam. Palaemonidae							+				
36	<i>Palaemon</i> sp. Suborder Brachyura Fam. Pinnotheridae			+								
37	<i>Pinnotheres cyclinus</i> Shen		+									
38	<i>Pinnotheres affinis</i> Fam. Xanthidae					+						
39	<i>Epixanthus frontalis</i> (H. M. Edw.)	*										
40	<i>Pilumnopus makiana</i> (Rathbun)	*										
41	<i>Heteropanope glabra</i> Stimpson	*										
42	<i>Ozius</i> sp.	*										
43	<i>Etisus laevimanus</i> Randal	*										
44	<i>Daira perlata</i> Herbst		+									
45	<i>Pilumnus</i> sp.					+	+					
46	<i>P. spinulus</i> Shen										+	
47	<i>Leptodiis exaratus</i> (H. M. Edw.) Fam. Grapsidae								+	+		
48	<i>Metropograpsus quadridentatus</i> Stimpson Fam. Portunidae						+					
49	<i>Thalamita crenata</i> Latreille Phylum Mollusca Class Gastropoda Fam. Trochidae										+	
50	<i>Trochus (Tectus) pyramis</i> Born	*										
51	<i>T. maculatus</i> Linne	*										
52	<i>Monodonta labio</i> (Linne)	*										

No	Taxon	Sites	3	4	5	6	7	8	10	11	12	15
53	<i>Umbonium vestiarum</i> (Linne)								+			
	Fam. Valvatidae											
54	<i>Valvata cristata</i> Muller	*										
	Fam. Trichotropidae											
55	<i>Trichotropis isignis</i> Midd.									+		
	Fam. Mitridae											
56	<i>Mitra coffea</i> Sch. & W.	*										
	Fam. Cypridae											
57	<i>Cypraea felina</i> Gmelin	*										
	Fam. Conidae											
58	<i>Comus textile</i> Linne	*										
	Fam. Costellariidae											
59	<i>Vexillum aureolatum</i> (Reeve)		+									
	Fam. Potamididae											
60	<i>Batillaria zonalis</i> (Brugiere)							+				
	Fam. Strobidae											
61	<i>Strombus isabella</i> Lam.	*										
	Muricidae											
62	<i>Morula magnifera</i> (Severby)	*										
63	<i>Chicoreus torrefactus</i> (Severby)	*										
	Fam. Pissurellidae											
64	<i>Diodora mus</i> (Reeve)					+						
	Class Bivalvia											
	Fam. Arcidae											
65	<i>Arca (Arca) ventricosa</i> Lamarek		+			+		+				
66	<i>Arca (Barbatia) decussata</i> Sowerby				+	+			+	+		+
67	<i>Arca (Arca) navicularis</i> Brugiere							+				
68	<i>Arca subcrenata</i> Lischke						+					
	Fam. Mytilidae											
69	<i>Modiolus barbatus</i> (Linne)		+								+	
70	<i>Modiolus (Amygdalum) watsoni</i> E. A. Smith			+		+	+					
71	<i>Lithophaga malaccana</i> Reeve		+	+	+	+	+	+	+	+	+	+
72	<i>L. zitteliana</i> Dunker								+			
73	<i>L. teres</i> (Philippi)		+	+	+	+	+	+	+		+	+
74	<i>L. (Botula) cinnamomina</i> (Chemnitz)				+					+	+	
75	<i>Lithophaga (Leiosolenus) curta</i> Lischke								+			
76	<i>L. lima</i> (Jousseanume)									+		
77	<i>Septifer bilocularis</i> (Linne)								+			
	Fam. Pectinidae											
78	<i>Chlamys nobilis</i> (Reeve)	*										
	Fam. Pinnidae											
79	<i>Pinna pectinata</i> Linne	*										
	Fam. Vulsellidae											
80	<i>Pedalion quadrgularis</i> (Reeve)		+					+				
81	<i>Pedalion legumen</i> (Gmelin)		+									+
82	<i>P. serratula</i> (Reeve)											+
	Fam. Chamidae											
83	<i>Chama refelexa</i> Reeve	*										
84	<i>C. dunkeri</i> Lischke	*										
	Fam. Tellinidae											
85	<i>Tellina perna</i> Spengler											+
86	<i>Chlamys nibilis</i> (Reeve)		+									
	Fam. Gastrochaenidae											
87	<i>Gastrochaena cuneiformis</i> Spengler		+	+		+		+		+	+	+
	Fam. Pholadidae											

No	Taxon	Sites	3	4	5	6	7	8	10	11	12	15
88	<i>Pholadidea (Caliptopholas) -cheveyi</i> Lamy						+					
89	<i>Barnea (Anchomasa) fragilis</i> Sowerby					+						+
90	<i>Barnea</i> sp. Fam. Laternulidae					+						
91	<i>Laternula truncata</i> (Lamarck)		+				+				+	+
92	<i>L. valenciennesii</i> Reeve Phylum Echinodermata Fam. Ophiactidae							+				
93	<i>Ophiactis savignyi</i> (Müller et Troschel)		+	+							+	
94	<i>O. affinis</i> Duncan		+					+				
95	<i>O. modesta</i> Brok				+			+				
96	<i>O. definata</i> Koehler Fam. Ophiotrichidae										+	
97	<i>Ophiotrix signata</i> Koehler Fam. Amphiuroidae		+									
98	<i>Amphioplus impressus</i> (Lj.) Fam. Ophiolpididae			+							+	
99	<i>Amphiura koreae</i> Duncan								+			

Note:

- With mark + : Recorded species in JICA project survey

- With mark * : Past recorded species

5.5.1c. List of zoobenthos in sublittoral zone in soft bottom

No	Taxon	Sites	2	3	6	7	10	14	15	18	22	25
	Phylum Annelida											
	Class Polychaeta											
	Fam. Aphroditidae											
1	<i>Polydortes melanonotus</i> (Grube)		+									
2	<i>Sihnelais</i> sp. Fam. Eunicidae	*										+
3	<i>Hyalinoecia tubicola</i> O.F.Müller	*										+
4	<i>Lumbriconereis simplex</i> Southern						+					
5	<i>Onuphis conchylega</i> Sars							+				
6	<i>O. holobranchiata</i> Marenzeller										+	
7	<i>Marphysa stragulum</i> (Grube)		+					+		+		
8	<i>Drilonereis filum</i> Claparede			+		+				+		
9	<i>Drilonereis</i> sp.							+				
10	<i>Diopatra neapolitana</i> Delle Chiaje Fam. Chrysopetalidae	*										+
11	<i>Pseudoeurythoe paucibranchiata</i> F. Fam. Hesionidae	*										
12	<i>Podarke angustifrons</i> (Grube)		+									
13	<i>Leocrates</i> sp.			+								+
14	<i>Leocrates claparedii</i> (Costa) Fam. Amphinomididae						+					
15	<i>Notophyllum</i> sp.								+			
16	<i>Pseudoeurythoe paucibranchiata</i> Fauvel					+		+	+	+		+
17	<i>Pseudoeurythoe</i> sp. Fam. Phyllodocidae						+					
18	<i>Eteone</i> sp. Fam. Nephthydidae							+	+			
19	<i>Nephtys polybranchia</i> Southern			+		+	+	+	+	+		+
20	<i>N. oligobranchia</i> Southern Fam. Glyceridae	*										+

No	Sites	2	3	6	7	10	14	15	18	22	25
21	<i>Glycera lancadivae</i> Schmarda						+				
22	<i>G. sagittariae</i> McIntosh						+				
23	<i>G. longipinnis</i> Grube							+			
24	<i>G. prashadi</i> Fauvel *										+
	Fam. Aricidae										
25	<i>Scoloplos kergueliensis</i> McIntosh *										+
	Fam. Spionidae										
26	<i>Laonice</i> sp. *										
	Fam. Maldanidae					+					
27	<i>Asychis</i> sp.	+									
28	<i>Maldane sarsi</i> Malmgreni *										+
29	<i>Maldane</i> sp.		+				+	+			
	Fam. Ampharetidae										
30	<i>Amphicteis</i> sp. *										+
	Fam. Opheliidae										
31	<i>Annotrypane aulogaster</i> Rathke *							+			+
	Fam. Terebellidae										
32	<i>Lysilla</i> sp. *										+
33	<i>Terebellides stroemi</i> Sars		+				+				+
	Fam. Sternaspidae										
34	<i>Sternaspis scutata</i> Ranzi		+		+	+	+				+
	Fam. Chaetopteridae										
35	<i>Phyllochaetopterus</i> sp.		+				+				
	Phylum ARTHROPODA										
	Class Crustacea										
	Order Decapoda										
	Suborder Macrura										
	Fam. Alpheidae										
36	<i>Alpheus</i> sp.	+		+			+	+			
37	<i>Athanas</i> sp.	+									
	Fam. Pandalidae										
38	<i>Pandalidae</i> gen. sp.						+				
	Suborder Brachyura										
	Fam. Ocypodidae										
39	<i>Camptandrium sexdentatum</i> St.					+					
	Fam. Goneplacidae										
40	<i>Chasmocarcinops gelasimoides</i> Alcock						+	+		+	
41	<i>Carcinoplax vestitus</i> (de Haan)								+	+	+
	Fam. Portunidae										
42	<i>Portunus pelagicus</i> (Linne) *										
43	<i>P. tweedei</i> (Shen) *										
44	<i>Portunus</i> sp. *										
45	<i>P. hastatoides</i> Fabricius *										
46	<i>Charybdis helleri</i> (A. M. Edw) *										
47	<i>Ch. cruciata</i> (Herbst) *										
48	<i>Thalamita danae</i> Stimpson *										
49	<i>Th. gurjanovae</i> Tien *										
50	<i>Th. stimpsoni</i> A. M. Edw. *										
51	<i>Scylla serrata</i> Forskal *										
	Pinnotheridae										
52	<i>Xenophthalmus pinnotheroides</i> W. *										
	Fam. Leucosidae										
53	<i>Philyra carinata</i> Bell									+	
	Fam. Penacidae										
54	<i>Metapenaeopsis stridulans</i> Alcock *										
	Order Stomatopoda										
	Fam. Squillidae										

No	Sites	2	3	6	7	10	14	15	18	22	25
55	<i>Squilla latreilli</i> (Bydoux et Souleyet) *										+
	Class Scaphopoda										
	Fam. Dentaliidae										
56	<i>Dentalium aprinum</i> Linne		+	+	+		+	+			+
57	<i>D. elephantinum</i> Linne						+			+	
58	<i>D. octangulatum</i> Donovan					+			+	+	
59	<i>D. longirostrum</i> Reeve							+	+		
	Class Gastropoda										
	Fam. Architectonicidae										
60	<i>Helicis stramineus</i> (Gmelin)			+							+
61	<i>H. variegatus</i> (Gmelin)						+				
	Fam. Vanikoroidae										
62	<i>Vanikoro cancellata</i> (Lamarck)		+								
	Fam. Nassariidae										
63	<i>Nassarius margaritifera</i> Dunker		+								
	Fam. Mitridae										
64	<i>Mitra paupercula</i> (Linne)		+		+						
	Fam. Turritellidae										
65	<i>Turitella fasciata</i> Menke									+	
	Fam. Bullidae										
66	<i>Alys cylindricus</i> (Hebling)							+			
	Fam. Terebridae										
67	<i>Terebra dimidiata</i> (Linne)							+			
68	<i>Terebra</i> sp.		+							+	
	Fam. Valvatidae										
69	<i>Valvata cristata</i> Muler	+			+						+
70	<i>V. piscinalis</i> Muler	+									
	Class Bivalvia										
	Fam. Arcidae										
71	<i>Arca (Anadara) granosa</i> (L.)			+							
	Fam. Corbulidae										
72	<i>Corbula erythron</i> Lamarck						+				+
	Fam. Glaucomyidae										
73	<i>Glaucomya chinensis</i> (Gray)				+						
	Fam. Glymerididae										
74	<i>Glycymeris</i> sp.		+								
	Fam. Tellinidae										
75	<i>Tellina remies</i> Linne			+			+				
76	<i>T. rugosa</i> Born							+		+	
77	<i>T. virgata</i> Linne									+	
78	<i>T. jodoensis</i> Lischke		+							+	
79	<i>T. perna</i> Spengler		+				+	+			+
80	<i>T. forguna</i> Q. et G. *										+
	Fam. Psammobiidae										
81	<i>Sanguinolaria (Soletellina) diplos</i> (Linne)					+		+		+	
82	<i>Psammotaea elongata</i> Lamarck *										+
83	<i>Psammobia radiata</i> Philippi			+							
84	<i>Gouldia micronodulosa</i> Chuang *										+
	Fam. Veneridae										
85	<i>Autigona lamellaris</i> Schumacher				+						
86	<i>Cyclina sinensis</i> (Gmelin)						+		+		
87	<i>Tapes turgida</i> (Lamarck)						+			+	
88	<i>Dosinia (Phascosoma) aspera</i> (Reeve)						+				
89	<i>Gafrarium tumidum</i> Roding			+			+				+
90	<i>Paphia (Paratapes) undulata</i> (Born)			+		+					
91	<i>P. amabilis</i> (Philippi) *										
92	<i>Chione (Clausinella) isabellina</i>		+								+

No	Sites	2	3	6	7	10	14	15	18	22	25
	(Philippi)										
	Fam. Cuspidariidae										
93	<i>Cuspidaria nobilis</i> (A. Adams)		+			+	+	+		+	+
	Fam. Lucinidae										
94	<i>Codakia paytenorum</i> (Fredale)			+							
	Fam. Semeleidae										
95	<i>Semele cordiformis</i> (Halten)					+		+			
	Fam. Solenidae										
96	<i>Simonovacula constricta</i> (Lamarck)	*									
	Phylum Echinodermata										
	Fam. Ophiomyxidae										
97	<i>Ophiomyxa irregularis</i> Kochler							+			
98	<i>O. australis</i> Lutken	*									+
	Fam. Amphiuroidae										
99	<i>Ophiocera neglecta</i> Kochler								+		
100	<i>Ophiura micracantha</i> H. L. Clark						+				
101	<i>Amphipholis misera</i> Kochler						+				
102	<i>Amphioptus</i> sp.								+		
103	<i>Ophiophragmus japonicus</i> Matsumoto					+			+		
	Fam. Leganidae										
104	<i>Laganum depressum</i> Lesson							+			

Note: - With mark +: Recorded species in JICA project survey
- With mark *: Past recorded species

5.5.2 Inventory of zoobenthos in Ha Long bay

No	Taxon	Note
	Class Polychaeta	
	Fam. Aphroditidae	
1	<i>Eupanthalis tubifex</i> (Ehlers)	*
2	<i>Hololepidonella</i> sp.	*
3	<i>Iphione muricata</i> Savigny	*
4	<i>Leanira japonica</i> McIntosh	*
5	<i>Lepidonotus caninulatus</i> Grube	+
6	<i>L. melanogrammus</i> Haswell	+
7	<i>Lepidonotus</i> sp.	*
8	<i>Polyodontes melanonotus</i> (Grube)	+
9	<i>Sthenelais</i> sp.	+
10	<i>Eupanthalis</i> sp.	+
	Fam. Eunicidae	
11	<i>Diopatra neapolitana</i> Delle Chiaje	*
12	<i>Drilonereis filum</i> Claparede	*
13	<i>Drilonereis</i> sp ₁	*
14	<i>Eunice antennata</i> Savigny	*
15	<i>Eunice siciliensis</i> Grube	*
16	<i>E. gracilis</i> Crossland	*
17	<i>Eunice afra</i> var. <i>paupera</i> Grube	*
18	<i>Eunice</i> sp.	*
19	<i>Onuphis holobranchiata</i> Marenzeller	*
20	<i>O. eremita</i> Aud. & M. Edw.	*
21	<i>O. conchylega</i> Sarc	*

No	Taxon	Note
22	<i>Marphysa fallax</i> Mar & Bobr.	+
23	<i>M. stragulum</i> Grube	+
24	<i>Lysidice collaris</i> Grube *	+
25	<i>Hyalinoeia tubicola</i> O.F.Muller	+
26	<i>Lumbriconereis simplex</i> Southern	+
	Fam. Nereididae	
27	<i>Neanthes capensis</i> Willey	+
28	<i>Tylorhynchus heterochaetus</i> Q.	+
29	<i>Nereis onychophora</i> Horst	+
30	<i>Nereis jacksoni</i> Kinberg	+
31	<i>N. longilingulis</i> Monro **	+
31	<i>Perinereis nigropunctata</i> Horst **	+
	Fam. Amphinomidae	
32	<i>Amphinome indica</i> Fauvel	+
33	<i>Eurythoe parvecarunculata</i> Horst	+
34	<i>Notophyllum</i> sp.	+
35	<i>Pseudoeurythoe paucibranchiata</i> Fauvel	+
36	<i>Pseudoeurythoe</i> sp.	+
37	<i>Paramphinome indica</i> Fauvel *	
38	<i>Chloeia parva</i> Baird *	
	Fam. Chrysopetalidae	
39	<i>Bhawania cryptocephala</i> Gravier *	
40	<i>Chrysopetalum ehlersi</i> Gravier *	
41	<i>Chrysopetalum</i> sp.	+
	Fam. Glyceridae	
42	<i>Glycera rouxii</i> Aud. & Edw.	+
43	<i>Glycera laucadivae</i> Schmarda	+
44	<i>G. sagittariae</i> McIntosh	+
45	<i>G. longipinnis</i> Grube	+
46	<i>G. prashadi</i> Fauvel	+
	Fam. Hesionidae	
47	<i>Leocrates claparedii</i> (Costa)	+
48	<i>L. diploguathus</i> Monro *	
49	<i>Podarke angustifrons</i> (Grube) **	+
50	<i>Leocrates</i> sp.	+
	Fam. Syllidae	
51	<i>Syllis (Haplosyllis) spongicola</i> Grube	+
	Fam. Phyllodocidae	
52	<i>Eteone</i> sp.	+
	Fam. Nephthydidae	
53	<i>Nephtys polybranchia</i> Southern	+
54	<i>N. olygobranchia</i> Southern	+
55	<i>N. inermis</i> Ehlers *	
56	<i>N. dibranchis</i> Grube *	
	Fam. Aricidae	
57	<i>Aricia exaramata</i> Fauvel *	
58	<i>Scoloplos marsupialis</i> Southern *	
59	<i>Scoloplos kergueliensis</i> McIntosh	+
	Fam. Spionidae	
60	<i>Scolecopsis</i> sp. *	
61	<i>Laonice</i> sp.	+
	Fam. Maldauidae	

No	Taxon	Note
62	<i>AxiotHELLa</i> sp.	*
63	<i>Asychis</i> sp.	+
64	<i>Maldane sarsi</i> Malmgreni	+
65	<i>Maldane</i> sp.	+
	Fam. Ampharetidae	
66	<i>Amage biloculata</i> (Moore)	*
67	<i>Amage</i> sp.	*
68	<i>Melinopsis</i> sp.	*
69	<i>Amphicteis</i> sp.	+
	Fam. Ophellidae	
70	<i>Polyophthalmus pictus</i> (Dujardin)	*
71	<i>Armandia leptocirris</i> Grube	*
72	<i>Annotrypane aulogaster</i> Rathke	+
	Fam. Sternaspidae	
73	<i>Sternaspis scutata</i> Ranzani	+
	Fam. Chaetopteridae	
74	<i>Phyllochaetopterus</i> sp.	+
	Fam. Terebellidae	
75	<i>Terebellides stroemi</i> Sars	+
76	<i>Pista</i> sp.	+
77	<i>Lysilla</i> sp.	+
78	<i>Loimia medusa</i> (Savigny)	*
79	<i>Polycirrus</i> sp.	+
	Fam. Owenidae	
80	<i>Owenia fusiformis</i> D.- Chiaje	+
	Fam. Capitellidae	
81	<i>Capitellethus</i> sp.	+
82	<i>Heteromastides</i> sp.	+
	Fam. Sabellidae	
83	<i>Branchionma cingulata</i> (Grube)	**
84	<i>Ditrupa arietina</i> O.F. Muller	**
85	<i>Dasychone cingulata</i> Grube	**
86	<i>Laonome indica</i> Southern	+
87	<i>Hipsicomus phaeotaenia</i> (Schmarda)	+
88	<i>Potamila leptochaeta</i> Southern	+
89	<i>Sabellastarte indica</i> Savigny	*
90	<i>Sabella</i> sp1.	+
	Fam. Chloraemidae	
91	<i>Stylaroides parvatus</i> Grube	**
92	<i>Stylaroides</i> sp.	*
	Fam. Serpulidae	
92	<i>Spirobranchus giganteus</i> (Pallas)	+
94	<i>Protula</i> sp.	+
95	<i>Serpula vermicularis</i> Linacus	+
	Fam. Chaetopteridae	
96	<i>Phyllochaetopterus</i> sp.	*
	Class Sipunculoidea	
	Fam. Sipunculidae	
97	<i>Sipunculus</i> sp.	+
98	<i>Phascolosoma</i> sp.	+
	Class Crustacea	

No	Taxon	Note
	Fam. Balanidae	
99	<i>Balanus amphitritae</i> Darwin	*
100	<i>Balanus</i> sp.	+
	Fam. Chthamalidae	
101	<i>Chthamalus</i> sp.	+
	Fam. Lepadidae	
102	<i>Lepas</i> sp.	*
103	<i>Mitella</i> sp.	*
	Fam. Penaeidae	
104	<i>Penaeus merguensis</i> de Man	+
	<i>P. monodon</i> Fabricius	+
105	<i>Metapenaeopsis stridulans</i> Alcock	*
106	<i>Metapenaeus ensis</i> (de Haan)	+
	Fam. Alpheidae	
107	<i>Alpheus</i> sp.	+
108	<i>Athanas</i> sp.	+
109	<i>Synalpheus</i> sp.	+
	Fam. Hippolitidae	
110	<i>Hippolyte</i> sp.	+
	Fam. Palaemonidae	
111	<i>Palaemon</i> sp.	+
	Fam. Pandalidae	
112	<i>Pandalidae</i> gen. sp.	+
	Fam. Portunidae	
113	<i>Portunus pelagicus</i> (Linne)	*
114	<i>P. tweedei</i> (Shen)	*
115	<i>Portunus</i> sp.	*
116	<i>P. hastatoides</i> Fabricius	*
117	<i>Charybdis helleri</i> (A. M. Edw)	*
118	<i>Ch. cruciata</i> (Herbst)	*
119	<i>Thalamita danae</i> Stimpson	*
120	<i>Th. gurjanovae</i> Tien	*
121	<i>Th. stimpsoni</i> A. M. Edw.	*
122	<i>Th. crenata</i> Latreille	+
123	<i>Scylla serrata</i> Forskal	+
	Fam. Pinnotheridae	
124	<i>Pinnotheres affinis</i>	+
125	<i>P. parvulus</i> Stimpson	*
126	<i>P. cyclinus</i> Shen	*
127	<i>Xenophthalmus pinnotheroides</i> White	*
128	<i>Xenophthalmus</i> sp.	+
129	<i>Pinixa tumida</i> Stimpson	+
	Fam. Goneplacidae	
130	<i>Chasmocarcinops gelasimoides</i> Alcock	**
131	<i>Carcinoplax vestitus</i> (de Haan)	+
	Fam. Leucosidae	
132	<i>Philyra carinata</i> Bell	**
	Fam. Xathidae	
133	<i>Epixanthus frontalis</i> (H. M. Edw.)	*
134	<i>Pilumnopeus makiana</i> (Rathbun)	*
135	<i>Heteropanope glabra</i> Stimpson	*
136	<i>Ozius</i> sp.	*
137	<i>Etisus laevimanus</i> Roodall	*

No	Taxon	Note
138	<i>Daira perlata</i> (Herbst)	+
139	<i>Pilumnus</i> sp.	+
140	<i>P. spinulus</i> Shen	+
141	<i>Leptodius exaratus</i> (H. M. Edw.)	+
142	<i>Lydia annulipes</i> (H.M. - Edw.)	+
	Fam. Ocypodidae	
143	<i>Heteropanope glabra</i> Stimpson	+
144	<i>Camptandrium sexdentatum</i> St.	+
145	<i>Ilyoplax deschampsii</i> (Rathbun)	+
146	<i>I. formosensis</i> Rathbun	+
147	<i>I. serrata</i> Shen	+
148	<i>I. tansuiensis</i> Sakai	+
149	<i>Cleistostoma dilatatum</i> de Haan	+
150	<i>Paracleistostoma</i> sp.	+
151	<i>Macrophthalmus erato</i> de Man	+
152	<i>Macrophthalmus</i> sp.	+
153	<i>Uca marionis</i> Desmarest	+
154	<i>Uca arcuata</i> de Haan	+
155	<i>Uca dussumieri</i> H.M. - Edw.	+
156	<i>Uca</i> sp.	+
157	<i>Dotilla witchmani</i> de Man	+
	Fam. Mictyridae	
158	<i>Mictyris longicarpus</i> Latreille	+
	Fam. Grapsidae	
159	<i>Hemigrapsus</i> sp.	+
160	<i>Metoplax sheni</i> Gordon	+
161	<i>M. longipes</i> Stimpson	+
162	<i>Metopograpsus messor</i> (Forsk.)	+
163	<i>M. quadridentatus</i> Stimpson	+
164	<i>Varuna litterata</i> (Fabricius)	+
165	<i>Sesarma plicata</i> (Latreille)	+
166	<i>S. bidens</i> (de Haan)	+
167	<i>Gaetice depressus</i> (de Haan)	+
168	<i>Helice tridens</i> Sheni	+
169	<i>Metropograpsus quadridentatus</i> St.	+
	Fam. Squillidae	
170	<i>Squilla latreillei</i> (Eyndoux et Souleyet)	+
171	<i>Squilla</i> sp.	+
172	Order Isopoda	+
	Class Scaphopoda	
	Fam. Dentaliidae	
173	<i>Dentalium aprinum</i> Linne	+
174	<i>D. elephatinum</i> (Linne)	+
175	<i>D. octangulatum</i> Donovam	+
176	<i>D. longitrossum</i> Reeve	+
	Class Gastropoda	
	Fam. Fissurellidae	
177	<i>Diodora nus</i> (Reeve)	+
	Fam. Trochidae	
178	<i>Trochus (Tectus) pyramis</i> Born.	+

No	Taxon	Note
179	<i>F. maculatus</i> Linne	*
180	<i>Monodonta labio</i> (Linne)	*
181	<i>Umbonium vestiarum</i> (Linne)	+
182	<i>Clanculus denticulatus</i> (Gray)	*
	Fam. Turbinidae	
183	<i>Lunella coronata granulata</i> (Gm.)	+
	Fam. Neretidae	
184	<i>Nerita (Theliostylla) albicilla</i> L.	+
185	<i>N. (Ritena) yoldi</i> Recluz.	*
186	<i>N. (R.) striata</i> Burrow.	*
187	<i>N. planospira</i> Anton	*
188	<i>N. polita</i> L.	*
189	<i>Clithon sowerbianus</i> Recluz	*
190	<i>C. retropectus</i> (V. Martens)	*
191	<i>C. oualaniensis</i> (Lesson)	+
	Fam. Viviparidae	
192	<i>Bellanya</i> sp.	*
193	<i>Cipangopaludina chinensis</i> (Gray)	**
	Fam. Littorinidae	
194	<i>Littorinopsis intermedia</i> (Ph.)	+
195	<i>Littorinopsis scabra</i> (L.)	+
196	<i>L. coccinea</i> (Gmelin)	*
197	<i>L. undulata</i> Gray	*
	Fam. Hydrobiidae	+
198	<i>Bithynia ussuriensis</i> But. El Eh	*
199	<i>Alocinma longicornis</i> (Benson)	*
	Fam. Turritellidae	
200	<i>Turritella fasciialis</i> Menke	+
201	<i>Turritella terebra</i> (L.)	*
	Fam. Architectonicidae	
202	<i>Heliacus tramineus</i> (Gmelin)	*
203	<i>Heliacus variegatus</i> (Gmelin)	*
204	<i>Architectonica</i> sp.	*
	Fam. Terebridae	
205	<i>Terebra dimidiata</i> (Linne)	+
206	<i>Terebra</i> sp.	+
	Fam. Potamididae	
207	<i>Cerithidea microptera</i> (Kiener)	+
208	<i>C. cingulata</i> (Gmelin)	+
209	<i>C. ornata</i> (A. Adams)	*
210	<i>C. rhizophorum</i> A. Adams	*
211	<i>C. sinensis philippi</i>	+
212	<i>Cerithidea</i> sp.	+
213	<i>Batillaria zonalis</i> (Bruguiere)	+
214	<i>Terebraria sulcata</i> (Born)	+
	Fam. Planaxidae	
215	<i>Planaxis sulcatus</i> (Born)	+
	Fam. Cerithiidae	
216	<i>Clypeomorus trailli</i> (Sowerby)	*

No	Taxon	Note
217	<i>Cl. bifasciatus</i> (Sowerby)	+
218	<i>Cl. pellucida</i> H.&J.	*
219	<i>Cerithium minutum</i> Sowerby	*
220	<i>C. sinense</i> (Gmelin)	*
	Fam. Melanidae	
221	<i>Melanoides tuberculata</i> (Müller)	+
	Fam. Strombidae	
222	<i>Strombus isabella</i> Lam.	*
	Cancellariidae	
223	<i>Cancellaria</i> sp.	*
	Fam. Solaridae	
224	<i>Solarium</i> sp.	*
	Fam. Nassariidae	
225	<i>Nassarius pullus</i> L.	*
226	<i>N. gaudiosus</i> (Hinds)	+
227	<i>N. olivaceus</i> Brug.	*
228	<i>N. margaritiferus</i> Dunker	+
	Cypridae	
229	<i>Cyprea felina</i> Gmelin	*
	Fam. Conidae	
230	<i>Conus textile</i> Linne	*
	Fam. Mitridae	
231	<i>Mitra paupercula</i> (Linne)	+
232	<i>M. retusa</i> Lamarek	+
233	<i>M. coffea</i> Schubert & Wagner	*
	Fam. Nassidae	
234	<i>Nassa succincta</i> Adams	*
	Fam. Muricidae	
235	<i>Chicoreus torrefactus</i> (Sowerby)	*
236	<i>Morula magninatra</i> Blain	*
237	<i>Murex trapa</i> Röding	*
238	<i>Thais trigona</i> (Reeve)	+
	Fam. Costellariidae	
239	<i>Vexillum aureolatum</i> (Reeve)	+
	Fam. Fasciolaridae	
240	<i>Peristernia incarnata</i> (Kiener)	*
	Fam. Volutidae	
241	<i>Fulgoraria rupestris</i> (Gmelin)	*
	Fam. Umbraculidae	
242	<i>Umbraculum</i> sp.	*
	Fam. Bullidae	
243	<i>Atys cylindricus</i> (Helbling)	**
	Fam. Valvatidae	
244	<i>Valvata cristata</i> Muller	+
	Fam. Vanikoroidae	
245	<i>Vanikoro cancellata</i> (Lamarek)	+
	Fam. Trichotropidae	
246	<i>Trichotropis isignis</i> Middendorff	**
	Class Bivalvia	+

No	Taxon	Note
	Fam. Arcidae	
247	<i>Anadra subcrenata</i> Lischke	+
248	<i>A. inflata</i> (Reeve)	+
249	<i>Arca (Barbatia) fusca</i> Brugniere.	+
250	<i>A. (Arca) ventricosa</i> Lamarsk	+
251	<i>A. (Anadara) granosa</i> (Linne)	+
252	<i>A. (Barbatia) decussata</i> Sowerby	+
	Fam. Mytilidae	
253	<i>Brachydontes curvatus</i> (Dunker)	*
254	<i>Br. emarginatus</i> (Benson)	*
255	<i>Br. senhousei</i> (Benson)	+
256	<i>Br. japonicus</i> (Dunker)	+
257	<i>Septifer bilocularis</i> (Linne)	*
258	<i>Modiolus atrata</i> (Lischke)	*
259	<i>M. barbatus</i> (Linne)	+
260	<i>M. (Amygdalum) watsoni</i> E. A. Smith	+
261	<i>Lithophaga malaccana</i> Reeve	+
262	<i>L. zitteliana</i> Dunker	+
263	<i>L. teres</i> (Philippi)	+
264	<i>L. (Botula) cinnamomina</i> (Chemnitz)	+
265	<i>L. (Leiosolemus) curta</i> Lischke	+
266	<i>L. (Leiosolemus) lima</i> (Jousseanume)	+
	Fam. Pinnidae	
267	<i>Pinna pectinata</i> Linne	*
	Fam. Corbulidae	
268	<i>Corbula erythrodon</i> Lamarek	+
	Fam. Vulsellidae	
269	<i>Pedalion quadrangularis</i> (Reeve)	+
270	<i>P. legumem</i> (Gmelin)	+
271	<i>P. serratula</i> (Reeve)	+
	Fam. Pteriidae	
272	<i>Pteria martensii</i> (Dunker)	+
	Fam. Lucinidae	
273	<i>Lucina edentula</i> Linne	+
274	<i>Codakia paytenodum</i> Iredale	+
	Fam. Anomyidae	
275	<i>Placuna sella</i> (L.)	+
276	<i>Pl. placenta</i> (L.)	+
	Fam. Ostreidae	
277	<i>Ostrea echinata</i> Q. & G.	+
278	<i>O. glomerata</i> Gould	+
279	<i>O. cucullata</i> Born	+
280	<i>O. delslamellosa</i> Lischke	*
281	<i>Ostrea mordax</i> Gould	+
	Fam. Pectinidae	
282	<i>Chlamys nobilis</i> (Reeve)	+
	Fam. Cardidae	
283	<i>Cardium</i> sp.	*
	Fam. Psammobidae	

No	Taxon	Note
284	<i>Sanguinolaria (Soletellina) diphos</i> (Linne)	+
285	<i>Sanguinolaria</i> sp.	+
286	<i>Psammobia radiata</i> Philippi	+
287	<i>Psammotaea elongata</i> Lamarck	+
288	<i>Asaphis dichotoma</i> Anton *	
	Fam. Chamidae	
289	<i>Chama reflexa</i> Reeve *	
290	<i>C. dunkeri</i> Lischke *	
	Fam. Veneridae	
291	<i>Anomalodiscus squamosa</i> (L.)	+
292	<i>Anomalocardia flexuosa</i> (Linne)	+
293	<i>Paphia malabarica</i> (Chemnitz)	+
294	<i>P. (Paratapes) undulata</i> (Born)	+
295	<i>P. amabilis</i> (Philippi)	+
296	<i>Tapes turgida</i> (Lamarck)	+
297	<i>Gafrarium divaricatum</i> (Ch.)	+
298	<i>G. tumidum</i> Roding	+
299	<i>Katelysia rimularis</i> (Lam.) *	
300	<i>Venus (Clausinella) isabellina</i> Philippi	+
301	<i>Gomphina aequilatera</i> (Sowerby)	+
302	<i>Dosinia laminata</i> (Reeve)	+
303	<i>D. japonica</i> Reeve *	
304	<i>D. (Phascosoma) aspera</i> (Reeve)	+
305	<i>Cyclina sinensis</i> (Gmelin)	+
306	<i>Autigona lamellaris</i> Schumacher	+
	Fam. Semellidae	
307	<i>Semele crenulata</i> (Sowerby)	+
308	<i>S. cordiformis</i> (Holtén)	+
	Fam. Solenidae	
309	<i>Sinonovacula constricta</i> (Lamarck)	+
	Fam. Donacidae	
310	<i>Donax faba</i> Gmelin	+
	Fam. Tellinidae	
311	<i>Tellina remies</i> Linne	+
312	<i>T. virgata</i> Linne **	+
313	<i>T. jedoensis</i> Lischke	+
314	<i>T. perna</i> Spengler **	+
315	<i>T. rugosa</i> Born	+
316	<i>Tellina</i> sp.	+
317	<i>Arcopagia</i> sp. *	
	Fam. Glaucomyidae	
318	<i>Glaucomya chiuensis</i> (Gray)	+
	Fam. Mactridae	
319	<i>Mactra antiquata</i> Spengler	+
	Fam. Teredinidae	
320	<i>Bankia sauli</i> (Wright) *	
321	<i>Teredo nauti</i> (Wright) *	
	Fam. Gastrochaenidae	
322	<i>Gastrochaena cuneiformis</i> Spengler	+

No	Taxon	Note
	Fam. Pholadidae	
323	<i>Pholadidea (Caliptopholas) cheveyi</i> Lamy	** +
324	<i>Barnea (Anchomasa) fragilis</i> Sowerby	+
325	<i>Barnea</i> sp.	+
	Fam. Laternulidae	
326	<i>Laternula truncata</i> (Lamarck)	+
327	<i>L. valenciennesii</i> Reeve	** +
	Phylum Echinodermata	
	Fam. Ophiactidae	
328	<i>Ophiactis savignyi</i> (Müller et Troschel)	+
329	<i>O. affinis</i> Duncan	+
330	<i>O. modesta</i> Brok	** +
331	<i>O. defmata</i> Kochler	** +
	Fam. Ophiotrichidae	
332	<i>Ophiotrix signata</i> Kochler	** +
	Fam. Amphiuroidae	
333	<i>Amphioplus impressus</i> (Ljungman)	+
334	<i>Amphioplus</i> sp.	+
335	<i>Amphipholis misera</i> Kochler	** +
336	<i>Ophiodes neglecta</i> Kochler	** +
337	<i>Ophiura micracontha</i> H.L. Clark	** +
338	<i>Ophiophragmus japonicus</i> Matsumoto	** +
	Fam. Ophiolepididae	
339	<i>Amphiura koreae</i> Duncan	** +
	Fam. Ophiomyxidae	
340	<i>Ophiomyxa irregularis</i> Kochler	** +
341	<i>O. australis</i> Lutken	+
	Fam. Laganidae	
342	<i>Laganum depressum</i> Lesson	** +

Note +: Recorded species in JICA project survey
 *: Past recorded species
 **: New recorded species in JICA project survey

5.5.3 Biomass of zoobenthos

5.5.3a. Biomass of zoobenthos in mangrove swamps

Site \ Taxon	I	II	III	IV	V	VI	Mean
Annelida	152 - 115946.3	37 - 66376.9	16 - 12454.2	8 - 97.7	13 - 1600.3	32 - 66617.9	43 - 43848.9
Crustacea	24 - 2277.1	35 - 1937.6	28 - 1912.0	8 - 6616.5	888 - 336919.5	0 -	164 - 58277.1
Mollusca	160 - 5263.2	226 - 110290.4	866 - 191133.6	424 - 80953.6	24 - 5381.3	16 - 4835.4	286 - 66309.6
Total	336 - 123486.6	298 - 178604.9	910 - 205499.8	440 - 87667.8	925 - 343901.1	48 - 71453.3	

5.5.3b. Biomass of zoobenthos in coral reefs

Taxon \ Site	3	4	5	6	7	8
Annelida	43.2- 1436.5	4.0- 690.3	4.5- 56.9	16.9- 486.6	5.5- 238.1	19.8- 866.3
Crustacea	1.3- 13.7	2.0- 52.1	0.5- 4.7	5.8- 140.7	0- -	5.6- 263.9
Mollusca	11.4- 1980.3	2.0- 302.3	6.0- 2705.3	20.1- 15485.3	5.5- 1596.7	23.5- 14337.8
Echinodermata	9.9- 422.9	1.0- -	2.0- 212.4	1.2- 320.2	0.6- 22.2	0.7- 5.6
Total	65.8- 3853.4	9.5- 1044.7	13.0- 2979.3	44.0- 16432.8	11.6- 1868.0	49.6- 15473.6

Taxon \ Site	10	11	12	15	Mean
Annelida	6.9- 274.8	7.5- 510.6	30.2 1231.3	14.6- 289.7	15.3- 608.1
Crustacea	3.2- 229.9	4.3- 79.7	1.5- 31.5	15.3- 250.6	4.0- 106.7
Mollusca	4.9- 2966.7	9.5- 33312.2	30.0 16196.0	67.5- 17008.6	18.0- 10589.1
Echinodermata	2.6- 54.2	1.6- 140.6	0- -	0- -	1.9- 117.8
Total	17.6- 3525.6	22.9- 34043.1	61.7 17458.8	97.4- 17548.9	

5.5.3c. Biomass of zoobenthos in sublittoral zone in soft bottom

Taxon \ Site	3	4	5	6	7	8
Annelida	43.2- 1436.5	4.0- 690.3	4.5- 56.9	16.9- 486.6	5.5- 238.1	19.8- 866.3
Crustacea	1.3- 13.7	2.0- 52.1	0.5- 4.7	5.8- 140.7	0- -	5.6- 263.9
Mollusca	11.4- 1980.3	2.0- 302.3	6.0- 2705.3	20.1- 15485.3	5.5- 1596.7	23.5- 14337.8
Echinodermata	9.9- 422.9	1.0- -	2.0- 212.4	1.2- 320.2	0.6- 22.2	0.7- 5.6
Total	65.8- 3853.4	9.5- 1044.7	13.0- 2979.3	44.0- 16432.8	11.6- 1868.0	49.6- 15473.6

Taxon \ Site	10	11	12	15	Mean
Annelida	6.9- 274.8	7.5- 510.6	30.2 1231.3	14.6- 289.7	15.3- 608.1
Crustacea	3.2- 229.9	4.3- 79.7	1.5- 31.5	15.3- 250.6	4.0- 106.7
Mollusca	4.9- 2966.7	9.5- 33312.2	30.0 16196.0	67.5- 17008.6	18.0- 10589.1
Echinodermata	2.6- 54.2	1.6- 140.6	0- -	0- -	1.9- 117.8
Total	17.6- 3525.6	22.9- 34043.1	61.7 17458.8	97.4- 17548.9	

5.5.4 Species number of zoobenthos

5.5.4a. Species number of zoobenthos in mangrove swamps

Groups	Survey point								
	I	II	III	IV	V	VI	VII	VIII	IX
Polychaeta	2	4	5	2	3	2	0	0	0
Crustacea	7	8	5	2	3	4	2	1	1
Mollusca	3	4	16	4	1	1	5	2	0
Total	12	16	26	8	7	7	7	3	1

5.5.4b. Species number of zoobenthos in coral reefs

Groups	Survey point									
	3	4	5	6	7	8	10	11	12	15
Polychaeta	6	8	8	4	2	1	6	9	4	5
Crustacea	6	5	0	3	2	4	2	4	1	0
Mollusca	11	4	4	9	6	10	6	4	6	9
Echinodermata	3	2	1	0	0	2	1	1	2	0
Total	26	19	13	16	10	20	15	18	13	14

5.5.4c. Species number of zoobenthos in sublittoral zone in soft bottom

Groups	Survey point									
	2	3	6	7	10	14	15	18	22	25
Polychaeta	4	7	0	4	6	12	7	4	1	15
Crustacea	2	0	1	1	1	3	2	1	3	2
Mollusca	2	10	8	5	4	11	9	4	10	11
Echinodermata	0	0	0	0	1	2	2	3	0	1
Total	8	17	9	10	12	28	20	12	14	29

5.5.5 Dominant species of zoobenthos

5.5.5a. Dominant species of zoobenthos in mangrove swamps

Species	Occurring frequency(%)	Sampling point								
		I	II	III	IV	V	VI	VII	VIII	IX
<i>Balanus amphitrite</i>	67		+	+	+			+	+	+
<i>Cerithidea cingulata</i>	78	+	+	+		+		+	+	+

5.5.5b. Dominant species of zoobenthos in coral reefs

Species	Occurring frequency(%)	Sampling point									
		3	4	5	6	7	8	10	11	12	15
<i>Arca decussata</i>	50			+	+			+	+		+
<i>Lithophaga malaccana</i>	100	+	+	+	+	+	+	+	+	+	+
<i>L. teres</i>	90	+	+	+	+	+	+	+		+	+
<i>Gastrochaena cuneiformis</i>	70	+	+		+		+		+	+	+
<i>Lepidonotus carinulatus</i>	70	+	+	+	+			+	+		+
<i>Eunice siciliensis</i>	50	+		+				+	+		+
<i>Synalpheus sp.</i>	60	+	+		+		+	+	+		

5.5.5e. Dominant species of zoobenthos in sublittoral zone in soft bottom

Species	Occuring frequency(%)	Sampling point									
		2	3	6	7	10	14	15	18	22	25
<i>Dentalium aprinum</i>	60		+	+	+		+	+			+
<i>Cuspidaria nobilis</i>	60		+			+	+	+		+	+
<i>Pseudoeurythoe paucibranchiata</i>	50				+		+	+	+		+
<i>Nephtys polybranchia</i>	70		+		+	+	+	+	+		+
<i>Sternaspis scutata</i>	50		+		+	+	+	+			+

5.5.6 Economically valuable species of zoobenthos in Ha Long bay

No	Species	Value	No	Species	Value
1	<i>Haliois diversicolor</i>	F, E, M	33	<i>Sepia aculeata</i>	
2	<i>Trochus pyramis</i>	F, E, A	34	<i>S. lycidas</i>	F, E
3	<i>T. niloticus</i>	F, E, A	35	<i>S. esculenta</i>	F, E
4	<i>T. maculatus</i>	F, E, A	36	<i>S. elliptica</i>	F, E
5	<i>Turbo articulatus</i>	F, E, A	37	<i>S. rohsou</i>	F, E
6	<i>Nerita albicilla</i>	F	38	<i>S. latimanus</i>	F, E
7	<i>Turritella fortilirata</i>	F, M, A	39	<i>S. kobeensis</i>	F, E
8	<i>Strombus isabella</i>	F	40	<i>S. torosa</i>	F, E
9	<i>Arca antiquata</i>	F	41	<i>S. pharamis</i>	F, E
10	<i>A. granosa</i>	F, E	42	<i>S. tigris</i>	F, E
11	<i>A. subcrenata</i>	F	43	<i>Metasepia tulbergi</i>	F
12	<i>Mytilus smaragdinus</i>	F, E	44	<i>Sepiella maudroni</i>	F
13	<i>Pinna sp.</i>	F	45	<i>Sepiadarium kochii</i>	
14	<i>Pinctada martensii</i>	F, E	46	<i>Penaeus mergutensis</i>	F, E
15	<i>Amusium pleuronectes</i>	F	47	<i>P. orientalis</i>	F, E
16	<i>Ostrea rivularis</i>	F, E	48	<i>P. semisulcatus</i>	F, E
17	<i>Cardium latum</i>	F	49	<i>P. monodon</i>	F, E
18	<i>Trachycardium flavum</i>	F	50	<i>P. japonicus</i>	F, E
19	<i>Meretrix meretrix</i>	F, E	51	<i>Parapenaeopsis hardwickii</i>	
20	<i>Gafrarium pectinatum</i>	F	52	<i>Metapenaeus ensis</i>	F, E
21	<i>Anomalodiscus squamosa</i>	F	53	<i>M. joyneri</i>	F, E
22	<i>Cyclina sinensis</i>	F, E	54	<i>M. affinis</i>	F, E
23	<i>Dosinia laminata</i>	F	55	<i>Scylla serrata</i>	F, E
24	<i>Sanguinolaria diphos</i>	F	56	<i>Portunus sanguinolentus</i>	F, E
25	<i>Solen grandis</i>	F	57	<i>P. trituberculatus</i>	
26	<i>Pharella acutidens</i>	F	58	<i>P. pelagicus</i>	
27	<i>Loligo beka</i>	F	59	<i>Charybdis helleri</i>	F
28	<i>L. chinensis</i>	E	60	<i>Eriphia laevimana</i>	F
29	<i>L. tagoi</i>		61	<i>Sipunculus nudus</i>	F
30	<i>L. duvanceli</i>		62	<i>Phascolosoma similis</i>	F
31	<i>L. gotoi</i>		63	<i>Lingula sp.</i>	F
32	<i>L. formosana</i>				

Note: F: food E: export A: art M: Medicine

5.5.7 Rare, precious and endangered species of zoobenthos in Ha Long area

No	Species	Rare - precious	Endangered
	Bivalvia		
1	<i>Isognomon padibulum</i>	+	
2	<i>Anadara suberenata</i>	+	
3	<i>Pinna bullata</i>	+	
4	<i>Pinctada margaritifera</i>		+
5	<i>Sanguinolaria diplos</i>	+	
6	<i>Dosinia japonica</i>	+	
	Gastropods		
7	<i>Cypraea felina</i>	+	
8	<i>Chicoreus torrefactus</i>	+	
9	<i>Murex trapa</i>	+	
10	<i>Turbo articulatus</i>	+	
	Crab		
11	<i>Ozius</i> sp.	+	
	Cucumber		
12	<i>Holothuria marteusii</i>	+	

5.5.8 The results of zoobenthos analysis

5.5.8a. The results of zoobenthos in mangrove swamps

Biomass (mg/m²)

No	Species	I1	I2	I3	II1	II2	II3	IIc	III1	IIIc	III2	III3	III4	IV0	V2	V0	V1	V2	V3
1	Equivalva sp																		1269
2	Equivalva sp								8794										
3	Tylosinchoa heterocheta												195						
4	Eugaster gaudichaudii			3760.7				2442.0											3125.6
5	Glycymeris										29.3								
6	Ocenebra pedunculata																		488.9
7	Caprellidae sp.							87.9											
8	Heteromastix sp.													67.7					
9	Fundulus								11526.3										
10	Nereis (Nereis) acuminata			24220.0															
11	Squilla palustris																		78.1
12	Chironomus tentaculatus							68.7	429.6										
13	Dugesia longicauda							1546.7	356.7										
14	Chironomus tentaculatus							691.3											
15	Mysis															232.0			
16	Uca sp.			429.6															
17	Dreissena										2962.3								
18	Mysis longicauda										945.2								
19	Mysis longicauda					411.1		1538.1											961.4
20	Mysis longicauda			773.1							429.6								
21	Squilla palustris			1974.0															
22	Dugesia							1248.5											672541.5
23	Mysis														6616.5				
24	Chironomus												2644.0						
25	Chironomus														1322.8				
26	Chironomus																		
27	Cerithium													50799.6					
28	Cerithium				154287.8			3893.6	19156.1	12791.2	127288.2	317161.8	331677.8		85646.7	3361.3			
29	Cerithium												121799.8						
30	Palaemon			6.0															
31	Mysis					41.6													
32	Nereis									1348.3									
33	Mysis										624.5								
34	Mysis												284.7						
35	Ancora									821.9									
36	Bryozoa										3729.2								
37	Bryozoa												7836.4						
38	Squilla																		
39	Uca				1689.0														
40	Ocenebra												4411.0						
41	Ocenebra												957.9						
42	Ocenebra																		
43	Amphioxus								131255.9					331755.9					
44	Nereis (Chironomus) acuminata												26792.3						
45	Glycymeris														16893.2				
46	Dugesia																		
47	Dugesia										7424.2								
48	Mysis																		4835.4
49	Larva			4726.1	2872.2														
50	Cerithium																		
51	Chironomus														15266.5				
52	Nereis																		
53	Fundulus							6437.0											
54	Squilla			113594.3															
55	Squilla							3782.7											
56	Thalassidroma				74432.2				112625.7										2930.4
57	Hydracarina																		1196.6
	Total			344727.4	266567.1	6437.0	10132.0	253145.5	32378.5	25825.1	117073.1	507677.0	263433.7	42611.7	87806.7	9740.3	674362.7	78.1	71453.3

5.5.8b. The results of zoobenthos in stone littoral

(1) Individual number(inds./m2)

No	Species	VII0	VII1	VIII0	VIII1	IX
1	<i>Arca (Barbatia) fusca</i>			848		
2	<i>Balanus amphitritae</i>		56			300
3	<i>Cerithidea cingulata</i>	16				
4	<i>Clypeomorus bifasciatus</i>				240	
5	<i>Lunella coronata</i>				16	
6	<i>Lydia annulipes</i>					8
7	<i>Metopograpsus quadridentatus</i>	160				32
8	<i>Metopograpsus sp.</i>		48			
9	<i>Nerita albicilla</i>					16
10	<i>Ostrea glomerata</i>		1,200			
11	<i>Planaxis sulcatus</i>				76	
12	<i>Septifer biloculatis</i>			560		
	Total	176	1,304	1,408	332	356

(2) Biomass(mg/m2)

No	Species	VII0	VII1	VIII0	VIII1	IX
1	<i>Arca (Barbatia) fusca</i>			107724.4		
2	<i>Balanus amphitritae</i>		0.0			0.0
3	<i>Cerithidea cingulata</i>	2016.6				
4	<i>Clypeomorus bifasciatus</i>				98142.6	
5	<i>Lunella coronata</i>				2214.6	
6	<i>Lydia annulipes</i>					0.0
7	<i>Metopograpsus quadridentatus</i>	4726.1				0.0
8	<i>Metopograpsus sp.</i>		0.0			
9	<i>Nerita albicilla</i>					0.0
10	<i>Ostrea glomerata</i>		361004.8			
11	<i>Planaxis sulcatus</i>				14396.4	
12	<i>Septifer biloculatis</i>			50976.1		
	Total	6742.7	361004.8	158700.5	114753.6	0.0

5.5.8c. The results of zoobenthos in coral reefs

Individual number (inds./kg)		Species														
No.	Species	3	4	5	6	7	8	10	11	12	15					
1	Lepidomolus capitatus	2.0	1.0		3.3	1.0	2.1	1.3	1.1	1.1						
2	Lepidomolus melanogaster														2.0	
3	Nereis eurychoera	0.6														
4	Nereis taenioides									0.5						
5	Nereis longlingensis						1.4				3.3					
6	Paraprionospio pinnata			1.5	2.0											
7	Funisia antennata	1.3	1.5													
8	Funisia sibirica	33.3	0.5				1.0	1.4	0.6							
9	Funisia gracilis								0.6							
10	Diloneireis flava									0.5						
11	Diloneireis sp.								0.6							
12	Lysidice collaris		0.5		1.3	0.5	2.1									
13	Funisia sp.				0.6											
14	Murphysa fallax						0.5	1.4								
15	Murphysa stagnifera							0.7								
16	Levinseniella claretti		0.5							2.2						
17	Syllis (Haplosyllis) spongicola	2.0														
18	Chrysopetala rhileri			0.5	1.3								0.5			
19	Branchionina cingulata	4.0											3.3			
20	Dirupe asiatica				0.6											
21	Dusychone cingulata				0.6											
22	Laonome indica					1.5										
23	Hippionus phaeocephala					0.5										
24	Potamilla lophochaeta							0.7								
25	Sabella sp.							0.7								
26	Stylodites parvulus			0.5	0.6	0.5				0.5						
27	Pista sp.								0.6							
28	Spirobranchus giganteus								0.6			0.5				
29	Protula sp.														0.6	
30	Serpula vermicularis			0.5												
31	Urechis sp.														12.0	
32	Broken worms		0.6	1.5	6.6		7.1	2.6	2.7	2.2						
33	Isopoda	1.3			1.3					1.6						
34	Galathea sp.	0.6			1.3											
35	Alpheus sp.		1.5	0.5	0.5											
36	Synalpheus sp.	5.3			2.0		0.7	2.6	1.1	0.5						
37	Hippolyte sp.								0.5							
38	Palaeomon sp.				0.6											
39	Panopeus eyrensis	0.6														
40	Panopeus affinis											0.5				
41	Diura perlata	0.6														
42	Palaemon sp.		0.5									0.5			2.6	
43	Palaemon spinulosus						0.7									
44	Leptodius exaratus						1.4	0.6								
45	Metopograpsus quadridentatus														13.3	
46	Thalassidroma crenata						0.7									
47	Galathea sp.									1.1						
48	Palaemon sp.						2.1									
49	Ophiodia savignyi	4.6		1.0	0.6											
50	Ophiodia affinis	1.3								0.5						
51	Ophiodia modesta						0.5			1.1						
52	Ophiodia signata	4.0														
53	Acropora implexus				0.6		0.7									
54	Amphibia koreae								2.6							
55	Ophiodia deimita			1.0												
56	Urechis vermicularis								0.7							
57	Trichoptera insignis									0.6						
58	Verrillina aureolatus	0.7														
59	Bullia zonaria						0.7									
60	Diodora mus				0.7											
61	Acia decussata			2.0												
62	Acia subarenata					0.5										
63	Modiolus barbatus											1.1				
64	Modiolus (Aucydadia) watsoni		0.5		0.7	2.0										
65	Lithophaga malaccana	2.0	0.5	4.0		1.0	5.0				2.8					
66	Lithophaga zithiana									1.4						
67	Lithophaga brevis	1.5	0.5	1.5	5.3	1.0	3.6	0.7			15.0	2.6				
68	Lithophaga (Borula) chinensis			0.5						1.1	5.6					
69	Lithophaga lima								0.7							
70	Serpis bicuspidata						0.7									
71	Pedalion quadrilaterum	2.0					0.7									
72	Pedalion leptaenon	0.7													1.4	
73	Pedalion serratum														0.7	
74	Tellina pema														0.7	
75	Chione nobilis	0.7														
76	Gastropoda cuneiformis	1.3	0.5		6.7		2.1		1.7	3.3	4.0					
77	Pholadidae (Calyptopholis) cheyevi					0.5										
78	Burnea (Anchonassa) fragilis				1.3										0.7	
79	Burnea sp.				0.7											
80	Laternula truncata										2.2					
81	Laternula valdebenesii							0.7								
82	Acia (Acia) naticularis							2.1								
83	Acia (Acia) ventricosa	1.3			0.7		5.0									
84	Acia (Barbula) decussata				3.3			0.7	2.8		8.0					
85	Lithophaga (Dibera) malaccana				0.7			0.7	3.3		49.3					
86	Lithophaga (Leioseltronus) curta							2.9								
87	Laternula truncata	0.7				0.5									0.7	
88	Modiolus barbatus (Hume)	0.7														
89	Sipunculus sp.							15.7								
	Total	72.9	8.0	15.0	44.0	11.5	63.1	17.6	22.9	61.7	97.3					

5.5.8d. The results of zoobenthos in sublittoral zone in soft bottom

Biomass(mg/m²)

	Species	2	3	6	7	10	14	15	18	22	25
1	Polydora melanostus	224.7									
2	Sibicula sp.										215.5
3	Hyalinoecia tubicola										217.3
4	Lambdionereis simplex					19.5					
5	Onuphis conchylega							915.1			
6	Onuphis holobranchiata									306.2	
7	Marphysa stragulum	59.8					105.6		75.7		
8	Dilonereis filum		318.7		69.6		105.6		148.4		
9	Dilonereis sp.						211.2				
10	Diopatra neapolitana										219.2
11	Pseudocerythoe paucibranchiata				275.3		78.8	142.4	76.9		273.5
12	Podurke angustifrons	29.9									
13	Leocrates sp.		64.1								
14	Leocrates elaparedii					279.3					
15	Notophyllum sp.							95.8			
16	Pseudocerythoi sp.					37.9					
17	Becone sp.						52.5	95.8			
18	Nephtys polybranchia		192.3		68.4	319.3	100.7	248.5	149.6		135.8
19	Nephtys oligobranchia										135.8
20	Glycera lamadivae						109.2				
21	Glycera sagittariae						218.6				
22	Glycera longipinnis							1354.1			
23	Glycera prashadi										273.5
24	Scoloplos kerguelensis										427.4
25	Laonice sp.					9.2					
26	Axychis sp.	543.3									
27	Maldane sarsi										135.8
28	Maldane sp.		624.5				112.3	279.6			
29	Amphiteis sp.										218.6
30	Annotrypae autogaster							45.2			135.8
31	Lysilla sp.										428.6
32	Terbellides stroeni		2584.9					2221.0			652.0
33	Stenaspis scutata		368.7		206.9	212.5	510.4				410.3
34	Phyllodocepterus sp.		612.9				1706.9				
35	Annelida non-identify							968.3			
36	Broken worm	149.6				232.6		1239.9		272.3	
37	Leocrates sp.										217.3
38	Alpheus sp.	6684.9		6648.8			366.7	708.9			
39	Athanas sp.	500.8									
40	Palaudidae gen spp.						91.3				
41	Camptandrium sexdentatum					138.9					
42	Chusnocerpinops gelatinoides						1659.5	1949.5		8861.4	
43	Carcinoplax vestitus								268.5	268.5	102.0
44	Philyra carinata									542.4	
45	Squilla latreillei										123.5
46	Broken specimens					53.7					
47	Ophiomyxa irregularis							347.9			
48	Ophiomyxa australis										7561.2
49	Ophiodera neglecta								91.5		
50	Ophura micracantha						205.2				
51	Amphipolis nuscra						207.7				
52	Amphipolus sp.								362.0		
53	Ophiophragus japonicus					1174.4			725.4		
54	Laganum depressum							148.7			
55	Dentalium aprinum		448.8	248.0	529.2			194.0			814.9
56	Dentalium elephantinum						1735.1			661.4	
57	Dentalium octangulatum								312.1	16.3	
58	Dentalium longirostrum							1446.1	337.5		
59	Helicium stramineus			443.2							69.7

Biomass(mg/m2)

	Species	2	3	6	7	10	14	15	18	22	25
60	<i>Helliacus variegatus</i>						246.9				
61	<i>Vanikoro cancellata</i>		29.2								
62	<i>Nassarius margaritiferus</i>		149.6								
63	<i>Mitra paupercola</i>		33.7		1714.8						
64	<i>Turritella fasciifalis</i>									83.8	
65	<i>Alys cylindricus</i>							289.7			
66	<i>Terebra dimidiata</i>							149.0			
67	<i>Terebra sp.</i>		46.7							87.7	
68	<i>Valvata cristata</i>	37.7			488.7						11.8
69	<i>Valvata piscinalis</i>	20.2									
70	<i>Arca (Anadara) granosa</i>			233.3							
71	<i>Corbula erythrodon</i>						192.0				172.8
72	<i>Glaucomya chinensis</i>				2071.8						
73	<i>Glycymeris sp.</i>		55.6								
74	<i>Tellina renies</i>						317.0				
75	<i>Tellina rugosa</i>							34.1		962.3	
76	<i>Tellina virgata</i>									143.5	
77	<i>Tellina jedoensis</i>		7.2	5.4						695.6	
78	<i>Tellina perna</i>		9.0				652.5	1090.3			767.3
79	<i>Sanguinolana (Soletellina) diphos</i>					31.1		454.5		812.1	
80	<i>Psammotaca elongata</i>										2256.0
81	<i>Psammobia radiata</i>			3558.6							
82	<i>Gouldia micronodulosa</i>										638.8
83	<i>Cyclina sinensis</i>							962.3	1955.6		
84	<i>Tapes turrida</i>							1097.5		1718.3	
85	<i>Dosinia (Phascosoma) aspera</i>							2233.5			
86	<i>Cafrarium tumidum</i>			135.8				1721.9			225.5
87	<i>Paphia (Paratapes) undulata</i>					1959.3					
88	<i>Paphia arabitis</i>			598.1							
89	<i>Chione (clausinella) isabellina</i>		187.8								57.4
90	<i>Cuspidaria nobilis</i>		49.6			168.7	327.2	99.3	4186.6		897.1
91	<i>Codakia paytenorura</i>			523.9							
92	<i>Semele cordiformis</i>					122.6		774.5			
93	<i>Sinonovacula coarctata</i>								1526.9		
94	Scaphopoda										
95	<i>Antigona lunellaris</i>				748.2						
96	<i>Tellina tongana</i>										19.1
	Total	7740.9	5783.3	12395.1	6122.9	4749.0	15338.1	15292.2	10246.7	15521.8	17817.5

5.6 MARINE FISH

5.6.1 Inventory of fish species in Ha Long bay

No	Family	Species	Habitats						
			Co	R	M	S	Cl	O	
1	Carcharhinidae	<i>Hypoprion parasorah</i> Cuv.		+					+
2		<i>Scoliodon sorrakowah</i> (Cuv.)		+					+
3	Rhynchobatidae	<i>Rhynchobatus djidensis</i> (F.)		+					
4	Platyrhinidae	<i>Platyrhina sinensis</i> (Bl. & Schn.)				+			
5	Dasyatidae	<i>Dasyatis kuhlii</i> Muller et Henle				+			
6		<i>D. zugei</i> (Muller et Henle)				+			
7	Myliobatidae	<i>Myliobatus tobijei</i> Blkr.				+			
8		<i>Clupanodon punctatus</i> (Schl.)				+			
9		<i>Dussumieria hasselti</i> Blkr.				+			
10	Clupeidae	<i>Sardinella aurita</i> Val.				+			+
11		<i>Ilisha indica</i> (Swainson)				+			
12		<i>Kowala coval</i> (Cuv.)		+				+	
13	Engraulidae	<i>Thryssa hamiltoni</i> (Gray)			+	+			
14		<i>Th. setirostris</i> (Brous.)			+	+			
15	Chirocentridae	<i>Chirocentrus nudus</i> (Swainson)				+			+
16	Synodontidae	<i>Saurida elongata</i> (Temm. & Schl.)				+			
17		<i>Trachinocephalus myops</i> (Bl. & Schn.)				+			
18	Muraenesocidae	<i>Muraenesox cinereus</i> (Forsk.)				+			
19	Ariidae	<i>Arius sinensis</i> (LacDplde)				+			
20		<i>A. thalassinus</i> (Rupp.)				+			
21	Plotosidae	<i>Plotosus anguillaris</i> (Bloch)	+			+			
22		<i>Hemirhamphus far</i> (Forsk.)							+
23	Hemirhamphidae	<i>H. sp.</i>	+						+
24		<i>H. intermedius</i> Cantor							+
25	Belonidae	<i>Tynosurus strongylurus</i> (Van Hessel)							+
26	Exocoetidae	<i>Parexocoetus brachypterus</i> (Rich.)							+
27	Holocentridae	<i>Myripristis murdjan</i> (Forsk.)	+						
28		<i>Holocentrus ruber</i> (Forsk.)	+						
29	Sphyraenidae	<i>Sphyraena pinguis</i> Gunther					+		
30		<i>Mugil affinis</i> Gunther	+		+				
31	Mugilidae	<i>M. carinatus</i> C. et V.			+				
32		<i>M. sp.</i>	+						
33	Polyuemidae	<i>Eleutheronema tetradactylus</i> (Shaw)					+		
34		<i>Polynemus sextarius</i> (B. et S.)					+		
35		<i>Cephalopholis pachycentron</i> (C. et V.)	+	+					
36		<i>Diploprion bifasciatum</i> Cuv. et Val.	+						
37		<i>Epinephelus undulatostratus</i> E. Randall	+	+					
38		<i>E. akaara</i> (Temm. et Schl.)	+	+				+	
39	Serranidae	<i>E. sexfasciatus</i> (Cuv. et Val.)	+	+				+	
40		<i>E. fasciatus</i> (Forsk.)	+	+				+	
41		<i>E. megachir</i> (Rich.)	+	+				+	
42		<i>E. malabaricus</i> (B. et S.)	+	+				+	
43		<i>E. sp.</i>	+	+				+	
44		<i>Lateolabrax japonicus</i> (C. V.)			+	+			
45		<i>Therapon jarbua</i> (Forsk.)			+	+			
46	Theraponidae	<i>Th. sp.</i>	+						
47		<i>Pelates quadrilineatus</i> Cuv. et Val.	+		+				
48	Priacanthidae	<i>Priacanthus tayenus</i> Richardson			+				

No	Family	Species	Habitats						
			Co	R	M	S	Cl	O	
49	Apogonidae	<i>Apogon quadrifasciatus</i> C. V.	+			+			
50		<i>A. doederleini</i> Jord. & Snyder.	+			+			
51		<i>A. sp.</i>	+						
52		<i>Apogonichthys striatus</i> (Smith & Radcliffe)	+			+			
53	Sillaginidae	<i>Sillago sihama</i> (Forsk.)				+			
54		<i>S. maculata</i> Q. et G.				+			
55	Lactariidae	<i>Lactarius lactarius</i> (Bl. & Schl.)				+			
56		<i>Chorinemus lysan</i> (Forsk.)						+	
57		<i>C. tol</i> C. V.						+	
58		<i>C. orientalis</i> (F. S.)						+	
59		<i>Trachurus japonicus</i> (Temm. Et Schl.)				+			
60		<i>Megalaspis cordyla</i> (Linn.)						+	
61		Carangidae	<i>Caranx (Carangoides) kalla</i> Cuv. et Val.	+			+		
62			<i>C. (C.) praeustus</i> Been				+		
63			<i>C. (C.) equula</i> T. et S.	+			+		
64			<i>C. (Anale.) djeddaba</i> (F.)				+		
65	<i>C. (Citula) chrysophrys</i> C. V.					+			
66	<i>Decapterus lajang</i> Bleeker					+		+	
67	<i>Alectis ciliaris</i> (Bloch)					+			
68	<i>A. indicus</i> (Rupp.)					+			
69	<i>Atropus atropus</i> (Bl. et Schl.)					+			
70	<i>Ulua mandibularis</i> (Macleay)					+			
71	Formionidae	<i>Formio niger</i> (Bloch)				+			
72		<i>Leiognathus equula</i> (Forsk.)				+			
73	Leiognathidae	<i>L. rivulatus</i> (Temm. & Schl.)				+			
74		<i>L. berbis</i> (Cuv. & val.)				+			
75		<i>L. brevirostris</i> C. V.				+			
76		<i>L. sp.</i>	+			+			
77		<i>Lutianus johnii</i> (Bloch)	+			+			
78		<i>L. argentimaculatus</i> (Forsk.)	+	+		+			
79		<i>L. lineolatus</i> (Ruppell)	+			+			
80		<i>L. lutianus</i> Bloch	+			+			
81		<i>L. erythropterus</i> Bloch				+			
82		Lutianidae	<i>L. chrysotaenia</i> (Bleeker)	+			+		
83	<i>L. russelli</i> (Bleeker)		+			+			
84	<i>Caesio coerulaureus</i> LacDplde		+						
85	<i>C. xanthonotus</i> Bleeker		+						
86	<i>C. cuning</i> (Bloch) (?)		+						
87	<i>C. erythrogaster</i> C. V.					+			
88	Nemipteridae		<i>Nemipterus sp.</i>				+		
89			<i>N. japonicus</i> (Bloch)				+		
90			<i>Gerres filamentosus</i> Cuvier				+		
91	Gerridae		<i>Gerreomorpha decacantha</i> (Bleeker)				+		
92		<i>G. japonica</i> (Bleeker)				+			
93	Pomadasyidae	<i>Pomadasy hasta</i> (Bloch)				+			
94		<i>P. maculatus</i> (Bloch)	+			+			
95		<i>Plectorhynchus pictus</i> (Thunberg)	+	+		+			
96		<i>P. sp.</i>	+						
97		<i>Scolopsis vosmeri</i> (Bloch)	+						
98		<i>S. taeniopterus</i> (C. V.)	+						
99		<i>S. bimaculatus</i> Rupp.	+						
100		Lethrinidae	<i>Lethrinus ornatus</i> C. V.				+		
101			<i>L. nebulosus</i> (Fors.)				+		
102			<i>Pentapus sp.</i>	+			+		

No	Family	Species	Habitats					
			Co	R	M	S	Cl	O
103	Sparidae	<i>Sparus macrocephalus</i> (Basilewsky)				+		
104		<i>S. latus</i> (Houttuyn)	+		+	+		
105		<i>Paragyrops edita</i> Tanaka				+		
106	Sciaenidae	<i>Arargyrosomus aureus</i> (Bloch)				+		
107		<i>Sciaena dussumieri</i> (C. & V.)				+		
108		<i>Sci. russelli</i> (C. V.)				+		
109		<i>Johnius belengerii</i> (C. V.)				+		
110	Mullidae	<i>Upeneus bensasi</i> (Femm. & Schl.)	+			+		
111		<i>U. sulphureus</i> C. V.				+		
112	Ephippidae	<i>Drepane punctata</i> (Linnaeus)				+		
113		<i>Platax teira</i> (Fors.)	+			+		
114	Scatophagidae	<i>Scatophagus argus</i> (Linn.)	+		+	+		+
115	Chaetodontidae	<i>Chaetodon octofasciatus</i> Bloch	+					
116		<i>C. wiebeli</i> Kaup	+					
117		<i>Coradion altivelis</i> McCulloch	+					
118		<i>Chelmodon rostratus</i> (Linn.)	+					
119	Pomacentridae	<i>Neopomacentrus bankeri</i> (Rich.) (?)	+					
120		<i>Abuleduf bengalensis</i> (Bloch)	+					
121	Cepolidae	<i>Acanthocephala krusensterni</i> (T.S.)	+					
122	Labridae	<i>Echeneis naucrates</i> Linn.	+					
123		<i>Halichoeres javanicus</i> (Bleeker)	+					
124		<i>H. nigrescens</i> (B. S.)	+					
125		<i>H. bicolor</i> (Bl. & Schn.) (?)	+					
126		<i>H. sp.</i>	+					
127		<i>H. sp.</i>	+					
128		<i>Choerodon azurio</i> (Jord. et Snyder)	+					
129	Scaridae	<i>Scarus ghobban</i> Forskal	+	+			+	
130		<i>S. dussumieri</i> C. V.	+	+			+	
131	Mugiloididae	<i>Paraperca xanthozona</i> (Blkr.)	+					
132	Blenniidae	<i>Ombranchius elegans</i> (Steind.)	+					
133	Callionymidae	<i>Callionymus richardsoni</i> (Bleeker)				+		
134		<i>C. flagris</i> J. F.				+		
135	Gobiidae	<i>Acentrogobius caninus</i> (Cuv. et Val.)		+			+	
136		<i>A. sp.</i>				+	+	
137		<i>Bathygobius fuscus</i> (Rupp.)				+		
138		<i>Glossogobius giuris</i> (Hamilton)			+	+		
139		<i>G. biocellatus</i> C. V.				+		
140		<i>Ctenogobius crinitus</i> (C. V.)				+		
141		<i>Oxyurichthys papuensis</i> (Cuv. et Val.)				+		
142		<i>Gnatholepis calliurus</i> (J. S.)				+		
143		<i>Quisquilius eugenius</i> J. E.				+		
144		<i>Cryptocentrus gymnocephalus</i> (Blkr.)				+		
145	<i>Amblygobius albimaculatus</i> (Ruppell)		+		+			
146	Pteriophthalmidae	<i>Pteriophthalmus cantonensis</i> (Osborn)			+	+	+	
147		<i>Boleophthalmus pectinirostris</i> (Linn.)			+	+	+	
148	Taenioididae	<i>Trypauchen vagina</i> (Bl. et Scho.)				+		
149		<i>T. taenia</i> Koumans				+		
150		<i>Trypauchenichthys sumatraensis</i> Hard.				+		
151		<i>Odontamblyopus</i> sp.			+	+		
152	Siganidae	<i>Siganus oramin</i> (Bl. & Schl.)	+		+	+		
153		<i>S. fuscescens</i> (Houtt.)	+		+	+		
154		<i>S. sp.</i>	+					
155	Trichiuridae	<i>Trichiurus lepturus</i> Linn.				+		
156		<i>Tri. haumela</i> (F.)				+		

No	Family	Species	Habitats						
			Co	R	M	S	Cl	O	
157		<i>Scomberomorus commersoni</i> (Lac.)							+
158	Scombridae	<i>S. guttatus</i> (B. S.)							+
159		<i>S. koeranus</i> Kishinouye							+
160	Stromateidae	<i>Stromateoides nozavae</i> (Lebk.)							+
161		<i>S. sinensis</i> (Euphrasen)							+
162	Scorpaenidae	<i>Scorpaenopsis cirrhosa</i> (Thunberg)	+				+		
163		<i>Sebasticus marmoratus</i> (Cuv. & Val.)	+				+		
164	Triglidae	<i>Lepidotrigla alata</i> (Houtt.)					+		
165	Aploactidae	<i>Paracentropogon indicus</i> (Day)	+						
166		<i>Trichopleura</i> sp.	+						
167		<i>Minous</i> sp.	+				+		
168	Synanceiidae	<i>Erosa</i> sp.	+				+		
169		<i>Hongaina</i> sp.	+				+		
170		<i>Polycaulus uranoscopa</i> (B. S.)	+						
171		<i>Suggrundus meerdervoorti</i> (Bleeker)				+	+		
172		<i>Platycephalus indicus</i> (Lin.)				+	+		
173	Platycephalidae	<i>Onigocia spinosus</i> (Femm. & Schl.)					+		
174		<i>Cociella scaber</i> (Linnaeus)					+		
175		<i>Inegocia japonica</i> (Vilesius)				+	+		
176		<i>Pseudorhombus arsius</i> (Hamilton)					+		
177	Bothidae	<i>P. malayanus</i> Blkr.					+		
178		<i>Arnoglossus tenuis</i> Gunther					+		
179		<i>Pardachirus pavoninus</i> (Lac.)					+		
180	Solecidae	<i>Solea ovata</i> Rich.				+	+		
181		<i>Zebrias quagga</i> (Kaup)				+	+		
182	Cynoglossidae	<i>Cynoglossus puncticeps</i> (R.)					+		
183		<i>C. melampetalus</i> (Rich.)					+		
184	Triacanthidae	<i>Triacanthus brevirostris</i> T. S.	+				+		
185	Balistidae	<i>Psilocephalus barbatus</i> (G.)	+						
186	Monacanthidae	<i>Monacanthus chinensis</i> (Osbeck)	+				+		
187		<i>M. sulcatus</i> Holl.	+				+		
188	Tetraodontidae	<i>Lagocephalus sceleratus suezensis</i> (Gohar)					+		
189		<i>Chelonodon patoca</i> (Han. et Buch)					+		
		Total	77	18	21	122	12		20

Notes: Co: Coral reefs R: Rock reefs M: Mangrove S: Soft bottom
Cl: Closed embayment O: Others

5.6.2 List of economically valuable fishes

No	Species
1	<i>Dasyatis kuhlii</i> Muller et Henle
2	<i>D. zugei</i> (Muller et Henle)
3	<i>Clupanodon punctatus</i> (Schl.)
4	<i>Dussumieria hasselti</i> Blkr.
5	<i>Sardinella aurita</i> Val.
6	<i>Thrissa hamiltoni</i> (Gray)
7	<i>Th. setirostris</i> (Brous.)
8	<i>Chirocentrus nudus</i> (Swainson)
9	<i>Saurida elongata</i> (Temm. & Schl.)
10	<i>Muraenesox cinereus</i> (Forsk.)
11	<i>Hemirhamphus intermedius</i> Cantor
12	<i>Mugil affinis</i> Gunther
13	<i>M. carinatus</i> C. et V.
14	<i>Mugil</i> sp.
15	<i>Holocentrus ruber</i> (For.)
16	<i>Epinephelus undulatostratus</i> E. Randall
17	<i>E. akaara</i> (Temm. et Schl.)
18	<i>E. sexfasciatus</i> (Cuv. et Val.)
19	<i>E. fasciatus</i> (Forsk.)
20	<i>E. megachir</i> (Rich.)
21	<i>E. malabaricus</i> (B. et S.)
22	<i>Epinephelus</i> sp.
23	<i>Caranx (Carangoides) kalla</i> Cuv. et Val.
24	<i>Leiognathus equula</i> (Forsk.)
25	<i>L. rivulatus</i> (Temm. & Schl.)
26	<i>L. berbis</i> (Cuv. & val.)
27	<i>L. brevirostris</i> C. V.
28	<i>Pomadasys hasta</i> (Bloch)
29	<i>Arargyrosomus aeneus</i> (Bloch)
30	Chaetodontidae
31	Pomacentridae
32	<i>Siganus</i> spp.
33	<i>Trichiurus haumela</i> (F.)
34	<i>Stromateoides nozavae</i> (Lehk.)
35	<i>S. sinensis</i> (Lüphthasen)
36	<i>Platycephalus indicus</i> (Liu.)

5.6.3 List of threatened fishes

No	Species
1	<i>Holocentrus ruber</i> (For.)
2	<i>Epinephelus undulatostratus</i> E. Randall
3	<i>E. akaara</i> (Temm. et Schl.) *
4	<i>E. sexfasciatus</i> (Cuv. et Val.)
5	<i>E. fasciatus</i> (Forsk.)
6	<i>E. megachir</i> (Rich.)
7	<i>E. malabaricus</i> (B. et S.)
8	<i>Epinephelus</i> sp.
9	Chaetodontidae
10	Pomacentridae
11	<i>Stromateoides nozavae</i> (Lehk.)

5.6.4 List of rare and precious species

No	Species
1	<i>Rhynchobatus djidensis</i> (Forsk.)
2	<i>Myrpristis murdjan</i> (Forsk.)
3	<i>Lutianus argentimaculatus</i> (Forsk.)
4	<i>Neopomacentrus banker</i> (Rich.)
5	<i>Abudefduf bengalensis</i> (Bloch)
6	<i>Acanthocephala krusenterni</i> (Femm. & Schl.)
7	<i>Echeneis naucrates</i> (Linne)
8	<i>Ombranchus elegans</i> (Steind.)
9	<i>Amblygobius albinaculatus</i> (Rupp.)

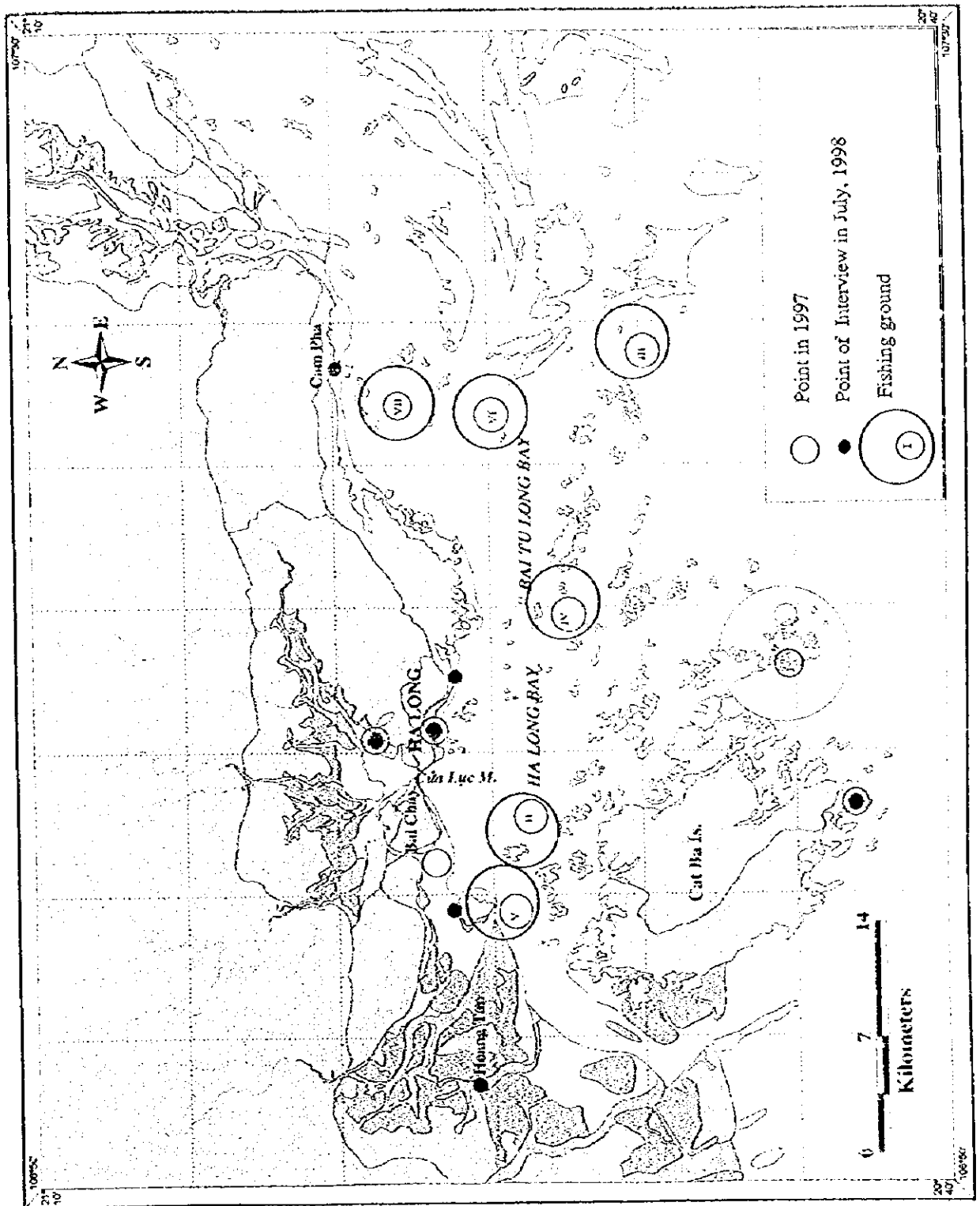
5.6.5 The major fishing grounds and target fishes

No	Fishing ground	Main species
I	Dau Be	Fishes belong to genus and families: <i>Upeneus</i> , <i>Saurida</i> , Sciaenidae, Serranidae, Bothidae, Leiognathidae, Platycephalidae, Shellfishes and Squids.
II	Dau Go	<i>Upeneus</i> spp., Leiognathidae, <i>Saurida</i> spp., <i>Pleuronectiformes</i> , <i>Siganus</i> spp., Platycephalidae, Bivalvia, Shellfishes and Squids.
III	Soi Den islet, Ngoc Vung	Serranidae, Sciaenidae, <i>Muraenesax</i> spp., <i>Saurida</i> spp.
IV	Cua Dua, Cong Do	Clupeidae, <i>Pleuronectiformes</i> , <i>Siganus</i> spp., Sciaenidae, <i>Saurida</i> spp.,
V	Tuan Chau	Leiognathidae, <i>Upeneus</i> spp., Clupeidae, <i>Saurida</i> spp., <i>Pleuronectiformes</i> , <i>Siganus</i> spp., <i>Sardinella aurita</i> , Platycephalidae, Bivalvia, Shellfishes and Squids.
VI	Cong Dong, Cong Tay	<i>Scomberomorus</i> spp., Carcharhinidae, Leiognathidae, Sciaenidae, <i>Clupanodon</i> spp., Bivalvia, Shellfishes and Squids.
VII	Hon Net - Hon Ong Cu	<i>Upeneus</i> spp., <i>Saurida</i> spp., Serranidae, <i>Siganus</i> spp., Sciaenidae, Leiognathidae, <i>Pleuronectiformes</i> , <i>Sillago</i> spp., Bivalvia, Shellfishes and Squids.

5.6.6 Nursery grounds of fish

Objects	Places
Pelagic fishes	Cua Luc, Tuan Chau, Dau Be
Bottom fishes	Near coral reef in Ha Long bay
Only <i>Lutianus</i> and <i>Epinephelus</i>	Ngoc Vung, Cong Do

5.6.7 Survey sites of fish and shellfish and fishing grounds in Ha Long bay



5.7 MARINE ALGAE

5.7.1 Inventory of macroalgae

No	Species	3	4	5	6	7	8	9	10	11	12	13	14	15
	Rhodophyta													
	Corallinaceae													
1	<i>Jania decussato-dichotoma</i> (Yendo)Yendo				+				+					
2	<i>Amphiroa zonata</i> Yendo										+			
3	<i>Corallina officinalis</i> L.										+			
4	<i>Lithophyllum okamurai</i> Forsk.	+	+	+		+		+	+		+			
5	<i>L. trichotomum</i> (Heydr.) Lem.	+		+				+	+					
	Peyssonneliaceae													
6	<i>Peyssonnelia calcea</i> Heydr.	+	+		+	+		+	+		+			
	Gracilariaceae													
7	<i>Ceratolictyon spongiosum</i> Zanard.	+	+	+	+	+	+		+	+	+			
	Rhodomelaceae													
8	<i>Polysiphonia kampsaxii</i> Boerg.	+	+	+	+	+	+		+	+	+			
	Phaeophyta													
	Dictyotaceae													
9	<i>Lobophora variegata</i> (Lanx.) Wom.	+	+	+	+	+	+	+	+	+	+	+	+	+
	Sargassaceae													
10	<i>Sargassum</i> sp1.				+									
11	<i>Sargassum</i> sp2				+									

5.7.2 Inventory of macroalgae including the records in existing literature

No	Species	Width distribution						Distribution by depth
		1	2	3	4	5	6	
	Cyanophyta							
	Chroococcaceae							
1	<i>Aphanocapsa littoralis</i> Hang.	+				+		littoral
	Oscillatoriaceae							
2	<i>Hydrocoleum lyngbyaceum</i> (Kuetz.) Gom.	+				+		-
3	<i>Oscillatoria limosa</i> J.Ag.ex.Gomont.	+						-
4	<i>O. linnetica</i> Lemm.	+					+	-
5	<i>O. salina</i> Biswas.	+					+	-
6	<i>O. margaritifera</i> (Kuetz.) Gom.				+			-
7	<i>O. nigro-viridis</i> Thwaites in Harvey.					+		-
8	<i>Lyngbya martensiana</i> Menegh. et Gom.	+					+	-
9	<i>L. infixa</i> Frem.	+					+	-
10	<i>L. majuscula</i> (Dillw.) Har.in Hooker	+						-
11	<i>L. aestuarii</i> Liebm. ex. Gom.		+		+			-
	Mastigocladaceae							
12	<i>Brachytrichia balani</i> (Lloyd) Born et Flah.	+			+		+	Upper lit.
	Phaeophyta							
	Ectocarpaceae							
13	<i>Ectocarpus breviarticulatus</i> J.Ag.	+						Lower lit.
14	<i>E. siliculosus</i> (Dillw.) Lyngb.		+	+	+		+	
15	<i>Giffordia mitchellae</i> (Harv.) Hamel.	+						
16	<i>G. indica</i> Papenf et Chihara.	+						
	Scytosiphonaceae							

No	Species	Width distribution						Distribution by depth
		1	2	3	4	5	6	
17	<i>Colpomenia sinuosa</i> (Roth.) Derb. Et Sol.	+	+	+	+	+	+	Middle lit.
18	<i>Hydroclathrus clathratus</i> (Bory) Hone.	+	+	+	+		+	Lower lit.
19	<i>Petalonia fasciata</i> Kuntze.			+				
20	<i>Rosenwinigea intricata</i> (J.Ag.) Boerg.		+	+	+			
Chnoosporaceae								
21	<i>Chnoospora implexa</i> (Her.) J.Ag.		+	+			+	middle & lower lit.
22	<i>C. minima</i> (Her.) Papenf.		+	+				
Sphacelariaceae								
23	<i>Sphacelaria furcigera</i> Kuetz.	+		+				lower lit.
Dictyotaceae								
24	<i>Dictyota papenf. J.Ag.</i>	+	+					Lower & sublittoral.
25	<i>D. friabilis</i> Setch.	+					+	
26	<i>D. divaricata</i> Lamx.		+					
27	<i>Padina crassa</i> Yam.	+					+	
28	<i>P. australis</i> Hauck.	+	+	+			+	
29	<i>P. tetrastrumatica</i> Hauck.			+	+			
30	<i>Lobophora variegata</i> (Lamx.) Womers.	+	+	+	+	+	+	sublittoral
Sargassaceae								
31	<i>Timbinaria ornata</i> J.Ag.		+	+			+	lower & sublittoral.
32	<i>Sargassum meclurei</i> Setch.	+		+	+		+	
33	<i>S. meclurei f. duplicatum</i> A.Zin.	+		+			+	
34	<i>S. siliculosum</i> J.Ag.	+	+		+		+	
35	<i>S. henslowianum</i> J.Ag.	+					+	
36	<i>S. tenerrimum</i> J.Ag.	+	+					
37	<i>S. vietnamensis</i> A.Zin.	+			+		+	
38	<i>S. heterocystum</i> Mont.		+					
39	<i>S. gracillimum</i> Rbd.	+	+	+	+			lower & sublittoral.
40	<i>S. duplicatum</i> J.Ag.	+	+	+			+	
41	<i>S. herklotsii</i> Setch.		+					
42	<i>S. racemosum</i> Yamada et Segi.	+						
43	<i>S. binderi</i> Sold.		+	+				lower & sublittoral.
44	<i>S. bacularia</i> (Mart.) C.Ag.	+						
45	<i>S. glaucescens</i> J.Ag.		+					
46	<i>S. incanum</i> Grun.			+				
Rhodophyta								
Goniotrichaceae								
47	<i>Goniotrichum humphreyi</i> Collins.	+				+		Lower lit.
48	<i>Asterocystis ornata</i> (C.Ag.) Hamel.	+						
49	<i>A. ramosa</i> Gobi.	+	+					
Bangiaceae								
50	<i>Erythrotrichia parietalis</i> Tanaka	+					+	
51	<i>E. parietalis var. majuscula</i> Tanaka		+					
52	<i>Bangia fusco-purpurea</i> (Dillw.) Lyngh.					+	+	Upper & middle lit.
Chaetangiaceae								
53	<i>Galaxaura fastigiata</i> Decne.	+	+	+	+		+	lower lit.
Helminthocladiaceae								
54	<i>Dermonema pulvinata</i> (Grun.) Fan.		+				+	upper lit.
Corallinaceae								
55	<i>Amphizoa achigoensis</i> Yendo					+		lower lit.
56	<i>A. zonata</i> Yendo		+					
57	<i>Corallina officinalis</i> L.	+	+		+			
58	<i>C. squamata</i> Ellis et Sol.	+	+		+	+	+	

No	Species	Width distribution						Distribution by depth
		1	2	3	4	5	6	
59	<i>Lithoporella pacifica</i> (Heydr.) Foslie	+			+	+		
60	<i>Jania capillacea</i> Harv.	+		+				
61	<i>J. decussata-dichotoma</i> Yendo				+		+	
62	<i>J. unguolata</i> Yendo		+	+		+		lower lit.
Acrochaetaceae								
63	<i>Acrochaetium thurethi</i> (Born.) Coll. et Her.	+						
Bonnemaisoniaceae								
64	<i>Asparagopsis taxiformis</i> (Del.) Coll. et Her.		+	+			+	lower & sublittoral
Gelidiaceae								
65	<i>Gelidium crinale</i> (Turn.) Lamx.	+	+			+		littoral
66	<i>G. pusillum</i> W.V. Bosse		+					littoral
67	<i>G. divaricatum</i> Mart.	+			+			
68	<i>G. heteroplatos</i> Boerg.		+					
69	<i>Gelidiella myrioclada</i> Feldm. et Ham.			+				
70	<i>G. acerosa</i> (Forsk.) Field.		+					
71	<i>Pterocladia tenuis</i> Okam.		+					
Cryptonemiales								
72	<i>Peyssonnelia calcea</i> Heydr.	+	+	+	+	+	+	
73	<i>P. caulifera</i> Okam.	+			+	+		
Gracilariaceae								
74	<i>Gracilaria crassa</i> (Haw.) J. Ag.		+		+		+	littoral
75	<i>G. firma</i> Zhang et Xia	+						
76	<i>G. cacalia</i> (J. Ag.) Daws.		+		+			
77	<i>Ceratodictyon spongiosum</i> Zanard.	+	+	+	+	+	+	lower lit.
Hypneaceae								
78	<i>Hypnea hamulosa</i> (Turn.) Mont.	+					+	
79	<i>H. esperi</i> Bory.	+	+					
80	<i>H. cervicornis</i> J. Ag.	+	+					
Phylloporaceae								
81	<i>Gymnogongrus pygmaeus</i> (Grev.) J. Ag.		+					
82	<i>Rhodomenia limiformis</i> Okam.		+					
Rhabdoniaceae								
83	<i>Catenella nipae</i> Zan.	+						
Gigartiniaceae								
84	<i>Gigartina acicularis</i> (Wulf) Lamx.	+						
Ceramiales								
85	<i>Callithamnion ramosissimum</i> Gardn.	+	+					littoral
86	<i>Ceramium mazatlanense</i> Daws.	+	+	+	+			
87	<i>C. clarionense</i> Setch. et Gardn.	+			+			
88	<i>Griffithsia barbata</i> C. Ag.	+						
89	<i>Centroceras clavulatum</i> (Ag.) Mont.		+					
Rhodomeleaceae								
90	<i>Polysiphonia harlandii</i> Harv.	+					+	lower lit.
91	<i>P. tapinocarpa</i> Sur.		+				+	
92	<i>P. sertularioides</i> (Grol) J. Ag.	+						
93	<i>P. subtilissima</i> Mont.	+						
94	<i>P. kampsaxii</i> Boerg.	+						
95	<i>Bostrychia binderi</i> Harv.	+						
96	<i>B. tenella</i> J. Ag.	+						

No	Species	Width distribution						Distribution by depth
		1	2	3	4	5	6	
97	<i>Acanthophora spicifera</i> (Vahl.) Boerg.	+		+				-
98	<i>Laurencia parvipapillata</i> Tseng.	+					+	-
99	<i>L. intermedia</i> Yam.		+					Middle lit.
	Chlorophyta							
	Ulothricaceae							
100	<i>Ulothrix flacca</i> Thuret.	+					+	lower & sublittoral
	Ulvaceae							
101	<i>Ulva conglobata</i> Kjellm.	+	+	+	+		+	upper lit.
102	<i>U. fenestrata</i> Post. Et Rupr.		+					
103	<i>Enteromorpha flexuosa</i> (Wulf.) J.Ag.	+			+		+	
104	<i>E. prolifera</i> (Mert.) J.Ag.	+						middle lit.
105	<i>E. chaetomorphoides</i> Boerg.	+				+		lower lit.
106	<i>E. torta</i> (Mert.) Reimb.	+						
107	<i>E. tubulosa</i> Kuetz.	+						
108	<i>E. stipitata</i> var. <i>catbaensis</i> Dinh		+					
	Monostromataceae							
109	<i>Monostroma oxyspermum</i> Doty	+						upper lit.
	Cladophoraceae							
110	<i>Rhizoclonium kochianum</i> Kuetz.	+						
111	<i>Chaetomorpha capillaris</i> (Kuetz.) Boerg.	+			+			middle lit.
112	<i>Cladophora glomerata</i> Kuetz.	+			+		+	
113	<i>C. laetevirens</i> (Dillw.) Kuetz.	+			+			
114	<i>C. crispula</i> Vick.	+						
115	<i>C. albida</i> (Huds.) Kuetz.	+						
116	<i>C. fascicularis</i> (Mert.) Kuetz.	+	+					
	Siphonocladaceae							
117	<i>Cladophoropsis sumdanensis</i> Reimb.	+	+					sublittoral
118	<i>C. membranacea</i> (C.Ag.) Boerg.		+	+				
	Valoniaceae							
119	<i>Valonia macrophysa</i> Kuetz.		+	+	+			lower lit.
	Anadyomenaceae							
120	<i>Microdictyon nigrescens</i> (Yam.) Setch.		+	+				
	Derbesiaceae							
121	<i>Derbesia marina</i> Kjellm.	+						
	Codiaceae							
122	<i>Codium repens</i> (Crouan.) Vick.	+	+		+		+	
123	<i>C. adhaerens</i> (Cabr.) Ag.	+			+		+	
	Udoteaceae							
124	<i>Chlorodesmis hillebrandii</i> C. Gepp.						+	
	Caulerpaceae							
125	<i>Caulerpa sertularioides</i> (Gmel.) Howe.		+					lower lit.
126	<i>C. serrulata</i> (Forsk.) Boerg.	+						
127	<i>C. racemosa</i> (Forsk.) Ag.				+		+	
128	<i>C. taxifolia</i> (Vahl.) C.Ag.	+	+	+				middle lit.
129	<i>C. peltata</i> (Turn.) Lamx.		+					lower lit.

Legend : 1. South Ha Long Bay
2. Southeast CatBa Isl.
3. Hang Trai & DauBe Isl.
4. Cong Do Isl.
5. Bo Hung Isl.
6. Cong Tay Isl.

5.7.3 List of rare, precious and economically valuable macroalgae in Ha Long bay

No	Species	Uses
Rhodophyta		
1	<i>Acanthophora spicifera</i>	Carrageenan
2	<i>Hypnea esperi</i>	Carrageenan
3	<i>H. cervicornis</i>	Carrageenan
4	<i>Gigartina acicularis</i>	Agar, carrageenan, antibiotics
5	<i>Laurencia parvipapilosa</i>	Agar, carrageenan, food
6	<i>Gracilaria firma</i>	Agar, food
7	<i>G. heteroclada</i>	Agar, food
8	<i>G. crassa</i>	Agar, food
9	<i>Bangia fusco-purpurea</i>	Food
Cyanophyta		
10	<i>Brachytrichia banani</i>	Food
Chlorophyta		
11	<i>Monostroma oxyspermum</i>	Food
12	<i>Ulva fenestrata</i>	Food
13	<i>U. conglobata</i>	Food
14	<i>Enteromorpha flexuosa</i>	Food & feed for animals
15	<i>E. prolifera</i>	Food & feed for animals
16	<i>Codium repens</i>	Helminthiasis
17	<i>Caulerpa sertularioides</i>	Food
18	<i>C. peltata</i>	Food
19	<i>C. taxifolia</i>	Food
20	<i>C. racemosa</i>	Food, blood pressure
Phaeophyta		
21	<i>Colpomenia sinuosa</i>	Food, Iodine
22	<i>Rosenvingea intricata</i>	Helminthiasis
23	<i>Turbinaria ornata</i>	Alginate, KCl, manitol
24	<i>Sargassum tenerrimum</i>	Blood pressure
25	<i>S. vietnamensis</i>	Iodine, active coal
26	<i>S. henslowianum</i>	Iodine, active coal
27	<i>S. duplicatum</i>	Iodine, active coal
28	<i>S. glaucescens</i>	Iodine, active coal
29	<i>S. binderi</i>	Alginate
30	<i>S. siliquosum</i>	Food
31	<i>S. meclurei</i>	Alginate

5.7.4 List of dominant macroalgal species

No	Species
Cyanophyta	
1	<i>Lyngbya aestuarii</i>
Phaeophyta	
2	<i>Colpomenia sinuosa</i>
3	<i>Hydroclathrus clathratus</i>
4	<i>Rosenvingea intricata</i>
5	<i>Cluospora implexa</i>
6	<i>C. minima</i>
7	<i>Padina australis</i>
8	<i>S. tetrastromatica</i>
9	<i>Sargassum meclurei</i>
10	<i>S. siliquosum</i>
11	<i>S. heterocystum</i>
12	<i>S. gracillimum</i>
13	<i>S. herklotsi</i>
Chlorophyta	
14	<i>Enteromorpha prolifera</i>

5.7.5 The results of macroalgae analysis

No.3 (Ba trai dao)

Date of sampling: July,11,1998

No	Species	Distribution
1	<i>Lobophora variegata</i> (Lamx.) Wom.	
2	<i>Peyssonnelia calcea</i> Heydr.	
3	<i>Ceratodictyon spongiosum</i> Zanard.	
4	<i>Polysiphonia kampsaxii</i> Boerg.	
5	<i>Lithophyllum Okamurai</i> Forsk.	
6	<i>L. trichotomum</i> (Heydr.) Lem.	

No.4 (Hang Trai)

Date of sampling: July,17,1998

No	Species	Distribution
1	<i>Lithophyllum Okamurai</i> Forsk.	Sublittoral
2	<i>Lobophora variegata</i> (Lamx.) Wom.	-
3	<i>Peyssonnelia calcea</i> Heydr.	-
4	<i>Ceratodictyon spongiosum</i> Zanard.	-
5	<i>Polysiphonia kampsaxii</i> Boerg.	-

No.5 (Is. Cong Ia)

Date of sampling: July,17,1998

No	Species	Distribution
1	<i>Lithophyllum Okamurai</i> Forsk.	Sublittoral
2	<i>L. trichotomum</i> (Heydr.) Lem.	-
3	<i>Lobophora variegata</i> (Lamx.) Wom.	-
4	<i>Polysiphonia kampsaxii</i> Boerg.	-
5	<i>Ceratodictyon spongiosum</i> Zanard.	-

No.6 (Is. Hang Cao)

Date of sampling: July,13,1998

No	Composition species	Distribution
1	<i>Lobophora variegata</i> (Lamx.) Wom.	Sublittoral
2	<i>Peyssonnelia calcea</i> Heydr.	-
3	<i>Ceratodictyon spongiosum</i> Zanard.	-
4	<i>Polysiphonia kampsaxii</i> Boerg.	-
5	<i>Jania decussato-dichotoma</i> (Yendo)Yendo	-
6	<i>Sargassum</i> sp1.	-
7	<i>Sargassum</i> sp2.	-

No.7 (Is. Cong Do dai)

Date of sampling: July,13,1998

No	Species	Distribution
1	<i>Lobophora variegata</i> (Lamx.) Wom.	
2	<i>Peyssonnelia calcea</i> Heydr.	
3	<i>Ceratodictyon spongiosum</i> Zanard.	
4	<i>Lithophyllum Okamurai</i> Forsk.	
5	<i>Polysiphonia kampsaxii</i> Boerg.	

No.8 (Cong Tra Son)

Date of sampling: July,15,1998

No	Species	Distribution
1	<i>Lobophora variegata</i> (Lamx.) Wom.	sublittoral
2	<i>Ceratodictyon spongiosum</i> Zanard.	-
3	<i>Polysiphonia kampsaxii</i> Boerg.	-

No.9 (Is. Tra Son)

Date of sampling: July, 15.1998

No	Species	Distribution
1	<i>Lobophora variegata</i> (Lamx.) Wom.	Sublittoral
2	<i>Lithophyllum Okamurai</i> Forsk.	-
3	<i>L. trichotomum</i> (Heydr.) Lem.	-
4	<i>Peyssonnelia calcea</i> Heydr.	-

No.10 (Is. West Gian muop)

Date of sampling: July, 15. 1998

No	Species	Distribution
1	<i>Polysiphonia kampsaxii</i> Boerg.	Sublittoral
2	<i>Lobophora variegata</i> (Lamx.) Wom.	-
3	<i>Lithophyllum Okamurai</i> Forsk.	-
4	<i>L. trichotomum</i> (Heydr.) Lem.	-
5	<i>Peyssonnelia calcea</i> Heydr.	-
6	<i>Jania decussato-dichotoma</i> (Yendo)Yendo	-
7	<i>Ceratodictyon spongiosum</i> Zanard.	-

No.11 (Cong Dong Nam)

Date of sampling: July,14.1998

No	Species	Distribution
1	<i>Lobophora variegata</i> (Lamx.) Wom.	Sublittoral
2	<i>Ceratodictyon spongiosum</i> Zanard.	-
3	<i>Polysiphonia kampsaxii</i> Boerg.	-

No.12 (Cat Da to)

Date of sampling: July,14.1998

No	Species	Distribution
1	<i>Polysiphonia kampsaxii</i> Boerg.	sublittoral
2	<i>Peyssonnelia calcea</i> Heydr.	-
3	<i>Lobophora variegata</i> (Lamx.) Wom.	-
4	<i>Lithophyllum Okamurai</i> Forsk.	-
5	<i>Ceratodictyon spongiosum</i> Zanard.	-
6	<i>Amphiroa zonata</i> Yendo	-
7	<i>Corallina officinalis</i> L.	-

No.13 (Is. Cong Dam)

Date of sampling: July, 14.07.1998

No	Species	Distribution
1	<i>Lobophora variegata</i> (Lamx.) Wom.	Sublittoral

No.14 (Is. East VanGio)

Date of sampling: July,14.1998

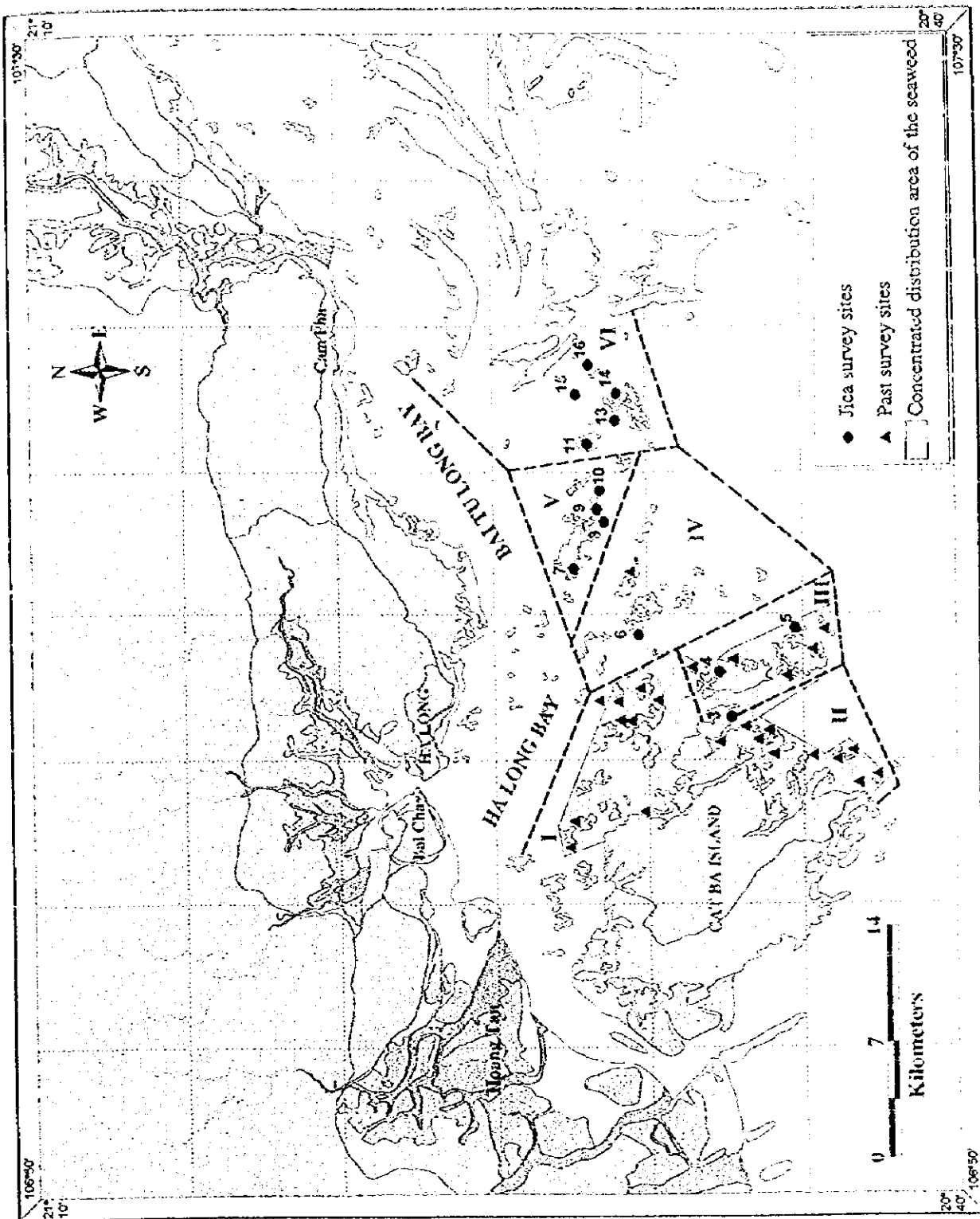
No	Species	Distribution
1	<i>Lobophora variegata</i> (Lamx.) Wom.	sublittoral

No.15 (Is. Gieng)

Date of sampling: July,14.1998

No	Species	Distribution
1	<i>Lobophora variegata</i> (Lamx.) Wom.	Sublittoral

5.7.6 Survey sites of macroalgae



5.8 CORAL REEFS

5.8.1 Location of survey sites

No	Islands	Co-ordinates	Survey parameters
1	Dam Nam	20°51'40" - 107°04'00"	Species composition, living coral cover,
2	Cong Go	20°51'23" - 107°05'38"	Species composition, living coral cover,
3	Ba Trai Dao	20°47'37" - 107°06'00"	Species composition, living coral cover,
4	Hang Trai	20°48'03" - 107°07'26"	Species composition, living coral cover,
5	Cong La	20°45'30" - 107°08'36"	Species composition, living coral cover,
6	Hang Cao	20°50'13" - 107°09'20"	Species composition, living coral cover,
7	Cong Do	20°52'35" - 107°10'52"	Species composition, living coral cover,
8	Cong Tra San	20°51'51" - 107°12'24"	Species composition, living coral cover,
9	H. Tra San	20°52'07" - 107°12'45"	Species composition
10	Gian Muop	20°52'12" - 107°13'10"	Species composition, living coral cover,
11	Cong Dong Nam	20°52'06" - 107°15'18"	Species composition, living coral cover,
12	Cat Da To	20°50'15" - 107°15'20"	Species composition, living coral cover,
13	Cong Dam	20°51'08" - 107°16'22"	Not corals
14	Van Gio	20°51'19" - 107°17'07"	Species composition
15	Hang Gieng	20°52'40" - 107°16'33"	Only dead corals
16	Hang Mat Men	20°52'13" - 107°17'54"	Not corals
17	Cong Tay	20°52'25" - 107°18'50"	Species composition, living coral cover,

5.8.2 Species number occurred in survey sites by genus

No	Genus	Number of species												
		1	2	3	4	5	6	7	8	9	10	11	12	17
1	<i>Acropora</i>	3	1	6	9	7	2	5	1	0	2	4	5	5
2	<i>Astreopora</i>	2	1	1	1	2	0	1	1	0	1	1	1	1
3	<i>Montipora</i>	3	0	3	3	5	0	1	3	0	5	4	3	5
4	<i>Porites</i>	4	3	4	3	4	3	3	2	2	4	2	3	2
5	<i>Goniopora</i>	3	4	3	4	3	2	3	2	1	2	3	3	4
6	<i>Alveopora</i>	0	0	0	1	1	0	1	0	0	1	0	1	0
7	<i>Pseudosiderastrea</i>	0	0	0	1	1	0	1	0	0	1	0	1	1
8	<i>Coscinarea</i>	1	0	0	0	1	0	0	0	0	1	0	0	1
9	<i>Psammocora</i>	0	0	1	0	2	0	2	1	0	1	0	1	1
10	<i>Pavona</i>	3	0	2	2	2	2	2	2	0	0	1	2	2
11	<i>Leptoceris</i>	1	0	1	1	1	0	1	0	0	1	1	0	0
12	<i>Pachyseris</i>	1	0	0	2	0	0	1	1	0	1	0	0	0
13	<i>Fungia</i>	0	0	0	3	3	0	3	1	1	0	1	1	1
14	<i>Halomitra</i>	0	0	0	1	0	0	1	0	0	0	0	1	0
15	<i>Sandalolitha</i>	0	0	1	0	1	0	0	1	0	0	1	0	1
16	<i>Podobacea</i>	1	0	1	1	1	0	1	1	1	1	1	0	1
17	<i>Lithophylon</i>	0	0	0	1	1	0	0	0	0	1	1	0	1
18	<i>Galaxea</i>	1	1	2	2	2	1	2	2	2	2	2	2	2
19	<i>Pectinia</i>	1	1	1	0	2	0	2	1	1	1	1	1	2
20	<i>Oxypora</i>	1	0	1	1	1	0	1	1	0	1	1	1	1
21	<i>Echinophyllia</i>	1	0	1	2	1	1	2	0	1	3	1	1	1
22	<i>Mycidium</i>	1	1	1	1	1	0	1	1	1	1	1	1	1
23	<i>Lobophyllia</i>	2	0	3	3	1	1	3	1	1	3	2	3	3
24	<i>Symphyllia</i>	1	2	3	3	3	1	4	2	1	3	3	2	3
25	<i>Merulina</i>	1	0	1	0	1	0	1	1	0	1	1	1	1
26	<i>Hydriophora</i>	0	0	1	1	1	0	1	0	0	0	1	1	2
27	<i>Favia</i>	6	1	4	5	7	4	6	5	2	5	5	5	4
28	<i>Barabatoia</i>	0	0	0	1	1	0	1	1	0	1	1	1	0

No	Genus	Number of species													
		1	2	3	4	5	6	7	8	9	10	11	12	17	
29	<i>Favites</i>	3	1	3	5	3	0	3	4	0	4	1	2	2	
30	<i>Goniastrea</i>	2	1	3	3	2	0	2	1	1	2	2	2	3	
31	<i>Platyygyra</i>	1	0	2	3	1	0	3	2	0	2	1	1	2	
32	<i>Montastrea</i>	0	0	1	1	1	0	2	1	0	0	1	1	1	
33	<i>Oulastrea</i>	1	0	1	1	1	0	1	1	0	0	1	1	1	
34	<i>Plesiastrea</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	
35	<i>Leptastrea</i>	2	2	2	2	3	2	2	2	2	2	2	3	2	
36	<i>Cyphastrea</i>	1	2	2	1	3	1	1	2	1	2	2	2	3	
37	<i>Echinopora</i>	1	0	2	2	0	0	1	0	0	2	0	1	1	
38	<i>Caulastrea</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	
39	<i>Turbinaria</i>	1	1	2	4	1	0	1	1	1	1	1	1	1	
40	<i>Tubastrea</i>	0	1	0	1	0	0	1	0	1	1	0	1	0	
41	<i>Dendrophyllia</i>	0	0	0	1	0	0	0	0	1	0	0	0	0	
	Number of genus	27	15	29	34	36	11	35	28	17	32	30	32	32	
	Number of species	49	28	59	76	73	20	67	45	21	60	50	65	62	

5.8.3 Percentage composition of coverage by live coral, dead coral and other components of sediment

Sites	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon	Dom
1	26.4	0.4	58.4		14.8				
2	19.1	4.8	50.8	19.6	4.4				
3	76.0		18.1	3.2	2.7				
4	78.1		21.6					0.3	
5	29.3		57.5	0.5	5.6			6.7	
6	32.7	5.6	29.9	6.1	26.1				
7	28.3	2.4	58.1		12.7				
8	19.2		58.8		12.6	9.6			
9									
10	52.7	2.7	28.3	14.0	2.3				
11	48.3	1.3	44.0		5.7			0.7	
12	52.3	1.6	39.7		5.0			0.7	
13									
14									
15									
16									
17	33.0	0.7	37.3		29.0				

5.8.4 Inventory of hard corals

No	Taxon	Sites													
		1	2	3	4	5	6	7	8	9	10	11	12	17	
	Acroporidae														
1	<i>Acropora humilis</i> (Dana)				+	+									
2	<i>A. glauca</i> (Brook)			+	+						+		+		
3	<i>A. nobilis</i> (Dana)	+		+	+	+	+	+				+	+	+	
4	<i>A. formosa</i> (Dana)	+						+					+		
5	<i>A. valenciennesi</i> (Ldw. & H.)				+										
6	<i>A. microphthalmia</i> (Verrill)				+	+	+	+				+			
7	<i>A. aspera</i> (Dana)	+		+		+			+				+	+	
8	<i>A. pulchra</i> (Brook)	+	+	+	+			+				+			
9	<i>A. millepora</i> (Fhr.)					+									

No	Taxon	Sites												
		1	2	3	4	5	6	7	8	9	10	11	12	17
10	<i>A. yongei</i> Veron & Pichon					+	+							
11	<i>A. cytherea</i> (Dana)			+	+						+	+		+
12	<i>A. hyacinthus</i> (Dana)			+	+	+					+			
13	<i>A. divaricata</i> (Dana)													+
14	<i>A. cerealis</i> (Dana)													+
15	<i>A. samoensis</i> (Brook)													+
16	<i>Astreopora myriophthalma</i> (Lam.)	+	+	+	+	+		+	+		+	+	+	+
17	<i>A. gracilis</i> Ber.	+				+								
18	<i>Montipora aequituberculosa</i> Ber.			+	+				+		+			+
19	<i>M. digitata</i> (Dana)					+								+
20	<i>M. hispida</i> (Dana)	+				+		+	+		+	+	+	+
21	<i>M. informis</i> Ber.			+	+	+					+	+	+	
22	<i>M. spongodes</i> Ber.	+				+								
23	<i>M. tuberculosa</i> Ber.				+	+					+			
24	<i>M. turgescens</i> Ber.	+									+			
25	<i>M. undata</i> Ber.											+	+	
26	<i>M. danae</i> Edw. et H.								+					
27	<i>M. venosa</i> (Lbr.)			+										
28	<i>M. nodosa</i> (Dana)											+		
29	<i>M. australiensis</i> Ber.													+
30	<i>M. hoffmeisteri</i> Wells													+
Poritidae														
31	<i>Porites solida</i> (Forsk.)	+	+	+			+	+			+		+	
32	<i>P. stephensoni</i> Cros.					+								
33	<i>P. lutea</i> Edw. & H.	+	+	+	+	+	+	+	+	+	+	+	+	
34	<i>P. lobata</i> Dana	+	+	+	+	+	+	+	+	+	+	+	+	+
35	<i>P. australiensis</i> Vaughan	+		+	+	+				+	+			+
36	<i>Goniopora stokesi</i> Edw. et H.	+	+	+	+	+	+	+			+	+	+	+
37	<i>G. lobata</i> Edw. & H.		+		+									+
38	<i>G. columna</i> Dana	+	+	+		+	+	+				+	+	+
39	<i>G. djiboutiensis</i> Vau.			+	+	+		+	+	+	+	+	+	
40	<i>G. stuchburyi</i> Wells	+	+	+										+
41	<i>Alveopora allingi</i> Hoff.				+	+		+			+		+	
Siderastreaeidae														
42	<i>Pseudosiderastrea tayamai</i> Y. & Sug.				+	+		+			+		+	+
43	<i>Coscinarea columna</i> (Dana)	+				+					+			+
44	<i>Psanmocora digitata</i> Edw. & H.					+		+						
45	<i>P. configua</i> (Espet)			+				+					+	
46	<i>P. profundacella</i> Gar.					+		+		+				+
Agariciidae														
47	<i>Pavona cactus</i> (For.)	+			+			+					+	+
48	<i>P. decussata</i> (Dana)	+		+	+	+	+	+	+		+	+	+	+
49	<i>P. varians</i> Verrill						+							
50	<i>Leptoceris mycetocerooides</i> Wells	+		+	+	+		+			+	+		
51	<i>Pachyseris rugosa</i> (Lam.)	+			+			+	+					
52	<i>P. speciosa</i> (Dana)				+						+			
Fungiidae														
53	<i>F. corona</i> Doderlein								+	+				
54	<i>F. khunzingeri</i> Dana				+									
55	<i>F. fungites</i> (L.)				+	+		+						+
56	<i>F. repanda</i> Dana				+	+		+						
57	<i>F. granulosa</i> Klunz.					+		+				+	+	
58	<i>F. valida</i> Verrill					+		+				+	+	
59	<i>Halomitra pileus</i> (Lam.)				+			+						+

No	Taxon	Sites														
		1	2	3	4	5	6	7	8	9	10	11	12	17		
60	<i>Sandalolitha robusta</i> (Quelch)			+		+			+			+			+	
61	<i>Podobacea crustacea</i> (Pallas)	+		+	+	+		+	+	+	+	+			+	
62	<i>Lithophylon undulatum</i> Ehr.				+	+						+	+		+	
Oculinidae																
63	<i>Galaxea astreata</i> (Lam.)			+	+	+		+	+	+	+	+	+	+	+	
64	<i>G. fascicularis</i> (L.)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Pectinidae																
65	<i>Pectinia lactuca</i> (Pallas)	+		+		+		+	+	+	+	+	+	+	+	
66	<i>P. paeonia</i> (Dana)		+			+		+							+	
67	<i>Oxypora lacera</i> Verrill	+		+	+	+		+	+		+	+	+	+	+	
68	<i>Echinophyllia echinata</i> (S.-Kent)			+	+		+	+		+	+	+	+	+	+	
69	<i>E. aspera</i> (Edw. & H.)	+			+	+					+					
70	<i>E. orpheensis</i> Veron & Pichon							+			+					
71	<i>Mycodium elephantotus</i> (Pallas)	+	+	+	+	+		+	+	+	+	+	+	+	+	
Mussidae																
72	<i>Lobophyllia hemprichi</i> (Ehr.)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
73	<i>L. corymbosa</i> (Forscal)			+	+			+			+		+	+	+	
74	<i>L. hattai</i> Y. S. & E.	+		+	+			+			+	+	+	+	+	
75	<i>Symphyllia recta</i> (Dana)		+	+	+			+			+	+			+	
76	<i>S. radians</i> Edw. & H.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
77	<i>S. agaricta</i> Edw. & H.			+	+	+		+	+		+	+	+	+	+	
78	<i>S. valenciennesi</i> Edw. & H.					+		+								
Merulinidae																
78	<i>Merulina ampliata</i> (Ell. et Sol.)	+		+		+		+	+		+	+	+	+		
80	<i>Hydnophora microconos</i> (Lam.)														+	
81	<i>H. exesa</i> (Pallas)			+	+	+		+			+	+	+	+		
Faviidae																
82	<i>Favia speciosa</i> (Dana)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
83	<i>F. pallida</i> (Dana)	+				+	+				+				+	
84	<i>F. laxa</i> Klunz.					+										
85	<i>F. maritima</i> Nemenzo	+	+	+	+	+	+	+	+		+	+	+	+	+	
86	<i>F. rotundata</i> (Gar.)	+		+	+			+	+		+	+	+			
87	<i>F. maxima</i> Veron & Pichon				+			+								
88	<i>F. favius</i> (Fors.)	+		+	+	+	+	+	+	+	+	+	+	+		
89	<i>F. matthai</i> Vaughan					+										
90	<i>F. lizardensis</i> V. & P.	+				+		+	+			+	+	+	+	
91	<i>Barabatoia amicornum</i> Edw. & H.				+	+		+	+		+	+	+	+		
92	<i>Favites pentagona</i> (Esper)	+		+	+	+		+	+		+					
93	<i>F. abdita</i> (Ellis & Solander)	+	+	+	+	+		+	+		+	+	+	+	+	
94	<i>F. chinensis</i> (Verrill)				+	+					+					
95	<i>F. flexuosa</i> Dana	+		+	+			+	+		+		+	+		
96	<i>F. halicora</i> Ehr.				+				+							
97	<i>Goniastrea retiformis</i> (Lam.)	+		+	+			+			+	+	+	+	+	
98	<i>G. favulus</i> (Dana)			+		+										
99	<i>G. aspera</i> Verrill				+									+	+	
100	<i>G. pectinata</i> (Ehr.)	+	+	+	+	+		+	+	+	+	+	+		+	
101	<i>Platygira daedalea</i> (Edw. & H.)	+		+	+	+		+						+	+	
102	<i>P. lamellina</i> (Ehr.)			+	+			+	+		+				+	
103	<i>P. sinensis</i> (Edw. and H.)				+			+	+		+	+				
104	<i>Montastrea curta</i> (Dana)			+	+	+		+	+			+			+	
105	<i>M. valenciennesi</i> (V. & H.)							+						+		
106	<i>Oulastrea crista</i> (Lam.)	+		+	+	+		+	+			+	+	+	+	
107	<i>Plesiastrea versipora</i> (Lam.)					+										
108	<i>Leptastrea inaequalis</i> Klunz.					+									+	

No	Taxon	Sites												
		1	2	3	4	5	6	7	8	9	10	11	12	17
109	<i>L. purpurea</i> (Dana)	+	+	+	+	+	+	+	+	+	+	+	+	+
110	<i>L. transversa</i> Klunzinger	+	+	+	+	+	+	+	+	+	+	+	+	+
111	<i>Cyphastrea serailia</i> (Forscal)	+	+	+	+	+	+	+	+	+	+	+	+	+
112	<i>C. chancidicum</i> (Fors.)		+			+							+	+
113	<i>C. microphthalmalma</i> (Lam.)			+		+			+			+	+	+
114	<i>Echinopora lamellosa</i> (Esper)	+		+	+			+			+		+	+
115	<i>E. gemmacea</i> (Lam.)			+	+						+			
116	<i>Caulastrea tumida</i> Matthai					+								
Dendrophyllidae														
117	<i>Turbinaria peltata</i> (Dana)	+	+	+	+	+		+	+	+	+	+	+	+
118	<i>T. bifrons</i> Brug.				+									
119	<i>T. reniformis</i> Ber			+	+									
120	<i>T. mesenterina</i> (Lam.)				+									
121	<i>Tubastrea coccinea</i> (Frh.)		+		+			+		+	+		+	
122	<i>Dendrophyllia sphaerica</i> Nemezo				+					+				
	Number of genus	27	15	29	34	36	11	35	28	17	32	30	32	32
	Number of species	49	28	59	76	73	20	67	45	21	60	50	65	62

5.8.5 List of hard corals in Ha Long bay including the records in existing literature

No	Taxon	1	2	3	4	5	6	7
Astrocoenidae								
1	<i>Stylocoeniella guentheri</i> B. - Smith		+	+				
Pocilloporidae								
2	<i>Stylophora pistillata</i> Esper							+
3	<i>Madracis kirhyi</i> Veron & Pichon							+
4	<i>Palauastrea ramosa</i> Yabe & Sug.		+	+				
Acroporidae								
5	<i>Acropora humilis</i> (Dana)		+	+	+	+		
6	<i>A. digitifera</i> (Dana)	+	+	+	+	+	+	
7	<i>A. gemmifera</i> (Brook)			+	+	+		
8	<i>A. glauca</i> (Brook)		+	+		+		+
9	<i>A. nobilis</i> (Dana)	+	+	+	+	+	+	
10	<i>A. formosa</i> (Dana)	+	+	+	+	+	+	
11	<i>A. acuminata</i> Verrill	+	+	+		+	+	
12	<i>A. valenciennesi</i> (Edw. & H.)		+			+		
13	<i>A. microphthalmalma</i> (Verrill)		+	+	+	+		
14	<i>A. aspera</i> (Dana)	+	+	+	+	+	+	+
15	<i>A. pulchra</i> (Brook)	+		+	+	+		+
16	<i>A. millepora</i> (Ehr.)	+	+	+	+	+	+	
17	<i>A. selago</i> (Studer)		+	+				+
18	<i>A. yongei</i> V. & P.		+	+		+		
19	<i>A. cytherea</i> (Dana)	+	+	+	+	+	+	
20	<i>A. hyacinthus</i> (Dana)		+	+	+	+		
21	<i>A. robusta</i> (Dana)		+	+			+	
22	<i>A. spicifera</i> (Dana)		+	+		+	+	
23	<i>A. monticulosa</i> (Bru.)				+	+	+	
24	<i>A. clathrata</i> (Bro.)		+	+	+	+	+	
25	<i>A. divaricata</i> (Dana)		+	+		+	+	
26	<i>A. nasuta</i> (Dana)	+	+	+	+	+		
27	<i>A. cerealis</i> (Dana)	+				+	+	
28	<i>A. samoensis</i> (Brook)		+	+				
29	<i>Astreopora myriophthalma</i> (Lam.)	+	+	+	+	+	+	+

No	Taxon	1	2	3	4	5	6	7
30	<i>A. gracilis</i> Ber.		+	+	+	+	+	
31	<i>Montipora stellata</i> Ber.	+	+	+				
32	<i>M. aequituberculosa</i> Ber.	+	+	+	+	+	+	
33	<i>M. digitata</i> (Dana)	+	+	+	+	+	+	
34	<i>M. angulata</i> (Lam.)		+	+	+	+		
35	<i>M. hispida</i> (Dana)		+	+		+	+	
36	<i>M. informis</i> Ber.	+	+	+	+	+	+	
37	<i>M. spongoides</i> Ber.	+	+	+	+			+
38	<i>M. tuberculosa</i> (Lam.)		+	+	+	+		
39	<i>M. hoffmeisteri</i> Wells				+	+	+	
40	<i>M. australiensis</i> Ber.	+			+		+	
41	<i>M. turgescens</i> Ber.	+	+	+	+	+		+
42	<i>M. turtlensis</i> Veron et Pichon	+	+	+	+	+		
43	<i>M. undata</i> Ber.		+	+				
44	<i>M. danae</i> Edw. et H.		+	+				
45	<i>M. venosa</i> (Ehr.)	+	+	+		+		
46	<i>M. nodosa</i> (Dana)		+	+				
Poritidae								
47	<i>Porites solida</i> (Forsk.)	+	+	+	+	+	+	+
48	<i>P. stephensoni</i> Cros.	+	+	+				+
49	<i>P. lutea</i> Edw. & H.	+	+	+	+	+	+	+
50	<i>P. lobata</i> Dana	+	+	+	+	+	+	+
51	<i>P. australiensis</i> Vaughan	+	+	+	+	+	+	+
52	<i>P. lichen</i> Dana							+
53	<i>P. annae</i> Cros.							+
54	<i>P. rus</i> (For.)							+
55	<i>Goniopora stokesi</i> Edw. et H.	+	+	+	+	+	+	+
56	<i>G. lobata</i> Edw. & H.	+	+	+	+	+	+	+
57	<i>G. columna</i> Dana	+	+	+	+	+	+	+
58	<i>G. djiboutiensis</i> Van.	+	+	+	+	+		+
59	<i>G. stuchburyi</i> Welis	+	+	+	+	+	+	+
60	<i>G. pandoraensis</i> Veron & Pic.		+	+	+			
61	<i>G. tenuidens</i> Quelch	+			+	+		
62	<i>Alveopora allingi</i> Hoff.	+		+	+	+		
Siderastreidae								
63	<i>Pseudosiderastrea tayamai</i> Y. & S.	+	+	+	+	+	+	
64	<i>Coscinarea columna</i> (Dana)	+	+	+	+	+	+	+
65	<i>C. exesa</i> Dana		+			+	+	+
66	<i>Psammocora digitata</i> Edw. & H.		+	+	+	+	+	
67	<i>P. configua</i> (Esper)	+	+	+	+	+	+	
68	<i>P. profundacella</i> Gar.	+	+	+	+	+	+	
69	<i>P. superficialis</i> Gar.							+
Agariciidae								
70	<i>Pavona cactus</i> (For.)	+	+	+	+	+	+	
71	<i>P. decussata</i> (Dana)	+	+	+	+	+	+	+
72	<i>P. varians</i> Ver.							+
73	<i>P. clavus</i> (Dana)		+	+	+	+	+	
74	<i>P. explanulata</i> (Lamarck)	+	+	+	+	+	+	
75	<i>P. minuta</i> Wells		+	+				
76	<i>Leptocercis mycetoceroïdes</i> Wells		+	+		+		
77	<i>L. explanulata</i> Y. & S.							
78	<i>L. scabra</i> Vau.	+	+	+	+		+	
79	<i>L. yabei</i> (Pil. & Sch.)			+	+	+		
80	<i>Pachyseris rugosa</i> (Lam.)		+	+	+	+		
81	<i>P. spectiosa</i> (Dana)	+	+	+				

No	Taxon	1	2	3	4	5	6	7
Fungiidae								
82	<i>F. corona</i> Doderlein		+	+				
83	<i>F. klunzingeri</i> Dana		+	+				
84	<i>F. fungites</i> (L.)	+	+	+	+	+	+	
85	<i>F. repanda</i> Dana		+	+	+	+	+	
86	<i>F. granulosa</i> Klunz.		+	+				
87	<i>F. scutaria</i> Lam.	+	+	+		+	+	
88	<i>H. valida</i> Verrill.		+		+	+	+	
89	<i>Halomitra pileus</i> (Lam.)		+	+	+	+	+	
90	<i>Sandalolitha robusta</i> (Quelch)	+	+	+	+	+	+	+
91	<i>Podobacea crustacea</i> (Pallas)	+	+	+	+	+	+	+
92	<i>P. mokai</i> Hoeksema			+	+	+	+	
93	<i>Lithophyllon edwardsi</i> R.		+					
94	<i>L. undulatum</i> Reh.	+	+	+	+	+	+	
95	<i>Polyphyllia talpina</i> Lam.							+
Oculinidae								
96	<i>Galaxea astreata</i> (Lam.)	+	+	+	+	+	+	+
97	<i>G. fascicularis</i> (L.)	+	+	+	+	+	+	+
Pectinidae								
98	<i>Pectinia lactuca</i> (Pallas)	+	+	+	+	+	+	
99	<i>P. paeonia</i> (Dana)	+	+	+	+	+	+	+
100	<i>Oxypora lacera</i> Verrill	+	+	+	+	+	+	+
101	<i>O. glabra</i> Nemenzo	+		+	+	+	+	
102	<i>Echinophyllia echinata</i> (S-le-Kent)	+	+	+		+	+	
103	<i>E. aspera</i> (Edw. & H.)	+	+	+	+	+	+	+
104	<i>E. orpheensis</i> Veron & Pichon		+	+	+	+	+	+
105	<i>Mycedium elephantotus</i> (Pallas)	+	+	+	+	+	+	+
Mussidae								
106	<i>Lobophyllia hemprichi</i> (Fhr.)	+	+	+	+	+	+	+
107	<i>L. corymbosa</i> (Forscal)	+		+	+	+	+	+
108	<i>L. hattai</i> Y.S. & E.	+	+	+	+	+	+	
109	<i>Symphyllia recta</i> (Dana)	+	+	+	+	+	+	
110	<i>S. radians</i> Edw. & H.	+	+	+	+	+	+	+
111	<i>S. agaricia</i> Edw. & H.	+	+	+	+	+	+	+
112	<i>S. valenciennesi</i> Edw. & H.	+	+		+	+		
113	<i>Acauthastrea echinata</i> (Dana)			+	+			
Merulinidae								
114	<i>Merulina ampliata</i> (Ell. et Sol.)	+	+	+	+	+	+	+
115	<i>Hydnophora microconos</i> (Lam.)	+	+	+	+	+	+	+
116	<i>H. exesa</i> (Pallas)	+	+	+	+	+	+	+
Faviidae								
117	<i>Favia speciosa</i> (Dana)	+	+	+	+	+	+	+
118	<i>F. pallida</i> (Dana)	+	+	+	+	+	+	+
119	<i>F. laxa</i> Klunz.	+	+		+	+	+	
120	<i>F. maritima</i> Nemenzo	+	+	+	+	+	+	
121	<i>F. rotumana</i> (Gar.)	+	+	+	+	+	+	
122	<i>F. veroni</i> Moll & Borel-Best		+	+				
123	<i>F. maxima</i> Veron & Pichon		+	+	+	+		+
124	<i>F. favius</i> (Fors.)	+	+		+	+		
125	<i>F. matthai</i> Vaughau	+	+		+	+		
126	<i>F. lizardensis</i> V. & P.	+			+	+	+	
127	<i>Barabatoia amicorum</i> Edw. & H.	+	+	+	+	+		
128	<i>Favites pentagona</i> (Esper)	+	+	+	+	+		
129	<i>F. abdita</i> (Ellis & Solander)	+	+	+	+	+	+	+
130	<i>F. chinensis</i> (Verrill)	+	+	+	+	+	+	
131	<i>F. flexuosa</i> Dana	+	+	+	+	+	+	+

No	Taxon	1	2	3	4	5	6	7
132	<i>P. complanata</i> (Ehr.)		+					+
133	<i>P. halicora</i> Ehr.				+	+	+	
134	<i>Goniastrea retiformis</i> (Lam.)	+	+	+	+	+	+	+
135	<i>G. favulus</i> (Dana)	+	+		+	+		
136	<i>G. aspera</i> Verrill	+	+	+	+	+	+	+
137	<i>G. pectinata</i> (Ehr.)	+	+	+	+	+	+	+
138	<i>G. australiensis</i> Edw & Hai.		+	+	+		+	
139	<i>Platygrya daedalea</i> (Edw. & H.)	+	+	+	+	+	+	+
140	<i>P. lamellina</i> (Ehr.)	+	+	+	+	+	+	
141	<i>P. sinensis</i> (Edw. and H.)	+	+	+	+	+	+	
142	<i>P. pini</i> Ch.		+		+	+		+
143	<i>Montastrea curta</i> (Dana)	+		+	+	+	+	
144	<i>M. annuligera</i> Edw. & Hai.		+	+	+	+		
145	<i>M. valenciennesi</i> (E. & H.)	+		+	+	+		
146	<i>Oulastrea crispa</i> (Lam.)	+	+	+	+	+	+	
147	<i>Plesiastrea versipora</i> (Lam.)		+	+	+	+	+	+
148	<i>Leptastrea inaequalis</i> Klü.					+		
149	<i>L. purpurea</i> (Dana)	+	+	+	+	+	+	+
151	<i>L. transversa</i> Klunzinger	+	+	+	+	+	+	+
152	<i>Cyphastrea serailia</i> (Forscal)	+	+	+	+	+	+	+
153	<i>C. chancidicum</i> (Fors.)	+	+	+	+	+	+	
154	<i>C. microphthalmia</i> (Lam.)	+	+		+	+	+	
155	<i>Echinopora lamellosa</i> (Esper)	+	+	+	+	+	+	+
156	<i>E. gemmacea</i> (Lam.)		+	+		+	+	
157	<i>Caulastrea tumida</i> Mathai			+	+		+	
158	<i>Leptoria phrygia</i> Ell. & Sol.		+	+	+	+		
Dendrophyllidae								
159	<i>Turbinaria peltata</i> (Dana)	+	+	+	+	+	+	+
160	<i>T. frondens</i> (Dana)		+	+				
161	<i>T. bifrons</i> Brug.		+	+	+	+		
162	<i>T. reniformis</i> Ber		+	+	+	+		
163	<i>T. mesenterina</i> (Lam.)	+	+	+	+	+		+
160	<i>T. stellulata</i> (Lam.)			+	+	+		
165	<i>Tubastrea coccinea</i> (Ehr.)	+	+	+	+			+
166	<i>T. aurea</i> Dana	+	+	+	+			+
167	<i>Culisia stellata</i> (Dana)		+	+	+			
168	<i>Balanophyllia cumingi</i> Ber.							+
169	<i>Dendrophyllia sphaerica</i> Nemenzo		+	+				+
170	<i>D. horsti</i> Gar. & Vaughan		+	+				+

Note: 3- Region I 4- Region II 5- Region III 6- Region IV
7- Region V 8- Region VI 9- Region VII

5.8.7 The substratum type in coral reefs

No.1 Dam Nam

Date: 20/7/1998

Time: 10^h - 12^h

Visibility: 1.5 - 2.0m

Quadrat	Depth	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon.
1		20		60		20			
2		16	4	36		44			
3		16		60		24			
4		36		64					
5		40		60					
6		16		40		44			
7		20		72		8			
8		32		68					
9		44		56					
10		24		68		8			
Aver.		26.4	0.4	58.4		14.8			

No.2 Cong Go

Date: 20/7/1998

Time: 13^h - 15^h

Visibility: 2.0 - 2.5m

Quadrat	Depth	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon.
1		16	8	44	32				
2		24	-	40	36				
3		16	-	84					
4		20	4	32	44				
5		32	12	36					
6		12	-	88					
7		28	4	44		24			
8		-	-	52	48				
9		20	12	48		20			
10		24	8	40	36				
Aver.		19.2	4.8	50.8	19.6	4.4			

No. 3 Ba Trai Dao

Date: 11/7/1998

Time: 12^h - 14^h

Visibility: 1.0 - 1.5m

Quadrat	Depth	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon.
1		100							
2		92		8					
3		80		12		8			
4		72		20		8			
5		92		8					
6		88		4		8			
7		60		40					
8		68		32					
9		84		16					
10		100		-					
11		100		-					
12		80		20					
13		44		40	16				
14		48		32	20				
15		32		40	12	16			
Aver.		76.0		18.1	3.2	2.7			

No.4 Hang Trai

Date: 17/7/1998

Time: 13^h - 15^h

Visibility: 3.0 - 3.5m

Quadrat	Depth	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon.
1		80		20					
2		72		28					
3		96		4					
4		68		32					
5		88		12					
6		48		52					
7		84		16					
8		52		48					
9		92		8					
10		84		16					
11		96		4					
12		60		40					
13		96		4					
14		76		24					
15		80		16					4
Aver.		78.1		21.6					0.26

No. 5 Cong La

Date: 17/7/1998

Time: 10^h - 12^h

Visibility: 1.5 - 2.0m

Quadrat	Depth	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon.
1		48		52					
2		40		48	4				8
3		16		80					4
4		60		32		8			
5		12		80					4
6		20		60		8			12
7		4		86					8
8		20		60	4				16
9		16		64					20
10		48		36		8			8
11		68		28					4
12		48		40					12
13		20		20		60			
14		4		96					
15		16		80					4
Aver.		29.3		57.5	0.5	5.6			6.7

No. 6 Hon Hang Cao

Date: 13/7/1998

Time: 10^h - 12^h

Visibility: 1.5 - 2.0m

Quadrat	Depth	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon.
1		20		40		40			
2		44	20	8		28			
3		40	12	28		20			
4		60		28		12			
5		40		20		40			
6		12		40		48			
7		32		32		36			
8		12		40		48			
9		36		20		44			
10		44		28		28			
11		12		68		20			
12		48	8	32	12	4			
13		20	32	12	20	16			
14		32	12	20	28	8			
15		40		28	32				
Aver.		32.7	5.6	29.9	6.1	26.1			

No. 7 Cong Do

Date: 13/7/1998

Time: 13:30^h - 15:30^h

Visibility: 1.5 - 2.0m

Quadrat	Depth	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon.
1		32	8	44		20			
2		40		60					
3		36		64					
4		32	12	56					
5		56		32		12			
6		12	4	68		14			
7		36		56		8			
8		16		52		32			
9		20		60		20			
10		24		64		12			
11		12		56		32			
12		24	8	52		36			
13		36	4	56		4			
14		32		68					
15		16		84					
Aver.		28.3	2.4	58.1		12.7			

No.8 Cong Tra San

Date: 15/7/1998

Time: 14^h - 15:30^h

Visibility: 1.5 - 2.0m

Quadrat	Depth	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon.
1		12		72		12	4		
2		20		56		8	16		
3		16		56		12	16		
4		24		60		8	8		
5		28		56		12	4		
6		20		60		12	8		
7		24		56		12	8		
8		16		60		16	8		
9		12		52		20	16		
10		20		60		12	8		
Aver.		19.2		58.8		12.4	9.6		

No.10 Hon Gian Muop

Date: 15/7/1998

Time: 10^h - 12^h

Visibility: 2.0 - 2.5m

Quadrat	Depth	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon.
1		40	8	44	8				
2		36	4	52	8				
3		44		48	4	4			
4		52		48					
5		56		40		4			
6		80		20					
7		76		24					
8		84		12		4			
9		72		20		8			
10		52	8	32		8			
11		28	12		60				
12		12			88				
13									
14									
15									
Aver.		52.7	2.7	28.3	14.0	2.3			

No. 11 Cong Dong Nam

Date: 14/7/1998

Time: 13^h - 14³⁰^h

Visibility: 1.5 - 2.0m

Quadrat	Depth	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon.
1		32	4	48		16			
2		40	4	40		12			4
3		76		24					
4		36		64					
5		44		40		12			4
6		68	8	24					
7		28		60		12			
8		44		56					
9		72		28					
10		48		44		8			
11		52		48					
12		40		52		8			
13									
14									
15									
Aver.		48.3	1.3	44.0		5.7			0.7

No. 12 Cat Da To

Date: 14/7/1998

Time: 1530^h - 17^h

Visibility: 2.0 - 2.5m

Quadrat	Depth	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon.
1		36	8	40		16			
2		44	4	36		12			4
3		80		20					
4		72	8	20					
5		40		60					
6		48		36		12			4
7		32		56		12			
8		48		52					
9		76		24					
10		52		40		8			
11		56		44					
12		44		48					
13									
14									
15									
Aver.		52.3	1.6	39.7		5.0			0.7

No. 17 Cong Tay

Date: 14/7/1998

Time: 10^h - 11³⁰^h

Visibility: 1.5 - 2.5m

Quadrat	Depth	HC (%)	SC (%)	DC (%)	R (%)	S (%)	M (%)	Alg (%)	Spon.
1		20		40		40			
2		40		32		28			
3		36		44		20			
4		64		20		16			
5		44		24		12			
6		16		40		44			
7		32		36		32			
8		16		36		48			
9		32		28		40			
10		40		32		28			
11		16		64		20			
12		40	8	32		20			
13									
14									
15									
Aver.		33.0	0.7	37.3		29.0			

Note: - HC: hard corals; - SC: soft corals; - DC: dead corals
 - Alg: algae; - S: sand; - R: rock; - M: mud

5.8.8 Survey sites of coral reefs

