

Species diversity and abundance of Euphylliidae (Cnidaria: Anthozoa: Scleractinia) corals in Tioman, Redang and Payar Islands, Peninsular Malaysia

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Abstract

The number of endangered coral species is increasing over the past decades due to multiple stresses and threats. Euphylliidae corals are among the species heavily targeted for the marine aquarium trade due to their colourful appearance and aesthetic importance. However, their distribution in Peninsular Malaysia has not been thoroughly investigated. Present study aims to investigate the diversity and abundance patterns of euphylliid species at 36 reef sites in Marine Protected Areas of Tioman, Redang and Payar Islands. Video transect surveyed a total of 671 euphylliids individuals belonging to six species from three genera. The diversity and evenness indices of euphylliids were significantly higher ($P < 0.05$) in Tioman compared to Redang and Payar Islands. Based on the total number of euphylliids recorded in the study areas, *Euphyllia ancora* (29.5%) was found to be the most dominant in Tioman, *Plerogyra sinuosa* (92.3%) in Redang and *Physogyra lichtensteini* (98.0%) in Payar. Current findings suggest that the combined factors of habitat heterogeneity, especially the reef morphology and substratum condition, and anthropogenic impacts have most likely influenced the distribution of this endangered coral species in Peninsular Malaysia.

Keywords: Euphylliidae corals, Diversity, Abundance pattern, Endangered species, Coral video transect, Peninsular Malaysia

Introduction

The Indo-Pacific coral family Euphylliidae Alloiteau, 1952 formerly known as the Euphyllidae Veron, 2000 contains five genera, namely *Euphyllia*, *Catalaphyllia*, *Nemenezophyllia*, *Plerogyra* and *Physogyra* (Veron, 2000). Previously, these genera have been classified based on morphological characteristics of solid, smooth and widely spaced septa with expanded tentacles, vesicles or mantles during the daytime (Veron, 2000). Recent phylogenetic relationships in accordance with evidence by fleshy vesicle mantle formations reveal that *Plerogyra*, *Physogyra* and *Nemenezophyllia* belong to *Incertae sedis*, that is closely related to *Blastomussa*, while only *Euphyllia* and *Catalaphyllia* are part of the Euphylliidae family (Fukami et al., 2008; Kitahara et al., 2010; Benzoni et al., 2014; Khodzori et al., 2017). However, this paper describes the Euphylliidae using previous taxonomic classification of Scleractinia following Veron (2000).

The Euphylliidae corals are among the most beautiful reef building corals due to their brightly coloured fleshy polyps (Veron, 2000). Moreover, their colourful appearance and fast-growth rate are the encouraging factors for these species to be exploited for the marine aquarium trade (Wabnitz et al., 2003; Rhyne et al., 2014). Previous study showed that more than 75% of the *Euphyllia* spp., particularly *E. ancora* and *E. glabrescens* were exported to the United State since 2009 until 2011 (Rhyne et al., 2014). Majority of them have been exported from countries within the Coral Triangle region, with Indonesia as the world's largest exporter (Tissot et al., 2010; Rhyne et al., 2014).

Wild harvesting and exploitation of marine ornamental species including the live corals, coral reef fish and invertebrates may result in reducing the population size of susceptible species, in particular the rare and endangered species (Wilkinson, 2008; Carpenter et al., 2008; Tissot et al., 2010). It has been estimated that 36% of coral reefs will be degraded in the next 30 years if the marine wild populations are continuously exploited in unsustainable ways together with persistent natural phenomena and other human induced disturbances (Tissot et al., 2010; Thornhill, 2012; Rhyne et al., 2014). As for conservation action for the Euphylliidae corals, the International Union for Conservation of Nature and Natural Resources (IUCN) has declared that most of the Euphylliidae corals are near-threatened and vulnerable species. Nevertheless, some of them are yet to be assessed due to deficiency of data.

Species lists of hard corals including the Euphylliidae have previously been published by Harborne et al. (2000) at Marine Protected Areas (MPAs) of Tioman and Redang. Five euphylliids (*Physogyra lichtensteini*, *Euphyllia ancora*, *E. divisa*, *E. glabrescens*, *E. yaeyamaensis* and *Plerogyra sinuosa*) have been recorded in Tioman and four of them (*P. lichtensteini*, *E. divisa*, *E. glabrescens*, and *P. sinuosa*) in Redang (Harborne et al., 2000). Recent study showed one additional species of *E. cristata*, that raises the species count to six euphylliids in Tioman (Khodzori et al., 2015). However, limited data and information on species richness patterns of the Euphylliidae have been documented in Peninsular Malaysia as compared to Sabah where a good deal of information has been published (e.g. Waheed and Hoeksema, 2013; Waheed and Hoeksema, 2014; Waheed et al., 2015). It is important to update the species list of these

near-threatened and vulnerable species in order to perform a continuous evaluation of their current status in the MPAs. Therefore, the present study contributes to filling the gap in information regarding the percentage coverage and abundance patterns as well as updating the species list of the Euphylliidae corals in Tioman, Redang and Payar Islands.

Materials and Methods

Study Area

Fieldwork was conducted during September 2013 - February 2014 in Tioman, Redang and Payar Islands (Figure 1 and Table 1). Tioman and Redang Islands were divided into 13 (T1 – T13) and 16 (R1 –R16) sampling sites, respectively. Payar Island which is smaller in size compared to Tioman and Redang was divided into 7n (P1 – P7) sampling sites (Table 1). These islands are recognized as popular tourism destinations in Peninsular Malaysia. According to the recent data, an average of 793, 359 tourists have visited the marine parks, including these islands (DMPM, 2013).

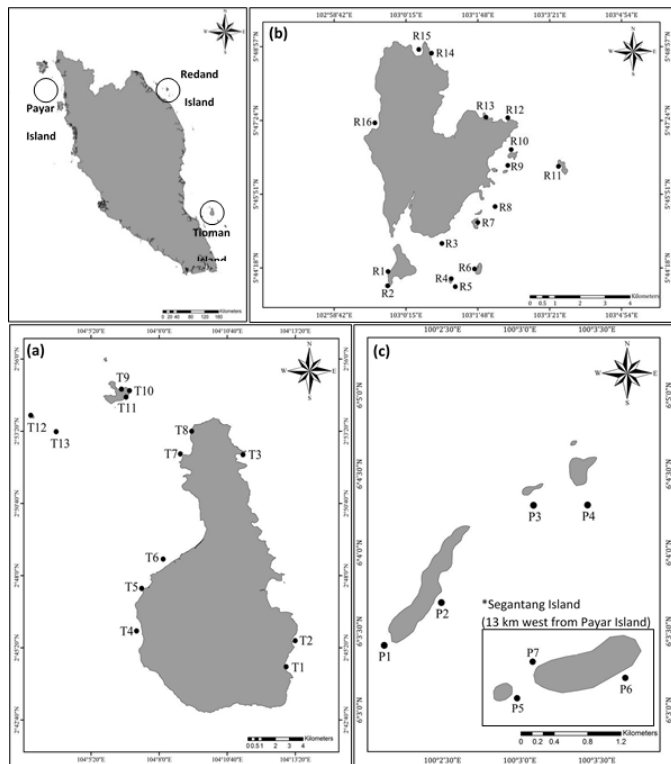


Figure 1: Study areas in Peninsular Malaysia (a) 13 reef sites in Tioman Island, (b) 16 reef sites in Redang Island, and (c) 7 reef sites in Payar Island

Field Sampling

A field survey was carried out at 36 reef sites using the Coral Video Transect (CVT) technique as adopted by Liew et al. (2012) with some adaptation. A total of 144 transects were used throughout the sampling period. An underwater camera (Olympus TG-3 protected with Olympus PT-053 waterproof case) was used to record video of benthic communities along the transect length with approximately 50 cm distance from the substrate and at a perpendicular angle to the bottom. The camera was run along the transect lines at a speed of 5 meter

per minute to record sharp and clear images. The additional pictures of living Euphylliidae corals surrounding reef sites were photographed *in situ* at both actual size and macro shots including the condition when the tentacles or vesicles were inflated and deflated to facilitate in the identification.

Table 1. Locality data of reef sites and maximum depth of transect in Tioman, Redang and Payar Islands

Survey Site	Island	Reef Site	Latitude (N)	Longitude (E)	Max. Transect Depth (m)
T1		Sanggit Bay	02°44'37.9"	104°12'58.4"	10
T2		Benuang Bay	02°45'35.7"	104°13'19.7"	12
T3		Dalam Bay	02°52'28.3"	104°11'16.9"	8
T4		Genting Village	02°45'57.3"	104°07'06.9"	10
T5		Tomok Island	02°47'31.6"	104°07'18.9"	9
T6	Tioman Island	Renggis Island	02°48'36.6"	104°08'09.4"	12
T7		Soyak Island	02°52'29.7"	104°08'49.9"	8
T8		Terdau Bay	02°53'20.0"	104°09'16.6"	10
T9		Gado Bay	02°54'53.4"	104°06'31.4"	12
T10		Tulai Bay	02°54'49.9"	104°06'50.3"	15
T11		Bayan Bay	02°54'35.6"	104°06'42.4"	12
T12		Sepoi Island	02°53'55.3"	104°02'58.3"	16
T13		Labas Island	02°53'19.1"	104°03'58.1"	18
R1		Tg. Ara	05°44'13.6"	102°59'51.9"	8
R2		Terumbu Kili	05°43'55.7"	102°59'51.3"	12
R3		Tg. Cina Terjun	05°46'26.1"	103°01'13.2"	14
R4		Batu Ling	05°44'11.9"	103°01'10.1"	14
R5		Chupak Island	05°44'04.6"	103°01'13.7"	12
R6		Ekor Tebu Island	05°44'16.8"	103°01'43.9"	8
R7		Kerengga Besar Island	05°45'15.5"	103°01'48.1"	12
R8	Redang Island	Chek Isa	05°45'35.4"	103°02'10.4"	12
R9		Mak Chantek	05°46'27.3"	103°02'26.9"	10
R10		Paku Besar Island	05°46'47.3"	103°02'31.3"	8
R11		Lima Island	05°46'26.1"	103°03'32.5"	15
R12		Tg. Gua Kawah	05°47'27.3"	103°02'26.9"	12
R13		Mak Delah Bay	05°47'27.9"	103°01'58.7"	10
R14		Tg. Tok Kong	05°48'48.7"	103°00'48.1"	12
R15		Tg. Chagar Hutang	05°48'53.4"	103°00'31.7"	18
R16	Pasir Mak Simpan	05°47'20.9"	102°59'34.9"	10	
P1	Payar Island	Banana Reef	06°03'41.0"	100°02'29.6"	8
P2		Coral Garden	06°03'24.7"	100°02'07.4"	12
P3		Kaca Island	06°04'18.1"	100°03'05.4"	10
P4		Lembu Island	06°04'18.2"	100°03'26.4"	8
P5		Segantang Bay	06°02'35.8"	099°55'27.5"	18
P6		Anemone Garden	06°02'38.0"	099°55'26.8"	15
P7		Tyre Reef	06°02'39.7"	099°55'31.6"	18

Image Processing and Data Analysis

All recorded videos of benthic communities for every reef site were converted to 300 snapshot images (75 images per transect tape) using the video converter. Total numbers of euphylliids were quantified into average percentage coverage for each species recorded at every island. The abundance of

each Euphylliidae species for every reef site was determined based on the total colony number counted in the snapshot images. It was categorized based on a rating scale of one to five dots: • = one or few (1 - 5 colonies), •• = uncommon (6 - 10 colonies), ••• = common (11 - 20 colonies), •••• = abundant (21 - 30 colonies) and •••••: dominant (> 30 colonies). The Shannon-Weiner diversity index, H' (Shannon and Weaver, 1949) and Pielou evenness index, J' (Pielou, 1966) were used to determine the diversity and evenness of the Euphylliidae corals recorded for every reef site. This univariate analysis was done using PAST (Paleontological Statistic) software version 3 (Hammer et al., 2001). The statistical comparison of One-Way Analysis of Variance (ANOVA) was performed to determine the significance of differences ($p < 0.05$) in the diversity and evenness value of the Euphylliidae among reefs sites and study areas using Minitab 17 software.

Results

Species Checklist of Euphylliidae Corals

A total of six species and three genera of *Euphyllia*, *Plerogyra* and *Physogyra* were identified in the study area following the book of Corals of the World (Veron, 2000) (Table 2, Figure 2). Based on the previous study done by Harborne et al. (2000) and compilation study by Affendi and Rosman (2012), species *E. cristata* was not documented in Tioman and Redang Islands, while species *P. lichtensteini* and *E. glabrescens* were not recorded in Payar Island. These species can be added to the existing list of coral species found in these islands. Other species recorded during earlier studies, but not encountered during the present survey are *E. yaeyamaensis* (Veron and Hudgson, 1989), *E. paradivisa* (Veron and Fenner, 2000), *E. paraglabrescens* (Veron and Fenner, 2000) and *Catalaphyllia jardinei* (Veron and Hudgson, 1989).

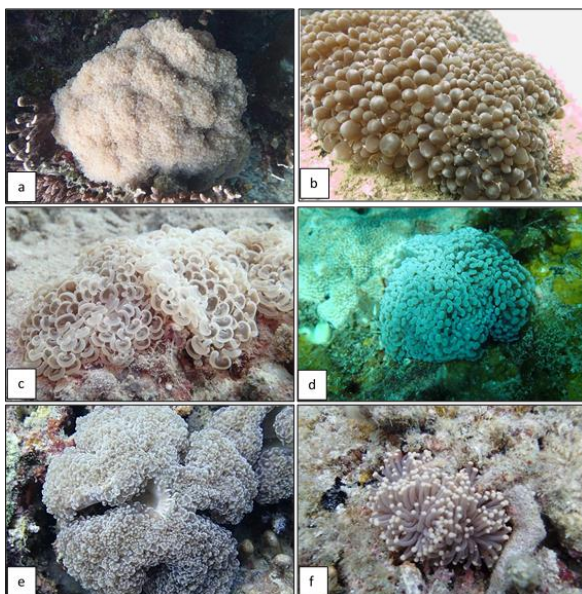


Figure 2: Euphylliidae corals recorded in Tioman, Redang and Payar Islands. (a) *P. sinuosa*, (b) *P. lichtensteini*, (c) *E. ancora*, (d) *E. cristata*, (e) *E. divisa*, (f) *E. glabrescens*.

Current Status of Euphylliidae Corals

Overall, a total of 671 individuals of euphylliids belonging to six species from three genera, *Plerogyra*, *Physogyra* and *Euphyllia*, were recorded in the study area. All six species were recorded in Tioman Island. *E. ancora* showed the highest average coverage (29.5% ± 1.5) followed by *E. divisa* (19.7% ± 1.3), *P. sinuosa* (19.1% ± 0.7) and *E. cristata* (17.9% ± 1.0). *P. lichtensteini* and *E. glabrescens* showed the lowest average coverage, covering the same percentage (6.9% ± 0.4). Among these species, *E. ancora* was dominant while *E. divisa* and *E. cristata*, were common species of euphylliids at T2 and no euphylliids were recorded at T4. *P. lichtensteini* and *E. glabrescens* were only found in a few colonies at certain reef sites in Tioman (Table 3).

In Redang Island, a total of five species from two genera (*Plerogyra* and *Euphyllia*) were recorded. *P. sinuosa* showed the highest average coverage with 92.3% ± 4.2 and was found to be the dominant species of euphylliids at four (R4, R8, R14 and R16) reef sites. *E. cristata* and *E. ancora* showed the lowest average coverage (0.3% ± 0.1) and were found only at R1 and R4, respectively. All *Euphyllia* spp. (*E. cristata*, *E. ancora*, *E. divisa* and *E. glabrescens*) were found in a few colonies at certain reef sites in Redang (Table 4). In Payar, less number of the Euphylliidae corals was recorded with only two species, namely *P. lichtensteini* and *E. glabrescens*. *P. lichtensteini* showed the highest average coverage (98.0% ± 6.7). It was found at all the reef sites and was categorized as the dominant species of euphylliids at P1 and P2. Out of 7 reef sites. *E. glabrescens* occurred at P1 and P2, in a few colonies in Payar (Table 5).

Table 2. Checklist of the Euphylliidae from 36 reef sites in Tioman, Redang and Payar Islands. The number of sites indicates the species occurrence frequencies. Previous records are indicated as follows: a = Harborne et al. (2000), b = Affendi and Rosman (2012), cross (-) = unrecorded species from the previous studies

No. of Species	Euphylliidae Species/ Current Records	No. of Sites	Previous Records	*IUCN Status
Tioman Island				
1	<i>Plerogyra sinuosa</i> (Dana, 1846)	9	a, b	NT
2	<i>Physogyra lichtensteini</i> (Milne Edwards and Haime, 1851)	6	b	V
3	<i>Euphyllia ancora</i> (Veron and Pichon, 1980)	7	a, b	V
4	<i>Euphyllia cristata</i> (Chevalier, 1971)	7	-	V
5	<i>Euphyllia divisa</i> (Veron and Pichon, 1980)	6	a, b	NT
6	<i>Euphyllia glabrescens</i> (Chamisso and Eysenhardt, 1821)	5	a, b	NT
Redang Island				
1	<i>Plerogyra sinuosa</i> (Dana, 1846)	15	a, b	NT
2	<i>Euphyllia ancora</i> (Veron and Pichon, 1980)	1	b	V
3	<i>Euphyllia cristata</i> (Chevalier, 1971)	1	-	V
4	<i>Euphyllia divisa</i> (Veron and Pichon, 1980)	8	a, b	NT
5	<i>Euphyllia glabrescens</i> (Chamisso and Eysenhardt, 1821)	2	a, b	NT
Payar Island				
1	<i>Physogyra lichtensteini</i> (Milne Edwards and Haime, 1851)	7	-	V
2	<i>Euphyllia glabrescens</i> (Chamisso and Eysenhardt, 1821)	2	-	NT

Note. * IUCN status updated from <http://www.iucnredlist.org> (NT: Near threatened; V: Vulnerable)

Table 3. Average coverage (%), diversity and abundance patterns as well as index of diversity (H') and evenness (J') of Euphylliidae corals in Tioman Island

Genera	Species	Tioman Reef Sites													Average Coverage (%)
		Sangit Bay T1	Benuang Bay T2	Dalam Bay T3	Genting Village T4	Tomok Island T5	Renggis Island T6	Soyak Island T7	Terdau Bay T8	Gado Bay T9	Tulai Bay T10	Bayan Bay T11	Sepoi Island T12	Labas Island T13	
<i>Plerogyra</i>	<i>Plerogyra sinuosa</i>	-	•	-	-	•	•	•	••	•	-	•	••	•	19.1% ± 0.7
<i>Physogyra</i>	<i>Physogyra lichtensteini</i>	-	•	-	-	-	-	•	-	•	-	•	•	•	6.9% ± 0.4
<i>Euphyllia</i>	<i>Euphyllia ancora</i>	•	•••••	-	-	-	-	-	••	•	-	••	•	••	29.5% ± 1.5
	<i>Euphyllia cristata</i>	•	•••	••	-	-	-	-	•	•	•	•	-	•	17.9% ± 1.0
	<i>Euphyllia divisa</i>	•	•••	••	-	-	-	-	•	•	-	•	-	•	19.7% ± 1.3
	<i>Euphyllia glabrescens</i>	•	-	-	-	-	-	•	-	-	•	-	•	•	6.9% ± 0.4
Total no. of species per site		4	5	3	0	1	1	3	4	4	2	6	3	6	
Total no. of colony per site		13	57	13	-	2	1	6	17	13	7	34	8	13	
Diversity index (H') per site		1.38	1.42	0.69	-	-	-	0.87	1.14	1.27	0.60	1.43	0.74	1.26	ΣH': 1.67
Evenness index (J') per site		1.00	0.89	1.00	-	-	-	0.79	0.82	0.89	0.87	0.80	0.93	0.78	ΣJ': 0.93

Note. •: one or few (1-5) ••: uncommon (6-10) •••: common (11-20) ••••: abundant (21-30) •••••: dominant (>30)

Table 4. Average coverage (%), diversity and abundance patterns as well as index of diversity (H') and evenness (J') of Euphylliidae corals in Redang Island

Genera	Species	Redang Reef Site																Average Coverage (%)
		Tg. Ara R1	Terumbu Kili R2	Tg. Cina Terjun R3	Batu Ling R4	Chupak Island R5	Ekor Tebu Island R6	Kerengga Besar Island R7	Chek Isa R8	Mak Chantek R9	Paku Besar Island R10	Lima Island R11	Tg. Gua Kawah R12	Mak Delah Bay R13	Tg. Tok Kong R14	Tg. Chagar Hutang R15	Pasir Mak Simpan R16	
<i>Plerogyra</i>	<i>Plerogyra sinuosa</i>	••	•	••	••••	••	-	••	••••	••	••	••	••	••••	••	••••	••	92.3% ± 4.2
<i>Euphyllia</i>	<i>Euphyllia ancora</i>	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	0.3% ± 0.1
	<i>Euphyllia cristata</i>	•	-	-	•	•	-	•	•	•	-	-	-	-	-	-	-	0.3% ± 0.1
	<i>Euphyllia divisa</i>	-	-	-	•	•	-	•	•	•	-	-	•	•	-	-	-	5.9% ± 0.4
	<i>Euphyllia glabrescens</i>	-	-	-	-	•	•	-	-	-	-	-	-	-	-	-	-	1.2% ± 0.2
Total no. of species per site		2	1	1	3	3	1	2	2	2	1	1	2	2	1	1		
Total no. of colony per site		11	5	16	70	30	3	17	33	11	15	14	7	18	36	13	40	
Diversity index (H') per site		0.30	-	-	0.39	0.20	-	0.36	0.14	0.30	0.58	-	-	0.59	0.29	-	-	ΣH': 0.33
Evenness index (J') per site		0.88	-	-	0.35	0.18	-	0.52	0.20	0.43	0.84	-	-	0.85	0.42	-	-	ΣJ': 0.21

Note. •: one or few (1-5) ••: uncommon (6-10) •••: common (11-20) ••••: abundant (21-30) •••••: dominant (>30)

Table 5. Average coverage (%), diversity and abundance patterns as well as index of diversity (H') and evenness (J') of Euphylliidae corals in Payar Island

Genera	Species	Payar Reef Site							Average Coverage (%)
		Banana Reef P1	Coral Garden P2	Kaca Island P3	Lembu Island P4	Segantang Bay P5	Anemone Garden P6	Tyre Reef P7	
<i>Physogyra</i>	<i>Physogyra lichtensteini</i>	•••••	•••••	••	••	••	••	••	98.0% ± 6.7
<i>Euphyllia</i>	<i>Euphyllia glabrescens</i>	•	•	-	-	-	-	-	2.0% ± 0.3
Total no. of species per site		2	2	1	1	1	1	1	
Total no. of colony per site		56	36	10	18	7	15	6	
Diversity index (H') per site		0.09	0.21	-	-	-	-	-	ΣH': 0.10
Evenness index (J') per site		0.13	0.30	-	-	-	-	-	ΣJ': 0.14

Note. •: one or few (1-5) ••: uncommon (6-10) •••: common (11-20) ••••: abundant (21-30) •••••: dominant (>30)

In terms of diversity and evenness the value of H' and J' of euphylliids did not differ significantly (p>0.05) between reef sites in Tioman, Redang and Payar Islands. However, total average values of H' and J' of euphylliids differed significantly between study areas in Tioman, Redang and Payar islands. Tioman showed higher total index of diversity and evenness indices (H': 1.67, J':0.93) compared to Redang (H': 0.33, J':0.21) and Payar Islands (H': 0.10, J':0.14).

Discussion

Present results indicate differences in the average percentage coverage, diversity and abundance of the Euphylliidae corals in the study areas. These corals were found to be more diversified and abundant in Tioman compared to Redang and Payar. In terms of the average coverage of euphylliids, *E. ancora* was found to be the most

dominant species which contributed the highest percentage in Tioman while *P. sinuosa* in Redang and *P. lichtensteini* in Payar. These differences can be attributed to the differences in reef morphology and substrate condition between study areas. Furthermore, the ability of an individual species to tolerate the changes in environmental parameters or anthropogenic disturbances are the other factors that determine the species occurrence in a particular reef area (Veron et al., 2011; Hughes et al., 2012; Hennige et al., 2013; Williams et al., 2013).

In Tioman Island, the distribution of Euphylliidae corals is scattered except at T4, where euphylliids were not recorded. Among euphylliid species, *E. ancora*, *E. divisa* and *E. cristata* ranged from common to dominant at T2 (east coast area) compared to other reef sites. The highest diversity of euphylliid species was recorded at T11 and T13 (remote reef area) and the lowest diversity was seen at T4, T5 and T6 (west coast area). The west coast area of Tioman is highly exposed to human impacts since there are many chalets and resorts along the seafront. Moreover, this area is also popular for water sport activities such as snorkeling, diving and boating. The extensive coastal development and widespread tourism related activities have contributed to many negative impacts on coral reefs which could be responsible for reduced species diversity (Harborne et al., 2000; Toda et al., 2007; Shahbudin et al., 2017).

In comparison to Tioman, the diversity of euphylliids was slightly lower in Redang. However, total number of species recorded per site in Redang was relatively low compared to Tioman. This could be due to low habitat heterogeneity in this island. This is consistent with the previous study that indicated that both the islands resembled in many geomorphological features - shallow depth and fringing reefs, but differed in habitat heterogeneity (Harborne et al., 2000). Habitat heterogeneity has been reported to be among the important factors that influence the diversity and abundance of corals. Habitat diversity provides many micro- and macro-habitats and niches that can support more species in an area (Planes et al., 2012; Hennige et al., 2013). In terms of species occurrence, *P. sinuosa* was dominant in Redang, covering 92.3% in average. This species existed in small solitary and large colonial forms, commonly in protected reef environments that are sheltered from strong waves and currents (Veron, 2000). The solitary form of this species was mostly found attached to the crevices and hangover to the rocky substrates while the colonial form to the bottom substrates (Veron, 2000). The reef slope morphology in Redang which was dominated by patches of boulders, and rocky and sandy substrates provided the habitat preferences for *P. sinuosa* to grow and propagate.

P. lichtensteini which was a dominant species in Payar, with a 98.0% coverage, is known for tolerating stress and is able to survive in turbid water and muddy substrate conditions (Chua and Charles, 1980; Veron, 2000) as well as in the environment where penetration of light is low (McClanahan et al., 2007) due to heavy sedimentation and siltation (Chua and Ross, 2000; Jonsson, 2003; Toda et al.,

2007). It has been reported that large amounts of suspended sediments have been transported by many rivers along the east coast of Sumatra and the west coast of Peninsular Malaysia (Lim, 1998; Soegiarto, 2000), leading to deterioration of the environmental conditions and stress on marine life. Other studies have also indicated that the concentrations of suspended sediments including silt and other particulate matters along the west coast were higher (49.8 mg/cm²/day at depth ranged 1 – 3 m) compared to the east coast of Peninsular Malaysia (3.5 mg/cm²/day at a depth of 1 - 12 m) (Lee and Mohamed, 2011). Apart from that, the colony growth of this species in the form of massive and platy structures may account for higher tolerance to resist strong wave and current actions compared to branching coral corals (Kenyon et al., 2006; McClanahan et al., 2007). In the light of these findings it can be postulated that a multiplicity of factors is responsible for dominance of the coral species surrounding reef sites in Payar.

Conclusion

In conclusion, 671 euphylliids belonging to 6 species and 3 genera were recorded in the study area. *E. ancora* was found to be the most dominant species in Tioman, *P. sinuosa* in Redang and *P. lichtensteini* in Payar. Research finding indicated that the diversity and evenness index were higher in Tioman compared to Redang and Payar. The diversity and abundance of the Euphylliidae corals are influenced by various factors such as reef morphology and substratum condition. Moreover, human activities may also contribute to reducing coral diversity, especially those belonging to the endangered categories. To protect the coral reef ecosystems the unsustainable coastal developments and other human activities should be monitored and controlled through enforcement regulations. The information generated by this study provides useful data to the Department of Marine Park Malaysia and other institutions about the occurrence of near threatened and vulnerable euphylliid species in Peninsular Malaysia for a better coral reefs management plan.

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