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Diversity and Abundance of Scleractinian Corals in the East Coast of Peninsular Malaysia: A Case Study of Redang and Tioman Islands

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Abstract - The species lists of scleractinian hard corals in Peninsular Malaysia have not been updated for 15 years. The present study aimed to determine the diversity and abundance patterns of scleractinian hard corals at twenty eight fringing reef sites along the coast of Redang and Tioman Islands. Visual photograph analyses of the coral video transect method revealed a total of 128 species from 47 genera in Redang and 239 species from 55 genera in Tioman. Following recent taxonomy of scleractinian corals, coral surveys and past studies revealed a total of 166 species from 53 genera in Redang and 350 species from 67 genera in Tioman. Current data at both islands presented a total of 358 species from 69 genera and 15 families of scleractinian corals with an additional 8 new species records for the east coast of Peninsular Malaysia. Acropora, Montipora and Porites were the most dominant genera and were found distributed within the coral assemblages. The reefs around both islands can be categorized under "good" coral conditions with the live corals cover from 40.9% to 73.5%. Overall findings indicated that the less affected reef zones by coastal development and human activities at both islands have established good coral conditions and coral genera diversity.

Keywords – scleractinian coral, coral diversity, coral abundance, marine protected area, Peninsular Malaysia

1. Introduction

Coral reefs comprise the highest levels of marine species diversity around the globe (Bowen et al. 2013). They are vital to the economy, subsistence and cash-crop fisheries of approximately 200 million people in the Coral Triangle (CT) area (Wilkinson 2008). The CT area encompasses the 16 ecoregions of six Asia-Pacific countries from the Philippines, Indonesia, East Malaysia (Sabah region), Timur Leste, Papua New Guinea and the Solomon Islands (Veron et al. 2011). This area has been largely recognized as the global center of coral mega biodiversity regions, which hosts 605 zooxanthellate coral species (Veron et al. 2011).

A recent study showed that 16 reef areas around the South China Sea (SCS) region (including the eastern part of Peninsular Malaysia) host about 571 zooxanthellate coral species (Huang et al. 2015). Based on the species list of hard corals published by Affendi and Rosman (2012), a total of 431 species have been recorded in the eastern part of Peninsular Malaysia. This region also had the highest coral diversity in comparison to the southern part with 245 species and the western part with only 63 species, which is revealed as the lowest coral diversity region in Peninsular Malaysia. The data compiled to date gives a species count of 480 hard corals in Peninsular Malaysia (Affendi and Rosman 2012). This figure represents approximately 80% of the total number of coral species identified by Huang et al. (2015) in the SCS region.

Most islands in Peninsular Malaysia have been protected under jurisdiction of the Department of Marine Park Malaysia (DMPM 2011). Redang and Tioman Islands, located on the east coast of Peninsular Malaysia, are recognized as the most popular Marine Parks that formed the basis for a valuable tourism industry with potential for ecotourism and educationrelated activities (Hanim et al. 2010). Besides healthy and diverse coral species, good infrastructure and tourism facilities,

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such as roads, an airport, resorts, hotels, restaurants, shops and a golf course have become major attractions for local and international tourists to visit these islands (Shahbudin et al. 2017).

Despite providing direct economic benefits for local communities, unsustainable coastal development activities and dredging impacts from construction of resorts and jetty facilities are among the major threats affecting coral reefs in these islands (Harborne et al. 2000; Maseri 2003). The large number of visiting tourists engaged in uncontrolled tourism activities such as diving, snorkeling and boating has also been correlated with a major decline in the live coral coverage (Badaruddin et al. 2004: Toda et al. 2007; Shahbudin et al. 2017). Furthermore, the natural impact from the bleaching phenomenon recorded in the middle of 2010 was observed to cause bleaching with respect to approximately 50% of the hard coral colonies around Redang and Tioman Islands (Tan and Heron 2011). Hence, the elevated current sea surface temperature (SST) due to global climate change is predicted to increase the number of bleaching events and further promote the emergence of coral diseases along the Malaysian reefs (Miller et al. 2015).

In light of this, management action such as updating a comprehensive inventory of scleractinian corals should be taken to ensure the conservation and sustainability of this ecosystem. The present study is considered important in providing holistic data and information on the current status of coral reefs in Redang and Tioman Islands. The aims of this study are 1) to update the list of scleractinian coral species in Redang and Tioman Islands by combining with previous data from Harborne et al. (2000), Affendi et al. (2005) and Affendi et al. (2007) using the most recent taxonomic classification of scleractinian corals, 2) to determine the generic diversity and abundance patterns of scleractinian corals and 3) to evaluate coral conditions at 28 sampling stations in Redang and Tioman Islands. The outcomes of this study may help the relevant agencies such as the section of Marine Park Malaysia, Department of Fisheries (DOF) and universities in updating hard coral inventories for future systematic conservation plans towards sustainable management of coral reef resources.

2. Materials and Methods

Sampling Area

Surveys were carried out between September 2014 and November 2014 at 28 sampling stations in Redang Island (15 sampling stations) and Tioman Island (13 sampling stations). Redang Island is located approximately 25 km from Merang and Tioman Island, 50 km from Mersing off the east coast of Peninsular Malaysia. The sampling stations were selected based on the information given by tourist operators and local communities about dive sites designated for snorkeling and diving activities around the islands. The sampling stations then were categorized into several sampling zones based on the difference in environmental conditions, coastal developments and human activities that might give a clear comparison regarding the diversity and abundance patterns of scleractinian corals (Fig. 1). All the sampling stations were categorized as fringing reef sites from a maximum depth of 18 m to the shallow reef crest of 3 m.

Corals survey method

The Coral Video Transect (CVT) method adopted by Liew et al. (2012) and optimized by Safuan et al. (2015) was used in this study with some modifications. Four x 30 m transect lines were placed in parallel form for every sampling station with a 3 m interval between each transect. A total of 112 transect lines were used in this study. The images of benthic communities along the transect lines were recorded using an underwater camera (Olympus TG-3 in a ratio of 16:4 and 1980×1080 high definition (HD) resolution) protected with a waterproof casing (Olympus PT-053). The height of the camera from the substrates was approximately 50 cm and held at a perpendicular angle to the bottom. The camera was run along the transect lines at a speed of 5 minutes per transect line to get clear and sharp images for coral identification. The additional stilt pictures of close-up coral corallites were captured to aid in the identification process. Scleractinian corals were identified using the books of Corals of the World (Veron 2000). The following update of species list was further standardized with the most recent taxonomic classification of scleractinian corals following the World Register of Marine Species (WoRMS).

Image processing and data analyses

The recorded videos of benthic communities along four x 30 m transect lines for every sampling station were converted to 300 images (approximately 80% of total image extracted). All the images were analyzed using Coral Point Count with Excel extension (CPCe) software version 4.1 developed by Kohler and Gill (2006) with 10 random points per image. Data were summarized into percentage cover of three benthic



a. Redang Island Marine Park

South Coast Zone

RS1: Tg. Ara (05°44'13.6"N 102°59'51.9"E) RS2: Terumbu Kili (05°43'55.7"N 102°59'51.3"E) RS3: Tg. Cina Terjun (05°46'26.1"N 103°01'10.1"E) RS4: Batu Ling (05°44'11.9"N 103°01'13.7"E) RS5: Pulau Chupak (05°44'04.6"N 103°01'13.7"E) RS6: Pulau Ekor Tebu (05°44'16.8"N 103°01'43.9"E)

East Coast Zone

RE1: Pulau Kerengga Besar (05°45'15.5"N 103°01'48.1"E) RE2: Chek Isa (05°45'35.4"N 103°02'10.4"E) RE3: Mak Chantek (05°46'27.3"N 103°02'26.9"E) RE4: Pulau Lima (05°46'26.1"N 103°03'32.5"E) RE5: Pulau Paku Besar (05°46'47.3"N 103°02'31.3"E)

North Coast Zone

RN1: Tg. Gua Kawah (05°47'27.3"N 103°02'26.9"E) RN2: Tlk. Mak Delah (05°47'27.9"N 103°01'58.7"E) RN3: Tg. Tok Kong (05°48'48.7"N 103°00'48.1"E) RN4: Tg. Chagar Hutang (05°48'53.4"N 103°00'31.7"E)

b. Tioman Island Marine Park

East Coast Zone

TE1: Tlk.Benuang (02°45'35.65"N 104°13'19.67"E) TE2: Tlk. Sanggit (02°43'55.7"N 104°12'58.35"E) TE3: Tlk. Dalam (02°46'26.1"N 104°11'16.98"E)

West Coast Zone

TW1: Pulau Tomok (02°47'31.61"N 104°07'18.95"E) TW2: Kg. Genting (02°45'57.34"N 104°07'06.97"E) TW3: Pulau Renggis (02°48'36.58"N 104°08'09.41"E) TW4: Pulau Soyak (02°52'29.72"N 104°08'49.89"E) TW5: Tlk. Salang (02°53'20.01"N 104°09'16.61"E)

Isolated Zone

TI1: Tlk. Gado (02°54'53.4"N 104°06'31.4"E) TI2: Tlk. Tulai (02°54'35.64"N 104°06'42.36"E) TI3: Tlk. Bayan (02°54'49.9"N 104°06'50.3"E) TI4: Pulau Sepoi (02°53'55.31"N 104°02'58.33"E) TI5: Pulau Labas (02°53'19.06"N 104°03'58.06"E)



Fig. 1. Location and coordinate position of 28 sampling stations in a) Redang Island Marine Park which were divided into three zones: south coast (RS1, RS2, RS3, RS4, RS5, RS6), east coast (RE1, RE2, RE3, RE4, RE5) and north coast (RN1, RN2, RN3, RN4,) zones. b) Tioman Island Marine Park which were divided into three zones: east coast (TE1, TE2, TE3), west coast (TW1, TW2, TW3, TW4, TW5) and isolated (TI1, TI2, TI3, TI4, TI5) zones

categories: live corals (live hard and soft corals), dead corals (coral rubbles and dead coral with algae) and others (coralline algae, other macroalgae, other invertebrates and abiotic elements). The coral condition was indicated by the percentage of live corals following Gomez et al. (1994) as excellent (100-75% live coral), good (74.9–50% live coral), fair (49.9–25% live coral), and poor (24.9-0% live coral). The abundance of each scleractinian genus was estimated based on a rating scale of one to five crosses (+) adopted by Fabricius and McCorry (2006) as followed: where +: one or few colonies covering < 1%of the corals; ++: uncommon, covering 1-5% of the corals; +++: common, covering 6-10% of the corals; ++++ = abundant, covering 11-20% of the corals; and +++++: dominant, covering > 20% of the corals. In addition, the Shannon diversity index (H') (Shannon and Weaver 1998) and Pielou's evenness index (J') (Pielou 1966) were used to determine the diversity and evenness of coral genera recorded for every sampling station using PAST (Paleontological Statistic) software version 3 (Hammer et al. 2001). The statistical test of Kruskal-Wallis was performed using Minitab 17 software to determine the significant differences (p < 0.05) on the mean of H' and J' indices between zones and islands.

3. Results

Checklist of scleractinian coral species

Following recent taxonomy of scleractinian corals, the coral survey recorded 128 species of scleractinian corals in Redang Island and 239 species in Tioman Island (Table 1). A previous study done by Harborne et al. (2000) recorded 135 scleractinian species at 6 reef sites (Tlk. Mat Delah, Chagar Hutang, Pulau Ling, Pulau Lima, Pulau Lang Tengah and Terumbu Kili) in Redang Island. Furthermore, a total of 325 scleractinian species were recorded in Tioman Island from surveys done by Harborne et al. (2000) at 7 reef sites (Batu Malang, Tlk. Juara, Pulau Gut, Pulau Tokong Bahara, Pulau Seri Buat, Tlk. Kadar at Pulau Tulai and Pulau Renggis), Affendi et al. (2005) at Tlk. Tekek and Affendi et al. (2007) at several reef sites from Kg. Paya to Kg. Genting. Therefore with regards to all studies above, present findings recorded a total of 358 species, 69 genera and 15 families (including 8 species and 5 genera of Inceratae sedis) of scleractinian corals in Redang and Tioman Islands. The result also revealed 31 species of new scleractinian coral records for Redang Island and 25 species for Tioman Island that were not documented during earlier studies. Moreover, 8 species are listed as new

scleractinian coral records for the east coast of Peninsular Malaysia (Fig. 2).

Diversity and abundance patterns of scleractinian coral genera

A total of 47 genera from 13 families including 2 genera of Incertae sedis were recorded in Redang Island (Table 2). Family Merulinidae was found dominant with an average coverage of $27.0\% \pm 0.6$ followed by Acroporidae, Poritidae and Fungiidae with $23.4\% \pm 4.4$, $15.0\% \pm 7.0$ and $12.6\% \pm$ 1.0, respectively. Genus Acropora had the highest average coverage with 16.1% followed by Porites 14.5%, Fungia 10.6%, Dipsastraea 7.4%, Favites 6.9%, Pocillopora 6.8%, Montipora 6.4%, Plerogyra 5.3% and Platygyra 4.5%. Meanwhile, other genera had only < 3% average coverage. Genera Acropora, Montipora, Pavona, Galaxea, Fungia, Lobophyllia, Dipsastraea, Favites, Platygyra, Pocillopora, Porites and Plerogyra were found to be well distributed at most of the sampling stations $(n \ge 3)$. Among these genera, *Acropora* and *Montipora* were found to be dominant at RE3 and RN1 which are located in the east coast and north coast zones, respectively. Genus Pocillopora was found to be dominant at RE5 in the east coast zone. Meanwhile other genera such as Fungia, Dipsastraea and Porites were found to be dominant at several sampling stations in the north coast zone. Genera Coscinarea, Cycloseris, Lithophyllon, Polyphyllia, Cynarina, Oxypora, Psammocora and Leptastrea were found to be poorly distributed and least abundant ($n \le 1$) in Redang Island. *Cynarina* was classified as a rare genus as it can be found at only one sampling station covering only a few colonies in Redang Island and was not found in Tioman Island.

In comparison, Tioman Island had a higher number of scleractinian coral genera compared to Redang Island with a total of 55 genera from 14 families including 4 genera of Incertae sedis being recorded (Table 3). Family Acroporidae was found to be dominant with an average coverage of $34.8\% \pm 5.1$ followed by Merulinidae, Poritidae and Euphylliidae with $23.9\% \pm 0.5$, $13.6\% \pm 6.3$ and $9.2\% \pm 1.2$, respectively. Similarly, genus *Acropora* also had the highest average coverage in Tioman Island with 21.5% followed by *Porites* 13.1%, *Montipora* 12.5%, *Favites* 7.3%, *Galaxea* 5.6%, *Platygyra* 5.0%, *Goniastrea* 3.5%, *Pavona* 3.3% and *Pocillopora* 3.1%. Other genera had only < 3% average coverage (Table 3). Genera *Acropora*, *Montipora*, *Pavona*, *Diploastrea*, *Galaxea*, *Fungia*, *Lobophyllia*, *Astrea*, *Dipsastraea*, *Favites*, *Goniastrea*, *Platygyra*, *Pocillopora* and *Porites* were found to be well distributed at

Table 1. Checklist of scleractinian coral species in Redang Island and Tioman Island Marine	Parks.	The sym	bol (x) indic	ates the sp	<i>becies</i>
occurrence. Species were not reported from previous records are highlighted. Pro-	evious	records a	are indicated	as follow	vs: a)
Harborne et al. (2000), b) Affendi et al. (2005), c) Affendi et al. (2007)					,
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No.	Scleractinian coral species	Redang Island	Previous	Tioman Island	Previous
	Acroporidae Verrill 1902	Marine Park	record a	Marine Park	records a, b, c
1	Acropora abrolhosansis Veron 1985				v
2	Acropora aculaus (Dono 1846)			v	A V
2	Acropora anthoganis (Brook, 1803)			X	X
1	Acropora apprassa (Ebrenberg, 1834)			А	A V
- -	Acropora aspara (Dana, 1846)	v	v	v	A V
6	Acropora austera (Dana, 1846)	X	Λ	x	X X
7	Acropora qui allace & Wolstenholme, 1008	Λ		А	A V
, Q	Acropora carduus (Dono, 1846)	V		Y	Α
0	Acropora carcalis (Dana, 1846)	X	v	X	v
10	Acropora elathrata (Prock 1801)	Λ	Λ	X	A V
10	Acropora culturala (Dopo, 1846)	Y	v	X	X
11	Acropora dandmum (Passott Smith 1800)	Х	Х	Х	X
12	Acropora digitifara (Dana 1846)	Y	v	Y	X
13	Acropora diguijera (Dana, 1846)	X	X	X	Х
14	Acropora divaricala (Dana, 1840)	Х	Х	X	Y
15	Accoporational veron & wanace, 1984			Х	X
10	Acropora elseyi (Brook, 1892)		X		X
1/	Acropora Joriaa (Dalla, 1840)	X	X	X	X
10	Acropora gemmijera (Brook, 1892)	X	Х	X	X
19	Acropora granais (Brook, 1892)	Х		X	X
20	Acropora healyaamai Wallaga 1007				X
21	Acropora noeksemai wanace, 1997			X	X
22	Acropora norrida (Dana, 1846)		X	X	X
23	Acropora numuis (Dana, 1846)	X	X	X	X
24	Acropora nyacintinus (Dana, 1846)	Х	Х	X	X
25	Acropora indonesia wallace, 199/*			Х	
26	Acropora intermedia (Brook, 1891)	Х	Х	х	Х
27	Acropora kirstyae Veron & Wallace, 1984				X
28	Acropora latistella (Brook, 1892)	Х	Х	х	Х
29	Acropora listeri (Brook, 1893)				Х
30	Acropora loripes (Brook, 1892)	Х	Х	Х	Х
31	Acropora lutkeni Crossland, 1952				х
32	Acropora microclados (Ehrenberg, 1834)				Х
33	Acropora microphthalma (Verrill, 1869)	Х	Х	Х	Х
34	Acropora millepora (Ehrenberg, 1834)			Х	Х
35	Acropora monticulosa (Brüggemman, 1879)			х	Х
36	Acropora muricata (Linnaeus, 1758)	Х	Х	Х	Х
37	Acropora nana (Studer, 18/8)				Х
38	Acropora nasuta (Dana, 1846)	Х	Х	х	Х
39	Acropora papillare Latypov, 1992				Х
40	Acropora pruinosa (Brook, 1893)				Х
41	Acropora pulchra (Brook, 1891)				Х
42	Acropora retusa (Dana, 1846)				Х
43	Acropora robusta (Dana, 1846)	Х	Х	Х	Х
44	Acropora samoensis (Brook, 1891)	Х	Х	х	Х

Table	1.	Continued
THOIC		Continued

No.	Scleractinian coral species	Redang Island Marine Park	Previous record "a"	Tioman Island Marine Park	Previous records "a, b, c"
45	Acropora secale (Studer, 1878)			х	Х
46	Acropora selago (Studer, 1878)			х	х
47	Acropora solitaryensis Veron & Wallace, 1984		Х	х	х
48	Acropora spicifera (Dana, 1846)			х	
49	Acropora subglara (Brook, 1891)	х			
50	Acropora tenuis (Dana, 1846)	X	Х	х	х
51	Acropora valida (Dana, 1846)				Х
52	Acropora valenciennesi (Milne Edwards & Haime, 1860)		Х	х	х
53	Acropora vaughani Wells, 1954				Х
54	Acropora yongei Veron & Wallace, 1984				Х
55	Alveopora minuta Veron, 2000				Х
56	Alveopora spongiosa Dana, 1846			Х	Х
57	Anacropora matthai Pillai, 1973			х	Х
58	Anacropora forbesi Ridley, 1884			х	
59	Anacropora reticulata Veron & Wallace, 1984				Х
60	Astreopora gracilis Bernard, 1896			х	х
61	Astreopora listeri Bernard, 1896				Х
62	Astreopora myriophthalma (Lamarck, 1816)	Х	х	х	Х
63	Astreopora ocellata Bernard, 1896		х	х	Х
64	Isopora bruggemanni (Brook, 1893)		Х	х	Х
65	Isopora cuneata (Dana, 1846)			х	
66	Isopora palifera (Lamarck, 1816)			Х	Х
67	Isopora togianensis (Wallace, 1997)				Х
68	Montipora aequituberculata Bernard, 1897	х	х	х	Х
69	Montipora altasepta Nemenzo, 1967	х	х		Х
70	Montipora cactus Bernard, 1897			х	
71	Montipora calcarea Bernard, 1897				Х
72	Montipora caliculata (Dana, 1846)				Х
73	Montipora capricornis Veron, 1985				х
74	Montipora cebuensis Nemenzo, 1976			х	
75	Montipora cocosensis Vaughan, 1918				х
76	Montipora confusa Nemenzo, 1967			х	Х
77	Montipora crassituberculata Bernard, 1897			х	Х
78	Montipora danae (Milne Edwards & Haime, 1851)			х	х
79	Montipora delicatula Veron, 2000			х	Х
80	Montipora digitata (Dana, 1846)				Х
81	Montipora effusa Dana, 1846				х
82	Montipora efflorescens Bernard, 1897			Х	
83	Montipora flabellata Studer, 1901*			х	
84	Montipora florida Nemenzo, 1967				Х
85	Montipora foliosa (Pallas, 1766)		х	х	х
86	Montipora foveolata (Dana, 1846)				х
87	Montipora friabilis Bernard, 1897			х	х
88	Montipora gaimardi Bernard, 1897	х	Х		х
89	Montipora grisea Bernard, 1897			X	
90	Montipora hirsuta Nemenzo, 1967				Х

No.	Scleractinian coral species	Redang Island Marine Park	Previous record "a"	Tioman Island Marine Park	Previous records "a, b, c"
91	Montipora hispida (Dana, 1846)	Х	Х	Х	Х
92	Montipora informis Bernard, 1897	х	Х	х	х
93	Montipora malampaya Nemenzo, 1967		х		Х
94	Montipora meandrina (Ehrenberg, 1834)				Х
95	Montipora millepora Crossland, 1952		х	Х	Х
96	Montipora mollis Bernard, 1897		Х		
97	Montipora monasteriata (Forskål, 1775)			х	Х
98	Montipora nodosa (Dana, 1846)				х
99	Montipora palawanensis Veron, 2000				Х
100	Montipora peltiformis Bernard, 1897				Х
101	Montipora spumosa (Lamarck, 1816)				х
102	Montipora stellata Bernard, 1897	Х		х	х
103	Montipora tuberculosa (Lamarck, 1816)		х	х	х
104	Montipora turgescens Bernard, 1897			Х	
105	Montipora turtlensis Veron & Wallace, 1984			х	
106	Montipora undata Bernard, 1897			X	х
107	Montipora venosa (Ehrenberg, 1834)			х	х
108	Montipora verrucolosus Veron, 2000			х	х
109	Montipora verrucosa (Lamarck, 1816)			х	х
110	Montipora vietnamensis Veron. 2000			X	
	Agariciidae Grav. 1847				
111	Gardineroseris planulata (Dana, 1846)	х	Х	Х	X
112	Leptoseris explanata Yabe & Sugiyama, 1941	х	х		x
113	Leptoseris foliosa Dinesen. 1980				x
114	Leptoseris gardineri Van der Horst. 1921				x
115	Leptoseris hawaiiensis Vaughan, 1907	х	х		x
116	Leptoseris mycetoseroides Wells, 1954	x	x		x
117	Leptoseris napyracea (Dana, 1846)				x
118	Leptoseris scabra Vaughan 1907			x	x
119	Leptoseris tubulifera Vaughan 1907			<u> </u>	x
120	Leptoseris vahei (Pillai & Scheer, 1976)				x
120	Payona binartita Nemenzo 1979		v		x
121	Pavona cactus (Forskål 1775)	v	A V	v	X X
122	Payona claurus (Dana 1846)	А	л	A V	x
123	Payona danai Milne Edwards & Haime 1860			A V	X X
124	Payona dacussata (Dana 1846)	v	v	A V	X X
125	Payona duardani Voyahan 1007	А	Λ	Λ	A V
120	Payona amlanulata (Lomerek, 1816)	Y	v	v	X
127	Payona from diferra (Lamarak, 1816)	А	X	X	X
120	Pavona fronaljera (Lalilaick, 1810)		Х	Х	X
129	Pavona gigamean venin, 1809				X
130	Pavona maialvensis (Gardiner, 1903)				X
131	Pavona venosa (Enrenberg, 1834)			X	X
132	r avona varians verrini, 1804	X	X	X	X
122	Astrocoeniidae Koby, 1890				_
133	<i>Palauastrea ramosa</i> Yabe & Sugiyama, 1941				X
134	Stylocoeniella armata (Enrenberg, 1834)				Х
135	<i>Stylocoeniella cocosensis</i> Veron, 1990			Х	Х
136	Stylocoeniella guentheri Bassett-Smith, 1890			Х	Х

No.	Scleractinian coral species	Redang Island Marine Park	Previous record "a"	Tioman Island Marine Park	Previous records "a b c"
	Coscinaraeidae Benzoni, Arrigoni. Stefani & Stolarski. 2012	internite i urk		internet i urk	1.00140 4,0,0
137	Coscinaraea columna (Dana, 1846)	Х	Х	х	X
138	Coscinaraea exesa (Dana, 1846)			х	х
139	Coscinaraea hahazimaensis Yabe & Sugiyama, 1936				х
	Dendrophylliidae Gray, 1847				
140	Turbinaria frondens (Dana, 1846)		Х	Х	
141	Turbinaria irregularis Bernard, 1896				х
142	Turbinaria mesenterina (Lamarck, 1816)	х	х	х	х
143	Turbinaria peltata (Esper, 1794)	х	х	х	х
144	Turbinaria reniformis Bernard, 1896				х
145	Turbinaria stellulata (Lamarck, 1816)	х	х	х	х
	Diploastraeidae Chevalier & Beauvais, 1987				
146	Diploastrea heliopora (Lamarck, 1816)	Х	Х	Х	Х
	Euphylliidae Alloiteau, 1952				
147	Catalaphyllia jardini (Saville-Kent, 1893)		Х	Х	
148	Euphyllia ancora Veron & Pichon, 1980	х		х	х
149	Euphyllia cristata Chevalier, 1971*	х			
150	Euphyllia divisa Veron & Pichon, 1980	X	х	х	х
151	Euphyllia glabrescens (Chamisso & Eysenhardt, 1821)	х	х	х	х
152	Euphyllia paradivisa Veron, 1990				х
153	Euphyllia paraglabrescens Veron, 1990				х
154	Euphyllia yaeyamensis (Shirai, 1980)			х	х
155	Galaxea astreata (Lamarck, 1816)	х	х	х	х
156	Galaxea fascicularis (Linnaeus, 1767)	х	х	х	х
157	Galaxea horrescens (Dana, 1846)				х
158	Pachyseris foliosa Veron, 1990		х	х	х
159	Pachyseris gemmae Nemenzo, 1955			х	х
160	Pachyseris rugosa (Lamarck, 1801)	х	х	х	х
161	Pachyseris speciosa (Dana, 1846)	х	х	х	х
	Fungiidae Dana, 1846				
162	Ctenactis albitentaculata Hoeksema, 1989	Х	Х	Х	X
163	Ctenactis crassa (Dana, 1846)	х	х	х	х
164	Ctenactis echinata (Pallas, 1766)	х	х	х	х
165	Cycloseris costulata (Ortmann, 1889)			х	х
166	Cycloseris distorta (Michelin, 1842)				х
167	Cycloseris fragilis (Alcock, 1893)	х	х	х	х
168	Cycloseris mokai (Hoeksema, 1989)			х	
169	Cvcloseris somervillei (Gardiner, 1909)			х	х
170	Cycloseris tenuis (Dana, 1846)				х
171	Cycloseris vaughani (Boschma, 1923)				х
172	Danafungia horrida (Dana, 1846)		х	х	х
173	Danafungia scruposa (Klunzinger, 1879)	х	х		х
174	Fungia fungites (Linnaeus, 1758)	X	x	х	x
175	Heliofungia actiniformis (Ouov & Gaimard, 1833)		-	x	x
176	Heliofungia fralinae (Nemenzo. 1955)				x
177	Herpolitha limax (Esper, 1797)	х	х	х	х
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No.	Scleractinian coral species	Redang Island Marine Park	Previous record "a"	Tioman Island Marine Park	Previous records "a, b, c"
178	Lithophyllon concinna (Verrill, 1864)	Х	Х	х	X
179	Lithophyllon repanda (Dana, 1846)	Х	х	х	Х
180	Lithophyllon scabra (Döderlein, 1901)			х	х
181	Lithophyllon spinifer (Claereboudt & Hoeksema, 1987)				Х
182	Lithophyllon undulatum Rehberg, 1892	х	Х	х	Х
183	Lobactis scutaria (Lamarck, 1801)				Х
184	Pleuractis granulosa (Klunzinger, 1879)	х	Х	х	х
185	Pleuractis gravis (Nemenzo, 1955)	х		х	
186	Pleuractis moluccensis (Van der Horst, 1919)		Х	x	х
187	Pleuractis paumotensis (Stutchbury, 1833)		Х	х	Х
188	Podabacia crustacea (Pallas, 1766)		х	х	х
189	Podabacia motuporensis Veron, 1990			х	Х
190	Polyphyllia talpina (Lamarck, 1801)	х	Х	х	Х
191	Sandalolitha dentata Quelch, 1884			х	х
192	Sandalolitha robusta (Quelch, 1886)	х	Х	х	х
	Lobophylliidae Dai & Horng, 2009				
193	Acanthastrea brevis Milne Edwards and Haime, 1849*			х	
194	Acanthastrea echinata (Dana, 1846)			х	
195	Acanthastrea hemprichi (Ehrenberg, 1834)	х	х	х	Х
196	Acanthastrea pachysepta Chevalier, 1975			Х	х
197	Acanthastrea subechinata Veron, 2000*	х		х	
198	Cynarina lacrymalis (Milne Edwards & Haime, 1849)	х			
199	Echinophyllia aspera (Eillis & Solander, 1786)		Х	х	х
200	Echinophyllia orpheensis Veron & Pichon, 1980	х	Х	х	х
201	Homophyllia australis (Milne Edwards & Haime, 1849)		Х		Х
202	Homophyllia bowerbanki (Milne Edwards, 1857)				
203	Lobophyllia agaricia Milne Edwards & Haime, 1849	Х	Х	Х	Х
204	Lobophyllia corymbosa (Forskål, 1775)			Х	Х
205	Lobophyllia diminuta Veron, 1985				Х
206	Lobophyllia flabelliformis Veron, 2000	Х		х	Х
207	Lobophyllia hassi Pillai & Scheer, 1976			х	Х
208	Lobophyllia hataii Yabe, Sugiyama & Eguchi, 1936	х	Х	х	х
209	Lobophyllia hemprichii (Ehrenberg, 1834)	х	Х	х	х
210	Lobophyllia radians Milne Edwards & Haime, 1849		Х	х	Х
211	Lobophyllia recta (Dana, 1846)	X	Х	х	Х
212	Lobophyllia robusta Yabe & Sugiyama, 1936	Х		х	Х
213	Lobophyllia valenciennesii Milne Edwards & Haime, 1849	Х	Х	х	Х
214	Lobophyllia vitiensis (Brüggemann, 1877)		Х	X	Х
215	Micromussa diminuta Veron, 2000*			Х	
216	Micromussa lordhowensis Veron and Pichon, 1982			Х	Х
217	Micromussa multipunctata Hodgson, 1985				Х
218	Micromussa regularis Veron, 2000				Х
219	Oxypora crassispinosa Nemenzo, 1979			х	Х
220	Oxypora glabra Nemenzo, 1959				Х
221	Oxypora lacera (Verrill, 1864)	Х	Х		Х
222	Australogyra zelli (Veron, Pichon & Wijsman-Best, 1977)				Х

Table 1. Continued	
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No. Seleractinane Orat species Marine Park record "a" Marine Park record "a" Marine Park records "a, b, e" 23. Astrea arunitgera Milne Edwards & Haime, 1849 x x x x 23. Astrea curia Dana, 1846 x x x x 23. Coelastrea turiada Mathai, 1928 x x x x 24. Coelastrea palauensis (Yabe & Sugiyama, 1936) x x x x 25. Coelastrea palauensis (Yabe & Sugiyama, 1936) x x x x 26. Cophastrea opaonica Yabe & Sugiyama, 1932 x x x 27. Cyphastrea oscilinan (Lamarck, 1816) x x x 23. Cyphastrea seralita (Forskal, 1775) x x x 23. Dipastrea abial (Veron, 2000) x x x 23. Dipastreae abial (Veron, 2000) x x x 23. Dipastreae abianthoide (Wells, 1954) x x x 23. Dipastreae abianthoide (Wells, 1954) x x x 24. Dipastreae aritima (Namenzo, 1971) x x x 24. Dipastraea matrima (Nemenzo, 1971) x <td< th=""><th></th><th></th><th>Redang Island</th><th>Previous</th><th>Tioman Island</th><th>Previous</th></td<>			Redang Island	Previous	Tioman Island	Previous
Merulinidae Verril, 1865 223 Astree annultgera Milhe Edwards & Haime, 1849 x x 24 Astree annultgera Milhe Edwards & Haime, 1849 x x 25 Caulastree aturida Matthai, 1928 x x 26 Coelastree apparentis (Yabe & Sugiyama, 1936) x x x 27 Cophastree ahcidelication (Forskil, 1775) x x x 29 Cyphastree ahcidelication (Forskil, 1775) x x x 21 Cyphastree apponice Yabe & Sugiyama, 1932 x x x 21 Cyphastree acelline (Jona, 1846) x x x 22 Cyphastree acelline (Jona, 1846) x x x 23 Cyphastree acelline (Jorskil, 1775) x x x x 23 Dipasatree annus (Jona, 1846) x x x x 24 Dipasatree annus (Grown (Jono) x x x x 23 Dipasatree annus (Grown (Jono) x x x x	No.	Scleractinian coral species	Marine Park	record "a"	Marine Park	records "a, b, c"
223 Astrea annulizera Mine Edwards & Haine, 1849 x x 224 Astrea annulizera Mine Edwards & Haine, 1849 x x 225 Caulastrae atunida Mathai, 1928 x x 226 Celastrea aplauensis (Vabe & Sugiyama, 1936) x x x 227 Coelastrea apparen (Verril, 1866) x x x 228 Cyphastrea agassi: (Vaughan, 1907) x x x 229 Cyphastrea agassi: (Vaughan, 1907) x x x 230 Cyphastrea agassi: (Vabe & Sugiyama, 1932 x x x 231 Cyphastrea onicoruhthalma (Lamarek, 1816) x x x 232 Cyphastrea oranicorum (Mine Edwards & Haine, 1849) x x x 233 Dipasatreae anicorum (Mine Edwards & Haine, 1849) x x x x 234 Dipasatreae foursi (Forskil, 175) x x x x 235 Dipasatreae foursi (Veron, 2000) x x x x 236 Dipasatreae anitima (Nemeruzo, 1971) x x x <td< td=""><td></td><td>Merulinidae Verrill, 1865</td><td></td><td></td><td></td><td></td></td<>		Merulinidae Verrill, 1865				
224 Astrea curita Dana, 1846 x x x 225 Caulastrea aumida Mathai, 1928 x x 226 Coelastrea agnera (Vertil, 1866) x x x 227 Cyphastrea agnesis (Vabughan, 1907) x x x 228 Cyphastrea chalcidicum (Forskal, 1775) x x x 231 Cyphastrea chalcidicum (Forskal, 1775) x x x 232 Cyphastrea orgenica Yabe & Sugiyama, 1932 x x x 233 Cyphastrea orgenica (Torskal, 1775) x x x 233 Cyphastrea orgenica (Torskal, 1775) x x x 234 Dipastreea anicorum (Milne Edwards & Haime, 1849) x x x 235 Dipastreea anicorum (Milne Edwards & Haime, 1849) x x x 236 Dipastreea dirakthoides (Vells, 1954) x x x 237 Dipastreea dirakthoides (Wells, 1954) x x x 238 Dipastreea mathatin (Romenzo, 1971) x x x 240 Dipastreea mathatin (Nemenzo, 1971) x x x 243 Dipastreea mathatin (Nemenzo, 1970) x x x 244	223	Astrea annuligera Milne Edwards & Haime, 1849				х
225Caulastraea unida Mathai, 1928xx226Coelastrea aspera (Vernil, 1866)xxx227Coelastrea golamenis (Yabe & Sugiyama, 1936)xxx228Cyphastrea egassici (Vaughan, 1907)xxx229Cyphastrea incrophulatina (Lamarck, 1816)xxx231Cyphastrea incrophulatina (Lamarck, 1816)xxx232Cyphastrea ocellina (Dana, 1846)xxx233Cyphastrea ocellina (Orana, 1846)xxx234Dipsastraea amicorum (Milne Edwards & Haime, 1849)xxx235Dipsastraea amicorum (Milne Edwards & Haime, 1849)xxx236Dipsastraea amicorum (Milne Edwards & Haime, 1849)xxx237Dipsastraea amicorum (Milne Edwards & Haime, 1849)xxx238Dipsastraea faviaformis Veron, 2000xxx239Dipsastraea faviaformis Veron, 2000xxx240Dipsastraea faviaformis Veron, 2000xxx241Dipsastraea maritima (Nemenzo, 1971)xxxx242Dipsastraea maritima (Veron, Pichon & Wijsman-Best, 1977)xxxx243Dipsastraea maritima (Veron, 2000)xxxx244Dipsastraea maritima (Veron, 2000)xxxx245Dipsastraea maritima (Veron, 2000)xxx246	224	Astrea curta Dana, 1846	х		х	Х
226Coelastrea agaora (Verrill, 1866)xxxx227Coelastrea agaora (Varill, 1866)xxxx228Cyphastrea dalacidicum (Forskil, 1775)xxxx230Cyphastrea chalcidicum (Forskil, 1775)xxxx231Cyphastrea ocellina (Dana, 1846)xxx232Cyphastrea ocellina (Dana, 1846)xxx233Cyphastrea agaorica (Veron, 2000)xxxx235Dipsastraea abia (Veron, 2000)xxxx236Dipsastraea abia (Veron, 2000)xxxx237Dipsastraea favia (Forskil, 1775)xxxx238Dipsastraea favia (Forskil, 1775)xxxx239Dipsastraea favia (Forskil, 1775)xxxx240Dipsastraea favia (Forskil, 1775)xxxx241Dipsastraea favia (Forskil, 1775)xxxx242Dipsastraea haidnoides (Veron, Pichon & Wijsman-Best, 1977)xxxx243Dipsastraea marshae (Veron, 2000)xxxx244Dipsastraea marshae (Veron, 2000)xxxx245Dipsastraea marshae (Veron, 2000)xxxx246Dipsastraea rounama (Gardiner, 1899)xxxx247Dipsastraea rounama (Gardiner, 1899)x	225	Caulastraea tumida Matthai, 1928	Х	х		
227Coelastrea palauensis (Yabe & Sugiyama, 1936)xx228Cyphastrea chalcidicum (Forskil, 1775)xxx230Cyphastrea chalcidicum (Forskil, 1775)xxx231Cyphastrea incrophthalma (Lamarek, 1816)xxx232Cyphastrea orelina (Dana, 1846)xxx233Cyphastrea orelina (Dana, 1846)xxx234Dipsastrea orelina (Dana, 1846)xxx235Dipsastreae albida (Veron, 2000)xxxx236Dipsastreae albida (Veron, 2000)xxxx237Dipsastreae faviaformis Veron, 2000xxxx238Dipsastreae faviaformis Veron, 2000xxxx239Dipsastreae halmhoides (Wells, 1954)xxxx240Dipsastreae halmhoides (Wells, 1954)xxxx241Dipsastreae maritima (Nemenzo, 1971)xxxx242Dipsastreae maxima (Veron, Pichon & Wijsman-Best, 1977)xxxx243Dipsastreae maxima (Veron, 2000)xxxx244Dipsastreae maxima (Veron, 2000)xxxx245Dipsastreae maxima (Veron, 2000)xxx246Dipsastreae maxima (Veron, 2000)xxx247Dipsastreae rotunana (Gardiner, 1899)xxx248Dipsastreae	226	Coelastrea aspera (Verrill, 1866)	х		х	х
228Cyphastrea agassizi (Yaughan, 1907)xx229Cyphastrea adacticum (Forskäl, 1775)Xxx230Cyphastrea anicrophthalma (Lamarck, 1816)xx231Cyphastrea anicrophthalma (Lamarck, 1816)xx232Cyphastrea serallia (Forskäl, 1775)Xxx233Cyphastrea serallia (Forskäl, 1775)Xxx234Dipsastraea amicorum (Milne Edwards & Haine, 1849)xxx235Dipsastraea amicorum (Milne Edwards & Haine, 1849)xxx236Dipsastraea faviafornis Veron, 2000xxx237Dipsastraea faviafornis Veron, 2000xxx238Dipsastraea faviafornis Veron, 2000xxx239Dipsastraea faviafornis Veron, 2000xxx240Dipsastraea helianthoides (Wells, 1954)xxx241Dipsastraea maritima (Nemenzo, 1971)xxxx242Dipsastraea maritima (Nemenzo, 1971)xxxx243Dipsastraea maritima (Veron, 2000)xxxx244Dipsastraea maritima (Veron, 2000)xxxx245Dipsastraea roumana (Gardiner, 1899)xxxx246Dipsastraea roumana (Gardiner, 1899)xxxx251Dipsastraea virantamesis (Veron, 2000)xxx252Echinopora lamellaa (Esper, 1795) <td>227</td> <td>Coelastrea palauensis (Yabe & Sugiyama, 1936)</td> <td></td> <td></td> <td>х</td> <td>х</td>	227	Coelastrea palauensis (Yabe & Sugiyama, 1936)			х	х
229Cyphastrea chalcidicum (Forskål, 1775)xxxx230Cyphastrea iraponica Yabe & Sugiyama, 1932x231Cyphastrea arealia (Aponica Yabe & Sugiyama, 1932x232Cyphastrea ocellina (Dana, 1846)x233Cyphastrea seralia (Forskål, 1775)xx234Dipsastraca anicorum (Milne Edwards & Haime, 1849)xx235Dipsastraca anicorum (Milne Edwards & Haime, 1849)xxx236Dipsastraca faviaformis Veron, 2000)xxx237Dipsastraca faviaformis Veron, 2000xxx238Dipsastraca favia (Forskål, 1775)xxxx239Dipsastraca favia (Forskål, 1775)xxxx240Dipsastraca fucia (Neenskä, 1954)xxxx241Dipsastraca maritima (Nemenzo, 1971)xxxx242Dipsastraca marihae (Veron, Pichon & Wijsman-Best, 1977)xxxx243Dipsastraca marihae (Veron, Pichon & Wijsman-Best, 1977)xxxx244Dipsastraca navima (Veron, Pichon & Wijsman-Best, 1977)xxxx245Dipsastraca routamana (Gardiner, 1899)xxxx246Dipsastraca vienamensis (Veron, 2000)xxxx251Dipsastraca vienamensis (Veron, 2000)xxxx252Echinopora andmicata (Lamarch, 186)xxx <td>228</td> <td>Cyphastrea agassizi (Vaughan, 1907)</td> <td></td> <td></td> <td></td> <td>х</td>	228	Cyphastrea agassizi (Vaughan, 1907)				х
230Cyphastrea japonica Yabe & Sugiyama, 1932x231Cyphastrea microphthalma (Lamarck, 1816)xx232Cyphastrea oscilia (Dana, 1846)xx233Cyphastrea scralia (Forskål, 1775)xxx234Dipsastraea amicorum (Milne Edwards & Haime, 1849)xxx235Dipsastraea amicorum (Milne Edwards & Haime, 1849)xxxx236Dipsastraea amicorum (Milne Edwards & Haime, 1849)xxxx237Dipsastraea favia formis Veron, 2000xxxx238Dipsastraea favia (Forskål, 1775)xxxx239Dipsastraea favia (Forskål, 1775)xxxx239Dipsastraea helianthoides (Wells, 1954)xxxx241Dipsastraea maritima (Nemenzo, 1971)xxxx242Dipsastraea maritima (Nemenzo, 1971)xxxx243Dipsastraea maritima (Nemenzo, 1971)xxxx244Dipsastraea nosaria (Veron, 2000)xxxx245Dipsastraea rosaria (Veron, 2000)xxxx246Dipsastraea rosaria (Veron, 2000)xxxx247Dipsastraea vietnamesis (Veron, 2000)xxxx248Dipsastraea vietnamesis (Veron, 2000)xxxx250Dipsastraea vietnamesis (Veron, 2000)xx <td>229</td> <td>Cyphastrea chalcidicum (Forskål, 1775)</td> <td>х</td> <td></td> <td>х</td> <td>х</td>	229	Cyphastrea chalcidicum (Forskål, 1775)	х		х	х
231Cyphastrea microphthalma (Lamarck, 1816)xx232Cyphastrea ocellina (Dana, 1846)x233Cyphastrea ocellina (Forskil, 1775)xx234Dipsastraea albida (Veron, 2000)xx235Dipsastraea camrasensis (Latypov, 2013)*xx236Dipsastraea favus (Forskil, 1775)xxx237Dipsastraea favus (Forskil, 1775)xxx238Dipsastraea favus (Forskil, 1775)xxx240Dipsastraea favus (Forskil, 1775)xxx241Dipsastraea farus (Veron, Pichon & Wijsman-Best, 1977)xxx242Dipsastraea maritima (Nemenzo, 1971)xxxx243Dipsastraea maritima (Nemenzo, 1971)xxxx244Dipsastraea maritima (Neron, Pichon & Wijsman-Best, 1977)xxxx245Dipsastraea maritima (Veron, Pichon & Wijsman-Best, 1977)xxxx246Dipsastraea rosaria (Veron, 2000)xxxx247Dipsastraea rosaria (Veron, 2000)xxxx248Dipsastraea columana (Gardiner, 1899)xxxx251Dipsastraea vietinamensis (Veron, 2000)xxxx252Echinopora ammaformis (Veron, 2000)xxxx253Dipsastraea columana (Gardiner, 1899)xxxx254Dipsastraea	230	Cyphastrea japonica Yabe & Sugiyama, 1932				х
222Cyphastrea ocellina (Dana, 1846)xx233Cyphastrea serailia (Forskål, 1775)xxx234Dipsastraea albida (Veron, 2000)xxx235Dipsastraea albida (Veron, 2000)xxx236Dipsastraea camrasensis (Latypov, 2013)*xxxx237Dipsastraea faviaformis Veron, 2000xxxx238Dipsastraea faviaformis Veron, 2000xxxx239Dipsastraea faviaformis Veron, Pichon & Wijsman-Best, 1977)xxxx240Dipsastraea maritima (Nemenzo, 1971)xxxxx242Dipsastraea maritima (Nemenzo, 1971)xxxxx243Dipsastraea maritima (Nemenzo, 1971)xxxxx244Dipsastraea maritima (Nemenzo, 1971)xxxxx245Dipsastraea maritima (Veron, Pichon & Wijsman-Best, 1977)xxxx246Dipsastraea rosaria (Veron, Pichon & Wijsman-Best, 1977)xxxx247Dipsastraea rosaria (Veron, 2000)xxxx248Dipsastraea rosaria (Veron, 2000)xxxx249Dipsastraea vietnamensis (Veron, 2000)xxx251Dipsastraea vietnamensis (Veron, 2000)xxx252Echinopora gemmacea (Lamarck, 1816)xxx253 </td <td>231</td> <td>Cyphastrea microphthalma (Lamarck, 1816)</td> <td></td> <td></td> <td>х</td> <td>х</td>	231	Cyphastrea microphthalma (Lamarck, 1816)			х	х
233Cyphastrea serailia (Forskål, 1775)xxxx234Dipsastreae albida (Veron, 2000)xxx235Dipsastreae albida (Veron, 2000)xxx236Dipsastreae faviaformis Veron, 2000xxx237Dipsastreae faviaformis Veron, 2000xxx238Dipsastreae faviaformis Veron, 2000xxx239Dipsastreae laradensis (Veron, Pichon & Wijsman-Best, 1977)xxx241Dipsastreae naritima (Nemerzo, 1971)xxxx242Dipsastreae maritima (Nemerzo, 1971)xxxx243Dipsastreae maritima (Nemerzo, 1971)xxxx244Dipsastreae maritima (Veron, Pichon & Wijsman-Best, 1977)xxxx245Dipsastraea maritima (Veron, 2000)xxxx246Dipsastraea rosaria (Veron, 2000)xxxx247Dipsastraea rosaria (Veron, 2000)xxxx248Dipsastraea rosaria (Veron, 2000)xxxx250Dipsastraea veroni (Moll & Best, 1984)xxxx251Dipsastraea veroni (Moll & Best, 1984)xxxx252Echinopora lamellosa (Esper, 1795)xxxx253Echinopora lamellosa (Esper, 1795)xxxx254Echinopora lacificus Veron, 1990x	232	Cyphastrea ocellina (Dana, 1846)				х
234Dipsastraea albida (Veron, 2000)xxxx235Dipsastraea amicorum (Milne Edwards & Haime, 1849)xxxx236Dipsastraea amicorum (Milne Edwards & Haime, 1849)xxxx237Dipsastraea faviaformis Veron, 2000xxxx238Dipsastraea faviaformis Veron, 2000xxxx239Dipsastraea faviaformis Veron, 2000xxxx240Dipsastraea helianthoides (Wells, 1954)xxxx241Dipsastraea marima (Veron, Pichon & Wijsman-Best, 1977)xxxx242Dipsastraea marima (Veron, 2000)xxxx243Dipsastraea marima (Veron, 2000)xxxx244Dipsastraea roaria (Veron, 2000)xxxx245Dipsastraea rosaria (Veron, 2000)xxxx246Dipsastraea rosaria (Veron, 2000)xxxx247Dipsastraea rotumana (Gardiner, 1899)xxxx248Dipsastraea veroni (Moll & Best, 1984)xxxx250Dipsastraea veroni (Moll & Best, 1984)xxxx261Dipsastraea veroni (Moll & Best, 1984)xxxx271Dipsastraea veroni (Moll & Best, 1984)xxxx251Dipsastraea veroni (Moll & Best, 1984)xxx <t< td=""><td>233</td><td>Cyphastrea serailia (Forskål, 1775)</td><td>Х</td><td></td><td>х</td><td>х</td></t<>	233	Cyphastrea serailia (Forskål, 1775)	Х		х	х
235Dipsastraea amicorum (Milne Edwards & Haime, 1849)xxxxxx236Dipsastraea camrasensis (Latypov, 2013)*xxxx237Dipsastraea faviaformis Veron, 2000xxxx238Dipsastraea faviaformis Veron, 2000xxxx239Dipsastraea helianthoides (Wells, 1954)xxxx240Dipsastraea nitina (Nemenzo, 1971)xxxxx241Dipsastraea marihae (Veron, 2000)xxxxx242Dipsastraea marihae (Veron, Pichon & Wijsman-Best, 1977)xxxxx243Dipsastraea marihae (Veron, Pichon & Wijsman-Best, 1977)xxxxx244Dipsastraea anathaii (Vaughan, 1918)xxxxxx245Dipsastraea pallida (Dana, 1846)xxxxxx246Dipsastraea rosaria (Veron, 2000)xxxxxx247Dipsastraea speciosa (Dana, 1846)xxxxxx250Dipsastraea arunatus (Veron, 2000)xxxxxx251Dipsastraea veroni (Moll & Best, 1984)xxxxx252Echinopora ammiformis (Nemenzo, 1959)xxxxx253Echinopora ananiformis (Nemenzo, 1959)xxxx2	234	Dipsastraea albida (Veron, 2000)				х
236Dipsastrace camrasensis (Latypov, 2013)*xxx237Dipsastrace favia/formis Veron, 2000xxx238Dipsastrace favia/formis Veron, 2000xxx239Dipsastrace alcardensis (Forskål, 1775)xxxx240Dipsastrace alcardensis (Veron, Pichon & Wijsman-Best, 1977)xxxx241Dipsastrace maritima (Nemenzo, 1971)xxxxx242Dipsastrace maritima (Nemenzo, 1971)xxxxx243Dipsastrace marine (Veron, 2000)xxxxx244Dipsastrace maxima (Veron, Pichon & Wijsman-Best, 1977)xxxxx245Dipsastrace anaxima (Veron, 2000)xxxxxx246Dipsastrace arotumana (Gardiner, 1899)xxxxxx247Dipsastrace arounana (Gardiner, 1899)xxxxxx250Dipsastrace a vientamensis (Veron, 2000)xxxxxx251Dipsastrace a vientimensis (Veron, 2000)xxxxx252Echinopora gemmacea (Lamarck, 1816)xxxxx253Echinopora lamellosa (Esper, 1795)xxxxx254Echinopora mamiformis (Nemenzo, 1959)xxxxx255Echinopora mamiformis (Nemenzo, 19	235	Dipsastraea amicorum (Milne Edwards & Haime, 1849)	Х	х	х	Х
237Dipsastrace faviaformis Veron, 2000xxx238Dipsastrace favias (Forskål, 1775)xxxx239Dipsastrace favia (Forskål, 1775)xxxx240Dipsastrace helianthoides (Wells, 1954)xxxx241Dipsastrace anaritima (Nemenzo, 1971)xxxx242Dipsastrace maritima (Nemenzo, 1971)xxxx243Dipsastrace maritima (Nemenzo, 1971)xxxx244Dipsastrace maritima (Nemenzo, 1971)xxxx243Dipsastrace maritima (Nemenzo, 1971)xxxx244Dipsastrace maxima (Veron, Pichon & Wijsman-Best, 1977)xxxx245Dipsastrace nosaria (Veron, 2000)xxxxx246Dipsastrace orsaria (Veron, 2000)xxxx248Dipsastrace a speciosa (Dana, 1846)xxxxx250Dipsastrace a vienamensis (Veron, 2000)xxxx251Dipsastrace a vienamensis (Veron, 2000)xxxx252Echinopora lamellosa (Esper, 1795)xxxx253Echinopora anamiformis (Nemenzo, 1959)xxxx254Echinopora ammiformis (Nemenzo, 1959)xxxx255Echinopora ammiformis (Nemenzo, 1959)xxxx	236	Dipsastraea camrasensis (Latypov, 2013)*	х		Х	
238Dipsastrace favus (Forskål, 1775)xxxx239Dipsastrace helianthoides (Wells, 1954)xxx240Dipsastrace helianthoides (Wells, 1954)xxx241Dipsastrace lizardensis (Veron, Pichon & Wijsman-Best, 1977)xxxx242Dipsastrace maritima (Nemenzo, 1971)xxxxx243Dipsastrace matthait (Vaughan, 1918)xxxxx244Dipsastrace matthait (Vaughan, 1918)xxxxx245Dipsastrace naxima (Veron, Pichon & Wijsman-Best, 1977)xxxx246Dipsastrace around (Gardiner, 1899)xxxxx247Dipsastrace otumana (Gardiner, 1899)xxxxx248Dipsastrace aroundana (Gardiner, 1899)xxxxx250Dipsastrace a truncatus (Veron, 2000)xxxxx251Dipsastracea (Lamarck, 1816)xxxxx252Echinopora horrida Dana, 1846xxxxx253Echinopora nammiformis (Nemenzo, 1959)xxxx254Echinopora nammiformis (Nemenzo, 1959)xxxx255Echinopora nammiformis (Nemenzo, 1959)xxxx256Echinopora pacificus Veron, 2000)xxxx257Favi	237	Dipsastraea faviaformis Veron, 2000	х			х
239Dipsastraea helianthoides (Wells, 1954)xxx240Dipsastraea lizardensis (Veron, Pichon & Wijsman-Best, 1977)xxxx241Dipsastraea maritima (Nemenzo, 1971)xxxxx242Dipsastraea maritima (Nemenzo, 1971)xxxxx243Dipsastraea marshae (Veron, Pichon & Wijsman-Best, 1977)xxxxx244Dipsastraea maxima (Veron, Pichon & Wijsman-Best, 1977)xxxxx245Dipsastraea anatima (Veron, Pichon & Wijsman-Best, 1977)xxxxx246Dipsastraea anatima (Veron, 2000)xxxxxx247Dipsastraea rotumana (Gardiner, 1899)xxxxxx248Dipsastraea vietnamensis (Veron, 2000)xxxxxx250Dipsastraea vietnamensis (Veron, 2000)xxxxxx251Dipsastraea vietnamensis (Veron, 2000)xxxxxx252Echinopora horrida Dana, 1846xxxxxxx253Echinopora horrida Dana, 1846xxxxxxx254Echinopora lamellosa (Esper, 1795)xxxxxx255Echinopora namiformis (Nemenzo, 1959)xxxxxx256Echinop	238	Dipsastraea favus (Forskål, 1775)	х		х	х
240Dipsastraea lizardensis (Veron, Pichon & Wijsman-Best, 1977)xxxx241Dipsastraea maritima (Nemenzo, 1971)xxxx242Dipsastraea maritima (Nemenzo, 1971)xxxx243Dipsastraea maritima (Veron, 2000)xxxx244Dipsastraea matthaii (Vaughan, 1918)xxxx245Dipsastraea matthaii (Veron, Pichon & Wijsman-Best, 1977)xxx245Dipsastraea rosaria (Veron, 2000)xxx246Dipsastraea rosaria (Veron, 2000)xxx248Dipsastraea ordumana (Gardiner, 1899)xxxx249Dipsastraea iruncatus (Veron, 2000)xxxx250Dipsastraea vietnamensis (Veron, 2000)xxxx251Dipsastraea vietnamensis (Veron, 2000)xxxx252Echinopora gemmacea (Lamarck, 1816)xxxx253Echinopora damellosa (Esper, 1795)xxxx254Echinopora pacificus Veron, 1990xxxx255Echinopora pacificus Veron, 1990xxxx256Echinopora pacificus Veron, 1990xxxx257Favites addita (Ellis & Solander, 1786)xxxx258Favites chinensis (Verrill, 1866)xxxx259Favites	239	Dipsastraea helianthoides (Wells, 1954)			х	х
241Dipsastraea maritima (Nemenzo, 1971)xxxx242Dipsastraea marshae (Veron, 2000)xx243Dipsastraea marshae (Veron, 2000)xxx244Dipsastraea maxima (Veron, Pichon & Wijsman-Best, 1977)xxx245Dipsastraea maxima (Veron, 2000)xxxx246Dipsastraea rotumana (Gardiner, 1899)xxxx247Dipsastraea rotumana (Gardiner, 1899)xxxx248Dipsastraea speciosa (Dana, 1846)xxxx250Dipsastraea veroni (Moll & Best, 1984)xxxx251Dipsastraea veroni (Moll & Best, 1984)xxxx252Echinopora gemmacea (Lamarck, 1816)xxxxx253Echinopora lamellosa (Esper, 1795)xxxx254Echinopora maniniformis (Nemenzo, 1959)xxxx255Echinopora maniniformis (Nemenzo, 1959)xxxx256Favites acuticollis (Otrmann, 1889)xxxxx257Favites cohlensis (Veron, 2000)xxxxx256Echinopora lamellosa (Esper, 1786)xxxx255Echinopara famellosa (Esper, 1786)xxxx256Favites acuticollis (Otrmann, 1889)xxxx257Favites a	240	Dipsastraea lizardensis (Veron, Pichon & Wijsman-Best, 1977)	Х		х	х
242Dipsastraea marshae (Veron, 2000)xx243Dipsastraea maxihaii (Vaughan, 1918)xxx244Dipsastraea maxima (Veron, Pichon & Wijsman-Best, 1977)xxx245Dipsastraea nosaria (Veron, 2000)xxxx246Dipsastraea rosaria (Veron, 2000)xxxx247Dipsastraea rosaria (Veron, 2000)xxxx248Dipsastraea rosuria (Veron, 2000)xxxx249Dipsastraea speciosa (Dana, 1846)xxxx250Dipsastraea vietnamensis (Veron, 2000)xxxx251Dipsastraea vietnamensis (Veron, 2000)xxxx252Echinopora gemmacea (Lamarck, 1816)xxxx253Echinopora lamellosa (Esper, 1795)xxxx254Echinopora pacificus Veron, 1990xxxx255Echinopora pacificus Veron, 1990xxxx256Echinopora pacificus Veron, 1990xxxx257Favites aduita (Ellis & Solander, 1786)xxxx258Favites complanata (Ehrenberg, 1834)xxxx261Favites colemani (Veron, 2000)xxxx255Schinensis (Verrill, 1866)xxxx260Favites colemani (Veron, 2000)xxx <t< td=""><td>241</td><td>Dipsastraea maritima (Nemenzo, 1971)</td><td></td><td>х</td><td>х</td><td>х</td></t<>	241	Dipsastraea maritima (Nemenzo, 1971)		х	х	х
243Dipsastraea matthaii (Vaughan, 1918)xxxxx244Dipsastraea maxima (Veron, Pichon & Wijsman-Best, 1977)xxxx245Dipsastraea pallida (Dana, 1846)xxxxx246Dipsastraea rosaria (Veron, 2000)xxxxx247Dipsastraea rotumana (Gardiner, 1899)xxxxx248Dipsastraea speciosa (Dana, 1846)xxxxx249Dipsastraea truncatus (Veron, 2000)xxxxx250Dipsastraea vietnamensis (Veron, 2000)xxxxx251Dipsastraea veroni (Moll & Best, 1984)xxxxx252Echinopora gemmacea (Lamarck, 1816)xxxxx253Echinopora lamellosa (Esper, 1795)xxxx255Echinopora pacificus Veron, 1990xxxx256Echinopora pacificus Veron, 1990xxxx257Favites aduita (Ellis & Solander, 1786)xxxx258Favites colemani (Veron, 2000)xxxx256Favites colemani (Veron, 2000)xxxx257Favites acticollis (Ortmann, 1889)xxxx258Favites colemani (Veron, 2000)xxxx259Favites colemani (Veron, 2000)	242	Dipsastraea marshae (Veron, 2000)				х
244Dipsastraea maxima (Veron, Pichon & Wijsman-Best, 1977)xxx245Dipsastraea pallida (Dana, 1846)xxxx246Dipsastraea rosaria (Veron, 2000)xxxx247Dipsastraea rotumana (Gardiner, 1899)xxxx248Dipsastraea speciosa (Dana, 1846)xxxx249Dipsastraea speciosa (Dana, 1846)xxxx250Dipsastraea truncatus (Veron, 2000)xxxx251Dipsastraea vietnamensis (Veron, 2000)xxxx252Echinopora gemmacea (Lamarck, 1816)xxxx253Echinopora lamellosa (Esper, 1795)xxxx255Echinopora pacificus Veron, 1990xxxx256Echinopora pacificus Veron, 1990xxxx257Favites addita (Ellis & Solander, 1786)xxxx258Favites colimensis (Verrill, 1866)xxxx259Favites colemani (Veron, 2000)xxxx261Favites colemani (Veron, 2000)xxxx253Echinopora lamellosa (Esper, 1786)xxxx254Echinopora pacificus Veron, 1990xxxxx255Favites colemani (Veron, 2000)xxxxx260Favites colemani (Ve	243	Dipsastraea matthaii (Vaughan, 1918)	х		х	х
245Dipsastraea pallida (Dana, 1846)xxxx246Dipsastraea rosaria (Veron, 2000)xxx247Dipsastraea rotumana (Gardiner, 1899)xxx248Dipsastraea speciosa (Dana, 1846)xxxx249Dipsastraea speciosa (Dana, 1846)xxxx250Dipsastraea vietnamensis (Veron, 2000)xxxx251Dipsastraea vietnamensis (Veron, 2000)xxxx252Echinopora gemmacea (Lamarck, 1816)xxxx253Echinopora horrida Dana, 1846xxxx254Echinopora lamellosa (Esper, 1795)xxxx255Echinopora mammiformis (Nemenzo, 1959)xxxx256Echinopora pacificus Veron, 1990xxxx257Favites abdita (Ellis & Solander, 1786)xxxx258Favites collis (Ortmann, 1889)xxxxx259Favites colemani (Veron, 2000)xxxx261Favites colemani (Veron, 2000)xxxx262Favites collanata (Ehrenberg, 1834)xxxx263Favites halicora (Ehrenberg, 1834)xxxx	244	Dipsastraea maxima (Veron, Pichon & Wijsman-Best, 1977)			х	х
246Dipsastraea rosaria (Veron, 2000)xx247Dipsastraea rotumana (Gardiner, 1899)xx248Dipsastraea speciosa (Dana, 1846)xxx249Dipsastraea truncatus (Veron, 2000)xxx250Dipsastraea vietnamensis (Veron, 2000)xxx251Dipsastraea vietnamensis (Veron, 2000)xxx252Echinopora gemmacea (Lamarck, 1816)xxxx253Echinopora horrida Dana, 1846xxxx254Echinopora lamellosa (Esper, 1795)xxxx255Echinopora mamiformis (Nemenzo, 1959)xxxx256Echinopora pacificus Veron, 1990xxxx257Favites abdita (Ellis & Solander, 1786)xxxx258Favites chinensis (Verrill, 1866)xxxx259Favites chinensis (Verrill, 1866)xxxx260Favites complanata (Ehrenberg, 1834)xxxx261Favites complanata (Ehrenberg, 1834)xxxx263Favites halicora (Ehrenberg, 1834)xxxx	245	Dipsastraea pallida (Dana, 1846)	х		х	х
247Dipsastraea rotumana (Gardiner, 1899)xx248Dipsastraea speciosa (Dana, 1846)xxx249Dipsastraea truncatus (Veron, 2000)xxx250Dipsastraea vietnamensis (Veron, 2000)xxx251Dipsastraea veroni (Moll & Best, 1984)xxx252Echinopora gemmacea (Lamarck, 1816)xxxx253Echinopora horrida Dana, 1846xxxx254Echinopora lamellosa (Esper, 1795)xxxx255Echinopora mamiformis (Nemenzo, 1959)xxxx256Echinopora pacificus Veron, 1990xxxx257Favites abdita (Ellis & Solander, 1786)xxxx258Favites chinensis (Verrill, 1866)xxxx260Favites colemani (Veron, 2000)xxxx261Favites complanata (Ehrenberg, 1834)xxxx263Favites flexuosa (Dana, 1846)xxxx263Favites halicora (Ehrenberg, 1834)xxxx	246	Dipsastraea rosaria (Veron, 2000)			х	х
248Dipsastraea speciosa (Dana, 1846)xxxx249Dipsastraea truncatus (Veron, 2000)xxx250Dipsastraea vietnamensis (Veron, 2000)xxx251Dipsastraea veroni (Moll & Best, 1984)xxx252Echinopora gemmacea (Lamarck, 1816)xxxx253Echinopora horrida Dana, 1846xxxx254Echinopora lamellosa (Esper, 1795)xxxx255Echinopora pacificus Veron, 1990xxxx256Echinopora pacificus Veron, 1990xxxx257Favites abdita (Ellis & Solander, 1786)xxxx258Favites chinensis (Verrill, 1866)xxxx260Favites colemani (Veron, 2000)xxxx261Favites colemani (Veron, 2000)xxxx263Favites halicora (Ehrenberg, 1834)xxxx	247	Dipsastraea rotumana (Gardiner, 1899)				х
249Dipsastraea truncatus (Veron, 2000)xxx250Dipsastraea vietnamensis (Veron, 2000)xxx251Dipsastraea veroni (Moll & Best, 1984)xxx252Echinopora gemmacea (Lamarck, 1816)xxxx253Echinopora horrida Dana, 1846xxxx254Echinopora lamellosa (Esper, 1795)xxxx255Echinopora mammiformis (Nemenzo, 1959)xxxx256Echinopora pacificus Veron, 1990xxxx257Favites abdita (Ellis & Solander, 1786)xxxx258Favites chinensis (Verrill, 1866)xxxx260Favites colemani (Veron, 2000)xxxx261Favites complanata (Ehrenberg, 1834)xxxx263Favites halicora (Ehrenberg, 1834)xxxx	248	Dipsastraea speciosa (Dana, 1846)	х		х	х
250Dipsastraea vietnamensis (Veron, 2000)xxx251Dipsastraea veroni (Moll & Best, 1984)xxx252Echinopora gemmacea (Lamarck, 1816)xxxx253Echinopora horrida Dana, 1846xxxx254Echinopora lamellosa (Esper, 1795)xxxx255Echinopora mammiformis (Nemenzo, 1959)xxxx256Echinopora pacificus Veron, 1990xxxx257Favites abdita (Ellis & Solander, 1786)xxxx258Favites chinensis (Verrill, 1866)xxxx259Favites chinensis (Verrill, 1866)xxxx260Favites colemani (Veron, 2000)xxxx261Favites complanata (Ehrenberg, 1834)xxxx263Favites halicora (Ehrenberg, 1834)xxxx	249	Dipsastraea truncatus (Veron, 2000)			х	х
251Dipsastraea veroni (Moll & Best, 1984)xxxx252Echinopora gemmacea (Lamarck, 1816)xxxxx253Echinopora horrida Dana, 1846xxxxx254Echinopora lamellosa (Esper, 1795)xxxxx255Echinopora mamniformis (Nemenzo, 1959)xxxxx256Echinopora pacificus Veron, 1990xxxxx257Favites abdita (Ellis & Solander, 1786)xxxxx258Favites collis (Ortmann, 1889)xxxxx259Favites chinensis (Verrill, 1866)xxxx260Favites colemani (Veron, 2000)xxxx261Favites complanata (Ehrenberg, 1834)xxxx263Favites halicora (Ehrenberg, 1834)xxxx	250	Dipsastraea vietnamensis (Veron, 2000)			х	х
252Echinopora gemmacea (Lamarck, 1816)xxxxx253Echinopora horrida Dana, 1846xxxxx254Echinopora lamellosa (Esper, 1795)xxxxx255Echinopora mammiformis (Nemenzo, 1959)xxxxx256Echinopora pacificus Veron, 1990xxxxxx257Favites abdita (Ellis & Solander, 1786)xxxxx258Favites chinensis (Verrill, 1889)xxxxx259Favites colemani (Veron, 2000)xxxxx261Favites complanata (Ehrenberg, 1834)xxxxx263Favites halicora (Ehrenberg, 1834)xxxxx	251	Dipsastraea veroni (Moll & Best, 1984)			х	х
253Echinopora horrida Dana, 1846xxxxx254Echinopora lamellosa (Esper, 1795)xxxx255Echinopora mammiformis (Nemenzo, 1959)xxxx256Echinopora pacificus Veron, 1990xxxx257Favites abdita (Ellis & Solander, 1786)xxxx258Favites acuticollis (Ortmann, 1889)xxxx259Favites chinensis (Verrill, 1866)xxxx260Favites colemani (Veron, 2000)xxxx261Favites complanata (Ehrenberg, 1834)xxxx263Favites halicora (Ehrenberg, 1834)xxxx	252	Echinopora gemmacea (Lamarck, 1816)	х	х	х	х
254Echinopora lamellosa (Esper, 1795)xxxx255Echinopora mammiformis (Nemenzo, 1959)xxx256Echinopora pacificus Veron, 1990xxxx257Favites abdita (Ellis & Solander, 1786)xxxx258Favites acuticollis (Ortmann, 1889)xxxx259Favites chinensis (Verrill, 1866)xxxx260Favites colemani (Veron, 2000)xxxx261Favites complanata (Ehrenberg, 1834)xxxx263Favites halicora (Ehrenberg, 1834)xxxx	253	Echinopora horrida Dana, 1846	х	х	х	х
255Echinopora mammiformis (Nemenzo, 1959)x256Echinopora pacificus Veron, 1990xxx257Favites abdita (Ellis & Solander, 1786)xxxx258Favites acuticollis (Ortmann, 1889)xxxxx259Favites chinensis (Verrill, 1866)xxxx260Favites colemani (Veron, 2000)xxxx261Favites complanata (Ehrenberg, 1834)xxxx263Favites halicora (Ehrenberg, 1834)xxxx	254	Echinopora lamellosa (Esper, 1795)		х	х	х
256Echinopora pacificus Veron, 1990xxxxx257Favites abdita (Ellis & Solander, 1786)xxxxx258Favites acuticollis (Ortmann, 1889)xxxxx259Favites chinensis (Verrill, 1866)xxxx260Favites colemani (Veron, 2000)xxxx261Favites complanata (Ehrenberg, 1834)xxxx262Favites flexuosa (Dana, 1846)xxxx263Favites halicora (Ehrenberg, 1834)xxxx	255	Echinopora mammiformis (Nemenzo, 1959)				х
257Favites abdita (Ellis & Solander, 1786)xxxxx258Favites acuticollis (Ortmann, 1889)xxxxx259Favites chinensis (Verrill, 1866)xxxx260Favites colemani (Veron, 2000)xxxx261Favites complanata (Ehrenberg, 1834)xxxx262Favites flexuosa (Dana, 1846)xxxx263Favites halicora (Ehrenberg, 1834)xxxx	256	Echinopora pacificus Veron, 1990	х	х	х	х
258Favites acuticollis (Ortmann, 1889)xxxxx259Favites chinensis (Verrill, 1866)xxx260Favites colemani (Veron, 2000)xxx261Favites complanata (Ehrenberg, 1834)xxx262Favites flexuosa (Dana, 1846)xxx263Favites halicora (Ehrenberg, 1834)xxxx	257	Favites abdita (Ellis & Solander, 1786)	х	х	х	х
259Favites chinensis (Verrill, 1866)xx260Favites colemani (Veron, 2000)x261Favites complanata (Ehrenberg, 1834)xx262Favites flexuosa (Dana, 1846)xx263Favites halicora (Ehrenberg, 1834)xx	258	Favites acuticollis (Ortmann, 1889)	х	х	х	х
260Favites colemani (Veron, 2000)x261Favites complanata (Ehrenberg, 1834)xx262Favites flexuosa (Dana, 1846)xx263Favites halicora (Ehrenberg, 1834)xxx	259	Favites chinensis (Verrill, 1866)			х	х
261Favites complanata (Ehrenberg, 1834)xxx262Favites flexuosa (Dana, 1846)xxx263Favites halicora (Ehrenberg, 1834)xxx	260	Favites colemani (Veron, 2000)				х
262Favites flexuosa (Dana, 1846)xxx263Favites halicora (Ehrenberg, 1834)xxxx	261	Favites complanata (Ehrenberg, 1834)			х	х
263 Favites halicora (Ehrenberg, 1834) x x x x	262	Favites flexuosa (Dana, 1846)			х	х
	263	Favites halicora (Ehrenberg, 1834)	х	х	х	х
264 Favites magnistellata (Chevalier, 1971) x x x	264	Favites magnistellata (Chevalier, 1971)		х	х	х
265 Favites melicerum (Ehrenberg, 1834) x x	265	Favites melicerum (Ehrenberg, 1834)			х	Х
266 Favites micropentagonus Veron, 2000 x x	266	Favites micropentagonus Veron, 2000			х	Х
267 Favites paraflexuosus Veron, 2000 x x	267	Favites paraflexuosus Veron, 2000			х	Х
268 Favites pentagona (Esper, 1794) x x	268	Favites pentagona (Esper, 1794)		х	X	

No.	Scleractinian coral species	Redang Island Marine Park	Previous record "a"	Tioman Island Marine Park	Previous records "a, b, c"
269	Favites spinosa (Klunzinger, 1879)				x
270	Favites stylifera (Yabe & Sugiyama, 1937)				Х
271	Favites valenciennesi (Milne Edwards & Haime, 1849)			х	Х
272	Goniastrea edwardsi Chevalier, 1971	х	Х	х	Х
273	Goniastrea favulus (Dana, 1846)			х	Х
274	Goniastrea minuta Veron, 2000			х	Х
275	Goniastrea pectinata (Ehrenberg, 1834)	х	Х	х	Х
276	Goniastrea retiformis (Lamarck, 1816)			х	Х
277	Goniastrea stelligera (Dana, 1846)		Х	х	х
278	Hydnophora exesa (Pallas, 1766)	х	Х	х	х
279	Hydnophora grandis Gardiner, 1904		Х	х	х
280	Hydnophora microconos (Lamarck, 1816)	х	Х	х	х
281	Hydnophora rigida (Dana, 1846)	х		х	х
282	Leptoria phrygia (Ellis & Solander, 1786)	x	Х	х	х
283	Merulina ampliata (Ellis & Solander, 1786)	х	Х	х	х
284	Merulina scabricula Dana, 1846			х	х
285	Mycedium elephantotus (Pallas, 1766)				х
286	Oulophyllia bennettae (Veron, Pichon & Wijsman-Best, 1977)			х	х
287	Oulophyllia crispa (Lamarck, 1816)	х	Х	х	х
288	Paragoniastrea australensis (Milne Edwards & Haime, 1857)				Х
289	Paragoniastrea russelli (Wells, 1954)				Х
290	Paramontastrea salebrosa (Nemenzo, 1959)				Х
291	Pectinia alcicornis (Saville-Kent, 1871)			х	Х
292	Pectinia lactuca (Pallas, 1766)	Х	Х		Х
293	Pectinia maxima (Moll & Best, 1984)	Х	Х		Х
294	Pectinia paeonia (Dana, 1846)	Х	Х	Х	Х
295	Platygyra acuta Veron, 2000			Х	Х
296	Platygyra carnosus Veron, 2000			х	х
297	Platygyra crosslandi Matthai, 1928			х	Х
298	Platygyra daedalea (Ellis & Solander, 1786)	Х	Х	х	Х
299	Platygyra lamellina (Ehrenberg, 1834)	x	Х	х	х
300	Platygyra pini Chevalier, 1975	Х		X	х
301	Platygyra ryukyuensis Yabe & Sugiyama, 1936			Х	
302	Platygyra sinensis (Milne Edwards & Haime, 1849)	х	Х	х	Х
303	Platygyra verweyi Wijsman-Best, 1976	х	Х	Х	Х
304	Platygyra yaeyamaensis Eguchi & Shirai, 1977			Х	Х
305	Scapophyllia cylindrica Milne Edwards & Haime, 1849			Х	Х
306	Trachyphyllia geoffroyi (Audouin, 1826)			Х	Х
	Pocilloporidae Gray, 1842				
307	Pocillopora acuta Lamarck, 1816*			X	
308	Pocillopora damicornis (Linnaeus, 1758)	Х	Х	х	Х
309	Pocillopora grandis Dana, 1846				Х
310	Pociliopora meandrina Dana, 1846			х	Х
311	Poculopora verrucosa (Ellis & Solander, 1786)		Х	х	Х
312	Stylophora pistillata Esper, 1/9/			х	х
313	Stylopnora subseriata (Enrenberg, 1834)	X	Х	Х	X

Poritidae Gray, 1842 314 Goniopora columna Dana, 1846 x x 315 Goniopora djiboutiensis Vaughan, 1907 x x 316 Goniopora futicosa Saville-Kent, 1893 x x 317 Goniopora futicosa Saville-Kent, 1893 x x 318 Goniopora lobata Milne Edwards & Haime, 1860 x x 319 Goniopora norfolkensis Veron & Pichon, 1982 x x 310 Goniopora norfolkensis Veron & Pichon, 1982 x x 311 Goniopora stokesi Milne Edwards & Haime, 1851 x x 322 Goniopora tenuidens (Quelch, 1886) x x 323 Porites annae Crossland, 1952 x x x 324 Porites annae Crossland, 1955 x x x 325 Porites attenuata Nemenzo, 1955 x x x 328 Porites consensis Wells, 1950 x x x 329 Porites densa Vaughan, 1918 x x x 321 Porites densa Vaughan, 1907 x x x 322 <td< th=""><th>No.</th><th>Scleractinian coral species</th><th>Redang Island Marine Park</th><th>Previous record "a"</th><th>Tioman Island Marine Park</th><th>Previous records "a, b, c"</th></td<>	No.	Scleractinian coral species	Redang Island Marine Park	Previous record "a"	Tioman Island Marine Park	Previous records "a, b, c"
314 Goniopora columna Dana, 1846 x x 315 Goniopora djiboutiensis Vaughan, 1907 x x 316 Goniopora djiboutiensis Vaughan, 1907 x x 317 Goniopora lobata Milne Edwards & Haime, 1860 x x 317 Goniopora lobata Milne Edwards & Haime, 1860 x x 319 Goniopora somaliensis Vaughan, 1907 x x 320 Goniopora somaliensis Vaughan, 1907 x x 321 Goniopora somaliensis Vaughan, 1907 x x 322 Goniopora somaliensis Vaughan, 1907 x x 323 Porites annae Crossland, 1952 x x x 324 Porites annea Nemenzo, 1955 x x x 325 Porites australiensis Vaughan, 1918 x x x x 326 Porites coscensis Wells, 1950 x x x x 328 Porites cumulatus Nemenzo, 1955 x x x x 329 Porites densa Yaughan, 1918 x x x x 321 <t< td=""><td></td><td>Poritidae Gray, 1842</td><td></td><td></td><td></td><td></td></t<>		Poritidae Gray, 1842				
315 Goniopora djiboutiensis Vaughan, 1907 x 316 Goniopora fruticosa Saville-Kent, 1893 x 317 Goniopora lobata Milne Edwards & Haime, 1860 x x 318 Goniopora lobata Milne Edwards & Haime, 1860 x x 318 Goniopora lobata Milne Edwards & Haime, 1860 x x 318 Goniopora lobata Milne Edwards & Haime, 1851 x x 320 Goniopora somaliensis Vaughan, 1907 x x 321 Goniopora somaliensis Vaughan, 1907 x x 322 Goniopora tenuidens (Quelch, 1886) x x 323 Porites annae Crossland, 1952 x x x 324 Porites annae Crossland, 1952 x x x 325 Porites australiensis Vaughan, 1918 x x x 326 Porites coundatus Nemenzo, 1955 x x x 327 Porites coundulatus Nemenzo, 1955 x x x 328 Porites celindrica Dana, 1846 x x x x 331 Porites densa Vaughan, 1907 x	314	Goniopora columna Dana. 1846			х	X
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331Porites densit vitaginii, 1710x331Porites echinulata Klunzinger, 1879x332Porites evermanni Vaughan, 1907xx333Porites horizontalata Hoffmeister, 1925xx334Porites lichen Dana, 1846xx335Porites lichen Dana, 1846xx336Porites lutea Milne Edwards & Haime, 1851xx337Porites nayeri Vaughan, 1918xx338Porites monticulosa Dana, 1846xx340Porites negrosensis Veron, 1990xx341Porites nigrescens Dana, 1846xx342Porites mur (Forskål 1775)xx	330	Porites densa Vaughan 1918	A	21	Α	x
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339Porites murrayensis Vaughan, 1918x340Porites negrosensis Veron, 1990x341Porites nigrescens Dana, 1846x342Porites rug (Forskål 1775)x	338	Poritas manticulosa Dana 1846		v	v	x v
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341 Tornes migrescens Dalla, 1640 X X X	241	Povitas vigrasaans Dono. 1846	V		v	A
	242	Powites mug (Eorskål 1775)	X	v	X	X
$\begin{array}{cccc} 342 & I & O(1065 Fulls (1015 Kal, 1775)) \\ 242 & Dovitan nolida (Eorebål 1775) \\ & & & & & & & \\ \end{array}$	242	Poritas solida (Forskål, 1775)	X	А	X	X
345 1 Offices Solidar (Folskal, 1775) 244 Stylangeg numericity (Lippeque 1758)	243	Stylawaga munatata (Linnagua, 1759)	Λ		λ	X
344 Siyiaraea punciala (Lilliaeus, 1758) x Decommoscoridae Chavelier & Decuveie, 1087	344	Beammagaridae Chavalier & Decuveie, 1087				X
245 Prammocorg contigue (Ferror 1707)	245	Psammocong contigua (Espor 1707)	v	v	v	Y
246 Degammacora digitata Milno Edwards & Haimo 185 y y y y	246	Prammocora digitata Milno Edwarda & Haima 185	A	A V	A	A V
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346 F sammocora mersiraszi vali del Holst, 1921 X 240 Bagenmesserg profundasella Cardiner 1808 X	240	Psammocora mersiraszi vali del Holst, 1921	Y	v	v	X
Stepsettroideo Vouchen & Welle, 1042	349	Siderectroidee Voucher & Wells, 1042	X	X	X	X
250 Bacudosidorgatuog tayami Yoko & Sugiyamo 1025	250	Baaudosidorgatuag tayami Voho & Sugiyomo 1025		N/		
Solerentinia incertea cadia	330	<i>Fseudosiderasired layami</i> Tabe & Sugiyama, 1955		X		X
251 <i>Blastomusaa walla</i> i Wiisman Dost 1072	251	Plastomussa wallsi Wijsman Post 1072		v		v
252 Leptastica acqualia Veren 2000	252	Lontagtuag acqualia Voron 2000		Х		X
252 Leptastrea aequaits veron, 2000 x	252	Leptastrea aequalis Veron, 2000				X
254 Leptastrea pumpung (Dono 1846)	222	Leptustrea prunosa Clossiand, 1932	X	X	X	X
534 Lepiasirea purpurea (Dana, 1840) X X X 255 Lepiasirea transporte Klupzinger 1870 X X X	254 255	Leptustrea purpurea (Dana, 1840)	X	Х	X	X
256 Dhysomma lighteneteini (Milno Edwards & Haimo 1951)	222 256	Dhugomug lightengtoini (Milno Edwards & Hoime, 1951)	X		X	X
257 Dimercine concernation (Name Edwards & Halline, 1651) X X	250	<i>Physogyra lichlensielli</i> (Willie Edwards & Halme, 1851)		-	X	X
55/ Fierogyra sinuosa (Dana, 1846) X X X X 259 Discientus suminous (Lemeraly 1816)	33/ 250	Pleniestra unin and (Lana, 1846)	Х	X	X	X
530 Fiesussirea versipora (Lamarck, 1610)XXXTOTAL SDECIES129125220225	328	riesiusirea versipora (Lamarck, 1810)	179	X 125	X 220	X 325

Note. * New scleractinian species records for the east coast of Peninsular Malaysia



Fig. 2. New scleractinian species records for the east coast of Peninsular Malaysia. a) Acropora Indonesia, b) Montipora flabellate, c) Euphyllia cristata, d) Acanthastrea brevis, e) Acanthastrea subechinata, f) Micromussa diminuta, g) Dipsastraea camrasensis, h) Pocillopora acuta

most of the sampling stations ($n \ge 3$). Among these genera, *Acropora* was found to be dominant at most of the sampling stations. Genus *Montipora* was found to be dominant at TI2

in the isolated zone. Meanwhile *Porites* was found to be dominant at TW5 in the west coast zones. *Stylocoeniella*, *Catalaphyllia*, *Heliofingia*, *Echinophyllia*, *Micromussa*, *Oxypora*,

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Table 2. Average covera	ge (%),	diversity :	and apuliu	allee par		כובומרווויי	311 VUI 41 5V		TH NANJOA	Kedang I	sland M	arme Fan	<u> </u>			
-				l			Samp	oling sta	tion					l		
Scleractinian			South Co	ast Zon	0			East	t Coast Zc	ne			North Cc	oast Zon	e	Average
No corals	Tg. Ara	Terumbu Kili	Tg. Cina Terjun	Batu Ling	Pulau Chupak]	Pulau Ekor Tebu	Pulau Kerengga Besar	Chek Isa	Mak Chantek	Pulau Lima	Pulau Paku Besar	Tg. Gua Kawah	Tlk. Mak Delah	Tg. Tok Kong	Tg. Chagar Hutang	coverage (%)
	RS1	RS2	RS3	RS4	RS5	RS6	RE1	RE2	RE3	RE4	RE5	RNI	RN2	RN3	RN4	
Acroporidae																23.4 ± 4.4
1 Acropora	+ + +	++	+	++++	+	+++	+	+++++	+++++	+	+	+++++	+	+	++++	16.1
2 Astreopora	+		+	ı	+	ı	+	ı	ı	ı	+	+	+	+		0.9
3 Montipora	+		·	+	+	+	+	+++++	+++++	+	+	+++++	+	+	+	6.4
Agariciidae																2.2 ± 0.6
4 Gardineroseris	ı	·	ı	ı	ı	ı	ı	ı	+	ı	ı	ı	+	ı	ı	0.1
5 Leptoseris		•	+	+	+	ı	+	·	•	ı	ı	·	ı	·	·	0.1
6 Pavona	·	+	+	+	+	+	+	+	+	+	•	+	+	+	+	2.0
Coscinaraeidae																0.0 ± 0.0
7 Coscinaraea	ı	ı	ı	ı	ı	ı	ı	ı	·	ı	ı	+	ı	ı	ı	0.0
Dendrophylliidae																0.1 ± 0.0
8 Turbinaria		ı	+	ı	ı	,	ı	·	ı	ı	+	ı	ı	+	ı	0.1
Diploastraeidae																1.5 ± 0.0
9 Diploastrea	ı	ı	,	ı	·	·	+	ı	+	+	+	+	+	+		1.5
Euphylliidae																3.8 ± 0.8
10 Euphyllia	+	ı	,	+	+	+	+	+	+	ı	+	ı	+	+		0.4
11 Galaxea	+	ı	+	+	+	+	+	+	+	+	+	++++	++	+++++	+	2.9
12 Pachyseris	ı	ı	ı	ı	+	ı	+	+	+	+	+	+	+	+	+	0.5
Fungiidae																12.6 ± 1.0
13 Ctenactis	ı	+	ı	+	+	ı	+	ı	+	+	+	+	+	ı	+	1.0
14 Cycloseris	ı	·	+	ı	ı	ı	ı	ı	ı	ı	ı	·	·	·	·	0.0
15 Danafungia	ı	+	·	ı	ı	ı	ı	ı	ı	ı	+	·	+	·	·	0.1
16 Fungia	+	+++++	+	+++++++++++++++++++++++++++++++++++++++	++	+	+++++++++++++++++++++++++++++++++++++++	+	‡	+++++	+	+	+	+	+++++++++++++++++++++++++++++++++++++++	10.6
17 Herpolitha	+	·	·	+	+	ı	+	+	+	+	·	·	·	+	+	0.5
18 Lithophyllon	ı		·	ı	·	ı	ı	·	ı	ı	+	ı	ı	·	·	0.0
19 Pleuractis	ı	·	+	ı	ı	ı	ı	ı	ı	ı	+	·	·	·	·	0.2
20 Polyphyllia	ı	·	·	ı	·	ı	+	·	ı	ı	ı	ı	ı	·	·	0.0
21 Sandalolitha	ı	ı	ı	ı	ı	ı	+	ī	+	+	+	ı	+	ı	+	0.2
Lobophylliidae																1.9 ± 0.3
22 Acanthastrea	·	·	ı	ı	+	ı	+	·	•	·	ı	ı	+	+	·	0.2
23 Cynarina*	ı	ı	·	ı	+	ı	ı	·	ı	ı	·	·	ı	·		0.0
24 Echinophyllia	+	ı	ı	+	ı	ı	+	ı	ı	ı	ı	ı	ı	ı	ı	0.2
25 Lobophyllia	+	ı	+	+	+	ı	+	+	+	+	+	+	+	+	+	1.5
26 Oxypora	ı	·			+	,	,		'	,	'	,	,	'		0.0

No Scleractinian Tg. T corals Tg. T Ara Ara Ara 27 Astrea + 28 Caulastraea -		South Co													
No corals Tg. T Ara Merulinidae + 28 Caulastraea -	Tomme		ast Zon	e			East	Coast Z	one			North Co	oast Zon	e	Average
RSI Merulinidae + 27 Astrea + 28 Caulastraea -	Kili	Tg. Cina Terjun	Batu Ling	Pulau Chupak 1	Pulau Ekor Tebu	Pulau Kerengga Besar	Chek Isa	Mak Chantek	Pulau Lima	Pulau Paku Besar	Tg. Gua Kawah	Tlk. Mak Delah	Tg. Tok Kong	Tg. Chagar Hutang	coverage (%)
Merulinidae 27 Astrea + 28 Caulastraea -	RS2	RS3	RS4	RS5	RS6	RE1	RE2	RE3	RE4	RE5	RNI	RN2	RN3	RN4	
27 Astrea + 28 Caulastraea -															27.0 ± 0.6
28 Caulastraea	•	+		+	ı	+	+	+	+		+	++++	+	+	1.2
		+	·	ı		+			ı	ı	ı		·		0.1
29 Coelastrea +	·		+	ı	ı	·	·		ı	ı	+	·	·		0.1
30 Cyphastrea	·		+	ı	·	+	+		ı	ı	+	+	+		0.8
31 Dipsastraea +	+	+	+	+	+	++++++	+	+	+	+	‡	+++++	+++++	+	7.4
32 Echinopora +	+		+	+	·	+	+	·	+	ı	+	+	+ +	+	2.3
33 Favites +	+	+	+	+	+	+	+	+	+	ı	+	‡	+ + +	+	6.9
34 Goniastrea	ı	+	ı	ı	+	+	ı	+	+	+	+	+	++++++	+	2.0
35 Hydnophora	·	ı	ı	ı	ı	+	ı	ı	ı	ı	+	+	+	ı	0.4
36 Leptoria	·	ı	ı	+	ı	+	ı	ı	ı	ı	+	ı	ı	ı	0.1
37 Merulina +	ı	ı	ı	ı	ı	+	ı	+	ı	ı	ı	+	+	ı	0.6
38 Oulophyllia	·		ī	ı	ı	ı	ı	+	ı	ı	+	+	+	·	0.2
39 Pectinia	·	ı	+	+	ı	+	+	+	ı	ı	ı	+	+	·	0.4
40 Platygyra +	·	+	+	+	+	+	+	+	+	+	‡	++++++	+++++	+	4.5
Pocilloporidae															7.2 ± 2.2
41 Pocillopora ++	++	+	+	+	+	+		+	+++	+++++++++++++++++++++++++++++++++++++++	+	+	+	+	6.8
42 Stylophora	·	·	+	ı		·	·		+	ı	ı	·	+		0.2
Poritidae															15.0 ± 7.0
43 Goniopora -	ı	+	ı	ı	ı	ı	·	ı	ı	ı	ı	ı	ı	ı	0.5
44 Porites ++	·	+	+	+ + + +	+	‡	‡	+ + +	+	‡	+ + +	++ ++ ++	++ ++ ++	++	14.5
Psammocoridae															0.0 ± 0.0
45 Psammocora -	ı	ı	ı	ı	+	ı	ı	ı	ı	ı	ı	ı	ı	ı	0.0
Scleractinia Incertae sedis															5.3 ± 2.7
46 Leptastrea	ı	ı	·	I	ı	ı	·	ı	·	ı	ı	ı	+	ı	0.0
47 Plerogyra +	+	+	‡	+++++	ı	+	+	+	+	+	+	+	+++	+	5.3
Total Genera 19	10	20	22	25	13	32	18	24	21	21	25	29	29	19	

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]			Sai	npling sta	ution						
ςΝ Ο	Scleractinian	Eas	t Coast Z	one		We	st Coast	Zone			Ist	olated Zo	ne		Average
	corals	Tlk. Benuang	Tlk. Sanggit	Tlk. Dalam	Pulau Tomok	Kg. Genting	Pulau Renggis	Pulau Soyak	Tlk. Salang	Tlk. Gado	Tlk. Tulai	Tlk. Bayan	Pulau Sepoi	Pulau Labas	coverage (%)
		TE1	TE2	TE3	TW1	TW2	TW3	TW4	TW5	TI1	TI2	TI3	TI4	TI5	
	Acroporidae														34.8 ± 5.1
1	Acropora	‡	+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	+	‡	+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	++	+ + + +	‡	+++++	+++++	21.5
0	Astreopora	+	ı	·		+	+	+	+	+	·	·	ı	+	0.5
С	Isopora	+	+	ı	ı	ı	ı	ı	ı	ı	+	ı	+	+	0.3
4	Montipora	++++	‡	+	+	‡	+	+++++	+	++++	+++++++++++++++++++++++++++++++++++++++	+	+++++	+++++	12.5
	Agariicidae														4.4 ± 0.9
S	Gardineroseris	+	+	+	·	·	ı	ı	+	+	ı	+	ı	+	0.8
9	Leptoseris	ı	ı	+	ı	ı	ı	+	+	+	ı	+	ı	ı	0.3
٢	Pavona	+	+++++++++++++++++++++++++++++++++++++++	+	+	+	+	+	+	+	ı	+	+	+	3.3
	Astrocoeniidae														0.0 ± 0.0
×	Stylocoeniella *	ı	ı	+	·	·	ı	ı		·	·	ı		·	0.0
	Coscinaraeidae														0.2 ± 0.0
6	Coscinaraea	+	+	·	ı							·	ı		0.2
	Dendrophylliidae														0.3 ± 0.0
10	Turbinaria		+	·	+	·	ı	+	+	·	ı	+	,	+	0.3
	Diploastraeidae														1.0 ± 0.0
11	Diploastrea	+	+	+	+	+	ı	+	+	+	+	+	+	ı	1.0
	Euphylliidae														9.2 ± 1.2
12	Catalaphyllia *	ı	ı	I	ı	ı	+	ı	ı	ı	ı	ı	ı	ı	0.0
13	Euphyllia	‡	+	+	·	·	ı	+	+	+	+	‡	+	+	2.5
14	Galaxea	‡	+	++	+	+	+	+	+	++	+	+++++	+	+	5.6
15	Pachyseris	+	+	+	+	ı	ı	ı	+	ı	+	+	ı	+	1.1
	Fungiidae														3.7 ± 0.3
16	Ctenactis	+	ı	+	ı	+	+	ı		·	+	ı	ı	ı	0.2
17	Cycloseris		ı	ı	,		+	·		,	,	+	,		0.1
18	Danafungia		ı	+	,	·	ı	ı		ı	ı	+	·	·	0.0
19	Fungia	+	+	+	+	+	+	+	+	+	+++++	+	+	+	2.6
20	Heliofungia*		ı	·	·	·	ı	ı		+	•	ı	·	·	0.0
21	Herpolitha		ı	ı	+	·	+	+		·	ı	ı	ı	·	0.1
22	Lithophyllon	+	ı	ı	+	ı	ı	ı	+	·	ı	ı	+	ı	0.1
23	Pleuractis	ı	+	ı	+	+	ı	+	ı	ı	ı	+	ı	ı	0.2
24	Podabacia	ı	+	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	0.0
25	Polyphyllia	•	+	ı		•	+	ı		·	·	ı		•	0.0
26	Sandalolitha	+	+	ı	·	+	+	+	+	·	ı	+	ı	·	0.4

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, c	Scleractinian	Ea	st Coast Z	one		We	st Coast	Zone			lsc	olated Zo.	ne		Average
0	corals	711	TIL	T11	Pulan	Kα	Pulan	Pulan	TII/	T11	ТI	TIL	Pulan	Pulan	coverage
		Benuang	Sanggit	Dalam	Tomok	Genting	Renggis	Soyak	Salang	Gado	Tulai	Bayan	Sepoi	Labas	(%)
		TE1	TE2	TE3	TW1	TW2	TW3	TW4	TW5	TI1	T12	TI3	TI4	TI5	
Π	Lobophylliidae														4.0 ± 0.4
4 1	4 <i>canthastrea</i>	+	+	+				+	+		+	+	+		0.7
8 F	Echinophyllia	ı	+	ı	ı		ı	ı	ı	·	ı	ı	ı	ı	0.1
T (Lobophyllia	+	+	+	+	+	ı	+	+	+	+	+	+	+	3.2
V (Micromussa*	ı	+	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	0.0
2	Oxypora	ı	ı	ı	ı	+	ı	ı		ı	ı	ı	ı	ı	0.0
R	Merulinidae														23.9 ± 0.5
9 0	Astrea	+	+	+	+	+	+	+	+	+	ı	+	+	+	0.5
~	Coelastrea	+	ı	+	ı	,	ı	ı	ı	·	+	ı	+	ı	0.0
-	Cyphastrea	+	ı	+	ı		ı	+	+	+	ı	+	·	+	0.9
I S	Dipsastraea	+	+	+	+	+	+	+	+	+	ı	‡	ı	+	2.9
E E	Echinopora	‡	+ + +	+	ı	+	+	ı	+	+	+	ı	+	+	2.3
1	Favites	‡	‡	‡	+	+	+	+	‡	+	+	++++	+	‡	7.3
0	Goniastrea	+	‡	+	ı	+	+	‡	‡	+	+	+	+	+	3.5
- F	Hydnophora	+	+	+	ı	,	+	+	+	+	ı	+	ı	ı	0.4
7	Leptoria	ı	+	+	ı		ı	+		+	ı	ı	+	+	0.3
7	Merulina	+	+		+		+	+	+	+	·	·	·	+	0.3
0	Oulophyllia		+	+		+	·	+		+	ı	+	+	+	0.4
4	Pectinia	+				+									0.1
1	Platygyra	+	++++++	+	+	+	+	‡	+	+	+	‡	+	‡	5.0
Š	Scapophyllia*	·	·		·		·			+			,		0.0
1	Trachyphyllia*	ı	+	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	0.0
ł	Pocilloporidae														3.1 ± 1.0
1	Pocillopora	+	‡	+	ı	+	+	+	+	+	+	+	+	+	3.1
ړ پ	Stylophora	+	ı	ı	ı	,	ı	ı			ı	ı	ı	ı	0.0
Π	Poritidae														13.6 ± 6.3
_	Goniopora	ı	ı	ı	ı	+	+	+	+	+	ı	ı	ı	+	0.5
-	Porites	+	+	+	+	+	+ + +	++++++	++++	‡	+	++++++	‡	+++++	13.1
Η	Psammocoridae														0.5 ± 0.0
щ	Psammocora	+	+					+	+			+	ı	+	0.5
	Scleractinia Incertae sedis														1.3 ± 0.2
7	Leptastrea	ı	ı	+	ı		ı	ı			ı	ı	ı	+	0.1
	Physogyra	+	·		·	ı	·	+	ı	+		+	+	+	0.2
1	Plerogyra	+	·	·	+		+	+	+	+	ı	+	+	+	0.9
5	Plesiastrea			+				·	·		·	+	·	+	0.1
Ľ	Total Genera	34	34	30	19	23	24	31	30	29	18	31	23	30	

Table 4. Summary of coral coverage (%), coral condition, t	otal genera, Shannon di	versity (H') and Pielou's even	ness (J') index of corals in
Redang Island and Tioman Island Marine Parks	-	- · · ·	

	No	Sampling station	Live corals (%)	Dead corals (%)	Others (%)	Coral condition	Total genera	H'	J'
	South C	Coast Zone					-		
	RS1	Tg. Ara	42.4	43.9	13.7	Fair	19	2.19	0.76
	RS2	Terumbu Kili	55.6	35.4	9	Good	10	1.44	0.66
	RS3	Tg. Cina Terjun	40.9	3.1	56	Fair	20	2.41	0.76
	RS4	Batu Ling	46.5	36.9	16.6	Fair	22	2.55	0.84
	RS5	Pulau Chupak	53.8	32.2	14	Good	25	2.39	0.74
ark	RS6	Pulau Ekor Tebu	53.7	32.4	13.9	Good	13	1.76	0.71
e P;		Average	48.8 ± 2.6	30.7 ± 5.8	20.5 ± 7.2	Fair	18.7 ± 2.2	2.12 ± 0.2	0.75 ± 0.0
arin	East Co	oast Zone							
Ž	RE1	Pulau Kerengga Besar	44.2	31.9	23.9	Fair	32	2.81	0.81
and	RE2	Chek Isa	69.0	9.5	21.5	Good	18	2.29	0.79
Isl	RE3	Mak Chantek	48.6	23.9	27.5	Fair	24	2.35	0.74
ang	RE4	Pulau Lima	53.8	32.2	14	Good	21	2.43	0.78
Sed	RE5	Pulau Paku Besar	28.2	59.4	12.5	Fair	21	1.78	0.60
Η		Average	48.8 ± 6.6	31.4 ± 8.1	19.9 ± 2.9	Fair	23.4 ± 2.4	2.33 ± 0.2	0.74 ± 0.0
	North C	Coast Zone							
	RN1	Tg. Gua Kawah	73.5	13.9	12.6	Good	25	2.40	0.74
	RN2	Tlk. Mak Delah	53.2	5.8	41	Good	29	2.58	0.77
	RN3	Tg. Tok Kong	53.8	9.6	36.6	Good	29	2.83	0.83
	RN4	Tg. Chagar Hutang	45.9	42.3	11.8	Fair	19	2.01	0.70
		Average	56.6 ± 5.9	17.9 ± 8.3	25.5 ± 7.7	Good	26.0 ± 2.6	2.46 ± 0.2	0.76 ± 0.0
	East Co	oast Zone							
	TE1	Tlk. Benuang	59.0	29.7	11.3	Good	34	2.95	0.85
	TE2	Tlk. Sanggit	60.3	13.5	26.2	Good	34	2.71	0.78
	TE3	Tlk. Dalam	53.8	19.4	26.8	Good	30	2.56	0.76
		Average	57.7 ± 2.0	20.9 ± 4.7	21.4 ± 5.1	Good	33.3 ± 2.2	2.74 ± 0.1	0.80 ± 0.0
ark	West Co	oast Zone							
le P	TW1	Pulau Tomok	37.6	28.8	33.6	Fair	19	2.46	0.77
arin	TW2	Kg. Genting	45.1	20.6	34.3	Fair	23	2.33	0.79
Ň	TW3	Pulau Renggis	51.4	21.3	27.3	Good	24	1.95	0.62
and	TW4	Pulau Soyak	51.9	36.1	12	Good	31	2.44	0.70
lsl n	TW5	Tlk. Salang	52.8	37.8	9.4	Good	30	2.60	0.73
mar		Average	47.8 ± 2.9	28.9 ± 3.6	23.3 ± 5.3	Fair	26.0 ± 2.3	2.4 ± 0.1	0.72 ± 0.0
Tioi	Isolated	l Zone							
Ľ	TI1	Tlk. Gado	51.0	25.0	24	Good	29	2.56	0.76
	TI2	Tlk. Tulai	52.6	21.2	26.2	Good	18	1.66	0.57
	TI3	Tlk. Bayan	47.1	24.4	28.5	Fair	31	2.82	0.81
	TI4	Pulau Sepoi	49.2	20.4	30.4	Fair	23	2.00	0.66
	TI5	Pulau Labas	55.9	24.8	19.3	Good	30	2.60	0.75
		Average	51.2 ± 1.5	23.2 ± 1.0	25.6 ± 1.9	Good	26.0 ± 2.4	2.3 ± 0.2	0.71 ± 0.0
	Total A	verage of Redang	50.8 ± 2.6	27.5 ± 3.4	21.6 ± 1.0	Good	22.2 ± 1.5	2.28 ± 0.1	0.75 ± 0.0
	Total A	verage of Tioman	51.4 ± 1.6	24.8 ± 6.8	23.8 ± 1.9	Good	27.7 ± 1.6	2.43 ± 0.1	0.73 ± 0.0

Scapophyllia, Trachyphyllia, and *Stylophora* were found to be poorly distributed and least abundant ($n \le 1$). *Stylocoeniella,*

Catalaphyllia, Heliofungia, Micromussa, Scapophyllia and Trachyphyllia were classified as rare genera in Tioman Island.

Deringer

Coral coverage, coral condition and total index of coral genera

Live coral had a higher average coverage in Tioman Island $(51.4\% \pm 1.6)$ compared to Redang Islands $(50.8\% \pm 2.6)$. The live coral coverage in the north coast zone of Redang Island was higher compared to the east coast and the south coast zones with $56.6\% \pm 5.9$, $48.8\% \pm 6.6$ and $48.8\% \pm 2.6$, respectively (Table 3). RN1 and RE5 recorded the highest and the lowest coverage of live coral with 73.5% and 28.2%, respectively. Most of the sampling stations in the north coast zone were categorized as being in a "good" coral condition except for RN4. Most of the sampling stations in the south coast and east coast zones were categorized under "fair" coral condition. The average of the total number of coral genera also was higher at the north coast zone (26.0 ± 2.6) compared to the east coast (23.4 ± 2.4) and south coast (18.7) \pm 2.2) zones. The north coast zone had the highest H' and J' indices of coral genera with 2.46 ± 0.2 and 0.76 ± 0.0 , respectively.

In Tioman Island, the live coral coverage in the east coast zone was higher compared to the isolated zone and west coast zone with $57.7\% \pm 2.0$, $51.2\% \pm 1.6$ and $47.8\% \pm 2.9$, respectively. TE2 and TW1 recorded the highest and the lowest coverage of live coral with 60.3% and 37.6%, respectively. All sampling stations in the east coast zone were categorized under 'good' coral condition, whereas the sampling stations in the west coast and isolated zones were categorized under "good" and "fair" coral condition. The east coast zone also had the highest average of the total number of coral genera (33.3 ± 2.2), H' index (2.74 ± 0.1) and J' index (0.80 ± 0.0). Total average values of H' and J' indices of coral genera differed significantly between zones in Redang and Tioman Islands (p < 0.05) but did not differ significantly (p > 0.05) between both islands.

4. Discussion

Current status of scleractinian corals

The present data here showed that the scleractinian corals were found to be more diversified in Tioman compared to Redang Islands. A total of 239 species from 55 genera were recorded in Tioman, while only 128 species from 47 genera in Redang Islands. This is consistent with the previous study that reported a higher diversity of hard corals in Tioman (183 species) compared to Redang (149 species) Islands (Harborne et al. 2000). This study also revealed new scleractinian coral records for Redang Island (31 species) and Tioman Island (25 species) that were not reported during earlier studies done by Harborne et al. (2000), Affendi et al. (2005, 2007). Additionally, 8 new scleractinian species were recorded for the east coast of Peninsular Malaysia which supplements and updates the work done by Affendi and Rosman (2012). This provides useful data and information to marine park management personnel on the current status of scleractinian coral diversity at both Marine Parks.

Genera Acropora, Montipora, and Porites are found to be distributed at most of the reef sites in Redang and Tioman Islands. They are also found to be common to dominant at several reef sites in both Marine Parks. This is comparable with previous studies indicated that these coral genera cover the highest percentage and are found to be dominant in Tioman and Sibu Islands on the east coast of Peninsular Malaysia (Toda et al. 2007). Genus Acropora, which encompassed 60% coverage of the total Acroporidae family, is recognized to be naturally found distributed in the Indo-Pacific (Wallace 1999). Branching Acropora and foliose or encrusting Montipora are also known as fast growing species with lateral growth rates of 5–20 cm year per year (Done et al. 1988). They more rapidly expand, compared to slow growing massive *Porites*, with radial growth rates of 1–2 cm year per year (Kenyon et al. 2006; Hennige et al. 2013). However, Porites colonies have a stronger skeleton structure to resist high energy forces from waves and current actions compared to the more fragile Acropora and Montipora colonies (Hong and Sasekumar 1981; Hennige et al. 2013). Hence, it is suggested that the dominance of these coral genera is due to their ability to acquire adaptive capacities to tolerate any environmental conditions such as currents, wave actions and sedimentation loads, as contended by Veron et al. (2011).

Results regarding the abundance patterns of scleractinian coral genera also showed that *Fungia* and *Pocillopora* are found to be common to dominant at several reef sites in both Marine Parks. Genus *Fungia* from the family Fungiidae has been reported to be widely distributed and can be found to be dominant at certain particular reef areas (Veron 1995). Meanwhile, the dominance of *Pocillopora* from the family Pocilloporidae may be due to their reproductive and recruitment strategies, as suggested by Nakamura and Sakai (2010). Brooder spawned colonies of *Pocillopora* species, which fertilize their eggs internally, have higher survival rates due to their fast embryonic development time (Harii and Kayanne 2003). They are able to recruit nearby to their parents and are

distributed within the coral assemblages (Nakamura and Sakai 2010). In addition to that, the results also showed that the stress tolerator type of corals such as *Dipsastraea, Favites, Platygyra, Lobophyllia* and *Goniastrea* are found to be distributed in Redang and Tioman Islands. The distributional pattern of these coral genera is related with the ability to tolerate to any fluctuations in current and wave actions due to their massive and sub-massive life forms (Hong and Sasekumar 1981). Furthermore, they are also considered as less susceptible corals to trampling action caused by divers and snorkelers (Ammar and Mahmoud 2006).

Coral reef condition

The conditions of the coral reefs in Redang and Tioman Islands varied between "fair" and "good" with the live corals covering 50.8% and 51.4%, respectively. Overall, this study showed that the reefs around both islands were in "good" coral condition. A previous study also reported that the coral conditions at three reef sites in Tioman Island varied between "fair" and "good" (Toda et al. 2007). A similar finding has also been reported by RCM (2017) which found that the corals in Redang (50.0%) and Tioman (66.4%) Islands were in "good" condition. In making comparisons between zones categorized within reefs around islands, the north coast (56.6%) of Redang and the east coast (57.7%) and isolated (51.2%) zones of Tioman showed "good" average coral condition. Most of the reef sites were also categorized as being in "good" coral condition with the live corals ranging between 53.2–73.5% in Redang and 51.0-60.3% in Tioman Islands. This is likely due to less coastal development for resorts and human settlements established in these zones. Moreover, most reef sites within these zones have very minimum exposure to tourism related activities since they are oriented toward the open sea and are frequently exposed to strong currents and waves.

Meanwhile, the south coast (48.8%) and east coast (48.8%) zones of Redang and the west coast zone (47.8%) of Tioman showed "fair" average coral condition. Unsustainable coastal development is believed to be one of the factors which influenced the resulting "fair" coral condition at some reef sites in both islands. Previous studies indicated that the live corals at several reef sites in the east coast and south coast zones of Redang had declined due to dredging impacts from the construction of submarine water pipelines (Rezai et al. 1999; Maseri 2003). The reef sites near to Kg. Genting (TW2) and Pulau Renggis (TW3) in the west coast zone of Tioman

have also been impacted by the rapid construction of resorts and residential sites along the coastal area (Shahbudin et al. 2017). To date, a total of 72 resorts have been developed in Tioman and mostly concentrated along the west coast area (RCM 2017). Rapid and unsustainable coastal development activity may put the tenacity of coral reefs in jeopardy and consequently could lead to coral degradation if reefs are constantly stressed (Jordan et al. 2010).

Furthermore, most of the reef sites in these zones have been a focal point for tourists to venture into water sport activities such as snorkeling, diving and boating. The impacts of these activities can result in the breakage of coral into fragments (Wielgus et al. 2004; Praveena et al. 2012). It has been reported that inexperienced snorkelers and divers are frequently trampling or standing on the corals that this may have led to partial mortality due to the loosening and abrasion of coral fragments (Wielgus et al. 2004; Praveena et al. 2012). These factors, together with boating activities in shallow water areas especially less than 2 m in depth, might increase the re-suspension of bottom sediments. High suspended sediments cause the mortality of live corals to undertake the photosynthesis process (Erftemeijer et al. 2012).

On top of that, the large number of visiting tourists is another main factor that will likely lead to various associated negative impacts on coral conditions in both islands. According to the DMPM (2017), Redang and Tioman are among the most visited islands for both local and foreign tourists. Over three million tourists have visited these islands with an average of almost 200 thousands per year from 2000 to 2017 (DMPM 2017). The excessive number of visiting tourists has contributed to effluent discharges from resorts and chalets surrounding these islands. Nutrient enrichment has been frequently reported in Tioman and Redang Islands due to excess untreated sewage being disposed directly from the hotels and resorts onto the reefs (Hyde et al. 2013). Therefore, a comprehensive framework, good management, and enforcement are required to mitigate these emergent problems. Regulations regarding the carrying capacity of visitors to Marine Park should be implemented and regularly monitoring is required in order to sustain good coral conditions in Redang and Tioman Islands.

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References

- Affendi YA, Tajuddin BH, Lee YL, Adzis KA, Yusuf Y (2005) Scleractinian coral diversity of Kg Tekek, Pulau Tioman Marine Park. In: Proceedings of the 2nd regional symposium on environment and natural resources, Kuala Lumpur, Malaysia, 22–23 Mar 2005
- Affendi YA, Tajuddin BH, Yusuf Y, Kee Alfian AA, Wong NWS, Ooi JLS, Nasir MN (2007) Report on the marine biological resources survey of the proposed area for Pulau Tioman Airport, Pahang Darul Makmur. Marine Parks Department, Ministry of Natural Resources & Environment, Putrajaya, Technical Report, 226 p
- Affendi YA, Rosman FR (2012) Current knowledge on scleractinian coral diversity of Peninsular Malaysia. In: Kamarruddin I, Mohamed CAR, Rozaimi M, Kee Alfian AA, Fitra AZ, Lee JN (eds) Malaysia's marine biodiversity: inventory and current status. Department of Marine Park Malaysia, Putrajaya, pp 21–31
- Ammar MSA, Mahmoud MA (2006) Effect of physico-chemical factors and human impacts on coral distribution at Tobia Kebir and Sharm El Loly, Red Sea-Egypt. Egypt J Aquat Res 32(1):184–197
- Badaruddin M, Yusnita Y, Hussin AA, Abdullah A (2004) Tourism impact on aquatic ecosystem - a review. In: KUSTEM, Proceedings of the 3rd annual seminar on sustainability science and management, Kuala Terengannu, Malaysia, 4–5 May 2004
- Bowen BW, Rocha LA, Toonen RJ, Karl SA (2013) The origins of tropical marine biodiversity. Trends Ecol Evol 28(6):359–366
- Done TT, Osborne KK, Navin KK (1988) Recovery of corals post-Acanthaster: progress and prospects. In: Proceedings of the 6th international coral reef symposium, Townsville, pp 137–142
- DMPM (2011) Handbook of the living marine resources of Malaysia Marine Park. Department of Marine Park Malaysia (DMPM), Ministry of Natural Resources and Environment, Putrajaya, 23 p

DMPM (2017) Total number of visitors in marine parks from year

2000 to year 2017. Department of Marine Park Malaysia (DMPM). http://www.dmpm.nre.gov.my Accessed 4 Feb 2017

- Erftemeijer PL, Riegl B, Hoeksema BW, Todd PA (2012) Environmental impacts of dredging and other sediment disturbances on corals: a review. Mar Pollut Bull **64**:1737– 1765
- Fabricius KE, McCorry D (2006) Changes in octocoral communities and benthic cover along a water quality gradient in the reefs of Hong Kong. Mar Pollut Bull **52**(1):22–33
- Gomez ED, Alino PM, Yap HT, Licuanan WY (1994) A review of the status of Philippine reefs. Mar Pollut Bull **29**(1–3):62–68
- Hanim N, Salleh M, Redzuan O (2010) Importance-satisfaction analysis for Tioman Island Marine Park. https://mpra.ub.unimuenchen.de/22679/1/MPRA_paper_22679.pdf Accessed 4 Feb 2017
- Hammer Ø, Harper DAT, Ryan PD (2001) PAST: paleontological statistics software package for education and data analysis. Palaeontol Electron **4**(1):9
- Harii S, Kayanne H (2003) Larval dispersal, recruitment, and adult distribution of the brooding stony octocoral Heliopora coerulea on Ishigaki Island, southwest Japan. Coral Reefs 22(2):188–196
- Harborne A, Fenner D, Barnes A, Beger M, Harding S, Roxburgh T (2000) Status report on the coral reef of the East Coast of Peninsular Malaysia. Coral Cay Conservation, Malaysia, 89 p
- Hennige SJ, Suggett DJ, Hepburn L, Pugsley A, Smith DJ (2013) Coral reefs of the Wakatobi: processes of reef growth and loss. In: Unsworth RK, Clifton J (eds) Marine research and conservation in the coral triangle: the Wakatobi Marine National Park. Nova Science Publishers, New York, pp 27–44
- Hong AG, Sasekumar A (1981) The community structure of the fringing coral reef, Cape Rachado, Malaya. Smithsonian Institution, Washington DC, 16 p
- Huang D, Licuanan WY, Hoeksema BW, Chen CA, Ang PO, Huang H, Lane DJW, Vo ST, Waheed Z, Affendi YA, Yeemin T, Chou LM (2015) Extraordinary diversity of reef corals in the South China Sea. Mar Biodivers 45(2):157–168
- Hyde J, Chen SY, Chelliah A (2013) Five years of Reef Check monitoring data for Tioman, Perhentian and Redang Island. Malaysian J Sci **32**:117–126
- Jordan LKB, Banks KW, Fisher LE, Walker BK, Gilliam DS (2010) Elevated sedimentation on coral reefs adjacent to a beach nourishment project. Mar Pollut Bull **60**(2):261–271
- Kenyon JC, Vroom PS, Page KN, Dunlap MJ, Wilkinson CB, Aeby GS (2006) Community structure of hermatypic corals at French frigate shoals, Northwestern Hawaiian Islands: capacity for resistance and resilience to selective stressors 1. Pac Sci 60(2):153–175
- Kohler KE, Gill SM (2006) Coral point count with excel extensions (CPCe): a visual basic program for the determination of coral and substrate coverage using random point count methodology. Comput Geosci 32(9):1259–1269

Liew HC, Hii YS, Bachok Z, Ibrahim K, Wagiman S, Chan AA, Said A (2012) A guide to collecting digital videos for coral reef surveys and monitoring purposes. Department of Marine Parks Malaysia, Putrajaya, 28 p

Maseri NW (2003) Redang. Malays Naturalist 56:36-41

- Miller J, Sweet M J, Wood E, Bythell J (2015) Baseline coral disease surveys within three marine parks in Sabah, Borneo. PeerJ **3**:e1391. doi:10.7717/peerj.1391
- Nakamura M, Sakai K (2010) Spatio temporal variability in recruitment around Iriomote Island, Ryukyu Archipelago, Japan: implications for dispersal of spawning corals. Mar Biol 157(4):801–810
- Pielou EC (1966) Species-diversity and pattern-diversity in the study of ecological succession. J Theor Biol **10**(2):370–383
- Praveena SM, Siraj SS, Aris AZ (2012) Coral reefs studies and threats in Malaysia: a mini review. Rev Environ Sci Bio 11:27–39
- RCM (2017) Status of coral reefs in Malaysia, 2017. Reef Check Malaysia (RCM), Kuala Lumpur, 96 p
- Rezai H, Ibrahim HM, Idris BAG, Kushairi MRM (1999) Some effects of submarine pipeline construction on the sessile zoobenthic community of Redang Island. Hydrobiologia 405:163–167
- Safuan M, Boo WH, Siang HY, Chark LH, Bachok Z (2015) Optimization of coral video transect technique for coral reef survey: comparison with intercept transect technique. Open J Mar Sci 5:379–397
- Shahbudin S, Fikri Akmal K, Faris S, Normawaty MN, Mukai Y (2017) Current status of coral reefs in Tioman Island,

Peninsular Malaysia. Turk J Zool **41**(2):294–305

- Shannon CE, Weaver W (1998) The mathematical theory of communication. University of Illinois press, Illinois, 144 p
- Tan CH, Heron SF (2011) First observed severe mass bleaching in Malaysia, Greater Coral Triangle. Galaxea J Coral Reef Studies 13(1):27–28
- Toda T, Okashita T, Maekawa T, Alfian BAAK, Rajuddin MKM, Nakajima R, Chen W, Takahashi KT, Othman BHR, Terazaki M (2007) Community structures of coral reefs around Peninsular Malaysia. J Oceanogr 63(1):113–123
- Veron JEN (1995) Corals in space and time: the biogeography and evolution of the Scleractinia. Cornell University Press, Cornell, 321 p
- Veron JEN (2000) Corals of the world. Australian Institute of Marine Science, Townsville, 1382 p
- Veron JCE, DeVantier LM, Turak E, Green AL, Kininmonth S, Stafford-Smith M, Peterson N (2011) The coral triangle. In: Dubinsky Z, Stambler N (eds) Coral reefs: an ecosystem in transition. Springer, Amsterdam, pp 47–55
- Wallace C (1999) Staghorn corals of the world: a revision of the genus Acropora. CSIRO publishing, Clayton, 438 p
- Wielgus J, Chadwick-Furman NE, Dubinsky Z (2004) Coral cover and partial mortality on anthropogenically impacted coral reefs at Eilat, northern Red Sea. Mar Pollut Bull **48**(3):248–253
- Wilkinson C (2008) Status of coral reeefs of the world: 2008. Global Coral Reef Monitoring Network and Reef and Rainforest Research Centre, Townsville, 296 p

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