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Distribution, Abundance and Diversity of Wrasses (Family Labridae) Along Sharm El-Sheikh Coast, Red Sea

Magdy A. Alwany
Department of Marine Sciences, Faculty of Science, Suez Canal University, 41522 Ismailia, Egypt

ABSTRACT

This study examines the distribution, abundance and diversity of wrasse fishes (family Labridae) on reef flat and reef slope along 70 km of Sharm El-Sheikh coast, Red Sea. The total number of species was 30 species belonging to 15 genera. The average number of species was higher on the reef slope than on the reef flat, but individual numbers were higher on the reef flat than on the slope; (due to schooling of one small fish of one species on reef flat, Klunzinger's wrasse: *Thalassoma rueppellii*). This species was the most abundant species (185.0 fish/600 m^3), followed by the cleaner wrasse, *Labroides dimidiatus* (11.7 fish/600 m^3). Over all sites, four species (*Gomphosus coeruleus, L. dimidiatus, Pseudocheilinus hexataenia* and *T. rueppellii*) were recorded frequently and regularly. Generally, there was no clear zonation preference in the distribution of wrasses: but some species (e.g. *T. rueppellii*) preferred the reef flat habitat, others preferred the reef slope habitat (e.g. *G. coeruleus* and *Larabicus quadrilineatus*). The other species have roved frequently in all zones, but most of them occur frequently on reef slope. Two species only were found at inner reef flat in the study area, while the mid reef flat were dominated by 7 species, finally outer reef flat have 16 species of labrid fishes. All recorded species were found on the reef slope. Both the invertebrate-feeder and omnivores were most abundant in the area of study. They represented by 83.3 % of total fish population on Sharm El-Sheikh Reefs.

Key words: Abundance, coral reef fishes, Egypt, Red Sea, species diversity.

INTRODUCTION

An important goal of reef fish ecology is to determine the processes that are important in structuring reef fish assemblages (Doherty and Williams, 1988; Williams, 1991). Understanding population dynamics is especially challenging for relatively open marine populations. Consequently, debate has raged for decades among reef fish ecologists about whether the distribution and abundance of adults are determined by variation in the input of larvae or post-settlement modification of that input (Sale and Tolimieri, 2000; Doherty, 2002), space utilization (Jones, 1984), and others (Gerking, 1994; Robertson, 1996; Coleman and Wilson, 1996; Gregory and Anderson, 1997; Jones, 2005). Most coral reefs show a clear zonation and, within a reef, numbers and types of organisms may vary in the different zones (Bell and Galzin, 1984). Fishes are also influenced by this reef zonation, which is reflected in great spatial heterogeneity in terms of substrate composition and structural complexity (Done, 1982; Glynn *et al*., 1996; Rajasuriya *et al*., 1998). Accordingly, certain fish species or assemblages are characteristic for certain zones (Bell and Galzin, 1984; Harmelin-Vivien, 1989; Alwany, 1997; McClanahan and Arthur, 2001; Garpe and ?hman, 2003). They may be selective or non - selective, obligate, facultative or opportunistic in relation to their habitat (Bergman *et al*., 2000). Many reef fishes associate with particular microhabitats within the above-mentioned zones (Sale, 1991), although the importance of such associations in determining larger-scale patterns of distribution and abundance appears to vary widely among species (Munday, 2000).

Fishes constitute a dominant component of the reef fauna. Although the Red Sea fish fauna is taxonomically quite well known compared with other parts of the tropical Indo-Pacific Ocean, the community structure of coastal fishes has been less well investigated (Khalaf and Kochzius, 2002). On the northern Red Sea reefs, the distribution patterns of some coral reef fishes have been relatively documented, with marked differences among zones (especially reef flat versus slope). These differences extend along the length of the Red Sea spanning over 18° of latitude and 2270 km (Sheppard *et al*., 1992). The Red Sea has lower reef fish species diversity than the greater part of the Western Indo-Pacific, probably as a consequence of its relatively recent origin.

Wrasses (Family Labridae) were selected for this study because they are a diverse, highly conspicuous and important component of the ichthofauna on coral reefs which found in both tropical and temperate latitudes (Bellwood and Wainwright, 2002) throughout the world (Thresher, 1991). This is especially true on the Red Sea reefs, where they are the most species-rich family as damselfishes and one of the third most abundant families in the northern Red Sea (Alwany and Stachowitsch, 2007). Ranging from some of the smallest (< 40mm total length) to the largest (> 1m) fishes on reefs, family Labridae includes more than 500 species in over 60 genera (Parenti and Randall, 2000). Labrid fishes include both generalist species which feed on a range of invertebrates and specialist feeders such as the cleaner wrasse fish (*Labroides dimidiatus*) and those which feed exclusively on coral polyps or mucus (Randall *et al*., 1990). The primary objective of this study was to describe spatial patterns of distribution and abundance of labrid fishes (Wrasses) along 70 km of Sharm El-Sheikh coast, Red Sea. This inventory will

* *e-mail*: *magdy.elalwany@yahoo.com*

serve as baseline data for future comparisons. The second objective of the study was comparing the fish assemblages among habitat zones on reef flat and reef slope.

MATERIALS AND METHODS

Study area

Five different topographical reefs were studied along the Sharm El-Sheikh coast of the Red Sea, spanning a distance of 70 km (Fig. 1). The study area covered the reef flat (0.5-1 m) and reef slope until 10 m depth. Site 1 (Ras Tantur – 27° 59″ N, 34° 22″ E), both reef flat (40-50 m wide) and slope (relatively steep) of site 1 have well-developed coral communities with have strong wave action. Site 2 (Ras Nassrani - 27° 58″ N, 34° 23″ E), reef flat (50-70 m wide) is rich in coral and algae. Its reef slope (relatively steep) characterized by well-developed coral communities and strong wave action. Site 3 (Jordan Reef - 27° 58″ N, 34° 25″ E), reef flat (30-60 m wide) is rich in coral and algae. Its reef slope (steep) having well-developed coral communities and have strong current. Site 4 (Shoper Reef - 27° 58″ N, 34° 26″ E), reef flat (20-30 m wide) is rich in algae and echinoderms, while reef slope (gentle) is rich in coral and algae. Site 5 (Ras Mohammed - 27° 43″ N, 34° 15″ E), both reef flat (30-60 m wide) and slope (steep) of site 5 are also characterized by well-developed coral communities and have strong wave action.

Field methods

A detailed survey of the distribution and abundance of wrasses in a range of habitats and locations using visual census techniques were done. Underwater visual census techniques have been used to record fish densities and abundances on reefs for fifty years (Brock, 1954) and form the basis for population ecology studies and management decisions (Harmelin-Vivien *et al.*, 1985). Furthermore, they provide rapid estimates of the relative abundance and distribution of reef fishes (Samoilys and Carlos, 2000). Number of Labrid fishes (wrasses) were counted using this approach along transects (100 X 6 X 1 = 600 m^3) on the reef flat (RF, depth: 0.5-1 m) and reef slope (RS, depth: 1-10 m). On the reef flat, fishes were observed using snorkeling, on the reef slope using SCUBA during day-time from 11:00 to 14:00 h. The trophic categories and size range based on visual field observations were recorded; (CO: corallivore; HR: herbivore; IV: invertebrate-feeder; IF: invertebrate and fish egg-feeder; OM: omnivore; PL: planktivore).

Data analysis

The data were analysed statistically using the software packages PRIMER (V 5.0) and SPSS (V 11.5). Species richness was expressed by considering the number of species (D), and species diversity, but homogeneity were determined using the Shannon-Wiener diversity index (H') and the evenness index (J') (Pielou, 1966). These parameters were calculated for each site by pooling data from the sample replicates. When necessary, abundance data were square root transformed to produce normality and homogeneity of variance.

RESULTS

General distribution and abundance

The list and number of labrid fish species at reef flat and slope along Sham El-Sheikh coast is given in table (1). In general, the total number of species was 30 species belonging to 15 genera. The average number of

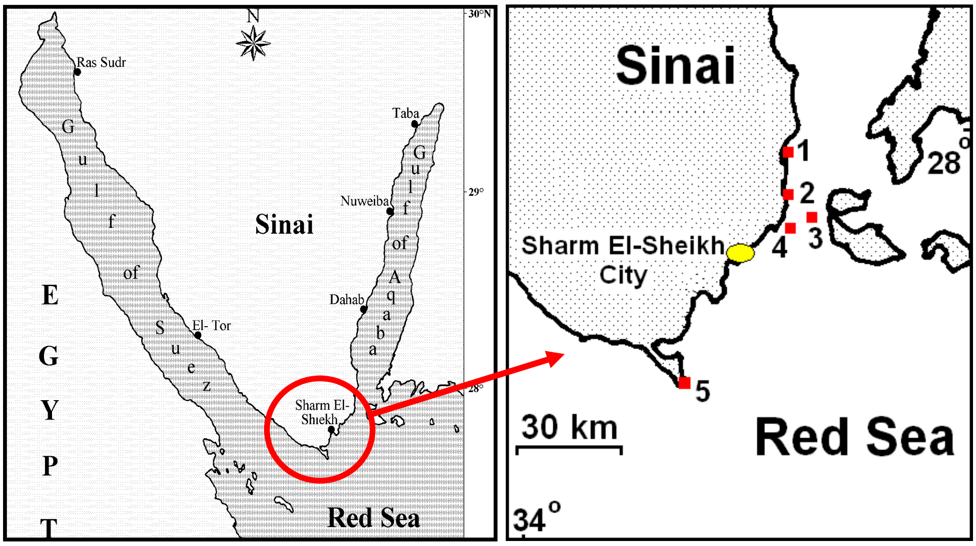

Figure (1): Map of Sharm El-Sheikh area showing the positions of different sites in the study area.

species was higher on the reef slope than on the reef flat, but individual numbers were higher on the reef flat than on the slope (due to schooling of small fish of one species on reef flat, Klunzinger's wrasse: *Thalassoma rueppellii*, Fig. 2). *T. rueppellii* was the most abundant species, especially at reef flat (185.0 fish/600 m^3, at reef flat of site 5 at Ras Mohammed). The cleaner wrasse, *Labroides dimidiatus,* was the second abundant species (11.7 fish/600 m^3, at reef flat of site 5 at Ras Mohammed). Site 5 (Ras Mohammed, in south) has the highest number of species (27 species), while site 1 (Ras Tantur, in north) has the lowest number of species (16 species). Over all sites, four species (*Gomphosus coeruleus, L. dimidiatus, Pseudocheilinus hexataenia* and *T. rueppellii*) were recorded frequently and regularly. One-way ANOVA showed that the influence of species is highly significant ($p < 0.001$, Table 2), but the influence of sites and zones was not significant ($p = 0.418$ and $p = 0.536$, respectively). The size of all species ranged between 7 to 48 cm (Table 3), except two large species, their size ranged between 70 to 100 cm (*Coris aygula*) and 100 to 130 cm (*Cheilinus undulates*).

Table (1): The mean abundance (mean±SD) of occurrence of each species of Labrid fishes on the reef flat (RF) and reef slope (RS) at different five sites along Sharm El-Sheikh coast.

Species	**Site 1**		**Site 2**		**Site 3**		**Site 4**		**Site 5**	
	RF	**RS**	**RF**	**RS**	**RF**	**RS**	**RF**	**RS**	**RF**	**RS**
Anampses caeruleopunctatus	0	1.0±0	0	0.3±0.6	0	1.3±0.6	0	1.3±0.6	0	1.3±0.6
Anampses lineatus	0	0.3±0.6	0	0	0	0	0	0	0	0.3±0.6
Anampses meleagrides	0	0.7±1.2	0	0	0	0.7±0.6	0	0.7±0.6	0	0.3±0.6
Anampses twistii	0	0	0	0.7±0.6	0	0.3±0.6	0	0.3±0.6	0	0.3±0.6
Bodianus antioides	0	0	0	3.0±1.0	0	0	0	0.3±0.6	0	1.0±1.0
Cheilinus abudjubbe	0	0	0	1.3±1.5	0	0.3±0.6	0	0.3±0.6	0	2.0±1.7
C. digrammus	0	0	0	2.0±2.0	0	0.3±0.6	0.3±0.6	0.7±1.2	0	1.3±0.6
C. fasciatus	0	0	0	1.0±1.0	0	0	0	0.3±0.6	0	0.3±0.6
C. lunulatus	0	0.7±0.6	0	3.7±1.5	0	0.7±0.6	0	1.0±1.0	0.3±0.6	1.3±0.6
C. mentalis	0	0	0	0	0	0	0	0	0	0.3±0.6
C. quinquecinctus	0	0	0	0.3±0.6	0	1.0±1.0	0	1.0±1.0	0	1.0±1.0
C. undulates	0	0	0.3±0.6	0.7±0.6	0	0	0	0.3±0.6	0.7±0.6	0.3±0.6
Coris aygula	0	0.3±0.6	0.3±0.6	1.0±1.0	0.3±0.6	1.7±0.6	0	1.7±0.6	0.7±0.6	1.7±1.5
C. gaimard	0	0	0	0	0	0	0	0	0.3±0.6	1.0±1.0
Epibulus insidiator	0	0	0.7±0.6	2.3±0.6	0	1.0±1.0	0.3±0.6	1.0±1.0	0.7±0.6	1.3±0.6
Gomphosus coeruleus	2.0±2.0	4.0±2.0	1.0±1.0	5.7±2.1	1.3±1.2	5.0±2.6	0.7±1.2	4.3±2.5	2.7±0.6	6.3±2.5
Halichoeres hortulanus	0	0	0.7±1.2	1.3±0.6	0	0	0	0	1.0±1.0	2.3±1.5
H. marginatus	0	0.7±1.2	0	0	0	0.3±0.6	0	0.3±0.6	0	0
H. scapularis	0	0	0.3±0.6	1.7±1.5	0	0	0	0	1.7±0.6	1.0±1.0
Hemigymnus fasciatus	0	1.0±1.0	0.3±0.6	3.3±1.2	0	0.7±1.2	0	1.0±0	2.0±0	3.7±0.6
Labroides dimidiatus	1.0±1.7	8.0±2.6	11.0±6.0	11.3±2.1	2.3±0.6	9.3±2.5	5.7±2.5	6.0±3.0	11.7±4.0	8.3±1.5
Larabicus quadrilineatus	0	0	0	0	0	1.7±0.6	0.3±0.6	0.7±1.2	0	0
Novaculichthys taeniourus	0	1.0±1.0	0.3±0.6	1.7±0.6	0.3±0.6	0.7±0.6	0	0.7±1.2	1.0±1.0	1.7±1.5
Pseudocheilinus hexataenia	2.7±1.2	7.7±2.5	2.7±1.2	9.0±2.6	2.0±2.0	2.3±0.6	0.7±1.2	5.3±1.5	6.7±2.1	12.0±2.0
Pseudodax moluccanus	0	0.7±1.2	0	1.3±1.5	1.0±1.0	0.7±0.6	0	2.3±1.5	1.3±0.6	1.7±0.6
Stethojulis albovittata	0	0	0	2.7±2.1	0	0	0	0	0	1.3±0.6
S. interrupta	0	1.3±0.6	0	0.3±0.6	0	1.0±1.0	0	1.0±1.0	0	0
Thalassoma lunare	0	0.3±0.6	0	0.3±0.6	0	0	0	0	0	1.3±0.6
T. purpureum	0.3±0.6	1.3±0.6	0	1.0±0	0	0	0	0.7±0.6	1.0±1.0	1.7±1.2
T. rueppellii	8.3±4.5	18.3±4.0	143.3±20.8	48.3±10.4	68.3±17.6	15.0±3.6	47.7±15.0	23.3±4.0	185.0±22.9	60.0±13.0

Table (2): One-way ANOVA performed on abundance of Labrid fishes (* = significant at 5 % significance level and ** = at 1 % significance level).

Factor	Source of variation	df	MS	F value	P value
	between groups	4	222.58	0.981	0.418
Sites	within groups	294	226.83		
	total	298			
	between groups	1	87.12	0.385	0.536
zones	within groups	298	226.51		
	total	299			
	between groups	29	1259.79	10.954	0.0001**
Species	within groups	270	115.01		
	total	299			

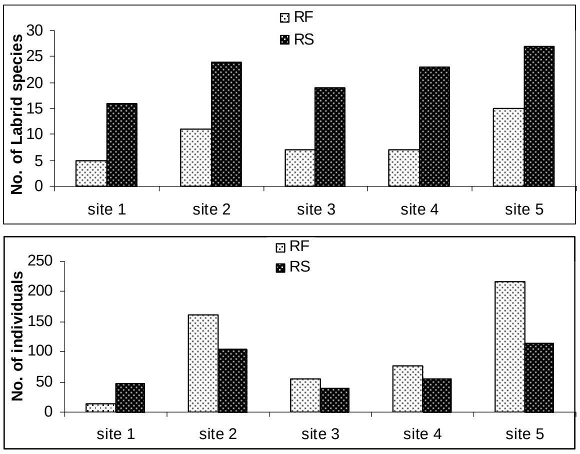

Figure (2): Average number of species and individuals for labrid fishes on the reef flat (RF) and reef slope (RS) along Sharm El-Sheikh coast.

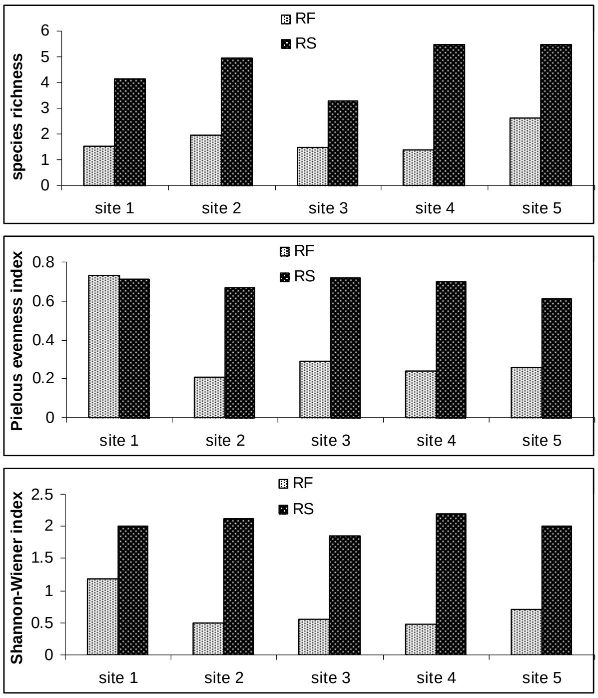

Figure (3): Fish community parameters of diversity (species richness, Evenness and Shanno-Wiener) of labrid fishes on reef flat and slope along Sharm El-Sheikh coast.

Habitat distribution and diversity

Generally, there was no clear zonation preference in the distribution of wrasses: but some species (e.g. *Thalassoma rueppellii*) preferred the reef flat, others preferred the reef slope (e.g. *Gomphosus coeruleus* and *Larabicus quadrilineatus*). The remaining species roved frequently in all zones, but most of them occur frequently on reef slope. Comparison of habitat preferences for labrid fishes gives clear pattern of distribution of this group on reefs (Table 3). On the reef flat, the most wrasse fishes preferred the outer reef flat before the reef edge. On the reef slope, on the other hand, many wrasses distributed between 5m and 10m depths without differences in their abundances. Two species only were found at inner reef flat in study area, while the mid reef flat have 7 species, finally outer reef flat have 16 species of labrid fishes. All recorded species (30 species) were shown on the reef slope.

On the reef flat, the average species richness ranged from 1.39 at site 4 to 2.60 at site 1. The highest evenness index (J´) was recorded at site 1 (0.73), while the site 2 yielded the lowest value (0.21). Average Shannon-Wiener diversity (H´) varied between 0.47 at site 4 and 1.18 at site 1 (Fig .3). On the reef slope, the average species richness ranged from 3.27 at site 3 to 5.50 at site 4. The highest evenness index (J´) was recorded at site 3 (0.72), while the site 5 yielded the lowest value (0.61). Average Shannon-Wiener diversity (H´) varied between 1.86 at site 3 and 2.19 at site 4.

Abundance of trophic groups

The total abundance of the various trophic groups at different reef zones revealed relations connected with the benthic substrate and physical parameters of these zones. In general, both the invertebrate-feeder (IV) and omnivores (O) are the most abundant in study area. They represent 83.3 % of total fish population in the study area (invertebrate-feeder 60.0 % and omnivores 23.3 % of the total fish population). The fish feeds on invertebrates, fish egg and small fishes (IF) were represented by 10.0 % and related to three *Thalassoma* species. Corallivores (CO) and planktivores (PL) were represented by one species for each group, *Larabicus quadrilineatus* and *Pseudocheilinus hexataenia* (Table 3), respectively. One wrasse species, *Pseudodax moluccanus*, feeds on algae beside the small invertebrates.

DISCUSSION

The distributions of animal populations and space used by individuals have long been central issues in ecology. Several factors affect space use by individuals, including: availability of habitat or microhabitat (Robertson, 1996; Jones, 2005), food resources (Gerking, 1994), presence of predators (Coleman and Wilson, 1996; Gregory and Anderson, 1997), and presence of competitors (Smith and Tyler, 1972; Robertson, 1996). This adds to local effects of coastal constructions, sedimentation, nutrient input, algal growth, coral destruction and pollution load. This study provides the first detailed research of distribution and abundance of wrasses on Sharm El-Sheikh area and even on the Red Sea reefs. Labridae (wrasses) and Pomacentridae (damselfishes) dominated the ichthyofauna in terms of species richness and Pomacentridae were most abundant (Khalaf and Kochzius, 2002; Alwany and Stachowitsch, 2007).

Table (3): Comparison of habitat preferences, trophic categories and size range for labrid fishes along Sharm El-Sheikh coast. The trophic categories and size range based on visual field observations (CO: corallivore; HR: herbivore; IV: invertebrate-feeder; IF: invertebrate and fish egg-feeder; OM: omnivore; PL: planktivore). The abundance of fishes (+++ = abundant, ++ = common, + = rare).

	Reef Flat			Reef Slope		Trophic category	Size range (cm)
	Inner RF	Mid RF	Outer RF	5 m depth	10 m depth		
Anampses caeruleopunctatus	-	-	-	+	+	IV	28-35
Anampses lineatus	-	-	-	+	-	IV	8-12
Anampses meleagrides	-	-	-	-	+	IV	15-22
Anampses twistii	-	-	-	+	-	IV	15-19
Bodianus anthioides	-	-	-	++	+	IV	15-21
Cheilinus abudjubbe	-	-	-	+	+	OM	30-40
C. digrammus	-	-	+	+	+	OM	15-19
C. fasciatus	-	-	-	+	++	OM	25-35
C. lunulatus	-	-	+	++	+	OM	42-48
C. mentalis	-	-	-	-	+	OM	12-18
C. quinquecinctus	-	-	-	+	+	OM	26-33
C. undulates	-	-	-	-	+	OM	100-130
Coris aygula	-	+	+	+	+	IV	70-100
C. gaimard	-	-	+	+	-	IV	28-33
Epibulus insidiator	-	-	+	++	+	IV	30-40
Gomphosus coeruleus	-	+	++	++	++	IV	22-30
Halichoeres hortulanus	-	-	+	+	+	IV	22-30
H. marginatus	-	-	-	+	+	IV	12-18
H. scapularis	-	-	+	+	+	IV	15-20
Hemigymnus fasciatus	-	+	+	+	+	IV	18-23
Labroides dimidiatus	+	+	++	+++	++	IV	8-13
Larabicus quadrilineatus	-	-	+	+	+	CO	8-14
Novaculichthys taeniourus	-	-	+	+	+	IV	22-28
Pseudocheilinus hexataenia	-	+	++	++	++	PL	7-11
Pseudodax moluccanus	-	-	+	+	+	IV, HR	20-26
Stethojulis albovittata	-	-	-	+	+	IV	8-13
S. interrupta	-	-	-	+	+	IV	8-15
Thalassoma lunare	-	-	-	+	+	IF	20-28
T. purpureum	-	+	+	+	+	IF	30-42
T. rueppellii	+	++	+++	+++	+++	IF	18-23

Pomacentridae species were the more abundant due to aggregations of planktivores species, such as half-and-half chromis, *Chromis dimidiata,* which feeds on zooplankton at the reef slope.

The interactions between topology, currents, and wave-induced water movement result in complex patterns of water movement around reefs (Bellwood and Wainwright, 2001). Habitat has often been documented as playing an important role in structuring assemblages of reef fish (Gillanders and Kingsford, 1998). The outer reef flat near the wave break has the greatest water movement (inner and mid reef flat are exposed to considerably less wave activity), so may provide suitable zones for labrid fishes rather than other reef flat microhabitats. The complexity of substrate at the outer reef flat also plays an important role in distribution of labrid fishes. The slope has more diverse communities, so it represented a good zone to many wrasse fishes. Bellwood and Wainwright (2001) reported that the distribution and shape of assemblages of labrids across the Great Barrier Reef is affects by water movement. On the Red Sea reefs, the distribution of labrids may affects by wave action and water movement.

In the present study, the highest similarity was found between the five studied reefs, although the site 3 and 4 are classified as barrier reefs in front of Sharm El-Sheikh city. Thirty species from reef flat to 10 m depth were recorded; Khalaf and Kochzius (2002) reported 38 species of labrid fishes on 5 coral reef sites and one site, which seagrass-dominated Al-Mamlah Bay at the Jordanian coast in the northern Gulf of Aqaba. No clear geographical pattern of wrasse distributions along the Egyptian reefs emerged (Alwany and Stachowitsch, 2007). Also, Letourneur (1996) has shown that habitats found in analogous zones of reefs at sites in the same area have similar fish assemblages.

In relation to their adult conspecfics, some juvenile of reef fishes show a preference for shallow habitats (Eckert, 1985). Habitat preferences in juvenile fish are suggested to promote increased protection against predators (Behrents, 1987), and accordingly, predator avoidance may provide an explanation of the observed association between juvenile abundance and percent branching structures. Habitat-associations may also be related to food requirements (McCormick, 1995). Fish of all size classes were frequently found in a variety of habitats, although recruits were only found in shallow-water habitats. In the present study, the schooling of small Klunzinger's wrasse: *Thalassoma rueppellii* on reef flat are good example of habitat-associations and preferences. Alwany *et al.* (2005) reported that the adult wrasse *T. rueppellii* rove more widely and enter

Acanthurus sohal territories on outer reef flat, were not attacked by the surgeonfish, whereas juvenile wrasses that were resident in the territories were subject to a moderate level of attack.

Green (1996) study the habitat use by labrid fishes at Lizard Island in northern Great Barrier Reef. He demonstrated that only one species, *Labroides dimidiatus*, was ubiquitous and occurred in low densities in all habitat zones. In the present study, the cleaner wrasse, *L. dimidiatus,* and Klunzinger's wrasse, *Thalassoma rueppellii,* were the only two species recorded in all habitat zones along Sham El-Sheikh coast. Foraging-path patterns have been suggested as an important factor in understanding the spatial exploitation of microhabitats (Fulton and Bellwood, 2002). They reported that the labrids exhibit a diversity of foraging-path patterns and microhabitat preferences during foraging. This finding explains why the cleaner wrasse, *L. dimidiatus*, occurred in all habitat zones in the present study, where it established a cleaning station, which attracts large fishes for ectoparasite removal.

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توزيع ووفرة وتنوع أسماك العروسة (عائلة: لابريدى) بطول ساحل شرم الشيخ، البحر الأحمر

مجدى عبدالمجيد العلوانى
قسم علوم البحار، كلية العلوم، جامعة قناة السويس، الإسماعيلية، مصر

الملخص العربـــى

أجريت هذه الدراسة للتعرف على توزيع ووفرة وتنوع أسماك العروسة (عائلة: لابريدى) على الشعب المرجانى المسطح والمائل بطول 70 كم لساحل شرم الشيخ بالبحر الأحمر. وقد وجد أن عدد الأنواع بلغ أعلاه على الشعب المرجانى المائل ،أكثر منه على الشعب المسطح، ولكن عدد أفراد الأسماك وجدت أكثر على الشعب المسطح منها على الشعب المائل (نظرا لوجود أسماك صغيرة من نوع واحد على الشعب المسطح:(سالاسوما روبيلى). هذا النوع سجل أعلى الأنواع كثافة (185 سمكة لكل 600 متر مكعب)، ثم تلاه فى الترتيب سمكة العروسة المنظفة (لابرويدس ديمدياتس) حيث وجد منها 11.7 سمكة لكل 600 متر مكعب. وفى جميع المواقع التى تمت فيها الدراسة، وجد أن هناك أربعة أنواع من أسماك العروسة تتكرر بشكل منتظم فى تلك المواقع وهى، جومفوسس كورولويس ، لابرويدس ديمدياتس ، بسيودوشلينس هيكستاينى ، سالاسوما روبيلى. عموما، لا توجد أفضلية لبعض المناطق فى توزيع أسماك العروسة: ولكن بعض الأنواع (مثل: سالاسوما روبيلى) تفضل التواجد فى بيئة الشعب المرجانى المسطح، والأنواع الآخرى (جومفوسس كورولويس و لارابيكس كوادريلنياتس) تفضل بيئة الشعب المرجانى المائل. الأنواع الباقية تتحرك بحرية تامة وبدون تقيد بين المناطق والبيئات المختلفة، ولكن أغلب تلك الأنواع تتواجد فى الغالب على الشعب المرجانى المائل.

ومن خلال هذه الدراسة وجد أن نوعين فقط من أسماك العروسة تتواجد فى منطقة الشعب المسطح الخلفى، بينما سجلت 7 أنواع فى بيئة الشعب المسطح الأوسط، بينما وجد على المسطح الأمامى 16 نوعا من تلك الأسماك. بينما تواجدت جميع الأنواع الثلاثين المسجلة على الشعب المرجانى المائل. كذلك وجد أن كلا من الأسماك آكلات اللافقاريات والآكلات المتنوعة (النباتية والحيوانية) هى أكثر أسماك العروسة وفرة فى منطقة الدراسة، حيث تمثل 83.3 % من مجموع أسماك العروسة على الشعاب المرجانية لساحل شرم الشيخ.