

Supplementary material

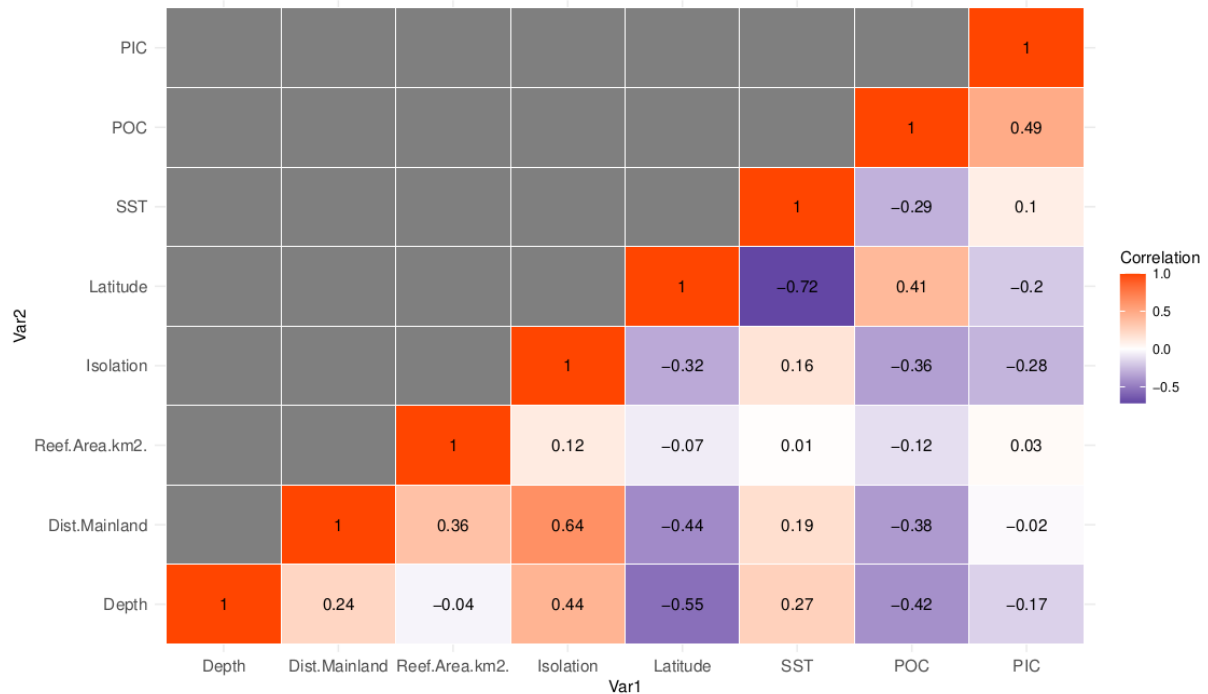


Figure S1. Correlation matrix with all the factors from the preliminary analysis.

Table S1 - GLM estimates for predictors of alpha diversity of rare species

	Estimate	S.E.	t	p
(Intercept)	17.331	1.033	16.773	0.000
Depth (m)	0.807	0.104	7.750	0.000
Reef area (km ²)	-5.886	3.392	-1.736	0.085
Isolation (km)	-0.009	0.002	-3.928	0.000
Turbidity (POC mg.m ⁻³)	-0.021	0.004	-5.672	0.000

Table S2 - GLM estimates for predictors of alpha diversity of common species

	Estimate	S.E.	t	p
(Intercept)	1.073	0.106	10.135	0.000
Depth (m)	0.040	0.011	3.718	0.000
Reef area (km ²)	1.447	0.347	4.167	0.000
Isolation (km)	0.004	0.002	-1.653	0.100
Turbidity (POC mg.m ⁻³)	-0.001	0.001	-2.461	0.015

Table S3 - GLM estimates for predictors of alpha diversity of dominant species

	Estimate	S.E.	t	p
(Intercept)	-1.460	0.732	-1.995	0.048
Depth (m)	0.030	0.009	3.294	0.001
Reef area (km ²)	1.552	0.033	4.719	0.000
SST (°C)	0.068	0.025	2.732	0.007

Table S4 - Selection of predictors to compose models of alpha diversity of rare species. Only the top 6 models based on lower AICc values are shown, and the best fit is presented in bold.

Depth	Isolation	POC	Reef Area	SST	df	logLik	AICc	delta	weight
+	+	+	+		6	-429.104	870.783	0.0000	0.434
+	+	+			5	-430.645	871.698	0.9154	0.275
+	+	+	+	+	7	-428.896	872.565	1.7822	0.178
+	+	+		+	6	-430.455	873.486	2.7027	0.112
+		+	+		5	-436.690	883.788	13.0049	0.001
+		+	+	+	6	-436.489	885.553	14.7705	0.000

Table S5 - Selection of predictors to compose models of alpha diversity of common species. Only the top 6 models based on lower AICc values are shown, and the best fit is presented in bold.

Depth	Isolation	POC	Reef Area	SST	df	logLik	AICc	delta	weight
+	+	+	+		6	-80.486	173.549	0.0000	0.302
+		+	+		5	-81.886	174.181	0.6321	0.220
+	+	+	+	+	7	-80.015	174.803	1.2543	0.161
+		+	+	+	6	-81.432	175.440	1.8912	0.117
+			+		4	-84.255	176.782	3.2336	0.059
+			+	+	5	-83.328	177.066	3.5175	0.052

Table S6 - Selection of predictors to compose models of alpha diversity of dominant species. Only the top 6 models based on lower AICc values are shown, and the best fit is presented in bold.

Depth	Isolation	POC	Reef Area	SST	df	logLik	AICc	delta	weight
+			+	+	5	-75.621	161.651	0.0000	0.273
+	+		+	+	6	-74.673	161.922	0.2707	0.238
+	+	+	+	+	7	-73.698	162.167	0.5165	0.210
+		+	+	+	6	-75.021	162.617	0.9657	0.168
+	+	+	+		6	-76.828	166.230	4.5796	0.027
+		+	+		5	-78.077	166.562	4.9111	0.023

Table S7: Pairwise results of the PERMANOVA.

Pair	Df	SumOfSqs	R2	F	Pr(>F)
Mu Ko Ang Thong_vs_Mu Ko Chang	1	2.3478885	0.3707136	20.0294527	0.001
	34	3.9855412	0.6292864	NA	NA
	35	6.3334296	1	NA	NA
Mu Ko Ang Thong_vs_Mu Ko Chumphon	1	1.3284976	0.2091954	9.7877879	0.001
	37	5.0220144	0.7908046	NA	NA
	38	6.350512	1	NA	NA
Mu Ko Ang Thong_vs_Ko Tao	1	2.6177029	0.5183748	23.6786686	0.001
	22	2.4321242	0.4816252	NA	NA
	23	5.0498271	1	NA	NA
Mu Ko Ang Thong_vs_Ko PhaNgan	1	1.3134017	0.3392613	11.2960695	0.001
	22	2.5579551	0.6607387	NA	NA
	23	3.8713568	1	NA	NA
Mu Ko Ang Thong_vs_Kep Islands	1	1.0330539	0.3169797	10.2098775	0.001
	22	2.2259998	0.6830203	NA	NA
	23	3.2590537	1	NA	NA
Mu Ko Ang Thong_vs_Ko Losin	1	3.4415907	0.5508791	26.9845798	0.001
	22	2.8058616	0.4491209	NA	NA
	23	6.2474523	1	NA	NA
Mu Ko Ang Thong_vs_Mu Ko Samet	1	0.9031933	0.1571933	8.0200055	0.001
	43	4.842554	0.8428067	NA	NA
	44	5.7457473	1	NA	NA
Mu Ko Ang Thong_vs_Mu Ko Sichang	1	1.218489	0.370915	12.971429	0.001
	22	2.066601	0.629085	NA	NA
	23	3.28509	1	NA	NA
Mu Ko Ang Thong_vs_Perhentian Islands	1	3.5761015	0.4361836	23.9824334	0.001
	31	4.6225145	0.5638164	NA	NA
	32	8.198616	1	NA	NA
Mu Ko Chang_vs_Mu Ko Chumphon	1	1.4388235	0.1941495	10.3597714	0.001
	43	5.9720827	0.8058505	NA	NA
	44	7.4109062	1	NA	NA
Mu Ko Chang_vs_Ko Tao	1	1.328205	0.281973	10.995749	0.001
	28	3.382193	0.718027	NA	NA
	29	4.710398	1	NA	NA
Mu Ko Chang_vs_Ko PhaNgan	1	2.0555056	0.3694607	16.4064344	0.001

	28	3.5080234	0.6305393	NA	NA
	29	5.563529	1	NA	NA
Mu Ko Chang_vs_Kep Islands	1	2.553943	0.4457134	22.5153866	0.001
	28	3.1760682	0.5542866	NA	NA
	29	5.7300111	1	NA	NA
Mu Ko Chang_vs_Ko Losin	1	2.377463	0.3876261	17.7236969	0.001
	28	3.7559299	0.6123739	NA	NA
	29	6.1333929	1	NA	NA
Mu Ko Chang_vs_Mu Ko Samet	1	2.5439785	0.3051578	21.5196048	0.001
	49	5.7926224	0.6948422	NA	NA
	50	8.3366008	1	NA	NA
Mu Ko Chang_vs_Mu Ko Sichang	1	1.4855092	0.3299534	13.7881408	0.001
	28	3.016669	0.6700466	NA	NA
	29	4.5021781	1	NA	NA
Mu Ko Chang_vs_Perhentian Islands	1	1.5737119	0.2202137	10.4488965	0.001
	37	5.5725828	0.7797863	NA	NA
	38	7.1462948	1	NA	NA
Mu Ko Chumphon_vs_Ko Tao	1	1.9426263	0.3053823	13.6288687	0.001
	31	4.4186658	0.6946177	NA	NA
	32	6.3612921	1	NA	NA
Mu Ko Chumphon_vs_Ko PhaNgan	1	1.7417981	0.2770787	11.8815667	0.001
	31	4.5444966	0.7229213	NA	NA
	32	6.2862947	1	NA	NA
Mu Ko Chumphon_vs_Kep Islands	1	1.8372161	0.3036843	13.5200333	0.001
	31	4.2125414	0.6963157	NA	NA
	32	6.0497575	1	NA	NA
Mu Ko Chumphon_vs_Ko Losin	1	2.9938409	0.3845039	19.3658721	0.001
	31	4.7924032	0.6154961	NA	NA
	32	7.786244	1	NA	NA
Mu Ko Chumphon_vs_Mu Ko Samet	1	1.7853836	0.2072538	13.5947648	0.001
	52	6.8290956	0.7927462	NA	NA
	53	8.6144792	1	NA	NA
Mu Ko Chumphon_vs_Mu Ko Sichang	1	1.0775192	0.2100156	8.2412835	0.001
	31	4.0531422	0.7899844	NA	NA
	32	5.1306614	1	NA	NA
Mu Ko Chumphon_vs_Perhentian Islands	1	2.648764	0.286111	16.031116	0.001
	40	6.609056	0.713889	NA	NA

	41	9.25782	1	NA	NA
Ko Tao_vs_Ko PhaNgan	1	1.61883	0.4530177	13.2514039	0.001
	16	1.9546065	0.5469823	NA	NA
	17	3.5734365	1	NA	NA
Ko Tao_vs_Kep Islands	1	2.92128	0.642897	28.805003	0.002
	16	1.622651	0.357103	NA	NA
	17	4.543931	1	NA	NA
Ko Tao_vs_Ko Losin	1	1.8194262	0.4523754	13.2170932	0.001
	16	2.202513	0.5476246	NA	NA
	17	4.0219393	1	NA	NA
Ko Tao_vs_Mu Ko Samet	1	2.6848219	0.3877544	23.4332615	0.001
	37	4.2392055	0.6122456	NA	NA
	38	6.9240274	1	NA	NA
Ko Tao_vs_Mu Ko Sichang	1	2.0681575	0.5856465	22.6143672	0.001
	16	1.4632521	0.4143535	NA	NA
	17	3.5314095	1	NA	NA
Ko Tao_vs_Perhentian Islands	1	0.9514496	0.1914148	5.918203	0.001
	25	4.0191659	0.8085852	NA	NA
	26	4.9706155	1	NA	NA
Ko PhaNgan_vs_Kep Islands	1	1.9029152	0.5211471	17.4131851	0.001
	16	1.7484821	0.4788529	NA	NA
	17	3.6513973	1	NA	NA
Ko PhaNgan_vs_Ko Losin	1	2.6176397	0.5292455	17.9879938	0.001
	16	2.3283439	0.4707545	NA	NA
	17	4.9459835	1	NA	NA
Ko PhaNgan_vs_Mu Ko Samet	1	1.5668796	0.2641439	13.2815726	0.001
	37	4.3650363	0.7358561	NA	NA
	38	5.9319159	1	NA	NA
Ko PhaNgan_vs_Mu Ko Sichang	1	1.6971574	0.5164435	17.0881696	0.002
	16	1.5890829	0.4835565	NA	NA
	17	3.2862403	1	NA	NA
Ko PhaNgan_vs_Perhentian Islands	1	2.5777913	0.3834408	15.5476076	0.001
	25	4.1449968	0.6165592	NA	NA
	26	6.7227881	1	NA	NA
Kep Islands_vs_Ko Losin	1	3.0961364	0.6079767	24.8138975	0.001
	16	1.9963886	0.3920233	NA	NA
	17	5.092525	1	NA	NA

Kep Islands_vs_Mu Ko Samet	1	1.5175372	0.2733997	13.9220798	0.001
	37	4.0330811	0.7266003	NA	NA
	38	5.5506183	1	NA	NA
Kep Islands_vs_Mu Ko Sichang	1	1.02996	0.450337	13.108743	0.001
	16	1.257128	0.549663	NA	NA
	17	2.287088	1	NA	NA
Kep Islands_vs_Perhentian Islands	1	3.5080769	0.4791723	23.0005157	0.001
	25	3.8130415	0.5208277	NA	NA
	26	7.3211184	1	NA	NA
Ko Losin_vs_Mu Ko Samet	1	4.0935404	0.4701715	32.8339201	0.001
	37	4.6129428	0.5298285	NA	NA
	38	8.7064832	1	NA	NA
Ko Losin_vs_Mu Ko Sichang	1	3.1859343	0.6342789	27.7491796	0.001
	16	1.8369894	0.3657211	NA	NA
	17	5.0229237	1	NA	NA
Ko Losin_vs_Perhentian Islands	1	1.5860017	0.2652662	9.025931	0.001
	25	4.3929033	0.7347338	NA	NA
	26	5.9789049	1	NA	NA
Mu Ko Samet_vs_Mu Ko Sichang	1	1.2461546	0.2433973	11.9028155	0.001
	37	3.8736819	0.7566027	NA	NA
	38	5.1198365	1	NA	NA
Mu Ko Samet_vs_Perhentian Islands	1	3.9795819	0.3823147	28.4715828	0.001
	46	6.4295957	0.6176853	NA	NA
	47	10.4091776	1	NA	NA
Mu Ko Sichang_vs_Perhentian Islands	1	2.9090533	0.4432711	19.9051597	0.001
	25	3.6536423	0.5567289	NA	NA
	26	6.5626957	1	NA	NA

Table S8. List of reef fish species in the Gulf of Thailand recorded in our ten surveyed sites.

Species	Ang-thong	Chang	Cumphon	Kep	Losin	Perhentian	Pha Ngan	Samet	Sichang	Tao
<i>Abudefduf bengalensis</i>	x	x	x	x		x	x	x	x	
<i>Abudefduf sexfasciatus</i>		x	x			x	x	x	x	x
<i>Abudefduf vagiensis</i>					x	x	x	x		
<i>Amblyglyphidodon aureus</i>					x	x				
<i>Amblyglyphidodon curacao</i>		x	x			x		x		x
<i>Amblyglyphidodon leucogaster</i>						x				
<i>Amphiprion clarkii</i>						x				
<i>Amphiprion ocellaris</i>						x				
<i>Amphiprion perideraion</i>	x	x	x		x	x		x	x	x
<i>Arothron mappa</i>						x				
<i>Bolbometopon muricatum</i>					x	x				
<i>Caesio caerulea</i>						x				
<i>Caesio cuning</i>	x	x	x	x	x	x		x		
<i>Carangoides bajad</i>		x	x		x	x				
<i>Carangoides ferdau</i>								x		
<i>Cephalopholis argus</i>		x	x						x	
<i>Cephalopholis boenak</i>	x	x		x	x	x	x	x		x

<i>Cephalopholis cyanostigma</i>		x			x	x				x
<i>Cephalopholis formosa</i>	x	x	x			x	x	x	x	x
<i>Cephalopholis microprion</i>			x			x				
<i>Cephalopholis miniata</i>			x			x				
<i>Chaetodon lineolatus</i>										x
<i>Chaetodon octofasciatus</i>	x	x	x	x	x	x	x	x	x	x
<i>Chaetodon speculum</i>					x					
<i>Chaetodon wiebeli</i>	x		x							x
<i>Cheilinus chlorourus</i>			x		x	x	x			x
<i>Cheilinus fasciatus</i>		x			x	x	x			x
<i>Cheilinus trilobatus</i>		x			x					
<i>Cheilodipterus artus</i>	x		x			x		x	x	x
<i>Cheilodipterus macrodon</i>		x	x					x		x
<i>Cheilodipterus quinquelineatus</i>		x	x			x	x	x	x	x
<i>Cheiloprion labiatus</i>			x			x				x
<i>Chelmon rostratus</i>	x	x	x	x			x	x		
<i>Chlorurus capistratoides</i>					x					
<i>Chlorurus sordidus</i>					x					x
<i>Chromis atripectoralis</i>		x				x				x
<i>Chromis cineracens</i>	x	x	x		x	x		x		

<i>Cirrhilabrus cyanopleura</i>			x		x			
<i>Cirripectes</i> sp		x	x				x	x
<i>Coradion chrysozonus</i>						x		
<i>Crenimugil crenilabis</i>		x	x	x				
<i>Dascyllus reticulatus</i>		x	x		x	x		x
<i>Dascyllus trimaculatus</i>		x	x		x	x		x
<i>Diademichthys lineatus</i>	x	x	x					x
<i>Diodon histrix</i>						x		
<i>Diodon liturosus</i>			x					x
<i>Diploprion bifasciatum</i>	x		x	x				x
<i>Diproctacanthus xanthurus</i>						x		x
<i>Epibulus insidiator</i>					x	x		x
<i>Epinephelus coioides</i>				x				
<i>Epinephelus corallicola</i>		x						
<i>Epinephelus fasciatus</i>	x		x		x	x	x	x
<i>Epinephelus merra</i>							x	
<i>Epinephelus ongus</i>								x
<i>Epinephelus quoyanus</i>	x	x						
<i>Eviota atriventris</i>						x		x
<i>Gerres oyena</i>							x	

<i>Gnathanodon speciosus</i>				X					
<i>Halichoeres argus</i>							X		
<i>Halichoeres chloropterus</i>	X	X	X			X	X	X	X
<i>Halichoeres erdmanni</i>						X			
<i>Halichoeres leucurus</i>		X	X			X		X	X
<i>Halichoeres marginatus</i>	X	X	X					X	X
<i>Halichoeres melanochir</i>						X			
<i>Halichoeres nigrecens</i>	X	X	X	X		X	X	X	X
<i>Halichoeres scapularis</i>					X				
<i>Halichoeres chrysotaenia</i>		X	X		X	X		X	X
<i>Hemiglyphidodon plagiometopon</i>		X	X		X	X		X	X
<i>Hemigymnus melapterus</i>			X			X			X
<i>Heniochus acuminatus</i>					X			X	X
<i>Heniochus pleurotaenia</i>					X				
<i>Heniochus singularis</i>			X					X	X
<i>Kyphosus cinerascens</i>						X			
<i>Labroides dimidiatus</i>		X	X		X	X		X	X
<i>Leptojulis cyanopleura</i>					X				
<i>Lethrinus ornatus</i>						X			
<i>Lutjanus carponotatus</i>				X					

<i>Lutjanus fulviflamma</i>			x		x						
<i>Lutjanus fulvus</i>								x		x	
<i>Lutjanus lutjanus</i>		x						x			
<i>Lutjanus monostigma</i>					x						
<i>Lutjanus quinquelineatus</i>										x	
<i>Lutjanus russellii</i>					x						
<i>Lutjanus vitta</i>										x	
<i>Meiacanthus grammistes</i>										x	
<i>Myripristis hexagona</i>		x		x						x	x
<i>Naso lituratus</i>										x	
<i>Neoglyphidodon nigroris</i>		x								x	x
<i>Neoniphon opercularis</i>										x	
<i>Neopomacentrus anabatooides</i>	x	x		x	x		x	x	x	x	x
<i>Neopomacentrus bankienri</i>	x	x		x	x				x	x	
<i>Neopomacentrus cyanomos</i>	x	x		x			x	x	x	x	x
<i>Ostorhinchus compressus</i>										x	
<i>Ostorhinchus cookii</i>	x			x	x					x	
<i>Ostorhinchus cyanosoma</i>				x	x					x	
<i>Ostorhinchus endekataenia</i>		x			x				x		x
<i>Ostracion cubicus</i>										x	

<i>Oxycheilinus digramma</i>			X		X	X	X			X
<i>Parachaetodon ocellatus</i>									X	
<i>Parioglossus interruptus</i>						X				
<i>Parioglossus philippinus</i>	X	X	X	X				X	X	
<i>Parupeneus barberinus</i>										X
<i>Parupeneus cyclostoma</i>		X								
<i>Parupeneus indicus</i>			X							X
<i>Pempheris adusta</i>				X	X					
<i>Pempheris oualensis</i>		X	X			X		X		X
<i>Pentapodus vitta</i>							X			
<i>Platax teira</i>									X	
<i>Plectorhinchus gibbosus</i>								X		
<i>Plectroglyphidodon lacrymatus</i>		X	X		X	X				X
<i>Plectropomus leopardus</i>					X	X		X		
<i>Plectropomus maculatus</i>			X					X		
<i>Pomacanthus annularis</i>			X		X	X				
<i>Pomacanthus sexstriatus</i>								X		
<i>Pomacentrus alexanderae</i>		X	X			X				X
<i>Pomacentrus chrysurus</i>	X	X	X			X	X	X		X
<i>Pomacentrus coelestis</i>	X	X	X		X	X	X	X		X

<i>Pomacentrus cuneatus</i>	x	x	x	x		x		x	x	
<i>Pomacentrus grammorhynchus</i>										x
<i>Pomacentrus moluccensis</i>			x			x				x
<i>Pomacentrus philipinus</i>						x				
<i>Pomacentrus tripunctatus</i>							x			
<i>Pseudochromis ransonneti</i>								x		
<i>Pseudomonacanthus macrurus</i>										x
<i>Ptereleotris microlepis</i>			x			x				
<i>Pterocaesio chrysozona</i>					x	x				
<i>Pterocaesio pisang</i>		x								
<i>Pterocaesio tessellata</i>						x				
<i>Pterocaesio tile</i>		x				x		x		
<i>Sargocentron rubrum</i>		x	x		x	x	x	x	x	x
<i>Scarus frenatus</i>										x
<i>Scarus ghobban</i>		x			x	x				x
<i>Scarus niger</i>					x	x				
<i>Scarus prasiognathus</i>					x					
<i>Scarus quoyi</i>					x	x				
<i>Scarus rivulatus</i>	x	x	x		x	x	x			x
<i>Scarus rubroviolaceus</i>					x	x				

<i>Scolopsis affinis</i>					X				X
<i>Scolopsis bilineata</i>			X		X	X			
<i>Scolopsis ciliata</i>	X	X	X			X	X	X	X
<i>Scolopsis margaritifera</i>			X			X	X		X X
<i>Scolopsis monogramma</i>			X	X	X			X	
<i>Scolopsis vosmeri</i>	X		X			X		X	X
<i>Selaroides leptolepis</i>			X						
<i>Siganus canaliculatus</i>				X			X		X
<i>Siganus corallinus</i>			X			X	X		X
<i>Siganus guttatus</i>			X	X	X			X	X X
<i>Siganus javus</i>	X	X	X	X	X	X		X	X
<i>Siganus lineatus</i>			X						
<i>Siganus punctatus</i>			X		X	X			
<i>Siganus virgatus</i>	X		X		X	X	X		X
<i>Sphyraena flavicauda</i>							X	X	
<i>Sphyraena obtusata</i>				X					
<i>Stegastes fasciolatus</i>	X	X	X			X	X	X	
<i>Stegastes obreptus</i>	X					X		X	
<i>Stethojulis bandanensis</i>					X				
<i>Stethojulis interrupta</i>			X						

<i>Stethojulis trilineata</i>					X			
<i>Taeniamia fucata</i>	X	X		X	X			
<i>Taeniamia macroptera</i>					X			
<i>Taeniamia zosterophora</i>					X			
<i>Taeniura lymma</i>	X						X	X
<i>Thalassoma lunare</i>	X	X		X	X			X
<i>Tylosurus crocodilus</i>		X						
<i>Upeneus tragula</i>	X	X	X			X	X	X
<i>Valenciennea muralis</i>						X		
<i>Zanclus cornutus</i>				X				
