تنوع السرطانات الحقيقية في نبات المانجروف على امتداد الساحل الجنوبي للمملكة العربية السعودية، البحر الأحمر

محمد عبد العزيز باعضكة

قسم الأحياء البحرية، كلية علوم البحار، جامعة الملك عبدالعزيز، جدة، المملكة العربية السعودية
mbaakdah@kau.edu.sa

المستلخص. تعد الدراسات السابقة على التنوع الحيوي للسرطانات الحقيقية المرتبطة بأشجار المانجروف على ساحل البحر الأحمر في المملكة العربية السعودية قليلة نسبيا. خلال هذه الدراسة، تمت دراسة التنوع الحيوي لسرطانات الحقيقة في منطقة الدرب (المحطة الأولى) ومنطقة جازان (المحطة الثانية)، والتي تشمل منطقة ذات الغطاء النباتي كثيف، ومنطقة شبه مغلقة (لاجون) التي تحيط بها أشجار المانجروف. وتم التعرف على عشرة أنواع من السرطانات الحقيقية تنتمي إلى خمس عوائل خلال المسح، وهي: ميتوبوجرابسيس ثوكوهار (Metopograpsus thukuhar) (عائلة الجرابسيدي)، وأشتوريت (Ashtoret sp.) (عائلة الماتوتيدي)، وماكروفثالميس ديبريسيس (Macrophthalmus depressus)، وماكروفثالميس جرانديديري (Macrophthalmus grandidieri) (عائلة الماكروفثالميدي)، وأوستراكا البيمينا (Austruca albimana)، وكرانيوكا إينفيرسا (Cranuca inversa)، وتيوبوكا يورفيللي (Tubuca urvillei) (عائلة أويسيبوديداي)، وإيريكارسينيس (Eurycarcinus sp.) (عائلة بيلومينيداي)، وبوريتينيس سيجنيس (Portunus segnis)، وثالاميتا (Thalamita sp.) (عائلة السرطانات السابحة بورتينيداي). وأظهرت نتائج تحليل التباين ANOVA بمتغير واحد أنه لا يوجد اختلاف بين المواقع من حيث الوفرة لهذه الأنواع. كما أشارت نتائج الدراسة إلى أن المساحات الواقعة مباشرة تحت أشجار المانغروف غنية بالأنواع، ولها قيم أعلى من معامل مارجاليف لثراء الأنواع (Margalef species richness)، ومكافئ بيلو (Pielou's evenness)، ومؤشر شانون- وينر للتنوع (diversity index Shannon–Wiener).

الكلمات المفتاحية: السرطانات الحقيقية، تنوع، أشجار المانجروف، البحر الأحمر، المملكة العربية السعودية.

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6	JSMV-1 vs JSMV-2	16.92	a) *M. grandidieri* b) *M. thukuhar* c) *M. depressus*	28.8 21.1 16.0
7	ADLSEMV-1 vs ADLSEMV-2	33.67	a) *Ashtoret* sp. b) *Thalamita* sp.	60.3 28.8
8	ADLSEMV-1 vs JLSEMV-1	41.01	a) *Thalamita* sp. b) *Ashtoret* sp.	47.5 38.7
9	ADLSEMV-1 vs JLSEMV-2	25.0	*Portunus segnis*	91
10	ADLSEMV-2 vs JLSEMV-1	65.6	a) *Ashtoret* sp. b) *Thalamita* sp.	44.2 42
11	ADLSEMV-2 vs JLSEMV-2	51.5	a) *P. segnis* b) *Ashtoret* sp	62.3 24.0
12	JLSEMV-1 vs JLSEMV-2	42.1	a) *Thalamita* sp. b) *Ashtoret* sp.	40.0 36.0

Abbreviations: ADSMV-1, Ad Darb site 1 under mangrove vegetation; ADSMV-2, Ad Darb site 2 under mangrove vegetation; JSMV-1, Jazan site 1 under mangrove vegetation; JSMV-2 , Jazan site 2 under mangrove vegetation; ADLSEMV-1, Ad Darb lagoon site 1 enclosed by mangrove vegetation; ADLSEMV-2, Ad Darb lagoon site 2 enclosed by mangrove vegetation; JLSEMV-1, Jazan lagoon site 1 enclosed by mangrove vegetation; JLSEMV-2, Jazan lagoon site 2 enclosed by mangrove vegetation

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Table 1. Mean numerical abundance of the brachyuran crabs ± SD (standard deviaton) from the study sites.

Location/site Species	Al Darb				Jazan			
	SMV-1	SMV-2	LSEMV-1	LSEMV-2	SMV-1	SMV-2	LSEMV-1	LSEMV-2
Metapograpsus thukukahar	20±3	36±6	-	-	22±2	42±7	-	-
*Ashtore*t sp.	-	-	3±1	-	-	-	23±6	2±1
Macrophthalmus depressus	-	20±3	-	-	26±8	14±2	-	-
M. grandidieri	-	-	-	-	-	6± 2	-	-
Austruca albimana	36±7	24±4	-	-	42±8	36±4	-	-
Cranuca inversa	18±3	8±3	-	-	27±6	22±4	-	-
Tubuca urvielli	-	-	-	-	7±3	3±1	-	-
Eurycarcinus sp.	-	-	-		1	-	-	-
Portunus segnis	-	-	3±1	2	-	-	8±3	26±8
Thalmita sp.	-	-	5±2	2±1	-	-	36±9	5±2

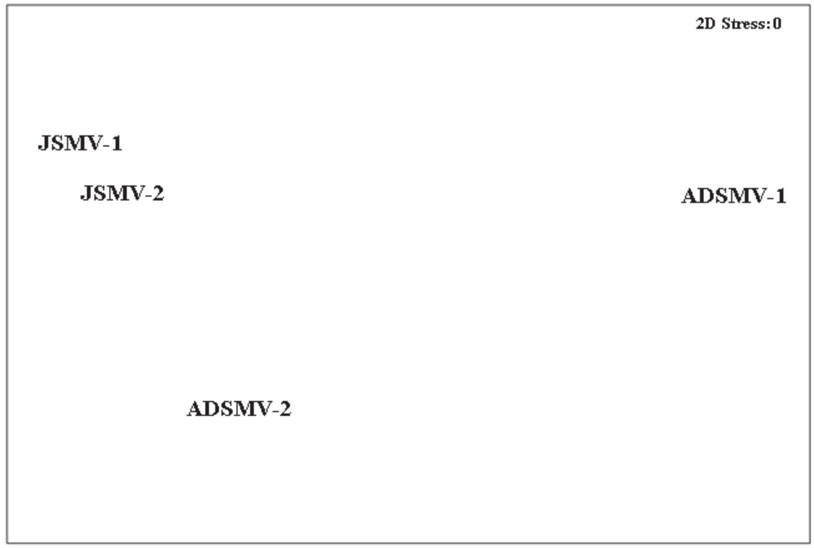
Abbreviations: SMV-1, asite 1 under mangrove vegetation; SMV-2, site 2 under mangrove vegetation; LSEMV-1, lagoon site 1 enclosed by mangrove vegetation; LSEMV-2, lagoon site 2 enclosed by mangrove vegetation

Table 2. One-way ANOVA results testing significant deviations of the mean of the brachyuran abundance of different sites.

		Sum of squares	df	Mean square	F	Sig.
Sites under mangrove vegetation from Al Darb and Jazan	Between groups Within groups Total Levene's test result	278.4 5562.0 5840.4 Levene statistic = 0.81, p = 0.8	2 24 27	92.8 231.75	0.400	0.754
Lagoon sites of Al Darb and Jazan	Between groups Within groups Total Levene's test result	815.0 742.0 1557.0 Levene statistic = 3.8, p = 0.6	3 8 11	271.67 92.75	2.92	0.1

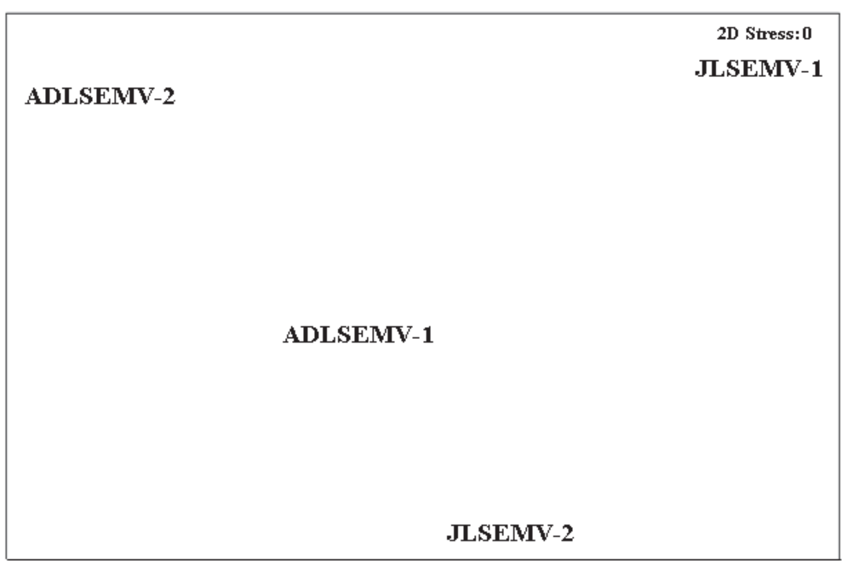
Table 3. Result of SIMPER analysis between study sites.

No	Contrasts	Dissimilarity between contrast (%)	Species contributed to dissimilarity between contrasts	Dissimilarity Contributed by Species between contrasts (%)
1	ADSMV-1 vs ADSMV2	25.97	a) *Macrophthalmus depressus* b) *Metapograpsus thukuhar* c) *Cranuca inversa*	52 18.0 16.6
2	ADSMV-1 vs JSMV-1	26.11	a) *Macrophthalmus depressus* b) *Tubuca urvielli* c) *Eurycarcinus* sp.	49 25.5 9.62
3	ADSMV-1 vs JSMV-2	26.1	a) *M. depressus* b) *Macrophthalmus grandidieri* c) *M.thukuhar*	36 23 19
4	ADSMV-2 vs JSMV-1	22.01	a) *T. urvielli* b) *Austruca albimana* c) *C. inversa*	27.7 16.6 24.8
5	ADSMV-2 vs JSMV-2	19.3	a) *M. grandidieri* b) *C. inversa* c) *T. urvielli*	29.3 22.3 22.7



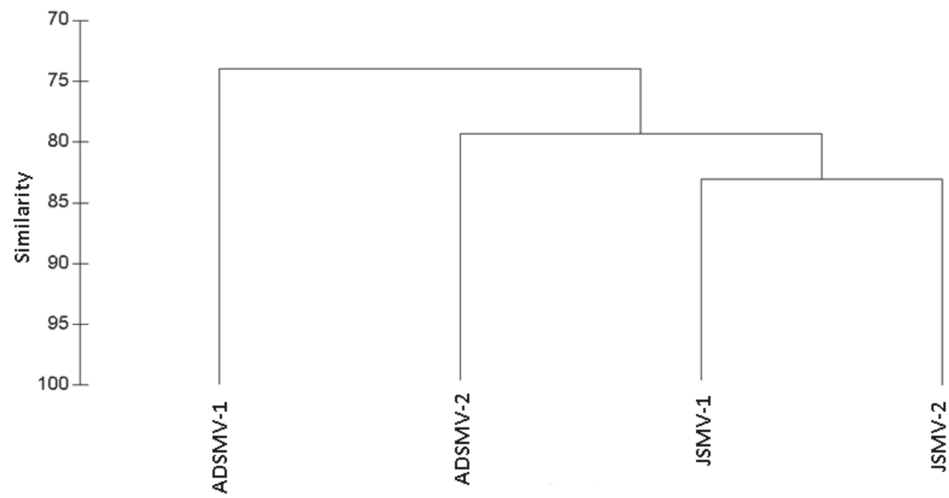
Abbreviations: ADSMV-1, Ad Darb site 1 under mangrove vegetation; ADSMV-2, Ad Darb site 2 under mangrove vegetation; JSMV-1, Jazan site 1 under mangrove vegetation; JSMV-2 , Jazan site 2 under mangrove vegetation.

Fig. 4(a). MDS- oration showing the relationship between sites under mangrove vegetation over abundance data of brachyuran crabs.



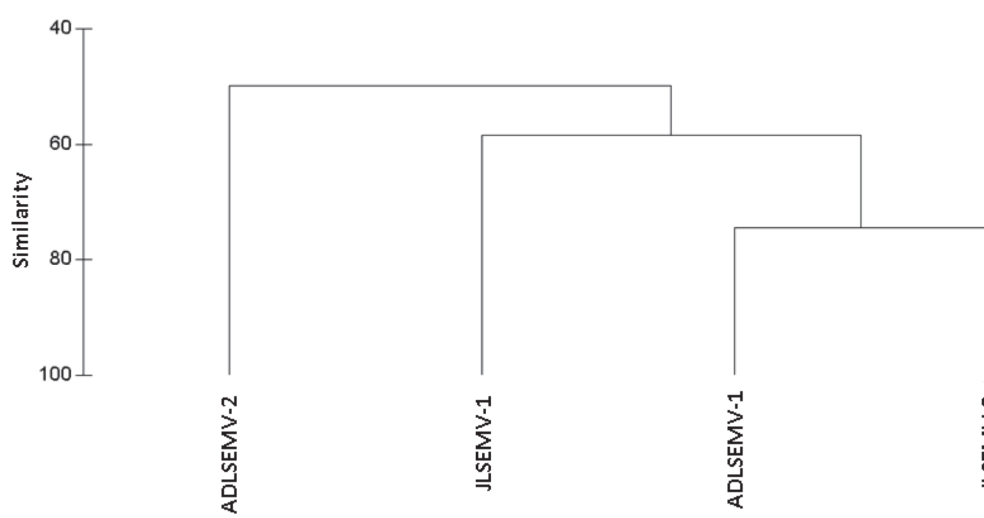
Abbreviations: ADLSEMV-1, Ad Darb lagoon site 1 enclosed by mangrove vegetation; ADLSEMV-2, Ad Darb lagoon site 2 enclosed by mangrove vegetation; JLSEMV-1, Jazan lagoon site 1 enclosed by mangrove vegetation; JLSEMV-2, Jazan lagoon site 2 enclosed by mangrove vegetation

Fig. 4(b). MDS-ordination showing the relationship between lagoon sites over abundance data.



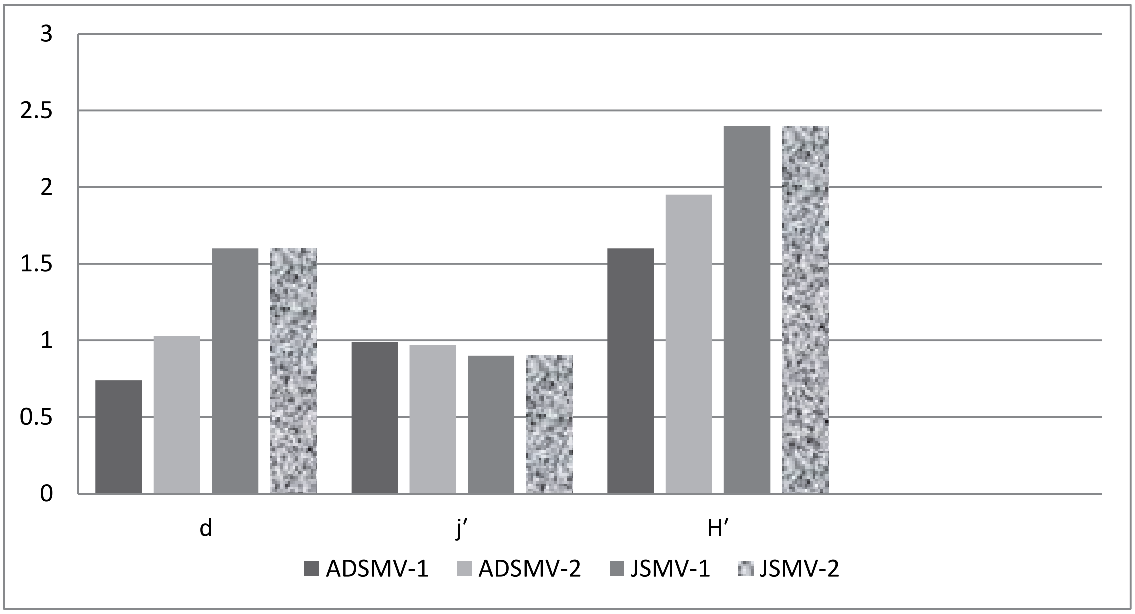
Abbreviations: ADSMV-1, Ad Darb site 1 under mangrove vegetation; ADSMV-2, Ad Darb site 2 under mangrove vegetation; JSMV-1, Jazan site 1 under mangrove vegetation; JSMV-2, Jazan site 2 under mangrove vegetation.

Fig. 3(a). Dendrogram showing the relationship between sites under mangrove vegetation over abundance data of brachyuran crab.



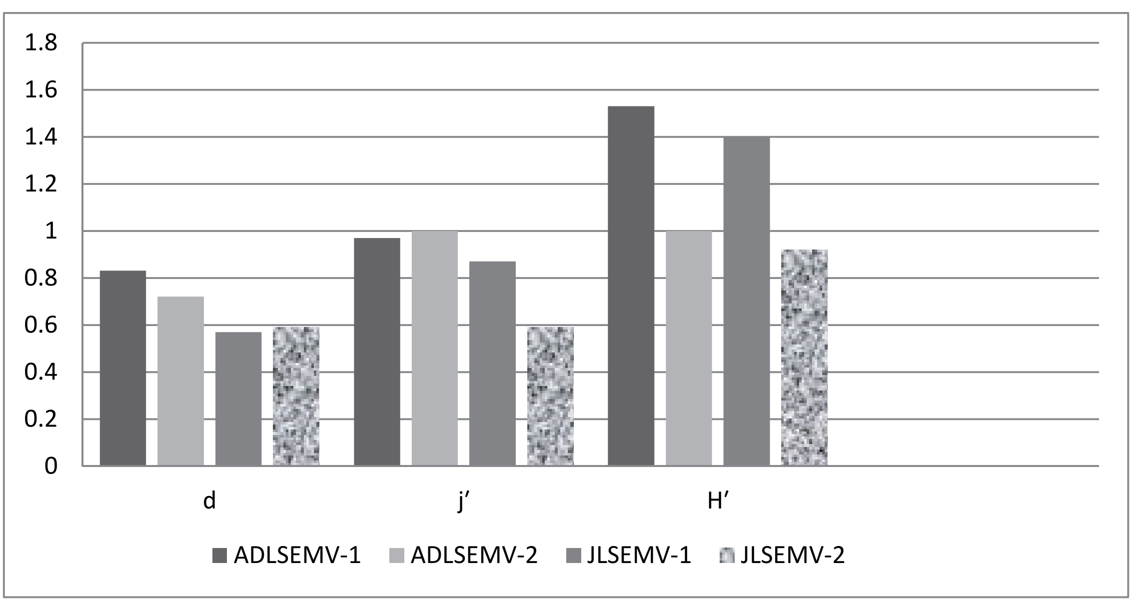
Abbreviations: ADLSEMV-1, Ad Darb lagoon site 1 enclosed by mangrove vegetation; ADLSEMV-2, Ad Darb lagoon site 2 enclosed by mangrove vegetation; JLSEMV-1,Jazan lagoon site 1 enclosed by mangrove vegetation; JLSEMV-2, Jazan lagoon site 2 enclosed by mangrove vegetation.

Fig. 3(b). Dendrogram showing the relationship between lagoon sites over abundance data of brachyuran crab.



Abbreviations: ADSMV-1, Ad Darb site 1 under mangrove vegetation; ADSMV-2, Ad Darb site 2 under mangrove vegetation; JSMV-1, Jazan site 1 under mangrove vegetation; JSMV-2, Jazan site 2 under mangrove vegetation.

Fig. 2(a). Margalef index (D) (Margalef, 1958), Pielou’s evenness (J) and the Shannon–Wiener species diversity index (H′) of the brachyuran crabs from the sites under mangrove vegetation.



Abbreviations: ADLSEMV-1, Ad Darb lagoon site 1 enclosed by mangrove vegetation; ADLSEMV-2, Ad Darb lagoon site 2 enclosed by mangrove vegetation; JLSEMV-1, Jazan lagoon site 1 enclosed by mangrove vegetation; JLSEMV-2, Jazan lagoon site 2 enclosed by mangrove vegetation.

Fig. 2(b). Margalef index (D) (Margalef, 1958), Pielou’s evenness (J′) and the Shannon–Wiener species diversity index (H′) of the brachyuran crabs from the lagoon sites enclosed by mangrove vegetation.

similarity level (Fig. 3a); in these sites, the number of species is higher (Table 1). SIMPER (Table 3) results reveal that 16.92% dissimilarity is found between these sites because of the absence of *M. grandidieri* in site 2, and higher abundance of *M. thukuhar* in the same site (Tables 1 and 3). In both the cluster diagram and MDS results, site 1 under the mangrove vegetation from Ad Darb was found to be an outgroup. SIMPER analysis reveals the absence of *M. depressus* is the main cause (Tables 1 and 3).

Ad Darb lagoon site 1 and Jazan lagoon site 2 are clustered together at the ~75% similarity level (Fig. 3b). The reason for the high similarity level is that out of the three species present in these two sites, the abundance of *Thalamita* sp. and *Ashtoret* sp. is almost the same (Table 1), and the 25% dissimilarity found between these two sites is accounted for *P. segnis* (Table 3). Jazan lagoon site 1 is an outgroup due to the higher abundance of *Ashtoret* sp. and *Thalamita* sp. (Tables 1 & 3). In SMV, *M. depressus*, *M. grandidieri* and *T. urvillei* caused dissimilarities between sites (Table 3). Only three species are present in the lagoon sites and all of them contributed to dissimilarity (Table 3). The presence or absence of a species and differences in the abundance of species resulted in dissimilarities between sites.

In Saudi Arabia, mangroves are well protected and destruction by anthropogenic activities is almost absent. However, the role of global warming in the destruction of Saudi mangroves cannot be ruled out (Alongi, D.M; Ward *et al*., 2016). Therefore, further detailed studies are needed to determine the biodiversity of the mangroves of Saudi Arabia.

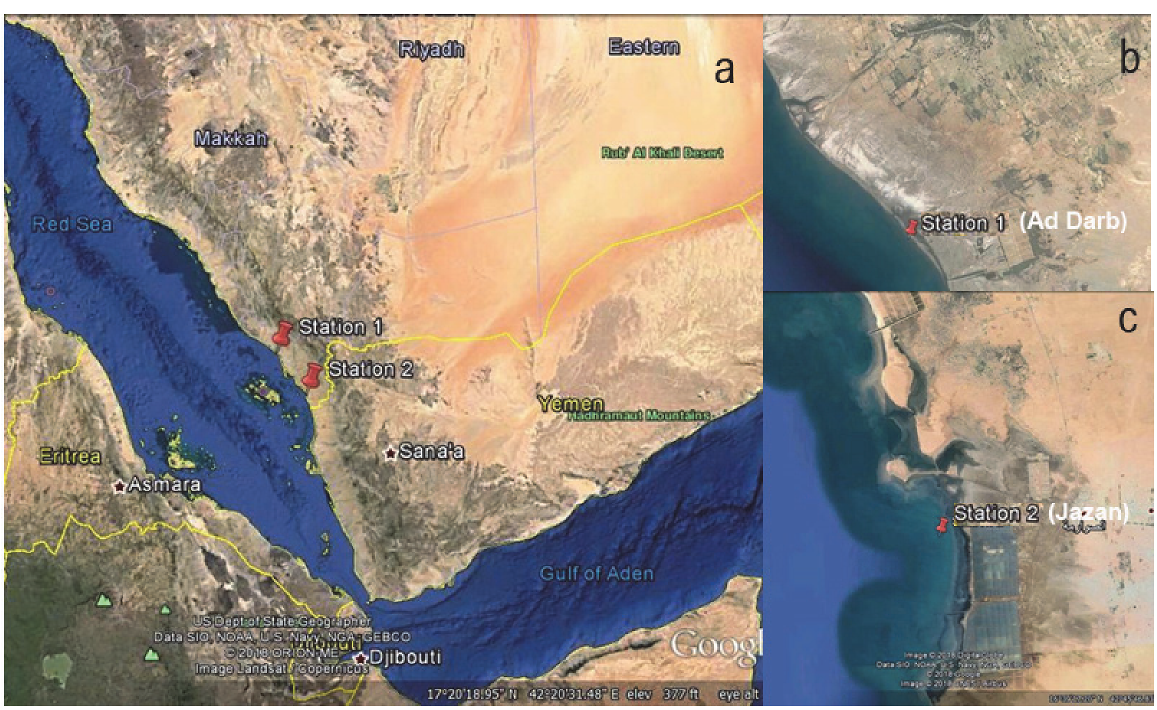


Fig. 1. Map of the study sites: a) Map showing study sites Ad Darb (Station 1) and Jazan. (Station 2), b) Map showing study sites Ad Darb (Station 1) and c) Map showing Jazan. (Station 2).

species were collected in this study. *Metopograpsus thukuhar*, *Ashtoret* sp., *Macrophthalmus depressus*, *M. grandidieri*, *Austruca albimana*, *Cranuca inversa*, *Tubuca urvillei*, *Eurycarcinus* sp. *Dotilla* sp. colonies were ubiquitously encountered at the sites under mangrove vegetation. However, this species was excluded from the survey as it was too small to be estimated by the time-based sampling method. The Jazan mangrove is species rich with ten species – maximum number of species recorded during this study. Three species are absent in Ad Darb mangrove, *M. grandidieri*, *Tubuca urvillei* and *Eurycarcinus* sp. *Dotilla* sp. is found in both Ad Darb and Jazan mangroves. The mangrove of Ad Derb is smaller areawise and its structural complexity is lesser as *Rhizophora mucronata* density is lower. This might have contributed to less species number (7 species). *Uca vocans* (= *Gelasimus vocans*) and *U. lactea annulipes* (= *Austruca annulipes*) described from Madia Creek close to Jazan were not recorded from the present study sites (Eshky, 1992). Saifullah (1996) reported *M. messor, Ocypode saraten* and *M. telescopius* from Saudi Arabia mangroves; these species were also absent in the study sites.

The faunal composition of the mangroves of the present study varied from those of the mangrove brachyuran fauna reported from other parts of the Middle East and Africa. In Al Doha, Kuwait, the available mangroves brachyuran species are *Uca lactea* (*Austruca lactea*)*,* *Naxima* sp., *Manningis arabicum*, *Ilyoplax stevensi*, *Sesarma plicatum* (*Parasesarma plicatum*) and *Eurycarcinus orientalis* (Al-Nafisi, 2009) and Onadeko *et al*., (2015) reported three mangrove crabs from the University of Lagos Lagoon Coast, Akoka, Nigeria: *Uca tangeri* (*Afruca tangeri*), *Sesarma huzardi* (*Perisesarma huzardi*) and *Goniopsis pelii*.

The Margalef index (*d*) is the ratio of the number of species and their abundance and has a good discriminating ability, and a value below 2 denotes poor species richness (Margalef, 1958). In the present study, *d* values do not exceed 2 (Fig. 2 a & b); in the mangrove ecosystem at Gaibu Beach, Pernambuco State, Brazil, this value ranged between 2.1 and 3.6 (Negromonte *et al*., 2012). The presence of a high number of species in the sites under mangrove vegetation in Jazan is attributed to the *d* value that is above 1.5. Pielou's evenness index (*J′*) (Pielou, 1977) shows how evenly individuals in different species are distributed. The SMV and LSEMV of Ad Darb have higher evenness. Perfect evenness in any animal community is a rare phenomenon. This rarity was observed in the first site under mangrove vegetation of Ad Darb, where three species are almost evenly distributed (Table 1). The lowest *J′* value was recorded in Jazan, sites 2, where the numerical abundance of *P. segnis* is several times higher than those of the other two species (Table 1). Pielou's value above 0.5 is fair (Pielou, 1977), and this value is above 0.5 in all the sites. In the mangrove ecosystem at Gaibu Beach, Pernambuco State, Brazil, *J′* values are always above 0.88 (Negromonte *et al*., 2012). In the mangrove forest, Pondicherry coast, India, *J′* values were low (between 0.41 and 0.072). In the Pichavaram and Vellar mangroves, India, this value ranged between 0.64 and 0.75 (Khan *et al*., 2005). The Shannon–Wiener index (*H′*) was higher in both the sites under mangrove vegetation in Jazan (above 2) as these sites have most of the species. Low *H′* values were found in the lagoon sites of Ad Darb and Jazan (Fig. 2 a & b). Higher evenness results in higher diversity index value (*H′*) (Richardson, 2004). The results of the present study corroborate this finding as the lower evenness (*J′*) range of lagoons is coupled with a lower diversity range (*H′*) (Fig. 2 a & b). Both the Jazan SMV are clustered together at the ~83%

Red Sea. The taxonomic status of several species mentioned in those works has changed. In such cases, the current names are given in parenthesis along with those species names.

3. Results

Ten species from five families were collected during the survey: *Metopograpsus thukuhar* (Grapsidae), *Ashtoret* sp. (Matutidae), *Macrophthalmus depressus*, *M. grandidieri* (Macrophthalmidae), *Austruca albimana*, *Cranuca inversa*, *Tubuca urvillei* (Ocypodidae), *Eurycarcinus* sp. (Pilumnidae), *Portunus segnis* and *Thalamita* sp. (Portunidae). Most of the species are found in SMV (7 species) than in LSEMV (3 species) (Table 1). *Metopograpsus thukuhar*, *Macrophthalmus depressus*, *Austruca albimana* and *Cranuca inversa* are numerically abundant in the mangroves of Ad Darb and Jazan. *Macrophthalmus grandidieri*, *Tubuca urvillei* and *Eurycarcinus* sp. are found only in the mangrove vegetation sites of Jazan (Table 1). *Portunus segnis* and *Thalamita* sp. are more abundant in Jazan lagoons. One-way ANOVA results revealed statistically insignificant mean numerical abundance between different sites under mangrove vegetation and lagoon in Ad Darb and Jazan (Table 2). Margalef species richness (*D*) and Shannon–Wiener diversity index (H') are higher in SMV ($D = 0.74–1.6$); in LSEMV, this range is 0.57–0.83. The range of H' is 1.6–2.4 in SMV and 0.92–1.53 in LSEMV (Fig. 2 a & b). Evenness (J') is always above 0.9 in SMV (Fig. 2a) and highly varied in LSEMV (0.59–1) (Fig. 2b). Perfect evenness (J') 1, a rare occurrence is recorded on site 1 of Ad Darb lagoon habitat (Fig. 2b).

The cluster diagrams reveal that in Jazan both the sites under mangrove vegetation are clustered together at the ~85% similarity level and Ad Darb lagoon site 1 and Jazan lagoon site 2 at the ~78% similarity level. Other sites have not formed any groups; this trend is also supported by MDS ordination (Fig. 4 a & b). The MDS ordination (Fig. 4a) revealed that site 1 under mangrove vegetation, Ad Darb, is an outgroup. The lowest faunal dissimilarity (16.9) is recorded between sites 1 and 2 found under mangrove vegetation, Jazan, and the highest, 65.6, between the two lagoon sites Ad Darb site 2 and Jazan site 1; faunal dissimilarity is lesser between SMV (range 16.92–26.1%) than LSEMV (range 25.0-65.6%) (Table 3). Of the sites under mangrove vegetation, faunal dissimilarities between Ad Darb sites 1 and 2, Ad Darb site 1 and Jazan site 1, and Ad Darb site 1 and Jazan site 2 are very narrow (range 25.9-26.1%). In the lagoon sites *P. segnis* contributed more to faunal dissimilarities (range 62.3-91%) and *M. depressus* in sites under mangrove vegetation (range 36–52%) (Table 3).

4. Discussion

The method of obtaining abundance data of mangrove fauna involves excavating a volume of sand within a quadrat and subsequently sieving (Wells, 1983, 1984). However, this method is intrusive (disrupts crab assemblages) and is labour intensive (Ashton *et al*., 2003). One of the non-intrusive methods is visual counting, although it has several disadvantages. These include bias towards active, colourful, dull-coloured, and substrate-resembling species and difficulty in species identification. The visual census technique is followed to evaluate decapod fauna in reef systems (Giraldes, *et al*. 2012). In this survey, the non-intrusive, time-based sampling method proposed by Ashton (1999, 2003) was followed as this method incurs less damage or no damage to the mangrove system and is scientifically accepted (Ashton *et al*., 1999; 2003). Although accurate estimation of the numerical abundance is not possible with this method, an overall estimation is possible (Ashton *et al*., 1999; 2003). Altogether, ten *leachii* (*Serenella leachii*) (Por and Dor 1975; Hogarth and Tubbs 1986; Vine, 1986; Mandura *et al*., 1987).

Although there are checklists for the mangrove-associated brachyuran crabs of the Saudi coast of the Red Sea (Por and Dor 1975; Hogarth and Tubbs 1986; Vine, 1986; Mandura *et al*., 1987), diversity studies of this animal group are limited. The results of such studies are essential for formulating conservation policies as mangroves are getting destroyed worldwide, mainly by anthropogenic activities. Baseline diversity data are important to understand the health of a mangrove system and to assess the changes taking place in space and time. Therefore, the present investigation focuses on the diversity of the brachyuran fauna of two mangroves, Ad Darb and Jazan.

2. Material and Methods

Data sets were collected from Ad Darb and Jazan mangroves. From each place, two habitats were surveyed, one under mangrove vegetation and lagoon enclosed by mangrove vegetation (Fig. 1). Sites surveyed under mangrove vegetation are abbreviated as 'SMV' and the sites of lagoon enclosed by mangrove vegetation as 'LSEMV'. From each habitat, two sites are selected for the survey. Altogether there are eight sites: ADSMV-1 (Ad Darb site 1 under mangrove vegetation), ADSMV-2 (Ad Darb site 2 under mangrove vegetation), JSMV-1 (Jazan site 1 under mangrove vegetation), JSMV-2 (Jazan site 2 under mangrove vegetation), ADLSEMV-1 (Ad Darb lagoon site 1 enclosed by mangrove vegetation), ADLSEMV-2 (Ad Darb lagoon site 2 enclosed by mangrove vegetation), JLSEMV-1 (Jazan lagoon site 1 enclosed by mangrove vegetation), JLSEMV-2 (Jazan lagoon site 2 enclosed by mangrove vegetation). From each site, three samplings were made and the average values were tabulated and statistically treated. In all the statistical tests, SMV and LSEMV sites are treated separately as species number and composition totally varied between them.

Sites JSMV-1 & 2 have larger areas of mangroves compared to ADSMV sites with high structural complexity. Both the places *Rhizophora mucronata* was the dominant plant species. In Ad Derb and Jazan, LSEMV sites are muddy without vegetation. For sample collection, the time-based sampling method proposed by Ashton (1999, 2003) is followed with two modifications. Sampling was extended for 30 minutes instead of 15 minutes, and four persons surveyed a $100m^2$ area instead of one. In LSEMV, crabs were collected by hand nets and in SMV, crabs were hand-picked. The crabs were identified based on standard keys (Sakai, 1976). Significant deviations of the mean of the brachyuran abundance of different sites were found out using one-way ANOVA. Prior to the test, the data sets were subjected to Levene's test to find out the homogeneity of variance (IBM SPSS Statistics, 20).

Various diversity indices such as Margalef index (D) (Margalef, 1958), Pielou's evenness (J') (Pielou, 1977) and the Shannon–Wiener species diversity index (H') (Shannon and Wiener 1949) were calculated (Primer-6 software) for determining the mean abundance data of each site. Bray–Curtis similarity coefficient was computed based on non-normalized, square root transformed mean abundance data sets (Bray and Curtis, 1957). Based on the Bray–Curtis similarity matrix, multidimensional scale plots and hierarchical agglomerative cluster diagrams were made. SIMPER analysis was performed based on the Bray–Curtis similarity matrix to find out the faunal dissimilarity between sites and the species that contributed to such dissimilarity (Primer-6 software). Most of the mangrove-related works were carried out long back in the

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Diversity of the Brachyuran Crabs of the Mangroves of Southern Red Sea Coast of Saudi Arabia

Mohammad Abdulaziz Baakdah

Department of Marine Biology, Faculty of Marine Sciences, King Abdul Aziz University, Jeddah, Saudi Arabia

mbaakdah@kau.edu.sa

Abstract. Studies on the diversity of the mangrove-associated brachyuran crabs of the Red Sea coast of Saudi Arabia are limited. The diversity of the brachyuran crabs from two stations, Ad Darb (station 1) and Jazan (station 2), was studied in this work. Sites under mangrove vegetation and lagoons enclosed by mangrove vegetation were included in the study. Ten species from five families were collected during the survey: *Metopograpsus thukuhar* (Grapsidae), *Ashtoret* sp. (Matutidae), Macrophthalmus depressus, M. grandidieri (Macrophthalmidae), *Austruca albimana*, *Cranuca inversa*, *Tubuca urvillei* (Ocypodidae), *Eurycarcinus* sp. (Pilumnidae), *Portunus segnis* and *Thalamita* sp.(Portunidae). One-way ANOVA results show that there are no variations between sites over abundance. Sites under mangrove vegetation are species rich, and have higher values of Margalef species richness, Pielou's evenness and Shannon–Wiener diversity index. Multivariate analyses show similarities or dissimilarities between different sites due to the presence or absence of species and their abundance.

Keywords: Brachyuran crabs, diversity, mangroves, Jazan, Red Sea.

1. Introduction

Brachyuran crabs are important components in the food chain of mangroves and their burrows facilitate soil aeration (Khan *et al.*, 2005). The excreta and exoskeleton of crabs contain several nutrients: carbon, nitrogen, phosphorus and several trace metals (Kuraeuter, 1976). Litter turnover in mangroves is accelerated by brachyuran crabs (Robertson, 1986). Considering all these characters, Lee (1998) commented that brachyurans play an important role in the functioning of the ecosystem. In general, mangrove forests are dominated by two types of burrowing crabs, sesarmids and fiddler crabs (Kristensen, 2008). Ashton *et al*. (2003) tried to find out whether brachyuran communities can be used as indicators to determine the status of mangrove forests for conservation purpose. The 1700-km-long Red Sea coast of Saudi Arabia extends between Yemen and Jordan. Mangroves are discontinuously distributed along the entire coast of Saudi Arabia (Saifullah, 1996). Mangrove brachyuran crab species recorded from the Red Sea include: *Uca inversa inversa* (= *Cranuca inversa)*, *U. cranuca albimana* (= *Austruca albimana*), *U. urvillei* (= *Tubuca urvillei*), *Macrophthalmus depressus, M. graeffei*, *M. grandidieri*, *M. inversa, M. telescopicus*, *Dotilla sulcata*, *Metopograpsus messor*, *M. thukuhar*, *Sesarma guttatum* (= *Perisesarma guttatum*)*, Sarmatium crassum*, *Scylla serrata*, *Portunus segnis, Ocypode saratan* (= *Ocypode saraten*), *Paracleistosoma*