MARINE FISHERIES OF THE GULF OF SUEZ*

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ABSTRACT

The Gulf of Suez, one of the two northern Gulfs of the Red Sea, is a flat-bottom shelf of this sea and its depth does not exceed 100 m and this is in contradistinction of the Gulf of Aqaba which is a much deeper trench. Two main fishing methods are used in the Gulf of Suez. There are trawling by otter trawl and purse-seining. Other methods are cast nets, set nets, beach seines, hook and line, etc. On the whole, trawling and purse-seinings which showed progressive increase from 1959 till 1962, from about 6,000 to 25,000 tons respectively. This increase was mainly due to introduction of purse-seines in 1960 and the increase of purse-seiners from 5 in 1960 to 16 in 1962. However, after this year the total production went on declining and reached about 12,000 tons in 1966. This is mainly due to declining of the landings of sardine from about 16,000 tons in 1968 to about 1,500 tons in 1966. On the contrary, bottom fishing has increased from 30% in 1962 to 72% in 1966, although the actual landings did not differ greatly.

Statistical data for fish landings are available for the Gulf of Suez as well as the adjacent part of the Suez Canal up to Ismaillya. This area has 8 landing sites of which receiving centres of Suez and of Al-Khor are the main and receive most of the fish landings. The paper discusses various aspects connected with the fisheries of the Gulf of Suez.

INTRODUCTION

THE Gulf of Suez in contradistinction to the Gulf of Aqaba is a flat-bottomed shelf of the Red Sea into which its surface water extends. The depth is about 80 m at the entrance, and 50 m in the main part and then decreases gradually towards the head where sedimentation is going on. The sides are mostly rocky and bounded by interrupted fringing coral reefs of different widths, but these tend to be narrower towards the north. Wind blown sand accumulates especially in the eastern or Sinai side where the fringing reef is thereby interrupted. Interruption of reefs is also caused by down-wash from the sides and this occasionally takes place in this part.

The main part in the geological history of the Red Sea is that the communication between it and the Indian Ocean has remained since the connection was first established in the Pliocene. There is nothing to corroborate the suggestion of Sewell (1948) that during the Glacial Epoch, the Red Sea was separated from the Indian Ocean by the relative elevation of the 'Sill'. On the contrary, there is evidence to show that the 'Sill' was covered throughout the Pleistocene period. Salinity of the Red Sea at its time of formation must have been normal and the fishes of the Indian Ocean had not to cope with the high salinity to which the fishes of the Red Sea are now subject. As time went on, the salinity gradually increased and thus some of the original fishes which were stenohaline, must have succumbed, while others must have adjusted themselves to the new conditions and therefore survived.

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At the northwestern end of the Red Sea, the Bay of Suez has been artificially communicated with the Mediterranean Sea, and a certain amount of water exchange has since been taking place between the two seas. This connection has initiated particular interest. Some important work has been attempted and most important in this respect is the Cambridge Expedition to the Suez Canal, the results of which were published in the Transactions of the Zoological Society of London in 1926. Generally speaking, more fishes have been able to pass from the Red Sea to the Mediterranean Sea, where they established themselves and flourished to the point of becoming economically important than in the reverse direction. Examples of Red Sea fishes that infiltrated into the Mediterranean are siganus nebulosus (Q. & G.) which is now fished on a large scale near Alexandria, Atherina forskali Ruppell and A. pingius Lacépède, which are found near Alexandria and in the coast of Palestine, Piatycephalus insidiator Forsskal, Crenidens forskali C. & V., Trichinus haumela Forsskal, and Mugil seheli Forsskal, (Gohar, 1954). The most important fishes that passed in the reverse direction are Serranus cabrilla (Linn.) and Sciaena aquila Cuvier, which are now fished abundantly in the northern half of the Gulf of Suez, but there seem to have confined themselves to the Gulf, without spreading any further south into the sea.

FISHING BOATS

Three types of fishing boats are operating in the Gulf of Suez. These are 1st, 4th and 5th class boats with about 18, 9 and 5 fishermen respectively. About 60% of the catch is landed by the first type of boats. Besides the weight of the catch by varieties, the information recorded in respect of these boats' landings on the sample days for statistical purposes since 1962 is as follows:

1. Licence number and name of boat.

2. Port of registration.

- 3. Date and time of departure.
- 4. Time of return and of catch.
- 9. Nature of tackle used.
 10. Distinction of catch.
- 5. Horse-power of engine.
- 11. Amount of fish retained for consumption by crew.

7. Location of fishing ground.

8. Depth of trawling, nature of bottom.

6. Size of crew.

For 4th and 5th class boats the following information is registered :

1. Licence number; 2. Date and time of departure; 3. Nature of tackle employed; 4. Size of crew; and 5. Distinction of catch.

FISH LANDINGS

Statistical data of the Gulf of Suez is usually considered in addition to the adjacent part of the Suez Canal. Along this whole area, including the Gulf, eight receiving centres are known. These centres lie at Suez, Al-Khor, Geneiva, Abu Romana Fayed, Al-Mahgar, Defreswar and Ismailiya. The landings at these centres for 1966 is shown in Table 1 from which it appears that Suez Centre receives more than 62% of the fish production from the whole area while Al-Khor comes next and receiving

about 27% of the landings. On the whole, the fishes caught from the proper Gulf are landed at Suez and Al-Khors where the motorized and sailing boats respectively anchor. In other regions, only the latter type of boats is operating.

Centre	Production			
	Metric tons	% in total		
Suez	7,604.6	62.7		
Al-Khor	3,289.3	27.1		
Geneiva	111.3 236.8	0.9		
Abu-Romana		2.0		
Fayed	242.9	2.0		
Al-Mahgar	114.7	0.9		
Defreswar	205.2	1.7		
Ismailiya	329.4	2.7		
Total	12134.2	100.0		

Table 1. Landings at different receiving centres in 1966

METHODS OF FISHING AND ANNUAL PRODUCTION

Two main fishing methods are adopted in the Gulf of Suez. These are trawling by otter trawl and purse-seining. Other methods adopted are cast nets, set-nets, beach seine, hook and line....etc. The catch by the first two methods is landed at the Suez receiving centre while fish caught by others is landed at the remaining centres.

Year	Purse-seiner	trawlers	Producti	on (tons)
	No.	N0.	Total	Sardin
1959		50	6.027	340
1960	5	50	9.010	2.300
1961	10	50	11,228	4,780
1962	16	54	25,384	16,340
1963	15	54	24,503	13,100
1964	15	50	18.130	4,650
1965	15	58	14.809	1.842
1966	15	58	12,134	1.576

Table 2. Number of boats and production in different years

Generally speaking, fish production has increased progressively from 1959 till 1962 and they have landings of about 6,000 and 25,000 metric tons respectively (Table 2). This increase was mainly due to the introduction of purse-seine and adopting electric light in 1960 during which five boats were operating by this method. This number increased to 10 and 16 boats in 1961 and 1962 respectively but decreased to 15 only in the following years. Besides, due to the success of fishing by light, 47 sailing boats adopted light and 'small' purse-seine in 1966. From 1963 onwards, the fish production went on declining and reached about 12,000 tonnes in 1966 (Fig. 1) (Anon, 1966). This is primarily due to the sardine fisheries which became poorer from one year to another. Thus, while sardine landings were 16,340 tonnes in 1962, they were only about 1,575 tonnes in 1966. This was



Fig. 1. Fish production of the Gulf of Suez in different years.

attributed to the fact that sardine stocks were affected by concentrated fishing and this is corroborated by the fact that the landed sardine was small ranging from 5 to 10 cms in length.

Production from the Suez Gulf is very high as compared with that from the adjacent part of the Suez Canal. Thus, whereas the fish landings were estimated as 12,134.2 m. tons in 1966 for all areas, the production of the Gulf alone formed 10,893.9 m. tons of which 7,604.6 tonnes were landed at Suez only and included the production by trawlers and purse-seiners. These two fishing methods contributed in fish production by 5,187.6 and 2,417.0 tonnes or 68.2% and 31.8% respectively. However, such a difference is the reverse to what prevailed in the preceding years especially in 1962 and 1963 when catch by purse-seiners preponderated. This can be revealed on considering the production of sardine and Caranx spp. as compared with that of bottom and shore fishes (Table 3).

Year	Production	Sardine & C	Caranx spp.	Bottom & shore fishes		
	(m.t.)	m.t.	%	m.t.	%	
1962	25,384	17.524	69.1	7,860	30.9	
1963	24,503	13.894	56.7	10,609	43.3	
1964	18,130	6.271	34.6	11.859	65.4	
1965	14,809	3,332	22.5	11,477	77.5	
1966	12,134	3,304	21.4	8,830	72.7	

Table 3. Production of Sardine, Caratix spp., and bottom and shore fishes in different years

In the Gulf of Suez, trawling is prohibited in July, August and September while purse-seining is prohibited in September, October and November. In 1966, trawlers' catch is the highest in the first three months of the calendar year and their landings were about 45% of their total production. May and June showed the lowest trawlers catch. On the other hand, catch by purse-seining was the highest in December while January came next. In general, production by purse-seiners is about 45% from their total catch in the first three months and about 62% in the first four months (Table 4) of the Calendar year (Fig. 2).



Fig. 2. Monthly production by trawling and purse-scining in 1966.

Months	Productio	n by Trawlers	Production by purse-sciners		
	m.t.	% from trawling catch	m.t.	%from purse seining catch	
January	496.2	9.56	460.9	19.06	
February	640.4	12.34	290.8	12.03	
March	446.0	8.59	320.0	13.24	
April	538.0	10.37	445.4	18.43	
May	389.1	7.50	141.0	5.83	
June	367.4	7.11	19.0	0.78	
July			26.2	1.08	
August		-	58.0	2.39	
October	816.5	15.73			
November	768.3	14.81		—	
December	725.7	13.98	655.7	27.12	

TABLE 4. Monthly production by trawlers and purse-seiners in 1966

COMMERCIAL FISHES

Gulf of Suez is known by its variety of fishes but few are of considerably high economic importance. Thus, as seen in Table 5 and Fig. 3, 15 groups or species



Fig. 3. Cumulative curve for fish production from the Gulf of Suez in 1966.

of fish comprise about 88% of the catch form the Gulf of Suez. Comparing the landings at Suez, we find that a comparable figure is reached only by 7 fishes which are Haret (lizard fish*), Sardine, Baga, Shokrom, Moza, Gambari (shrimps*) and barbouny (red mullet*). For Al-Khor, the picture is somewhat different as some fishes as Schleya (mullet*), Sho'our (Scavenger*), Balamita (Bonito*), Irsh (sharks*) appear to a greater degree than that of Suez receiving centre as the former has sailing boats adopting small tackle as cast nets, set nets, beach seines, hook and line, etc. (Fig. 4).



Fig. 4. Landings of different fishes at Al-khor and Suez receiving centres in 1966.

A single group of fishes may be represented by more than one species, but usually one species preponderates. Haret or lizard fishes for example is represented by four species viz., Synodus indicus, S. variegatus, Trachinocephalus myops and Saurida undosquamis. The last comprises more than 98% among the lizard fishes. Besides, Gambari or Shrimps are represented by Penaeus trisulcatus, P. monoceros, P. japonicus and P. semisulcatus and of these the first is the commonest.

Reviewing the landings by trawlers and purse-sciners at Suez, it can be revealed that few species are of importance. Thus, for the former boats, Haret, Shokhrom, Shrimps, and Barbouny are the main and constitute 52.5%, 15.4%, 7.1% and 4.9% respectively in 1966 and species of minor importance constituted altogether 20%.

* English name.

For purse-seiners, Sardine, Moza, and Shrimps comprised 39.8, 28.1, and 4.0% respectively and the species of less importance constituted collectively 28.1% in 1966 (Fig. 5).



Fig. 5. Landings by purse-seining and trawling from the Gulf of Suez.

In addition, the trend of the catch of the main species is different in the different years (Table 6). Thus, while the catch from *Saurida* increased progressively from 1962 to 1965, and its production becoming more than doubled in the last year, it decreased considerably in 1966. Shrimps showed the highest catch in 1964 but for 1965 and 1966, the catch is somewhat less. For Shokhrom, the landings increased from 1962 up to 1964 but declined in 1965 and further in 1966. For Barbouny the highest landings were in 1963 and this was followed by a progressive decline up to 1966. Baga was different as the last year showed the highest catch of this fish. Sardine fisheries has declined considerably throughout the different years, and the landings were about 16,340 and 1,576 tonnes in 1962 and 1966 respectively. This is accompanied by a decrease in the average size of the sardine fishes. On the reverse, Haret, the main fish caught by trawlers behaved differently. Mean body length of *Saurida undosquamis* was found 16.7, 18.7, and 19.0 em for 1964, 1965 and 1966 respectively. While age groups I to IV are represented in the catch, age group II preponderates forming more than 40% in 1963 to 1966. From 1964 to 1966, a great decline in age group I, besides an increase in age groups III and IV are observed. Age groups III and IV are on the average higher in percentage during March through June than in the remaining months and this is due to the fact that trawlers go more towards the south in the former period (Shinoda, 1969).

		Production (m.t.)				
Fish	Main Species	S.R.C ¹	A.R.C ³	Gulf of Suez	Percentage	
Haret	Saurida undosquamis	2,721.7	1.7	2,723.4	25.0	
Baga	Caranx fulvogullatus	845.9	875.6	1,721.5	15.8	
Sardine	Sardinella jussieu	962.2	613.1	1,575.3	14.5	
Shokhrom	Pristipoma striatus	785.4	60.9	846.3	7.8	
Moza	Etrumeus micropus	680.1	38.6	718.7	6.6	
Gambari	Penaeus trisulcatus	369.2	36.6	405.8	3.7	
Basarva	Atherina spp.		272.2	272.2	2.5	
Barbouny	Upeneus bensasi	256.1		256.1	2.3	
lehleva	Mugil seheli	4.9	196.4	201.3	1.9	
Sho'our	Lethrinus nebolusus	5.4	173.1	178.5	1.6	
Balamita	Euthynnus alleteratus	26.6	149.6	176.2	1.6	
Koshar	Epinephelus spp.	10.9	160.4	171.3	1.6	
Sobbait (cuttle	fish) —	137.7	4.5	142.2	1.3	
Scombry	Scomber japonicus	96.4	22.8	119.2	1.1	
Irsh	Carcharias spp.	39.3	78,7	118.0	1.1	
Others*		662.8	605.1	1,267.9	11.6	
	Total	7,604.6	3,289.3	10,893.9	100.0	

TABLE 5. Production of different fishes in 1966

Suez receiving centre
Al-Khor receiving centre
These include guitar fishes, Scomberomorus commersonii, sea breams, rabbitfish, Crabs, Sparus nocht, flat fishes, turtles, grey mullets,....etc.

Year		Fishes					
		Haret	Gambari (Shrimps)	Shokhrom	Barbouny (Red mullet)	Baga	Sardine
1962	•••	2,047	455	1,232	646	1,184	16,340
1963		3,121	435	1,745	1,110	734	13,100
1964		3,501	594	1,770	578	1,621	4,650
1965	••	4,963	562	1,307	556	1, 490	1,842
1966		2,723	573	869	256	1,828	1,576

TABLE 6. Production (m. t.) of some fishes in different years

EXPERIMENTAL FISHING

Reference may here be made to the work of the USSR boats viz. *LIRA* in September 1964 and *ICHTYOLOG* in November and December 1964 and March and April 1965 (Demidov, 1966; Vodyanitsky, 1966).

Thus, according to the records of LIRA boat, the catch per hour of bottom trawling is varying from the northern to the southern parts of the gulf. It was 22.3Kg/h in the north, 54.7 Kg/h in the middle of the gulf, but it was 168.7 Kg/h in the



Fig. 6. Map of the Gulf of Suez.

southern region (Table 7). This may be due to the intensive fishing in the north and middle of the gulf, because the fishing boats scarcely visit the southern region where the fishes are of big size if compared with those in the other two regions especially for lizard and pelagic fish as sardine and *Caranx* species. On the whole, the catch per hour in the Suez Gulf is higher than that of the Mediterranean regions. This is mainly due to the presence of pelagic fishes in higher concentration in the former district.

TABLE 7. Bottom trawling by LIRA in September 1964

Date	Region	Depth (m) No. of hauls			ation m.	Production Kg.
21/9	North of the Gulf	40-64	3	2	40	192.8
21/9	Middle of the Gulf	49-67	4	2	25	132.3
22/9	South of the Gulf	62-32	5	6	44	1,136.0

Experiments with underwater electric light in November and December 1964 showed a pronounced positive reaction of sardine and horse-mackerel to light of lamps. The process of fish gathering around the lamp was quite intensive. The concentration of fish became stable after 3 or 5 hours of lighting then fishing could start. The thickness of fish layer concentrated around the light was about 20-25 metres. Their catches made 2.22 tons at an average per haul under favourable fishing conditions. Some catches reached 4-5 tons and even 8 tons as maximum. For comparison, Egyptian fishermen can make two hauls by the purse seine and adoption of light during the night, and take about 1.5-2.5 tons for the same period.

On the whole, the conclusions attained by the work of *ICHTYOLOG* is summarized hereunder.

(a) The bulk of commercial fishes of the Suez Gulf is found mainly in the central part of the Gulf in the area of 50 square miles near the shore of Abu-Zenima (Fig. 6).

(b) The concentration of the small sized anchovy (55-70 mm long) occurred in the northern part of the Gulf. The anchovy was observed at day time as small shoals having from 30-50 metres in length and six to eight metres in height. Anchovy rose to the upper water layers and were actively attracted by artificial light during night time. The area of concentration of anchovy shoals was about 35 square miles near the cape of Ras-Abu-Dar in November 1964. In December all anchovy were concentrated in the northern extremity of the Gulf.

(c) Two species of horse-mackerel, *i. e.*, *Trachurus* sp. and *Decapterus* sp. are widely distributed in the central zone of the gulf. They composed 29.7% of the total catch taken by trawls and 46.9% of the catch taken by purse-seines. At the same time, both species were not traced in the trawl catches of Egyptian fishermen, and made respectively only about 10% and 20% in the light fishing by purse-seines.

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