

A COMPARATIVE STUDY ON THE CATCH CHARACTERISTICS OF PURSE-SEINE OPERATING DURING THE DAYTIME IN ABU-QIR AND EL-MEX BAYS, ALEXANDRIA (EGYPT)

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ABSTRACT

The catch of the purse-seine (operating during the daytime), taken from Abu-Qir Bay and El-Mex Bay of Alexandria, Egypt during the period from June 2001 to May 2002, was analysed. Four categories of fishes in Abu-Qir Bay were identified: economic category (70%), low-valued species (23%), juveniles (6%) and the non-edible species (1%). In El-Mex Bay, the catch encountered only three groups: low-valued species (69%), economic species (17%), and juveniles (14%). Species composition of Abu-Qir Bay Batch showed the presence of 61 species. Sardine spp.: *Sardinella aurita*; *Sardina pilchardus*; *Herklotsichthys punctatus* were found to be the most abundant species in the catch (43%); this was followed by rabbit fish: *Siganus rivulatus* and *Siganus luridus* (23%); mullets: *Mugil cephalus*; *Liza ramada*; *Liza aurata* and sea bass: *Dicentrarchus labrax* and *Dicentrarchus punctatus* constituted about (6%) for each. In El-Mex Bay, species composition of the catch involved 27 species. Anchovy: *Engraulis encrasicolus* was found to be the most dominant one (64%); followed by sardine spp.: *S. aurita*; *S. pilchardus*; *Dussumieria acuta*; *Sardinella maderensis* (26%) while the atherinids: *Atherina boyeri* amounted to only (2%) of the catch. From the present study, it is obvious that the purse-seine operating in Abu-Qir Bay and El-Mex Bay during the daytime have been resulted in the destruction of the fishing ground of most important economic species by removal of small and juvenile fishes before attaining their first sexual maturity

INTRODUCTION

The purse-seine net plays an important role in the Egyptian Mediterranean Fisheries where it contributes a considerable part to the catch (33%) (Anonymous, 2001). Therefore, there is an urgent need to manage the fisheries of this fishing method to conserve the standing stocks of the pelagic fish populations. In the present study the catch of the daytime purse-seine was studied in both Abu-Qir Bay and El-Mex Bay to get a review on the fisheries of purse seine operating at both Bays. The aim of this study is to analyse the daytime purse-seine catch taken from Abu-Qir Bay and El-Mex Bay and

describe the species composition, size composition, recruits and juveniles of most dominant species. This will help in suggesting the necessary recommendations that may be needed for the management of this fishing method.

MATERIALS AND METHODS

I. Area of Investigation:

Abu-Qir Bay: The Bay lies between 30°5' to 30°22' E and 31°16' to 31°21' N on the Mediterranean Sea and situated between Rosetta Mouth of the Nile River and Abu-Qir City. The Bay has a depth of about 12m (Faltas and Akel, 2003) (Fig.1).

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El-Mex Bay: It represents a shallow, sheltered eutrophic marine habitat. The Bay lies also on the Mediterranean Sea between 29°50' E and 31°10' N. with varying depth

from 1.5 to 15m. The Bay receives drainage and domestic sewage water through El-Mex Pumping Station (Fig.1).

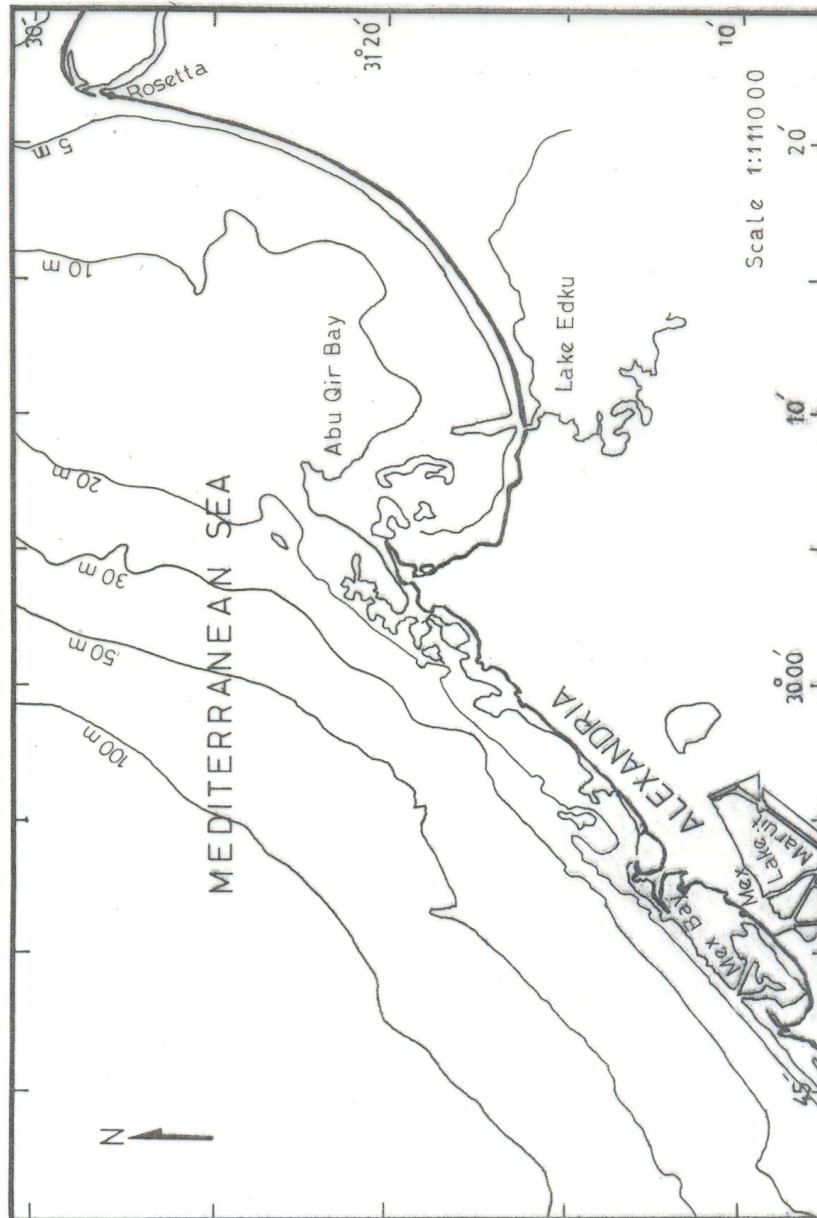


Fig. (1): A map showing Abu Qir Bay & El-Mex. Alexandria Egypt

II. Description Of The Fishing Gear used: Fig. (2 - after Faltas, 1983)

The purse-seine or the surrounding net is common in the Egyptian marine fisheries. ElHaweet (2001) gave a description of this method as follows: it consists of a long curtain with a bunt in the middle. Its upper edge is about 160m long with a buoy every 50cm and a lead line in the net bottom about 140m with weights every 30cm. A number of copper rings are attached along the lead line and through these rings passes the purse rope. The meshsize varies between 16 and 18mm. About 12-17 individuals are operating the net.

In the present study, only three daytime purse-seiners were noticed working in El-Mex Bay. Random fish samples were collected monthly from the catch of the daytime purse-seiners operating in Abu-Qir Bay and El-Mex Bay during the period from June 2001 to May 2002. It must be noted that in El-Mex Bay the fishing operations took place during three seasons only of the year (summer, autumn and winter). The collected samples were sorted, analysed and identified to species level according to Whitehead *et al.* (1986) and Fischer *et al.* (1987). Total lengths of all the individuals were measured and the corresponding total weight of each length was taken. The analyzed samples were pooled seasonally to give better view of the catch. Weight and number percentages were used as index of species and juveniles abundance respectively.

RESULTS

I. CATCH ANALYSIS

A. Catch Analysis in Abu-Qir Bay

Table (1), shows that the total catch can be divided into four categories; economic species (69.7%); low-valued species (23.3%); juveniles (5.9%) and the non-edible species (1.1%). For all the catch, the economic species acquired (75.6%) while the non-economic species attained only (24.5%).

Seasonally, the economic species and juveniles attained the maximum percentage

during autumn (89.4%) and they acquired the least percentage of the catch during winter (62.4%); while the vice versa was found for low-valued and non-edible spp. in autumn and winter (10.6% & 37.6% (respectively). Generally, the maximum percentage for both economic and non-economic species was found in summer (43.5%).

B. Catch Analysis in El-Mex Bay

Table (2), shows that three groups are distinguished; economic species (17%), juveniles (13.9%) and low-valued species (69%).

Seasonally, the economic group acquired the maximum percentage of the catch during summer (77.9%) and the least percentage was found in autumn (7.8%); while the opposite was detected for low-valued spp., in autumn (92.2%) and summer (22.1%). Generally, the maximum percentage of both economic and non-economic species was found in autumn (58.5%).

II. SPECIES COMPOSITION:

A. Abu-Qir Bay:

Table (3), shows that the economic species was represented by sardine spp. (33.8%) followed by rabbit fish (23.7%); mullet spp. and sea bass attained about (6%) for each of the total catch; scabbard fish: *Trichiurus lepturus* (2%); whereas scad fish: *Alepes djedaba* and spanish mackerel: *Scomberomorus commerson* acquired only (1%) for each of the total catch.

For the non-economic species, anchovy: *E. encrasicolus* acquired (15.6%) of the total catch followed by half beak: *Hyporamphus picarti* (3%); terapon perch: *Terapon puta* (2%).

Seasonally, sardine spp. acquired high percentage of the catch during summer and winter (59.2% and 23.99% respectively); rabbit fish got higher value of percentage during spring and autumn (35.1% and 64.7% respectively); mullet spp. attained (11.3% and 12.9%) in spring and winter respectively. Anchovy got higher percentage in the catch during winter and summer (28% and 18.3% respectively).

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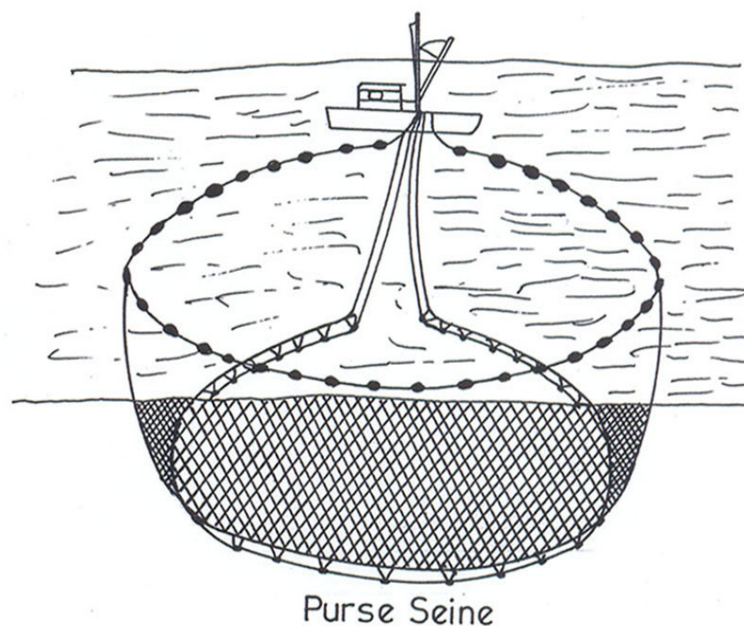


Fig. (2): A diagrammatic sketch of the purse seine net (After Fattas, 1983)

Table (1) : Catch composition from the daytime purse-seine in Abu-Qir Bay during 2001-2002

Season	Catch (kg.)						Total catch (kg.)	
	Economic species			Non-economic species				
	Economic spp.	Juveniles	Total	Low-valued spp.	Non-edible spp.	Total		
Summer	wt.	297.155	19.854	317.009	99.871	5.021	104.892	421.901
	%	(70.43)	(4.71)	(75.14)	(23.67)	(1.19)	(24.86)	(43.49)
Autumn	wt.	129.115	17.341	146.456	14.588	272.8	17.316	163.772
	%	(78.84)	(10.59)	(89.43)	(8.91)	(1.67)	(10.57)	(16.88)
Winter	wt.	150.94	10.228	161.168	95.622	1.501	97.123	258.291
	%	(58.44)	(3.96)	(62.4)	(37.02)	(0.58)	(37.60)	(26.62)
Spring	wt.	98.749	95.43	108.292	16.395	15.12	17.907	126.199
	%	(78.25)	(7.56)	(85.81)	(12.99)	(1.20)	(14.19)	(13.01)
Total catch	wt.	675.959	56.966	732.925	226.476	10.762	237.238	970.163
	%	(69.68)	(5.87)	(75.55)	(23.34)	(1.11)	(24.45)	

Table (2) - Catch composition from the daytime purse-seine in EL-Mex Bay during 2001-2002

Season	Catch (Kg.)						Total catch (Kg.)
	Economic species			Non-economic species			
	Economic spp.	Juveniles	Total	Low-valued spp.			
Summer	wt. 81.3 (29.02)	136.93 (48.88)	218.23 (77.91)	61.89 (22.09)			280.12 (17.41)
Autumn	wt. 66.48 (7.06)	6.59 (0.70)	73.07 (7.76)	868.35 (92.24)			941.42 (58.50)
Winter	wt. 125.92 (32.48)	80.5 (20.76)	206.42 (53.24)	181.33 (46.76)			387.75 (24.10)
Total catch	wt. 273.7 (17.01)	224.02 (13.92)	497.72 (30.93)	1111.57 (69.07)			1609.29 (1.75)

Table (3): Seasonal distribution of the most dominant species from the daytime purse-seine in Abu-Qir Bay during 2001-2002

Season	Catch (kg.)											Total catch (kg.)
	Economic species						Non-economic species					
	Sardine spp.	Rabbit spp.	Mullet spp.	Sea bass spp.	Scabbard sp.	Scad sp.	Spanish Mackerel	Anchovy sp.	Halfbeak sp.	Terapon perch		
Summer	wt. 249.8 (59.21)	40.959 (9.71)	3.1 (0.74)	-	-	2 (0.47)	7 (1.66)	77.272 (18.32)	21.925 (5.20)	-		421.901 (43.49)
Autumn	wt. 15.286 (9.33)	105.888 (64.66)	9.25 (5.65)	16.794 (10.26)	-	1.018 (0.62)	0.85 (0.52)	0.052 (0.03)	1.672 (1.02)	0.63 (0.39)		163.772 (16.88)
Winter	wt. 61.954 (23.99)	38.9 (15.06)	33.45 (12.95)	23 (8.91)	-	0.77 (0.30)	-	71.82 (27.81)	0.104 (0.04)	10.728 (4.15)		258.291 (26.62)
Spring	wt. 0.581 (0.46)	44.291 (35.10)	14.3 (11.33)	14 (11.09)	15.14 (11.99)	9 (7.13)	2.25 (1.78)	2.506 (1.99)	1.418 (1.12)	5.581 (4.42)		126.199 (13.01)
Total catch	wt. 32.762 (33.77)	230.038 (23.71)	60.1 (6.195)	53.794 (5.55)	15.14 (1.56)	12.788 (1.32)	10.1 (1.04)	151.65 (15.63)	25.119 (2.59)	16.939 (1.75)		970.163 (1.75)

From Table (4), it is clear that the total number of species recorded in Abu-Qir Bay was 61 including 37 economic species, 16 low-valued species and 8 non-edible species. A freshwater cichlid species (*Tilapia zillii*) was noticed in the catch due to the outflow of freshwater from Lake Edku and Tabia Pumping Station into the Bay.

B. El-Mex Bay:

From Table (5), the economic species was represented by sardine spp. (26.3%), while scad: *A. djedaba* contributed only about (2%). For the non-economic group: anchovy: *E. encrasicolus* represented the maximum percentage of the catch (63.7%) followed by atherinids: *A. boyeri* amounted about 2%.

Seasonally, sardine spp. (economic species) were having the maximum percentage in the catch during summer and winter (73% and 48.5% respectively) while anchovy (non-economic species) reached its maximum percentage in the catch during autumn and winter (89.2% and 46.8% respectively). Generally, the higher percentage of the catch (economic and non-economic species) was represented in autumn and winter (58.5% and 24.1% respectively).

From Table (6), it is evident that the total number of species recorded in El-Mex Bay was 27 including 13 economic species and 14 non-economic species. A freshwater species *Oreochromis aureus* was observed in the catch due to the input of the drainage from El-Mex Pumping Station into the Bay.

III. SIZE COMPOSITION:

A. Abu-Qir Bay:

The size composition of some species was presented in Table (7 - a & b):

1. *S. aurita*: varied between 8cm and 14cm with mean length 10cm. The majority of fishes (94%) had length ranged between 9cm and 11cm.
2. *H. punctatus*: varied between 7cm and 9 cm with mean length 7cm.
3. *S. rivulatus*: Its length varied between 3cm and 16cm with mean length of 10cm. Most fishes (63%) had length range between 8cm and 11cm.

4. *T. zillii*: ranged between 8cm and 14cm with mean length 11cm. The majority of fish (81%) had length ranged between 9cm and 12cm.

5. *D. sargus*: varied between 6cm and 10cm with mean length 8cm. Most fishes (89%) had length ranged between 7cm and 8cm.

6. *D. vulgaris*: measured between 2cm and 10cm with mean length 8cm. Most of fishes (64%) varied between 8cm and 9cm.

7. *E. encrasicolus*: ranged between 4cm and 9cm with mean length 7cm. The majority of fishes (97%) had length varied between 6cm and 8cm.

8. *H. picarti*: ranged between 7cm and 17cm with mean length 13cm. Most of fishes (81%) had length range between 13cm and 14cm.

9. *T. puta*: varied between 7cm and 12cm with mean length 10cm.

10. *G. niger*: ranged between 6cm and 12cm with mean length 8cm.

B. El-Mex Bay:

Concerning size composition of some dominant species, the data was shown in Table (8 - a & b).

1. *S. aurita*: measured between 4cm and 16cm with mean length 9cm. Most fishes (68%) had length ranged between 7cm and 9cm.

2. *S. pilchardus*: had length ranged between 8 cm and 10 cm with mean length 9 cm .

S. sphyraena: measured between 11cm and 15cm with mean length 13cm. Most of fishes (94%) ranged between 12cm and 14cm.

3. *L. mormyrus*: had length ranged between 3cm and 10cm with mean length 5cm.

4. *E. encrasicolus*: had length varied between 4cm and 9cm with mean length 7cm. The majority of fishes (85%) had length ranged between 6cm and 8cm.

5. *H. picarti*: measured between 12cm and 16cm with mean length 14cm. The majority of fishes (89%) measured between 14cm and 15cm.

6. *A. boyeri*: had length varied between 5cm and 11cm with mean length 9cm. The majority of fishes (89%) measured between 7cm and 10cm.

Table (4): Fish species composition of the daytime purse-seine in Abu-Qir Bay during 2001-2002

a. Economic species

<u>Pisces:</u>	<i>Euthynus alleteratus</i>
Family: Clupeidae	Family: Anguillidae
<i>Sardinella aurita</i>	<i>Anguilla anguilla</i>
<i>Sardina pilchardus</i>	Family: Sparidae*
<i>Herklotsichthys punctatus</i>	<i>Diplodus sargus</i>
Family: Siganidea	<i>Diplodus vulgaris</i>
<i>Siganus rivulatus</i>	<i>Crenidens crenidens</i>
<i>Siganus luridus</i>	<i>Pagellus acarne</i>
Family: Carangidae	<i>Boops boops</i>
<i>Caranx crysos</i>	<i>Lithognathus mormyrus</i>
<i>Alepes djedaba</i>	<i>Sparus aurata</i>
Family: Scombridae	Family Serranidae
<i>Scomberomorus commerson</i>	<i>Epinephelus alexandrinus</i>
Family: Mugilidae	Family: Cichlidae
<i>Liza aurata</i>	<i>Tilapia zillii</i>
<i>Liza ramada</i>	Family: Triglidae
<i>Mugil cephalus</i>	<i>Trigla lucerna</i>
Family: Moronidae	Family: Scianidae
<i>Dicentrarchus labrax</i>	<i>Umbrina cirrosa</i>
<i>Dicentrarchus punctatus</i>	<i>Argyrosomus regius</i>
Family: Trichiuridae	<u>Crustacea:</u>
<i>Trichiurus lepturus</i>	Family: Portunidae
Family: Sphyracidae	<i>Portunus pelagicus</i>
<i>Sphyracna sphyraena</i>	<i>Callinectes sapidus</i>
Family: Mullidae	Family: Penaeidae
<i>Mullus surmuletus</i>	<i>Peneus karathurus</i>
Family: Pomatomidae	<u>Cephalopoda:</u>
<i>Pomatomus saltator</i>	Family: Sepiidae
Family: Soleidae	<i>Sepia officianalis</i>
<i>Solea aegyptiaca</i>	Family: Octopodidae
Family: Thunnidae	<i>Octopus spp.</i>

b. Non-economic species

1. Low-valued species

Pisces:

Family: Engraulidae

Engraulis encrasicolus

Family: Hemiramphidae

Hyporamphus picarti

Family: Teraponidae

Terapon puta

Family: Atherinidae

Atherina boyeri

Atherina hepsetus

Family: Labridae*

Oxyrichthys novacula

Coris julis

Family: Belonidae

Belone belone

Family: Gobiidae*

Gobius niger

Gobius paganellus

Gobius cobitis

Oxyurichthys papuensis

Family: Monacanthidae

Stephanolepis hispidus

Family: Callionymidae

Callionymus filamentosus

Family: Centranchidae

Spicara smaris

Crustacea:

Family: Squilliidae

Oratosquilla massavensis

2. Non-edible species

Pisces:

Family: Triglidae

Lepidotrigla cavillone

Family: Leiognathidae

Leiognathus klunzingeri

Family: Apogonidae

Apogon taeniatus

Family: Labridae*

Symphodus tinca

Family: Blenniidae

Scartella cristata

Family: Syngnathidae

Hippocampus hippocampus

Crustacea:

Family: Portunidae

Carcinus aestuarii

Liocarcinus vernalis

Table (5) - Seasonal distribution of the most dominant species from the daytime purse-seine catch in El-Mex Bay during 2001-2002

Season	Catch (kg.)										Total catch (kg.)
	Economic species					Non-economic species (Low-valued species)					
	Sardine spp.	Mullet spp.	Barracuda sp.	Scad sp.	Spanish Mackerel	Anchovy sp.	Halfbeak sp.	Atherinids sp.			
wt.	204.560	1.000	13.640	-	-	3.950	-	3.700			280.120
Summer	%	(73.03)	(0.36)	(4.87)		(1.41)		(1.32)			(17.41)
wt.	30.800	1.000	-	22.500	0.300	839.950	12.900	28.200			941.420
Autumn	%	(3.27)	(0.11)		(2.39)	(0.03)	(89.22)	(1.37)			(58.50)
wt.	187.900	10.000	0.500	6.500	-	181.320	-	-			387.750
Winter	%	(48.46)	(2.58)	(0.13)	(1.68)	(46.76)					(24.10)
wt.	423.260	12.000	14.140	29.000	0.300	1025.220	12.900	31.900			1609.290
Total catch	%	(26.30)	(0.76)	(0.88)	(1.80)	(63.70)	(0.80)	(1.98)			

Table (6): Fish species composition of the daytime purse-seine in El-Mex Bay during 2001-2002

a. Economic species

Family: Clupeidae

Sardinella aurita

Sardinella maderensis

Sardina pilchardus

Family: Dussumiridae

Dussumieria acuta

Family: Mugilidae

Liza aurata

Liza ramada

Mugil cephalus

Family: Sphyraenidae

Sphyraena sphyraena

Family: Carangidae*

Alepes djedaba

Trachinotus ovatus

Family: Cichidae

Oreochromis aureus

Family: Thunnidae

Euthynnus alleteratus

Family: Sparidae*

Lithognathus mormyrus

Crenidens crenidens

Diplodus sargus

Oblada melanura

Diplodus annularis

Family: Scombridae

Scomber japonicus

Scomberomorus commerson

Family: Pomatomidae

Pomatomus saltator

Family: Scianidae

Umbrina cirrosa

Family: Siganiidae

Siganus rivulatus

b. Non-economic species

Family: Hemiramphidae

Hyporamphus picarti

Family: Belonidae

Tylosorus choram

Family: Engraulidae

Engraulis encrasicolus

Family: Atherinidae

Atherina boyeri

Family: Gobiidae

Gobius niger

Table (7-a) - Size composition of some dominant species from the daytime purse-seine catch in Abu-Qir Bay during 2001-2002

Length (cm)	Economic species												Non-economic species								
	<i>S. aurita</i>		<i>H. punctatus</i>		<i>S. rivulatus</i>		<i>T. zillii</i>		<i>D. sargus</i>		<i>D. vulgaris</i>		<i>E. encrasicolus</i>		<i>H. picarti</i>		<i>T. puta</i>		<i>G. niger</i>		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
2																					
3	3	1.43	47	59.49	14	0.44	1	1.89													
4	72	34.29	30	37.97	27	0.84	2	3.77													
5	103	49.05	2	25.32	48	1.50	1	1.89													
6					102	3.18															
7					215	6.70															
8	3	1.43	30	37.97	513	15.99	134	52.96													
9	72	34.29	2	25.32	536	16.70	12	22.64													
10	103	49.05			520	16.20	15	25.86													
11	23	10.95			453	14.20	3	5.17													
12	5	2.38			155	4.83	17	29.31													
13	3	1.43			255	7.85	8	13.79													
14	1	0.48			163	5.08	1	1.72													
15					206	6.42															
16					5	0.16															
17																					
Total number	210		79		3209		253		53		664		134		70		74				
Mean length		9.85 ± 0.88		7.4 ± 0.54		10.04 ± 2.51		10.85 ± 1.55		7.57 ± 0.69		7.55 ± 2.283		7.03 ± 0.80		13.36 ± 1.24		9.5 ± 1.11			7.86 ± 1.51

Table (7-b) - Size composition of some dominant species from the day time purse-peine catch in Abu Qir Bay during 2001-2002

Species	<i>S. aurita</i>	<i>H. punctatus</i>	<i>S. rivulatus</i>	<i>T. zillii</i>	<i>D. sargus</i>	<i>D. vulgaris</i>	<i>E. encrasicolus</i>	<i>H. picarti</i>	<i>T. puta</i>	<i>G. niger</i>
Length range (cm)	8-14	7-9	3-16	8-14	6-10	2-10	4-9	7-17	7-12	6-12
Mean length (cm)	9.85 ± 0.88	7.4 ± 0.54	10.04 ± 0.54	10.85 ± 1.55	7.57 ± 0.69	7.55 ± 2.28	7.03 ± 0.80	13.36 ± 1.24	9.5 ± 1.11	7.86 ± 1.51
Dominant length range (cm)	9-11	-	8-11	9-12	7-8	8-9	6-8	13-14	-	-
Percentage of dominant % length range	94%	-	63%	81%	89%	64%	97%	0.81	-	-

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Table (8-a) - Size composition of some dominant species from the daytime purse-seine catch in El-Mex Bay during 2001-2002

Length (cm)	Economic species						Non-economic species							
	<i>S. aurita</i>		<i>S. pilchardus</i>		<i>S. sphyraena</i>		<i>L. mormyrus</i>		<i>E. encrasicolus</i>		<i>H. picarti</i>		<i>A. boyeri</i>	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
3														
4	3	0.30					9	25.00	30	1.74			2	0.80
5							5	13.89	142	8.25			6	2.40
6	19	1.70					5	13.89	303	17.60			52	20.72
7	141	12.70					1	2.78	1039	60.34			48	19.12
8	454	41.01	8	47.06			4	11.11	134	7.78			24	9.60
9	158	14.30	4	23.53			3	8.30	74	4.30			99	39.44
10	70	6.30	5	29.41									20	7.97
11	36	3.25			5	5.10								
12	56	5.06			33	33.67							1	1.11
13	95	8.60			47	47.96							6	6.66
14	51	4.61			12	12.25							52	57.78
15	21	1.89			1	1.02							28	31.11
16	3	0.30											3	3.33
Total number	1107		17		98		36		1722		90		251	
Mean length		9.26 ± 2.25		8.82 ± 0.88		12.99 ± 0.78		5.33 ± 2.35		6.77 ± 0.92		14.29 ± 0.69		8.85 ± 1.43

Table (8-b) - Size composition of some dominant species from the day time purse-peine catch in El-Mes Bay during 2001-2002

Species	<i>S. aurita</i>	<i>S. pilchardus</i>	<i>S. sphyraena</i>	<i>L. mormyrus</i>	<i>E. encrasicolus</i>	<i>H. picarti</i>	<i>A. boyeri</i>
Length range (cm)	4-6	8-10	11-15	3-10	4-9	12-16	5-11
Mean length (cm)	9.26 ± 2.25	8.82 ± 0.88	12.99 ± 0.78	5.33 ± 2.35	6.77 ± 0.92	14.29 ± 0.69	8.85 ± 1.43
Dominant length range (cm)	7-9	-	12-14	-	6-8	14-15	7-10
Percentage of dominant % length range	68%	-	94%	-	85%	89%	89%

IV. FRY AND JUVENILES ABUNDANCE:

A. Abu-Qir Bay:

The seasonal abundance of fry and juveniles of some fishes are given in Table (9).

It was found that fry and juveniles of two species namely: *S. aurita* and *S. rivulatus* were found during the whole year, while fry and juveniles of three species namely: *H. punctatus*, *T. puta* and *C. crenidens* were recorded in three seasons from autumn to spring for the first two species and from winter to summer for the third one.

Fry and juveniles for about 8 species namely: *S. luridus*, *M. surmuletus*, *D. vulgaris*, *B. boops*, *D. annularis*, *L. mormyrus*, *A. djedaba* and *C. filamentosus* were recorded in two different seasons.

Fry and juveniles for about 12 species namely: *D. sargus*, *P. acarne*, *S. aegyptiaca*,

P. saltator, *S. officianalis*, *S. pilchardus*, *D. punctatus*, *U. cirrosa*, *E. alexandrinus*, *S. fluxuosa*, *Octopus* spp. and *S. smarís* were observed in one season only.

B. El-Mex Bay:

The seasonal abundance of fry and juveniles of some fishes are given in Table (10).

Fry and juveniles for one species (*S. aurita*) were recorded during the whole period of the three seasons.

Fry and juveniles for 2 species namely: *L. mormyrus* and *O. melanura* were observed during two seasons (summer and autumn respectively).

Fry and juveniles for 7 species namely: *D. sargus*, *S. pilchardus*, *S. commerson*, *S. rivulatus*, *S. maderensis*, *D. annularis* and *P. saltator* were recorded in one season only.

Table (9) - Seasonal abundance (Number percentage) of important fish juveniles from daytime purse-seine catch in Abu-Qir Bay during 2001-2002 (length range between parenthesis)

Species	Number percentage							
	Summer		Autumn		Winter		Spring	
A. Whole year								
<i>S. aurita</i>	47.90	(8-9)	0.70	(10)	43.70	(9-10)	7.80	(9-10)
<i>S. rivulatus</i>	28.30	(3-11)	35.70	(3-11)	21.50	(5-11)	14.50	(5-11)
B. Three seasons								
<i>H. punctatus</i>			2.40	(9)	92.70	(7-8)	4.90	(7-9)
<i>T. puta</i>			6.70	(10-11)	17.80	(7-11)	75.60	(9-10)
<i>C. crenidens</i>	40.00	(6-7)			20.00	(5)	60.00	(6-10)
C. Two seasons								
<i>S. luridus</i>	75.00	(10-11)			25.00	(7)		
<i>M. surmuletus</i>	77.80	(6-10)					22.20	(8)
<i>D. vulgaris</i>	4.00	(7-8)					96.00	(2-10)
<i>B. boops</i>	60.00	(11-12)	40.00	(10)				
<i>D. annularis</i>	85.70	(7-8)					14.30	(4)
<i>L. mormyrus</i>			50.00	(11)			50.00	(10)
<i>A. djedaba</i>			66.70	(9-11)	33.00	(10)		
<i>C. filamentosus</i>					66.70	(4-6)	33.30	(6)
D. One season								
<i>D. sargus</i>	100.00	(6-9)						
<i>P. acarne</i>	100.00	(11)						
<i>S. aegyptiaca</i>	100.00	(6)						
<i>P. saltator</i>	100.00	(3-5)						
<i>S. officianalis</i>	100.00	(3)						
<i>S. pilchardus</i>			100.00	(9)				
<i>D. punctatus</i>			100.00	(11-12)				
<i>U. cirrosa</i>			100.00	(13-14)				
<i>E. alexandrinus</i>			100.00	(11)				
<i>S. fluxuosa</i>			100.00	(8)				
<i>O. spp.</i>			100.00	(4)				
<i>S. smarís</i>							100.00	(6)

DISCUSSION

The day time purse-seine catch of the present study in Abu Qir Bay comprised mainly the *Family: Clupeidae* (43%) ; *Siganidae* (24%) ; *Engraulidae* (16%) and *Mugilidae* (6%) .This finding is more or less in agreement with that of El-Haweet (2001) in Abu Qir Bay who stated that *Family Clupeidae* represented 47% of the catch followed by *Engraulidae* 21% ; *Mugilidae* 13% and *Siganidae* 11% while Wassef *et al* (1985) reported *Clupeidae* and related pelagic species as the dominant constituents of the purse seine catch using light operating off Alexandria .El-Sayes (1992) also mentioned that the night catch was dominated by *Clupeidae* (51%) . Comparing the results obtained from Abu Qir and El-Mex Bays , it can be detected that *Family Clupeidae* was the most dominant in Abu Qir Bay (34%) while *Family Engraulidae* acquired the higher percentage of abundance in El-Mex Bay (64 %) , more over , *Family Siganidae* came second in abundance in Abu Qir Bay (24%) ,but it is found to have insignificant percentage in El-Mex Bay ,hence , the higher percentage of *Siganidae* in Abu Qir Bay characterized by presence of vegetation may be attributed to that this fish feed mainly on plant origin food such as green , brown and red algae as well as diatoms Abd El-Kader *et al* (2000)

In the present study , species numbered 61 spp. (37 families) in Abu Qir Bay and 27 spp.(16 families) in El-Mex Bay ,while El-Haweet (2001) mentioned only 37 spp. in Abu Qir Bay . The species richness of Abu Qir Bay may be due to that the Bay lies among highly fertile habitats in Egypt Samaan & Michael (1990) . Further more, El-Komi & Beltagy (1997) recorded that the bottom fauna and flora were more dense in Abu Qir Bay which receives agricultural and industrial discharges through Tabia Pumping Station .Shulman (1984) , Behrents (1987) and Koppel (1988) showed the importance of

shelter and vegetation that give favourable conditions for recruits and survival of juveniles .

Generally, the present study is in agreement with the finding given by El-Haweet (2001) for the same gear operated in Abu Qir Bay where the catch is characterized by fishes of small size groups namely : juveniles and maturing fishes , so it is recommended to manage the fishing operations of this gear (day time purse seine) in the inshore zone especially during the spawning season as well as nursery grounds of the most economic species to protect their stocks.

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