Egyptian Journal of Aquatic Biology and Fisheries
Zoology Department, Faculty of Science,
Ain Shams University, Cairo, Egypt.
ISSN 1110 – 6131
Vol. 29(6): 1 – 16 (2025)
www.ejabf.journals.ekb.eg

Assessment of Noncommercial Catch Caught by the Beach Seine Operating in the Southern Mediterranean Sea off Port Said, Egypt

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ARTICLE INFO
Article History:
Received: Aug. 9, 2025
Accepted: Oct. 24, 2025
Online: Nov. 3, 2025

Keywords:
Beach Seine,
Noncommercial catch,
Biodiversity,
Commercial species,
Port Said,
Mediterranean Sea,
Egypt

ABSTRACT

Beach seine is one of the most common fishing gears along the southern Mediterranean Sea off Port Said, Egypt. The low selectivity of this method leads to catching a high percentage of commercial juvenile fish, invertebrates and some endangered species. This study investigates the species composition and its quantity and highlights the impact of using this method along the southern coast of the Mediterranean Sea off Port Said, Egypt. In total, more than 6 tons of noncommercial were studied from 2018 to 2021 with some closing periods. About 60 hauls from beach seine were examined and more than 118,790 individuals were sorted belonging to 47 families and one class. This investigation identified 67 taxa including fish, in addition to the macroinvertebrate and other species. The economic and non-economic species represented 43 and 24 species, respectively. The economic juvenile species represented 64% of the noncommercial catch that made an alarm about the beach seine, an unsustainable marine fishing gear in the southern coast of the Mediterranean Sea off Port Said, Egypt. The current study is the first of its kind to cover such an extended period off Port Said and to document the amount of noncommercial catch obtained by that method. Consequently, urgent intervention and regulatory measures are essential to mitigate harmful practices along the Egyptian coasts.

INTRODUCTION

The Mediterranean Sea, renowned for its exceptional biodiversity, harbors a significant concentration of marine species within the upper 50 meters of the water column. However, only a small fraction (9%) of the total species diversity resides below 1000 meters depth **(Tudela & Sacchi, 2003; Danovaro *et al.*, 2010)**.

A substantial portion of Mediterranean fisheries activities takes place on the continental shelf. Data on fish catches are primarily sourced from fishery authorities and statistical administrations of individual countries, often relying on records of landings from fish auctions or other trading channels **(Tudela & Sacchi, 2003; Kelleher, 2005, Garibaldi, 2012; Gillett & Tauati, 2018)**.

Nevertheless, the reported landings significantly underestimate the true total catch for several reasons. A considerable amount of fish is directly sold for local consumption, and the statistical infrastructure in countless countries is insufficient to capture the full extent of fishing activities. Moreover, a substantial portion of the catch, known as non-commercial catch, is discarded at sea **(FAO, 2020)**. Consequently, the actual amount of fish extracted from marine resources is considerably higher than official landing statistics suggestion **(Watson, 2017)**.

Discarding practices in Mediterranean fisheries are affected by several factors such as capture of non-commercial species due to the limited selectivity of fishing gear, resulting in non-commercial that may be discarded if there are no suitable markets. Another factor is the lack of adequate storage or cooling facilities, particularly for small-scale fisheries targeting specific species. This can lead to the discarding of low-value non-commercial catch when caught in excessive quantities **(Tsagarakis *et al.*, 2013)**.

The existing legislation in some countries, such as minimum landing size regulations aimed at protecting juvenile fish can inadvertently contribute to discarding. While these regulations are intended to safeguard fish populations, they may lead to an increase in discards of undersized individuals, unless there are established markets for such fish, as is common in some Mediterranean countries **(McIlwain, 2015)**.

The current study aims to assess the noncommercial catch caught by unmanaged beach seine operating in the Southern Mediterranean Sea off Port Said and the quantification of beach seine fisheries, including noncommercial catch species, beside the study of sizes and weights of the noncommercial catch fish that was conducted to assess the impact of the fishing activities on the population structure of non-target species.

MATERIALS AND METHODS

1. Area of study

Port Said, located in the northeastern region of Egypt (Fig. 1), is bordered by the eastern portion of Lake Manzala to its west, the Suez Canal to its east and the Mediterranean Sea to its north **(Seif *et al.*, 2022)**. The sampling site is on the Egyptian Mediterranean coast near the entrance of the Suez Canal and Boughaz El-Gamil.

The beach seine catch was obtained at depths ranging from 1 to 10 meters using beach seine netting which was a widely employed fishing technique in the Port Said area for year-round capture of various valuable fish species **(Kassem *et al.*, 2025)**. After the fishing operation, the catch was classified into two categories: Commercial catch and non-commercial catch **(Kassem *et al.*, 2023)**.

Fig. 1. Sampling site from the Mediterranean Sea, Egypt (Location of Port Said coast)

2. Fishing operation and data collection

Sampling from noncommercial catch of beach seine fishing methods was seasonally conducted throughout the period from 2018 to 2021, with some closing period during the COVID-19 pandemic (2020), restrictions on fishing permits, biological blooms of certain marine species, unfavorable weather conditions, a shift to alternative fishing methods, declining catch rates, and a lack of assistance for fishing operations (Fig. 2). Subsamples of non-commercial catch collected during fieldwork preliminary data, such as total weight or number of containers, were estimated for the total quantity. However, a representative sample weighing 1-3 kilograms was taken from each species of the non-commercial catch for subsequent thorough analysis.

Fig. 2. Beach seine fishing method

Representative samples of specimens were transported to the laboratory for species identification, and sorting (Fig. 3) using the relevant taxonomic key **(Svetovidov *et al.*, 1984; Bariche, 2012; Akel & Philips, 2014)**. Finally, the morphometric measurements

obtained included maximum and minimum total lengths (cm) and weight (g) of each species. Concurrently, species were categorized by their economic value, which was calculated from the market price of the landed catch and local consumer demand in Port Said. This approach may vary across different countries.

Fig. 3. Sorting and identifying of the non-commercial catch samples

RESULTS

1. Economic and non-economic species from the non-commercial catch caught by the beach seine netting

During the study period, approximately 6 tonnes of non-commercial catch were randomly sampled represented four seasons. All samples were identified and processed in the laboratory. A total of over 118,790 marine organisms were analyzed. The study showed the economic species of non-commercial catch from beach seine nets comprised almost 64% of the total non-commercial catch, whereas the non-economic species represented only 36 % during the study period (**Error! Reference source not found.**).

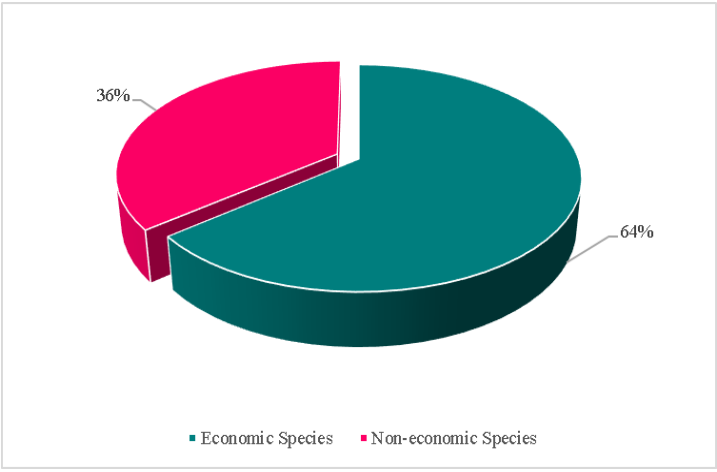

Fig. 4. Economic and non-economic species in the non-commercial catch from beach seine netting during the sampling period off Port Said

The study demonstrated that the non-commercial catch species collected from the study area comprised of fish and macroinvertebrate species belonging to 39 families. In total the investigation identified 67 marine species belonging to 47 families and one class including fish, in addition to macroinvertebrate and other species. It was found that these families might contain some economic or non-economic species. Approximately 43 economic species belonging to 28 families were observed, while only 24 of the non-economic species belong to 22 families (**Error! Reference source not found.**).

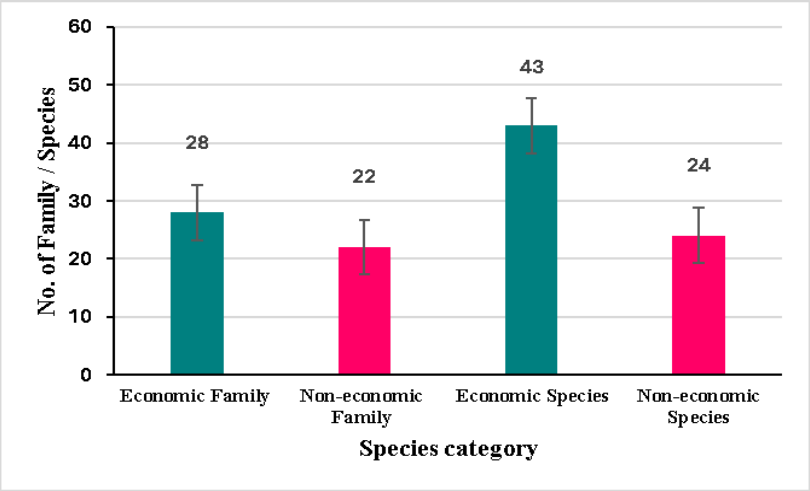

Fig. 5. The economic and non-economic family & species number caught as non-commercial during the sampling period off Port Said

2. Noncommercial catch composition of the beach seine netting

The survey conducted at Port Said documented a high diversity in non-commercial catch more than in commercial catch with 47 families and one class containing an average of 67 marine species (Table 1). Observations revealed the following data: Algae and plants represented by 4 groups (5 species), 4 Isopods species belonging to Idoteidae and Cymothoidae families and the last harmful species belonging to the Bolinopsidae and Rhizostomatidae families (These species are not attached to Table (1)).

Table (1) illustrates the different species by family and their abundance. In addition, eight families and one class were observed in very small quantities, including Echeneidae (*Remora* sp.), Alpheidae (*Alpheus* sp.), Idoteidae (*Idotea* sp.), Cymothoidae (Sp.1, Sp.2, and Sp.3), Ulvaceae (*Ulva* sp.), Rhodomelaceae (*Polysiphonia* sp.), and the class Phaeophyceae (two species of brown algae), as well as Bolinopsidae (*Mnemiopsis* sp.) and Rhizostomatidae (*Rhopilema nomadica*). They were observed in extremely large quantities during the study period and were disposed on the beach late in the fishing operation. Therefore, the total number of species observed during the non-commercial fishing study is 41 fish species (belonged to 29 families), 13 Crustaceans species (belonged to 7 families), 3 Molluscs species (belonged to 3 families) and the remaining recorded specimens belong to eight families and one class.

Table 1. Species composition of noncommercial by beach seine from Port Said, Egypt

No.	Family	Species	Abundance (%)	No.	Family	Species	Abundance (%)
Fish species ranked by economic value (highest to lowest)							
1	Sciaenidae	*Argyrosomus regius, Umbrina cirrosa*	2.672	15	Leiognathidae	*Equulites klunzingeri*	0.204
2	Moronidae	*Dicentrarchus labrax*	0.024	16	Sphyraenidae	*Sphyraena chrysotaenia*	0.035
3	Mugilidae	*Liza aurata*	0.024	17	Trichiuridae	*Trichiurus lepturus*	0.066
4	Sparidae	*Diplodus sargus, Diplodus annularis, Sarpa salpa*	0.035	18	Terapontidae	*Terapon puta*	0.173
5	Soleidae	*Solea aegyptiaca*	1.462	19	Tetraodontidae	*Lagocephalus spadiceus*	0.128
6	Mullidae	*Upeneus vittatus, Parupeneus forsskali*	0.017	20	Poeciliidae	*Poecilia latipinna*	0.021
7	Carangidae	*Alectis alexandrinus, Caranx crysos, Alepes djedaba, Trachinotus ovatus*	0.097	21	Gobiidae	*Gabius cobitis, Oxyurichthys papuensis, Trypauchen vagina*	0.854
8	Engraulidae	*Engraulis encrasicolus*	73.622	22	Atherinidae	*Atherinomorus forskalii*	0.010
9	Spratelloididae	*Spratelloides delicatulus*	0.028	23	Congridae	*Conger conger*	0.007
10	Dorosomatidae	*Herklotsichthys punctatus, Sardinella aurita, Sardinella maderensis*	7.842	24	Gerreidae	*Gerres oyena*	0.038
11	Dussumieriidae	*Dussumieria elopsoides, Etrumeus sadina*	0.252	25	Trachinidae	*Echiichthys vipera*	0.003
12	Hemiramphidae	*Hemiramphus archipelagic*	2.230	26	Triglidae	*Eutrigla gurnardus*	0.003
13	Alosidae	*Sardina pilchardus*	0.180	27	Pempheridae	*Pempheris vanicolensis*	0.003
14	Siganidae	*Siganus rivulatus*	0.021	28	Cichlidae	*Oreochromis aureus*	0.038

Cont. Table 1. Species composition of caught (noncommercial) by beach seine from Port Said, Egypt

No.	Family	Species	Abundance (%)	No.	Family	Species	Abundance (%)
Crustacean species ranked by economic value (highest to lowest)							
29	Penaeidae	*Metapenaeus monoceros, Metapenaeus stebbingi, Penaeus japonicus, Xiphopenaeus kroyeri*	2.959	32	Squillidae	*Erugosquilla massavensis*	0.028
30	Portunidae	*Portunus pelagicus, Charybdis japonica, Portumnus latipes*	0.999	33	Palaemonidae	*Palaemon elegans Palaemon adspersus*	0.156
31	Polybiidae	*Polybius vernalis*	1.589	34	Eriphiidae	*Eriphia verrucosa*	0.014
Molluscs species ranked by economic value (highest to lowest)							
35	Donacidae	*Donax trunculus*	3.844	37	Arcidae	*Anadara natalensis*	0.031
36	Mactridae	*Mactra corallina*	0.301				
Other							
38	Nereididae	Polychaeta sp.	0.003	39	Pontederiaceae	*Eichhornia crassipes*	0.003

A total of 26 fish families were identified during the study period, accounting for 90.08% of the total catch. Engraulidae was the most abundant fish family, representing 73.62% of the total high-value economic species. The bivalve families were dominant by about 4.18%. The remaining family's species were caught irregularly and in low quantities.

3. Seasonal variations and size composition for the most abundant and economic non-commercial species

The analysis of non-commercial catch from beach seine netting in Port Said revealed distinct seasonal variations. The majority of the non-commercial catch consisted of two categories: High-value economic species that were already lost and low-value economic species. Focusing on the seasonal patterns of future economic species, the seasonal variations were observed for the most abundant and economic noncommercial species. The economic value may vary from country to country or from governorate to governorate (Tables 2, 3).

According to data depicted in Tables (2, 3), it is observed that most of the marine organisms caught were very small in size, which indicates the extent of the catastrophe caused by this type of fishing net.

Table 2. Seasonal fluctuation (%) of the economic species in noncommercial caught by beach seine

Family	Species	Common name	Seasonal abundance fluctuation (%)							
			Spring		Summer		Autumn		Winter	
			No.	%	No.	%	No.	%	No.	%
Carangidae	*Alectis alexandrinus*	African threadfish			1	0.003				
	Caranx crysos	Blue runner			22	0.076				
	Alepes djedaba	Shrimp scad			2	0.007				
	Trachinotus ovatus	Pompano	1	0.003	2	0.007				
Cichlidae	*Oreochromis aureus*	Blue tilapia					1	0.003	10	0.035
Dorosomatidae	*Herklotsichthys punctatus*	Spotted herring	353	1.220	366	1.265	816	2.821	28	0.097
	Sardinella aurita	Round sardinella	22	0.076	123	0.425	331	1.144	3	0.010
	Sardinella maderensis	Madeiran sardinella	6	0.021	28	0.097	103	0.356	90	0.311
Alosidae	*Sardina pilchardus*	European pilchard	32	0.111					20	0.069
Spratelloididae	*Spratelloides delicatulus*	Delicate round herring			4	0.014				
Donacidae	*Donax trunculus*	Wedge Clam	1112	3.844						
Dussumieriidae	*Dussumieria elopsoides*	Slender rainbow sardine	1	0.003	1	0.003	67	0.232		
	Etrumeus sadina	Etrumeus teres	1	0.003	1	0.003			2	0.007
Engraulidae	*Engraulis encrasicolus*	European anchovy	9448	32.659	7564	26.147	2687	9.288	1599	5.527
Eriphiidae	*Eriphia verrucosa*	Yellow round crab	2	0.007					2	0.007
Gerreidae	*Gerres oyena*	Gerres oyena							11	0.038
Hemiramphidae	*Hemiramphus archipelagcus*	Jumping halfbeak	24	0.083	148	0.512	272	0.940	201	0.695
Gobiidae	*Gabius cobitis*	Giant goby	2	0.007	1	0.003	238	0.823		
	Oxyurichthys papuensis	Frogface goby							1	0.003
	Trypauchen vagina	Burrowing goby	3	0.010					2	0.007
Leiognathidae	*Equulites klunzingeri*	Klunzinger's ponyfish			59	0.204				
Mactridae	*Mactra corallina*	Rayed trough shell	35	0.121	12	0.045	2	0.007	37	0.128

Cont. Table 2. Seasonal fluctuation (%) of the economic species in noncommercial caught by beach seine

Family	Species	Common name	Seasonal abundance fluctuation (%)							
			Spring		Summer		Autumn		Winter	
			No.	%	No.	%	No.	%	No.	%
Moronidae	*Dicentrarchus labrax*	European seabass			7	0.024				
Mugilidae	*Liza aurata*	Golden grey mullet	1	0.003	6	0.021				
Mullidae	*Upeneus vittatus*	Yellowstriped goatfish	2	0.007						
	Parupeneus forsskali	Red Sea goatfish	1	0.003	2	0.007				
Penaeidae	*Metapenaeus monoceros*	Speckled shrimp	11	0.038	3	0.010	7	0.024		
	Metapenaeus stebbingi	peregrine shrimp	4	0.014			90	0.311	55	0.190
	Penaeus japonicus	Kuruma prawn							2	0.007
	Xiphopenaeus kroyeri	Atlantic seabob	34	0.118	77	0.266	208	0.719	365	1.262
Portunidae	*Charybdis japonica*	lady crab							121	0.418
	Portunus pelagicus	Blue swimming crab	66	0.228	2	0.007	35	0.121	58	0.200
Sciaenidae	*Argyrosomus regius*	Meagre	533	1.842	5	0.017			234	0.809
	Umbrina cirrosa	Shi drum	1	0.003						
Siganidae	*Siganus rivulatus*	Marbled Spinefoot			4	0.014	1	0.003	1	0.003
Soleidae	*Solea aegyptiaca*	Common sole	331	1.144	3	0.010	40	0.138	49	0.169
Sparidae	*Diplodus sargus*	White seabream	6	0.021						
	Diplodus annularis	Annular seabream			3	0.010				
	Sarpa salpa	Salema	1	0.003						
Sphyraenidae	*Sphyraena chrysotaenia*	Yellowstripe barracuda					10	0.035		
Squillidae	*Erugosquilla massavensis*	Red Sea mantis shrimp	4	0.014			4	0.014		
Terapontidae	*Terapon puta*	Small scaled terapon	13	0.045	2	0.007	17	0.059	18	0.062
Trichiuridae	*Trichiurus lepturus*	Largehead hairtail					19	0.066		

Table 3. Size composition of the economic species in the noncommercial catch by beach seine

Species	Size composition of the economic species							
	Spring		Summer		Autumn		Winter	
	L. R. (cm)	Wt. R. (g)	L. R. (cm)	Wt. R. (g)	L. R. (cm)	Wt. R. (g)	L. R. (cm)	Wt. R. (g)
Alectis alexandrinus			9.18	12.87				
Caranx crysos			5.8 - 12.0	2.6 - 16.6				
Alepes djedaba			4.66 - 9.42	0.93 - 8.31				
Trachinotus ovatus	10.24	10.26	4.46 - 5.93	0.73 - 1.95				
Oreochromis aureus					6.55	4.09	4.56 - 16.80	1.09 - 10.49
Dussumieria elopsoides	11.79	11.37	10.53	7.58	8.37 -9.14	4.27 - 10.82		
Herklotsichthys punctatus	5.94 - 7.23	1.91 - 3.91	4.89 - 11.88	0.99 - 14.65	5.62 - 8.55	1.37 - 5.60	5.60 - 8.49	1.36 - 4.86
Sardina pilchardus	4.36 - 6.56	0.63 - 1.77					1.69 - 8.17	0.04 - 4.48
Sardinella aurita	4.45 - 9.15	0.50 - 6.33	5.51 - 12.21	1.24 - 16.54	3.39 - 10.48	0.23 - 8.59	5.49 - 7.04	1.06 - 2.39
Sardinella maderensis	7.05 - 13.50	2.39 - 18.60	3.20 - 11.00	0.27 - 10.30	3.72 - 10.69	0.29 - 10.60	5.44 - 8.07	0.29 - 10.60
Spratelloides delicatulus			5.76 - 10.64	0.88 - 8.23				
Donax trunculus	1.28 - 2.99	0.12 - 2.90						
Etrumeus sadina	3.77	0.25	10.90	9.13			3.84 - 4.90	0.40 - 0.70
Engraulis encrasicolus	1.96 - 9.44	0.04 - 5.22	2.16 - 9.55	0.08 - 4.31	2.55 - 8.20	0.06 - 3.07	4.29 - 10.11	0.41 - 7.21
Eriphia verrucosa	1.16 - 8.20	0.57 - 96.95					1.12 - 9.29	0.61 - 100.26
Gerres oyena							3.06 - 6.20	0.26 - 2.66
Gabius cobitis	3.65 - 4.39	0.41 - 0.81	2.39	6.59	2.39 - 9.97	6.06 - 11.25		
Oxyurichthys papuensis							6.49	1.57
Trypauchen vagina	14.85 - 15.41	13.16 - 13.47						13.38 - 13.43
Hemiramphus archipelagcus	12.87 - 15.02	4.51 - 7.07	1.41 - 14.75	0.82 - 6.53	4.31 - 14.75	0.9 - 8.51		9.89 - 15.60

Cont. Table 3. Size composition of the economic species in by-catch

Species	Size composition of the economic species							
	Spring		Summer		Autumn		Winter	
	L. R. (cm)	Wt. R. (g)	L. R. (cm)	Wt. R. (g)	L. R. (cm)	Wt. R. (g)	L. R. (cm)	Wt. R. (g)
Equulites klunzingeri			3.17 - 9.55	0.31 - 9.68				
Mactra corallina	1.80 - 3.85	0.40 - 5.50	1.67 - 2.16	0.36 - 1.13	1.70 - 2.16	0.44 - 1.13	1.61 - 3.04	0.53 - 3.42
Dicentrarchus labrax			8.68 - 10.47	5.58 - 11.96				
Liza aurata	12.47	16.46	7.44 - 10.15	3.34 - 8.22				
Upeneus vittatus	5.14 - 7.63	1.26 - 4.33						
Parupeneus forsskali	9.82	9.66	5.36 - 6.05	1.03 - 2.25				
Metapenaeus monoceros	4.83 - 9.35	0.91 - 5.91	4.33 - 6.90	0.40 - 2.20	4.85 - 8.01	0.55 - 2.40		
Metapenaeus stebbingi	2.37 - 6.84	0.10 - 2.40			1.78 - 6.35	0.05 - 1.90	2.86 - 8.34	0.24 - 4.23
Penaeus japonicus							2.86 - 3.65	0.29 - 0.79
Xiphopenaeus kroyeri	4.21 - 6.75	0.60 - 2.36	2.80 - 8.27	0.11 - 3.12	2.01 - 8.08	0.12 - 2.67	1.35 - 8.64	2.95 - 3.26
Charybdis japonica							1.15 - 3.42	0.37 - 10.97
Portunus pelagicus	2.58 - 9.08	0.97 - 33.21	3.22 - 4.21	7.78 - 4.86	2.40 - 6.90	0.98 - 16.50	1.67 - 7.72	0.40 - 35.14
Argyrosomus regius	1.63 - 11.22	0.02 - 13.96	6.40 - 8.47	2.47 - 10.10			3.40 - 9.51	0.33 - 7.92
Umbrina cirrosa	9.40	7.39						
Siganus rivulatus			4.08 - 7.66	0.49 - 4.31	6.92	3.86	8.57	5.97
Solea aegyptiaca	3.51 - 9.48	0.42 - 7.02	3.91 - 5.68	0.44 - 1.99	5.40 - 10.45	1.89 - 5.58	2.85 - 5.88	0.16 - 1.68
Diplodus sargus	2.09 - 3.16	0.10 - 0.47						
Diplodus annularis			7.01 - 8.91	4.92 - 13.05				
Sarpa salpa	15.00	100.00						
Sphyraena chrysotaenia					4.62 - 9.12	0.33 - 3.65		
Erugosquilla massavensis	6.39 - 10.60	3.29 - 14.64			10.90 - 13.10	2.20 - 4.58		
Terapon puta	7.61 - 10.88	4.01 - 16.32	6.23 - 4.67	2.07 - 3.09	3.98 - 8.60	0.56 - 6.96	6.70 - 9.29	2.76 - 7.58
Trichiurus lepturus					13.08 - 25.80	7.91- 30.80		

4. Stock recruitment losses within beach seine noncommercial

The results indicated that the number of economic species individual discarded in the noncommercial was at its highest for *E. encrasicolus* (544807) followed by *G. cobitis* (11557), *H. archipelagcus* (9025), *D. elopsoides* (7696), *M. stebbingi* (6365), *H. punctatus* (4556), *X. kroyeri* (4553), *S. pilchardus* (2377), *S. aurita* (2096), *P. pelagicus* (1871), *A. regius* (1299), *S. aegyptiaca* (1016), *D. labrax* (362), *S. maderensis* (301) and finally *M. monoceros* (33) (Fig. 6).

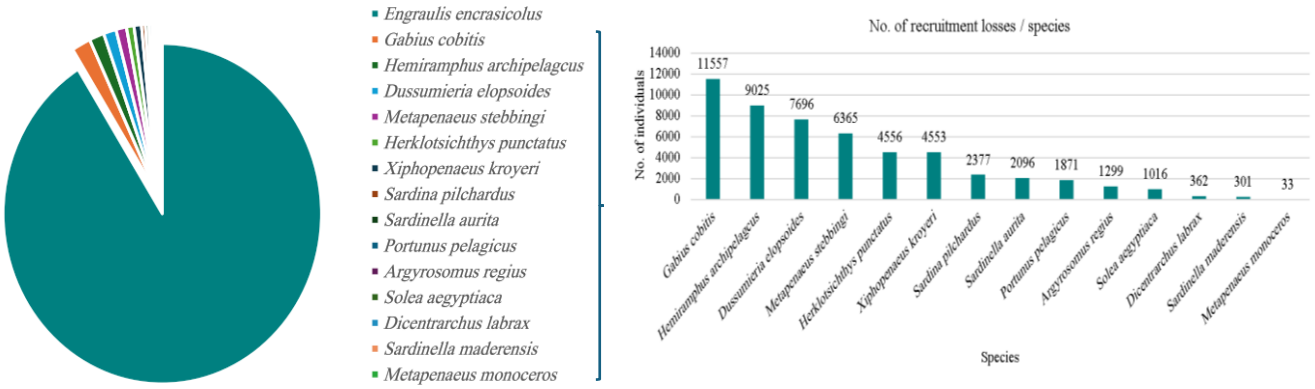

Fig. 6. No. of recruitment losses / species of the economic species caught by beach seine during the period of survey

DISCUSSION

Beach seine fishing in the Mediterranean Sea, particularly on the Egyptian coast of Port Said, is a significant activity that involves a large net with long wings and a small cod-end to capture fish in shallow waters ≤ 10 meters. It provides a large catch of juvenile fish, which are vital for future fish stocks, and can reduce biodiversity by removing the important commercial species. The data show that the fish in the beach-seine catches, even though being commercially important, were not large enough in size to have a significant value, making beach-seining less profitable in comparison with the other traditional fishing methods. Furthermore, the fishermen sell the noncommercial catch production as feed for fish farms in the area or as a feed for ducks.

In the present study, the collected catch was divided into two parts: the economic catch, which was often sold while still on the shore, and the non-commercial catch, which was subjected to laboratory analysis. By comparing the results of this study with those of the previous one, several differences were revealed. The dominant species in the commercial catch was *Caranx crysos*; while, in non-commercial catch, the dominant species was *Engraulis encrasicolus* which was dominant in the total catch, followed by *C. crysos*. In the Eastern Harbor, Alexandria, **Akel and Philips (2014)** reported that *E. encrasicolus* was found to be the most abundant species, followed by *H. punctatus*. While **Al-Sayes *et al.* (1987)** reported that *S. aurita* was the most abundant species, followed by *E. encrasicolus*. In Abu Qir Bay, **Faltas and Akel (2003)** reported that the catch was

dominated by *E. encrasicolus*, followed by *S. rivulatus*. While **Akel (2005)** postulated that Sardine spp. took the first place in the catch, followed by *S. rivulatus* and *S. luridus*. **Ahmed and El-Mor (2006)** reported that the two most dominant species were *Sparus auratus* and *Mugil cephalus* in El-Malaha Lake. **Abd El-Naby *et al.* (2019)** recorded juveniles of commercially important fish species (representing 40.6% of the total non-commercial catch) and low-value fish species (representing 59.4% of the total non-commercial catch) along the Ras Sader coast, Red Sea. Commercially important species, *Nemipterus aponicus* and *Trachurus indicus* and low-value species, were dominated by *Ostorhinchus fasciatus* and *Apogonichthyoides taeniatus*. **Farrag *et al.* (2023)** reported that three species, *Stolephorus indicus*, *Leiognathus* sp., and *Sardinella* sp., comprised approximately 76.11% of the total catch in in the United Arab Emirates in the Sea of Oman.

The variation in time and space undoubtedly had a direct impact on the dominant species observed in this study compared to other ones. The results suggest that abiotic environmental factors play a crucial role in determining the distribution and diversity of fish communities. Rocky environments, for example, provide habitats rich in algae, which are a major food source for the rabbitfish, explaining their high densities in some areas.

CONCLUSION

The results of discarded economic species in noncommercial indicated alarming levels, particularly when considering the total annual catch quantities. It was evident that the discard volume would have been significantly amplified, resulting in substantial economic losses. Given that the estimated price per kilogram of these species, when they are suitable for the marketable size will range between 150 and 250 Egyptian pounds, and their occasional use as feed in fish farms, the natural fish stock in the Mediterranean Sea was threatened for minimal economic return. This directly contradicted the United Nations Sustainable Development Goals, specifically Goal 14 concerning life below water. For the long-term management plans regarding fisheries resilience, there is a need to research and record current situations to understand the degradation of relevant marine habitats through comparison with the already existing data, also an effective management scheme should include different approaches aiming to address the mitigation of discards as well as the sustainability of resources, species of conservation from concern, and ecosystem structure

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