

ON THE PRAWN FISHERIES IN THE GULF OF SUEZ, EGYPT

By

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عن مصايد الجمبري في خليج السويس - مصر

محمد ياسين و إيهاب بيبارس
فاطمة عبد الرازق و عبد الفتاح غباشي

يكون الجمبري حوالي ١٣.٧٪ من محصول الصيد الكلي في خليج السويس وهناك ١١٪ من المصيد من الأنواع الكبيرة بينيس جابونيكس بيت ، بينيس سيمسلكاتس دي هان ، وبينيس لاتيسلكاتس كيشنوي ، والنوعان الصغيران حجماً وهما متيا بنيوبسس ستريديولانتس ألكوك وتراكيبينيس كيرفيروسترس ستمبسون يمثلان ٢.٧٪ فقط من المصيد .

وتكون النسبة المئوية من الأنواع الكبيرة ٤٧٪ من بينيس جابونيكس ، ٣٠٪ ب . لاتيسلكاتس ، ٢٣٪ ب . سيمسلكاتس وتحدث فترة الصيد المكثف من أكتوبر إلى مايو وتقع في نفس الوقت الذي يضع فيه بينيس سيمسلكاتس بيض (أكتوبر - مارس) . يمثل منتصف النصف الشمالي من الخليج أغنى مناطقه بالنسبة للأنواع الرئيسية الثلاثة . ومن ناحية الوزن حدث هبوط عام في معدل الانتاج لكل وحدة جهد من بداية موسم الصيد وحتى يناير - فبراير ثم زاد قليلاً بعد ذلك وربما كان ذلك لقدم أفراد جديدة من ب . لاتيسلكاتس إلى منطقة الصيد . ولقد أعطى موسم ١٩٨٣ - ١٩٨٤ إنتاجاً عالياً من الجمبري الكبير (٧٤٩ طناً) وذلك بجهد وصل إلى ١٣٦٩٠ يوم صيد .

Key Words: Suez Gulf, Penaeids.

ABSTRACT

Prawn fisheries in the Gulf of Suez constitute about 13.7% of the total fish and shrimp landings. About 11% are made up by three penaeid species namely: *Penaeus japonicus* Bate, *Penaeus semisulcatus* De Han and *Penaeus latisulcatus* Kishinouye. *Metapenaeopsis stridulantis* Alcock and *Trachypenaeus curvirostris* Stimpson are two further small species which form only 2.7% of the total landing of the trawlers in the Gulf.

Percentages of the three large species are 47% for *P. japonicus*, 30% for *P. latisulcatus* and 23% for *P. semisulcatus*. The intensive fishing period takes place from October to May, coinciding with the spawning period of *P. semisulcatus* (October-March).

The middle of the Northern half of the Gulf is the richest area for the three forms. The monthly catch weight per unit effort showed a general decline from the beginning of each fishing season to January-February. A slight increase occurred afterwards. This may be due to the new arrivals of *P. latisulcatus* to the fishery ground.

The fishing season 1983-1984 gave a high yield of the large prawns (749 tons) with a fishing effort of 13690 fishing days.

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INTRODUCTION

The Gulf of Suez is the principal fishing ground in the Egyptian sector of the Red sea. The catch from the Gulf contains a variety of fishes, crustaceans and molluscs (Bayoumi, 1972). Various fishing gears are used in the area in addition to hooks and lines. Fish prawn landing invariably takes place at Attaka (Fig. 1), 15 km south of Suez city. Fishing season begins from October within the Northern half of the Gulf and by May the fishing operations change to the Southern part of the Gulf.

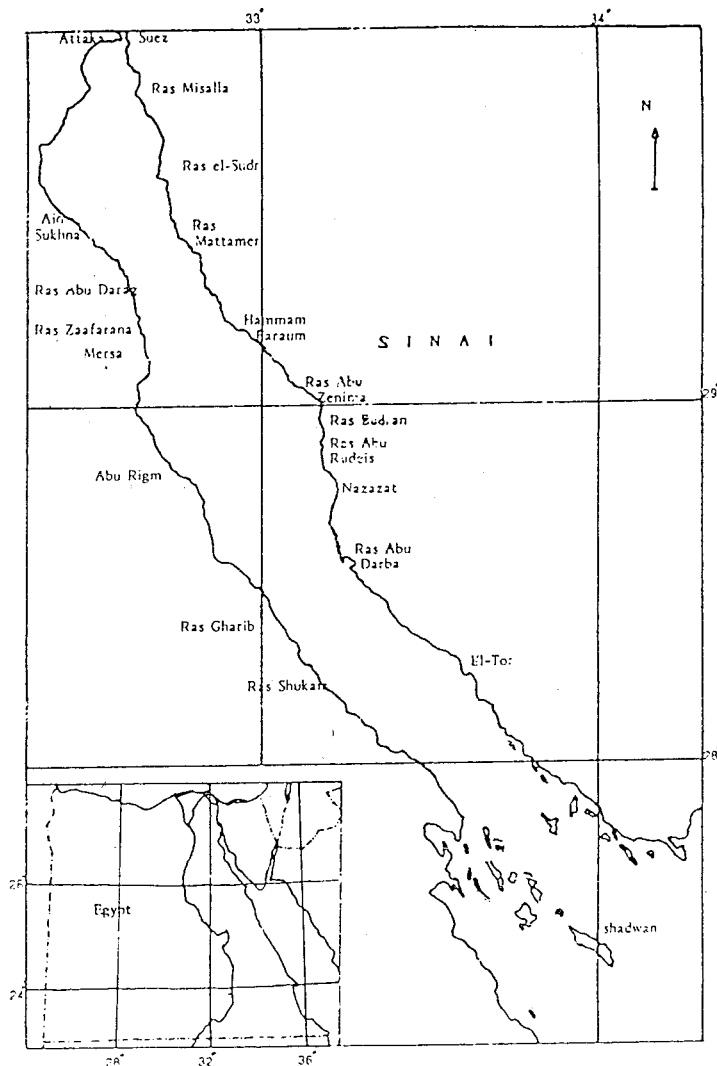


Fig. 1: Egypt and the Suez Gulf

Red Sea shrimp fisheries were investigated by Al Kholy and El Hawary (1970). However, so far there is no published information about their distribution, species composition, catch and effort in the Gulf.

The present work is part of a research project "Fisheries management of Egyptian sector of the Red sea and the Gulf of Suez." It deals with the penaeid shrimps of the Gulf of Suez to throw light on their fisheries in this prospectively productive area.

MATERIALS AND METHODS

Collection of the data continued for about three years: from February 1984 to December 1986. It was mainly obtained from commercial catches of the Gulf landed at Attaka fishing

Harbor. Weekly random samples were taken soon after unloading the fishing vessels. Nearly five boxes of about 100-120 kg of large species were purchased from the Egyptian Company for Marketing Fishes. The samples were brought to the laboratory for measurement. At the time of sampling the relevant Skipper was interviewed and information about the date of landing, vessel power, crew number, fishing days, mean number of trawl net shots per day, mean time duration per shot, the length of the trawl net and sweeps, the cod end mesh size and the fishing location were reported. Moreover, the quantity of specimens of the large prawn species was determined. In the laboratory the analysis of the sampled prawns included: identification of the species as well as counting and weighing the specimens of each. Species distribution along the Gulf was represented by a circle of a diameter proportional to its frequency in a location.

RESULTS

The Gulf of Suez is known for its variety of fishes, crustaceans and molluscs, where the total catch usually consists of many species, specially in the case of trawl fisheries (Fig. 2). Furthermore, a single group of fishes or prawns may be represented by more than one species. Commercial catches of the Gulf of Suez encompass five economically important species of prawns these are:

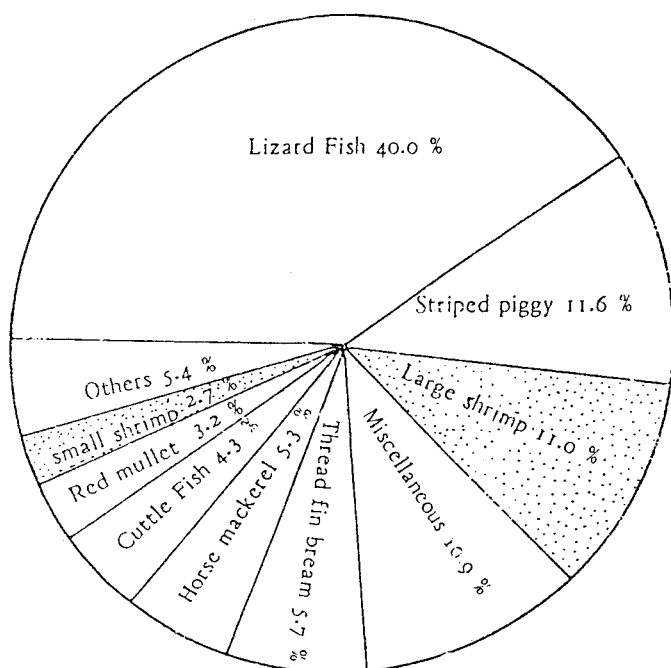


Fig. 2: Percentage of the species formed trawl catches from the Gulf of Suez in the period from 1979 to 1987.

- *Penaeus latisulcatus* Kishinouye, 1900.
- *Penaeus semisulcatus* De Han, 1850.
- *Penaeus japonicus* Bate, 1888.
- *Trachypenaeus curvirostris* Stimpson, 1860.
- *Metapenaeopsis stridulants* Alcock, 1905.

In the Gulf of Suez, the commercial catch of prawns is sorted by size before landing into two categories, large and small. The first three species are the large sized prawns and are covered in this paper.

Geographical distribution of the large species:

Table 1

Monthly catch (Kg) per unit fishing effort of large prawn species taken by the trawl Fishery in the Gulf of Suez during the Fishing seasons 1979/1980 to 1986/1987.

Fishing season	Item	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	
1979/1980	Catch/fishing day	80.7	52.8	50.6	37.6	22.6	23.5	27.4	28.3	29.8	43.3
	Catch / shot	12.9	8.4	7.9	6.5	3.2	3.3	4.2	4.6	4.5	6.7
	Catch hours trawling	4.2	2.8	3.0	2.2	1.1	1.2	1.5	1.7	1.8	2.4
	Catch/landing	567.2	371.0	470.1	321.1	177.8	225.9	218.7	220.9	220.7	338.8
1980/1981	Catch/fishing day	86.5	46.6	37.4	31.1	15.7	22.8	17.9	19.7	25.2	36.6
	Catch / shot	13.3	7.3	5.4	4.7	2.3	3.4	2.6	2.8	3.7	5.4
	Catch hours trawling	4.9	2.4	1.9	1.6	0.8	1.2	0.9	0.9	1.3	1.9
	Catch/landing	569.0	371.9	341.3	277.1	155.1	183.5	163.9	176.7	214.5	307.4
1981/1982	Catch/fishing day	140.6	79.2	46.	35.4	25.2	16.8	18.8	33.0	23.6	42.2
	Catch / shot	19.6	11.3	6.7	5.1	3.7	2.3	2.6	4.6	3.4	6.0
	Catch hours trawling	7.4	3.9	2.3	1.7	1.6	0.9	0.9	1.8	1.2	2.2
	Catch/landing	813.8	607.4	360.0	326.8	208.6	150.8	168.5	266.4	183.8	340.8
1982/1983	Catch/fishing day	100.2	56.5	38.4	25.7	17.2	16.3	19.0	33.4	24.6	38.9
	Catch / shot	13.2	7.9	5.5	3.6	2.3	2.0	2.3	5.0	3.3	5.3
	Catch hours trawling	4.9	2.7	1.8	1.2	0.8	0.8	1.0	1.9	1.7	2.0
	Catch/landing	773.9	549.2	362.9	242.5	120.4	138.2	167.3	272.2	179.2	328.9
1983/1984	Catch/fishing day		111.7	86.8	54.3	34.2	30.5	40.9	37.5	40.3	54.7
	Catch / shot		13.7	11.0	7.9	4.8	4.9	5.1	4.8	6.4	7.3
	Catch hours trawling		6.0	4.3	3.2	2.0	1.5	2.0	1.8	2.7	2.9
	Catch/landing		766.5	740.2	478.1	318.3	291.2	353.6	337.4	280.1	457.6
1984/1985	Catch/fishing day		86.1	38.8	31.4	16.6	14.4	51.0	31.3	23.3	35.4
	Catch / shot		10.5	4.7	4.3	2.5	2.0	6.7	4.1	3.3	4.7
	Catch hours trawling		4.5	1.9	1.7	0.9	0.8	3.1	1.9	1.8	2.0
	Catch/landing		645.8	327.9	240.6	151.3	126.7	468.7	263.0	471.9	316.6
1985/1986	Catch/fishing day		90.0	43.3	26.5	15.7	12.5	12.4	11.3	9.9	30.5
	Catch / shot		13.0	5.7	3.9	2.2	1.7	1.7	1.8	1.7	4.4
	Catch hours trawling		6.0	2.5	1.8	0.8	0.7	0.7	0.7	0.7	1.9
	Catch/landing		661.9	381.0	230.6	138.9	101.6	101.9	97.7	95.0	258.6
1986/1987	Catch/fishing day		43.6	23.6	19.1	13.5	12.4	15.2	11.1	9.4	21.1
	Catch / shot		5.9	3.0	2.9	1.7	1.6	1.5	1.4	1.2	2.7
	Catch hours trawling		2.4	1.2	1.3	0.7	0.7	0.6	0.7	0.5	1.1
	Catch/landing		350.9	217.5	169.1	116.6	108.2	108.7	89.6	79.5	177.7

In the Gulf of Suez, the commercial catch of prawns is sorted by size before landing into two categories, large and small. The first three species are the large sized prawns and are covered in this paper.

Penaeus latisulcatus, *Penaeus japonicus* and *Penaeus semisulcatus* are distributed from south-east Africa to the Gulf of Oman and the Arab Gulf, the Red Sea, also along the southern coast of India, from Burma to Japan and Australia. Both *P. japonicus* and *P. semisulcatus* entered the Eastern Mediterranean through the Suez Canal, but *P. latisulcatus* has not been recorded in Mediterranean waters (Holthuis, 1980).

Monthly occurrence and distribution:

The analysis of the magnitude and succession of the three large penaeid prawns in the commercial catches of the Gulf of Suez show some fluctuations in their abundance during the different fishing season as illustrated in Fig. 3. The occurrence by weight of *P. japonicus* (47.2%) was high compared to *P. latisulcatus* (29.76%) and *P. semisulcatus* (23%), during the period 1984-1986.

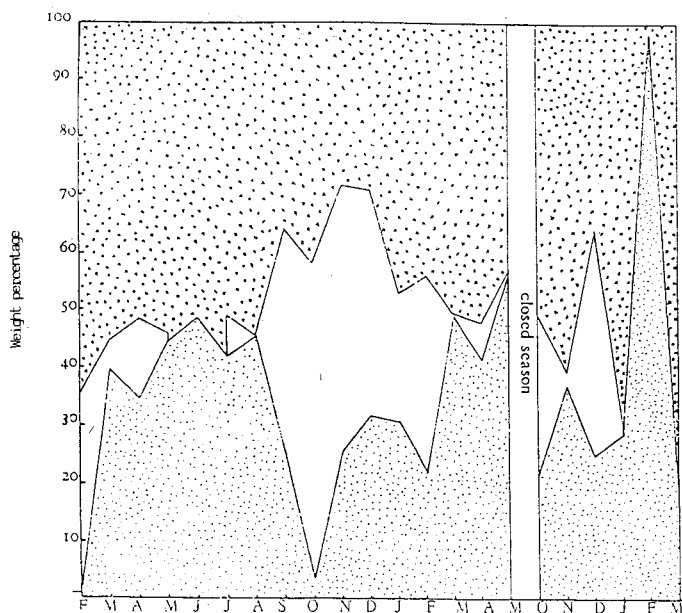


Fig. 3: Magnitude and succession of the large prawn species in the commercial catches from the Gulf of Suez during 1984-1985-1986.

P. latisulcatus *P. semisulcatus* *P. japonicus*

The northern half of the Gulf, particularly, Mersa Abu Rigm. Nazazat, Ras Abu Zenima. Hammam Faraun, Ras Zaafarana, Ras Sudr, Ras Mattamer and Ain Sukhna (Fig. 4) show the most suitable fishing areas for the three species.

In the Southern sector and in spring, at the end of each fishing season, the catch was composed mainly of *P. latisulcatus*. As the next fishing season begins i.e. in autumn, the fishing operations become intensified in the northern parts of the Gulf and the catch is mainly *P. semisulcatus*, *P. japonicus* is distributed throughout the Gulf.

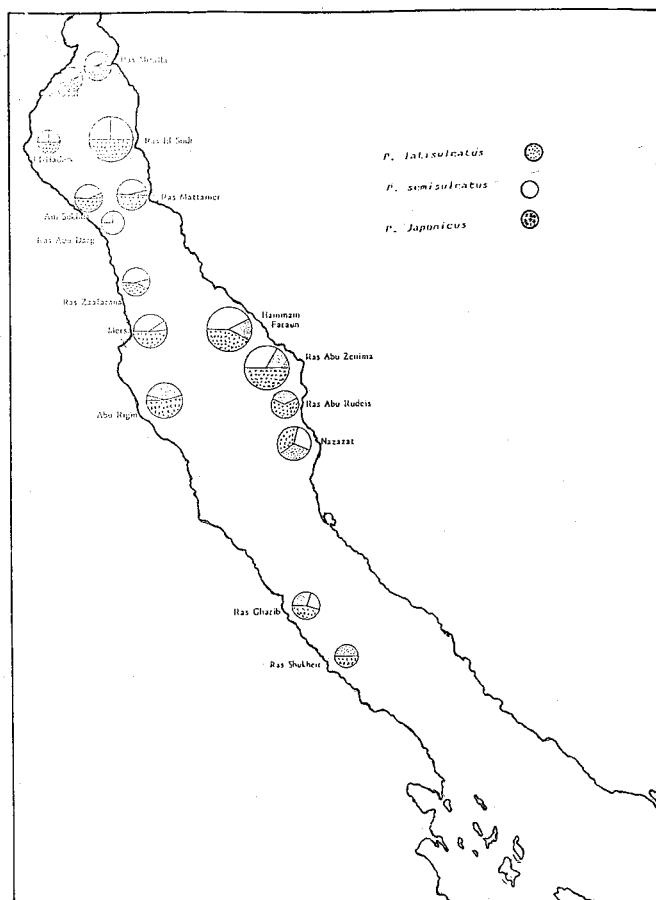


Fig. 4: Distribution of the large prawns along the Gulf of Suez

Catch and fishing efforts:

The commercial catches usually provide a useful estimate of the composition of the stock, at least over a wide ranges of sizes and ages. However, to have a real understanding to the fishing some measure of fishing effort is required.

Fishing effort and catch per unit effort quantities may be conveniently treated together. Fishing effort is a measure of fishing mortality and catch per unit effort is an index of abundance and level of exploitation of a fishery resource. Efforts in units of numbers of fishing days, shots, trawling hours, and landing were determined for each month. The estimation of each catch per unit effort involved dividing the landing of prawn by the associated estimated efforts.

Fig. 5 shows that the highest production of the large prawns took place in the fishing season 1983/1984, as the catch reached 749.1 tons. It is likely that this increase was due to the high fishing effort.

In respect to the fishing effort related statistics from 1979/1980 to 1986/1987 the estimated mean of the trawl shots per fishing day was about 7.1, that the hours trawling per fishing day was about 18.7, that of the hours trawling per shot was 2.6 and that of the number of fishing days per landing was about 8.3. These values were observed to be generally constant during months and seasons.

Regarding the fishing vessels, their lengths were about 23.7 m in average, their engines of about 258.4 h.p. and the number of the crew employed were about 11.4/vessel.

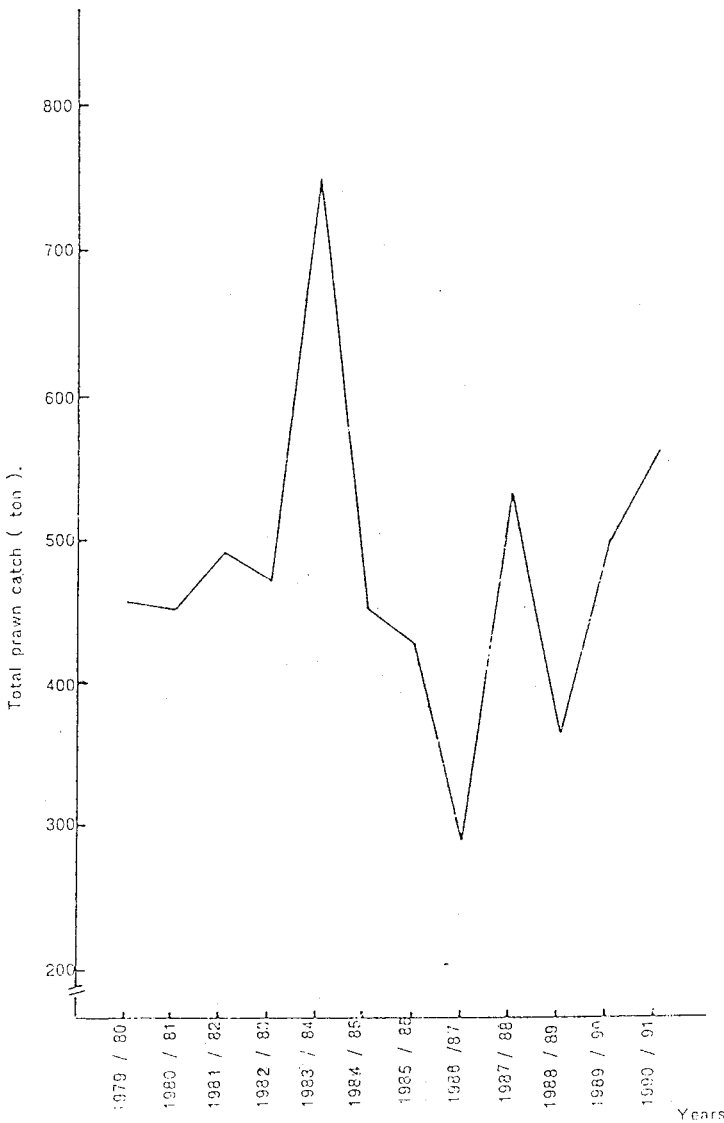


Fig. 5: The annual total catch in the Gulf of Suez from 1979 to 1991.

The estimated catches per unit fishing effort of the prawn in the Gulf of Suez during the seasons from 1979/1980 to 1986/1987 are shown in Table 1. Figure 6 shows that the catch per fishing effort (catch/fishing day) changed markedly during the different seasons from 1979/1980 - 1986/1987.

The monthly catch weight per unit effort shows a general decline from the beginning of each fishing season up to January-February and then a slight increase at the end of the season (Fig. 7). This may be due to the arrival of new recruit of prawns to the fishery ground at the end of the fishing season.

DISCUSSION

The fishing season (October-December) is seen to be the most productive months for the large prawns. Bebars (1985) considered this due to the relatively high stock abundance and the intensive fishing effort exerted through these months. *P. japonicus* constitutes the most common species, followed by *P. latisulcatus* and *P. semisulcatus*. This can be attributed to the coincidence of the most intensive fishing operations in the Gulf of Suez with the time of the maximum spawning activity of *P. semisulcatus* (from October to March) in the Gulf (Yassin, 1992).

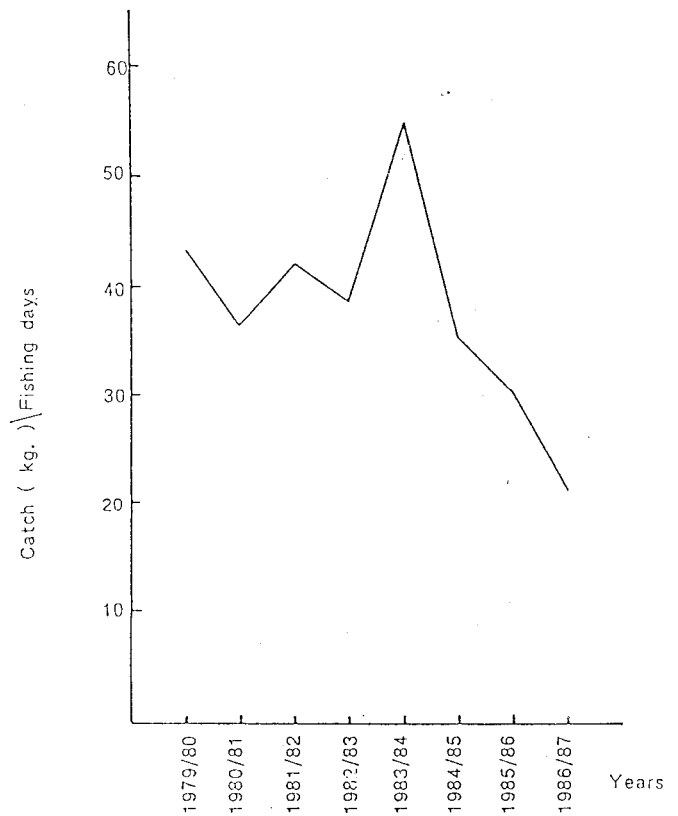


Fig. 6: Annual catch (Kg.) per fishing days of prawn in the Gulf of Suez.

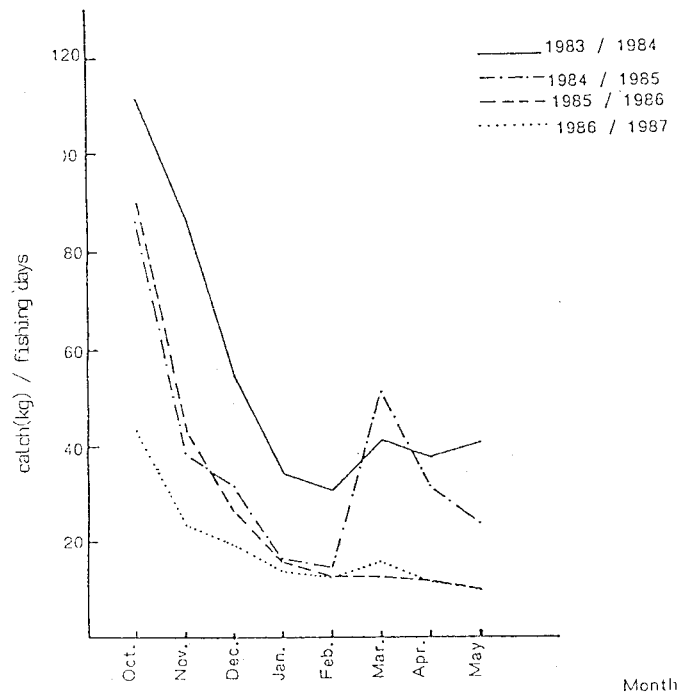


Fig. 7: Catch per fishing days of the prawns in the Gulf of Suez during 1983/84 - 1986/87.

The fishing effort expanded through the period of the study, reflecting a general fluctuating increase in the fishing season. Bebars (1985) related the increased fishing effort to an increase in the relative abundance of the stock, which encouraged the fishermen in order to get the possible income.

The monthly catch per unit effort shows a general decline from the beginning of each fishing season up to January-February, and then slightly increases to the end of the season. This can be explained by the introduction of new recruits, particularly *P. latisulcatus*, into the Fishery as reported by Abdel Razeq et al. (1983) and Sanders and Kedidi (1984).

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