

TRENDS IN CATCHES OF *PLECTROPOMUS PESSULIFERUS* (FOWLER) AND *PLECTROPOMUS AREOLATUS* (RUPPEL) IN THE RED SEA COAST OF SAUDI ARABIA FROM 1995 TO 2002

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ABSTRACT

Based on the Fisheries Statistics bulletins published by the Marine fisheries department, Ministry of Agriculture (1995–2002),

The coastline of the Red Sea in Saudi Arabia has been divided statistically into 3 areas from the North to the South. The Northern area extends from Haql to Al-Rayes, the Central area is from Al-Sateh to Al-Birk and the Southern area is from Al-Gahmah to Al-Muwassam including Farasan Islands.

According to the specifications of the boats and fishing gears, two sectors were identified, the Industrial sector and the Traditional sector.

The types of fishing gears used in the Traditional sector are hand lines, gillnets, traps. The first three fishing gears were discussed in the present study because of their relation to catch of *Plectropomus Pessuliferus* (Fowler) (Roving Coralgrouper) and *Plectropomus areolatus* (Ruppel) squaretail coralgrouper which are known locally as “Najil” and “Taradi” respectively.

The catch of these two species represent 2% of the total catch of fish in the Red sea area for each of them.

Roving coralgrouper catch varied from year to year where, the highest was 81% in 1996 while the lowest was 2% in 2001. Increase that reached up 35% was observed in 2002, in comparison to 1995. squaretail Coralgroupers species had a sharp rise, it reached 20.1% in 1996 and 12.3 % in 1999 while it increased to 50% in 2002.

From the period of 1995-2002 the catch of Roving coralgrouper at the Northern and Central areas were 41% of the total catch, while the Southern area lommel catch was 18%. For Squaretail coralgrouper, the catch of Northern and Central areas represented 57% and 43% of the total catch respectively, while the catch taken from Southern area only represented 0.02% (less than one metric ton).

INTRODUCTION

Plectropomus pessuliferus (Roving Coralgrouper) (Fowler) and *plectropomus areolatus* (squaretail coralgrouper) (Rappel) are economically considered as important fishes species along the coast of the Red Sea, and their prices are the highest (40 to 48 riyals per kilogram) i.e. 11 to 13 dollars, for

medium size fish. *Plectropomus areolatus* is misidentified as *P. pessuliferus* in some cases (Khalid Allah, 2000), and this may be the reason why low catch in the name of *P. areolatus* are mostly recorded at the southern area, because its land catch is recorded as *P. pessuliferus*. The methods used in catching these fishes along the coast are hand line, gill

nets and traps using traditional fishing boats (MAWR, 1979).

The Saudi Arabia Ministry of Agriculture is greatly concerned with the protection of these two species of fishes along the coast, therefore fishing was prohibited during the closed season this management method started in 1994 ; where the closed season was (from April 15 to 14 June) in 1994. Catching of *P. pessuliferus* and *P. areolatus* was also prohibited during the years (1995-1999-2001), so the landed catch in these periods was markedly decreased.

MATERIALS AND METHODS

Due to their economic value, private sector is investing in these two species, by breeding them in artificial farms in the Kingdom of Saudi Arabia, and the Fish Farming Center in Jeddah where it started a program for breeding these two species (Mohammad and Manuel 1993). For these reasons a study on following up of varieties in the land catch of these two species of fishes along the Red Sea Coast from 1995 to 2002, depending on statistical data submitted by the Ministry of Agriculture.

These data were compared on the bases of the coastal areas (northern, central, southern), and traditional methods used in catching these fishes (hand liner boats, gill netter boats and traps boats) to obtain the catch effort per trip.

Statistical surveying of the marine fisheries in the Kingdom follows two ways:

1- Industrial Fisheries:

The survey is done by complete enumeration of the logbook records reported from individual industrial fishing boats.

2- Traditional Fisheries:

The survey is done by means of the sample. Statistical areas for estimation were divided into 4 areas Viz. Arabic Gulf area, and the northern, central and the southern

area of the Red Sea. Data on fishing trips which were used as a frame of the survey, were collected from the coast guard stations.

The present paper deals only with the traditional fisheries of the 3 coastal areas of the Red Sea, and data were collected from traditional fishing methods in which hand liner, gill netter and traps are used. Data were presented in a way to show catch in each coastal area, catch according to the fishing gear used, and others showing catch per single trip. The average annual catch of these two species of fishes along the coast reached 776 metric tons, 384 mt for *P. pessuliferus* and 392 mt for *P. areolatus*. And the total quantities caught annually in the northern, central and southern coasts reached 377, 329 and 70 mt respectively.

The average annual number of trips was 354723, distributed as follows: 75917 trips for the Northern area, 20533 for the Central area and 73533 for the southern area.

Trends in catching *Plectropomus pessuliferus* (Fowler) and *Plectropomus areolatus* (Ruppel) fishes by traditional fishing boats along the Red Sea coast of Saudi Arabia during 1995-2002.

1- The catch of *Plectropomus pessuliferus* (Fowler) and *Plectropomus areolatus* (Ruppel) along the Red Sea Coast.

Catching the fishes of *Plectropomus pessuliferus* and *P. areolatus* along the Red Sea Coast of the Kingdom is carried out by traditional methods such as hand line, gill net and by traps (MAWR, 1979).

Catch of fishes takes place along the coast in three places, namely the northern, the central and the southern, through traditional fishing boats.

The total quantity of these two species that have been caught during 1995-2002 reached 6026 metric tons, i.e. 776 mt per year, which represent 5% of the total fish caught along the coast that amounted 131307 tons. A total of 2837786 trips were carried out to catch and land this commercial catch where the catch per trip was 2.2 kilogram. Catch of *Plectropomus pessuliferus*

represents 2.3% and *P. areolatus* 2.4% of the total catch.

The results are shown in table (1). Figure (1) illustrates the percent abundance of each of these two species during the period and fig. (1-a) the trends of such catch. The maximum amount of fishes caught which was 1144 tons was in 1996 representing a maximum percentage of 7.4% from the total. Then there was a drop to 5% during the period 1997-2000 to reach 740 to 837 tons, and the lowest landed catch was in years 1995 and 2001 with 3% and 4% to give 499 and 646 tons.

1-1: Trends of catch along the coastal areas:-

1-1-1: Northern coastal area

The total catch in this area reached a maximum of 3016 tons (49%) during the period 1995-2002, and it exceeded all other catch. The total trips were 607332 (21%), being second after the central area, and topping the southern area by 19067 trips.

Table (8) shows the number of fishing trips, where fish catch rate in the north reached 377 tons per year with a catch effort 5 kg/trip. Table (2) shows catch quantities in this area which reached 310 to 728 tons (38% to 65%) of the total catch respectively. During 1995 the northern area participated with 58% of the catch amounting 228 tons compared to other years. This may reflect abundance of fishes in this area. Fig. (2) shows catch sharing in areas Fig. (3) Shows the quantities caught from these two species of fishes, with a reduction of the quantity during the period (2000-2002) with a total of 311 tons during last year.

1-1-2: Central Coastal Area:-

The total quantity of fishes caught reached 2631 tons, representing an average of 42% of the total catch, with an annual catch of 329 tons, and the maximum catch was in 1997 (53%) which exceeds that of the northern area during this year by 13% (Table 2) due to increase in number of fishing trips. During 1998 catch was 398 tons (48%) with 5% less than previous year, in spite of

increase in number of trips. Average rate of catch per trip was only 1.6 kilogram (Table 4),

1-1-3: Southern Coastal Area:

The total catch during the period (1995-2002) reached 559 tons, representing 9% of the total coastal catch, i.e. the lowest, with an average annual catch of 70 tons (Table 2). Its catch ranged between 27 to 116 tons (2% to 14%) which is very low compared with the northern and central areas. This may indicate the low presence of these two species of fishes in the Southern area.

The total number of trips reached 588265 trips (21%) (Table 8). Catch effort was about 1 kg/trip. Fig (2) shows annual share of the three areas from the total, and Fig (5) shows quantities caught from these two species of fishes. The data indicate an increase in catch during the last years with a maximum during 2002.

1-2: Trends of Catch by Fishing gears during (1995-2002):-

1-2-1: Catch by hand liner boats:

Catch with hand line reached 5483 tons for both species of fishes along the Red Sea Coast, representing 88% of the total, with an average annual catch of 685 tons (Table 3). The number of trips was 1999401, representing 70% of the total trips (Table 9), with a rate of catch effort 2.7 kg/trip. In table (3) share percentage ranged between 83% and 92%, and catch quantities ranged between 450 to 1054 tons. This reflects the domination of this method in fishing these two species. Catch during 1997-1999 are more or less similar and ranging from 705 to 745 in 1999 in spite of lower fishing due to increase in number of trips. Later there was a reduction in catch and reached 581 tons in 2001. Table (6) shows boat share percentage, and Fig (7) illustrates the trend of fish catch quantities, with a low reduction in the slope starting from 1997.

1-2-2: Catch by gill netter boats:

The total catch of fish by gill netter boats throughout the coastal area reached 107 tons representing 2% of the total, with an

average annual catch of 13 tons (Table 3). A total of 592732 boats participated in this catch which is 12% of the total traditional boats trips (Table 9), catching 0.2 kilogram per trip. Share percentage of these trips during the period ranged between 1 and 4% i.e. between 4 to 48 tons. The catch was reduced in subsequent years, and also number of trips, with the exception of the year 2002 when the number of the trips was increased but catch rate didn't exceed 7 tons. (Table 6) shows the share of percentage of boats catch, and Fig (8) shows the trend of catch quantities, decreasing from early 1997. This may be due to the fact that fishes come to these nets casually.

1-2-3: Catch by traps boats:

The total amount caught by traps reached 32 tons from both species of fishes, representing 1% of the total, with average annual catch of 4 tons. Catch quantities ranged between 1 to 13 tons, with an increase of 4 tons in 1996 compared to 1995 in spite of the reduction in number of boats to 21445 compared to 25597 boats in 1995. This quantity was caught by 185335 boats, which is 7% of the total traditional fishing trips (Table 9), with the catch effort of 0.2 kg/trip. It represent the catch landed by gill netters, in spite of the difference in number of trips. Share percent of those trips ranged between 1 to 2% of the total catch. The period 1997-2001 witnessed stable reduction in catch, and then raised up again in 2002 to reach 5 tons (Table 3). Fig. (6) shows share percent of the boats in catch. And Fig. (9) illustrates trend of catch quantities, with big reduction from the beginning of 1997.

1-2-4: Catch by other boats:

In (table no. 3) the total amount of fishes caught by other types of boats came second to the hand line boats, and reached 584 tons from the both *P. pessuliferus* and *P. areolatus*, representing 9% of the total fishes caught. The annual average was 73 tons caught by 60317 boats which is 2% of the total traditional trips (table 9). The catch per effort was 9.7 kg/trips, representing the highest rate, and may be due to the

abundance of fishes and low number of boats. The share of these boats in catching fishes ranged between 2% in 1996 to 15% in 2002, and fish quantities from 25 tons in 1995 to 118 ton in 2001, taking in consideration that there was a close seasons in 1999 and 2001 which might have some effect. Fig. (6) illustrates boat share percentage. And fig. (10) shows trend of catching quantities.

2- Catch trend of *P. pessuliferus* at the Red Sea Coast:

The annual average catch of *P. pessuliferus* along the Red Sea catch 384 tons (table 4). The quantity caught from the Northern area is 155 tons, and from Central area is 159 tons, (40.4% and 41.4%) respectively from the total, while that from the Southern area is 70 tons only (18.3%). The range of catch from the Northern area is between 110 tons to 317 tons, and from the Central area is between 131 tons in 2001 to 199 tons in 1996, while the Southern area range is between 22 and 116 tons.

Generally the annual catch are similar in percentages as they ranged from 10% to 14% with an increase to 18% in 1996. fig. (11,12,13,14) catch trend of *P. pessuliferus* along the coast. There is consistency in catch generally, with gradual reduction in the North and Center, and an increase in the South. Fig. (15) shows quantities caught along the coast.

Table (5) illustrates the share of the different methods of catch in the quantities of the production. Hand line dominated with 79.6%, seconded by other means with 19%, While gill nett and traps do not exceed 1%. Figs. (16, 17, 18, 19) show the trend of fish caught by different methods, with stability in catch by hand line, and a grate drop in catch with gill nett, may be because it is rarely used in this kind of fishes and its reduced trips. The same trend is for the traps, while there is an increase in quantities caught by other means of catch, table (9), because there was a reduction in boats and increase in yield, so there is an increase in catch per trip. Fig. (20) shows quantities caught by different methods used.

3- Catch trend of *P. areolatus* along the Red Sea coast:

Catch of this species is only in the north and central area, while catch in the South does exceed one ton in 1995. The annual average of catch *P. areolatus* was 392 tons along the coast, 222 ton (57%) of total catch in the North and 170 tons (43%) in the Center. The range of catch in the North is between 165 in 1995 to 411 tons in 1996, while in the central area is between 34 to 264 tons (6% in 1995 to 19% in 1996). Fig. (21) shows trends of catch of *P. areolatus* according to percentage show gradual decrease with peak in 1996. Figures (22, 23) illustrate fishing trends in the North and Central, and the figures show the slope in the first and the stability in the second. Fig (24) shows the total catch quantities in coastal areas.

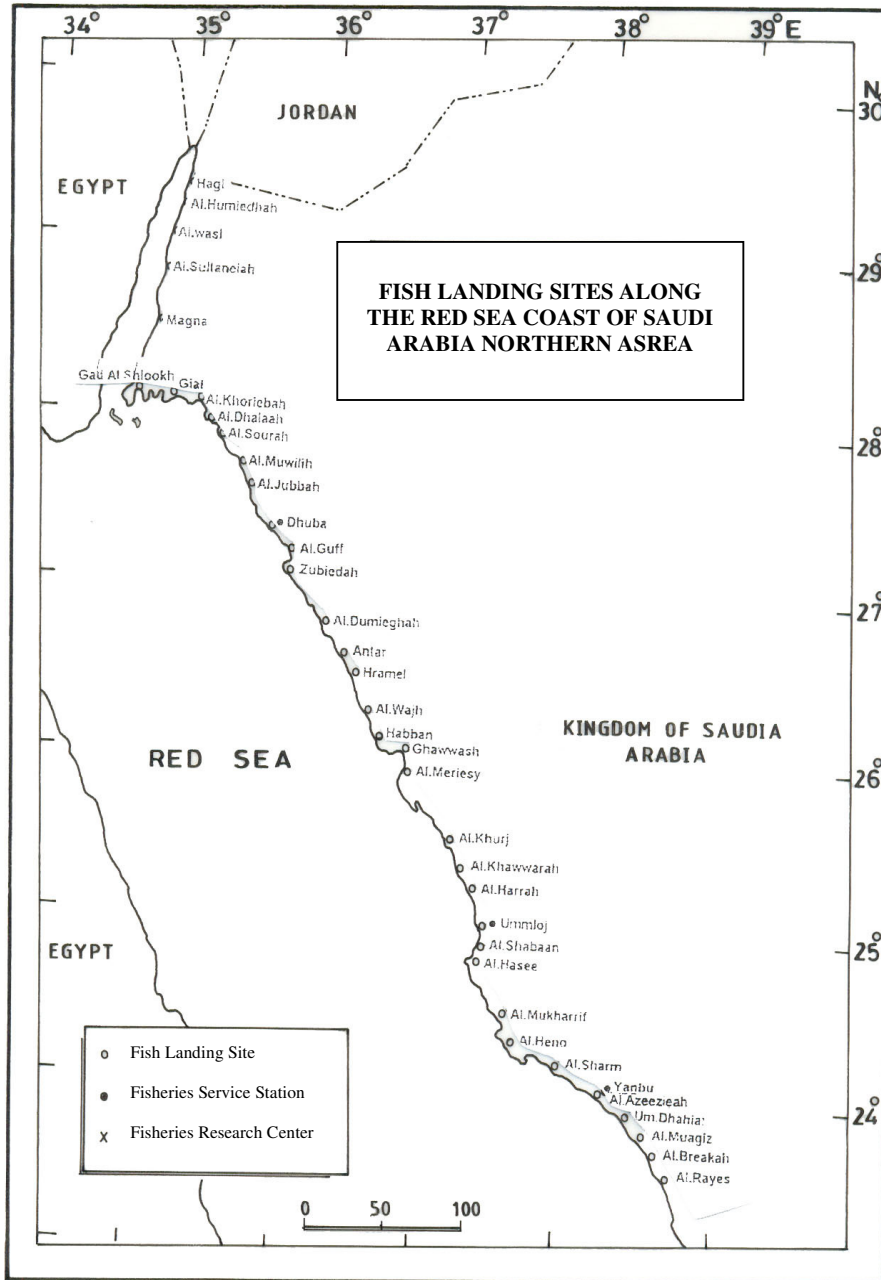
Table (7) shows that 97% of catch were through hand line boats, and 2% through gill netter boats, and 1% through traps boats and other means together.

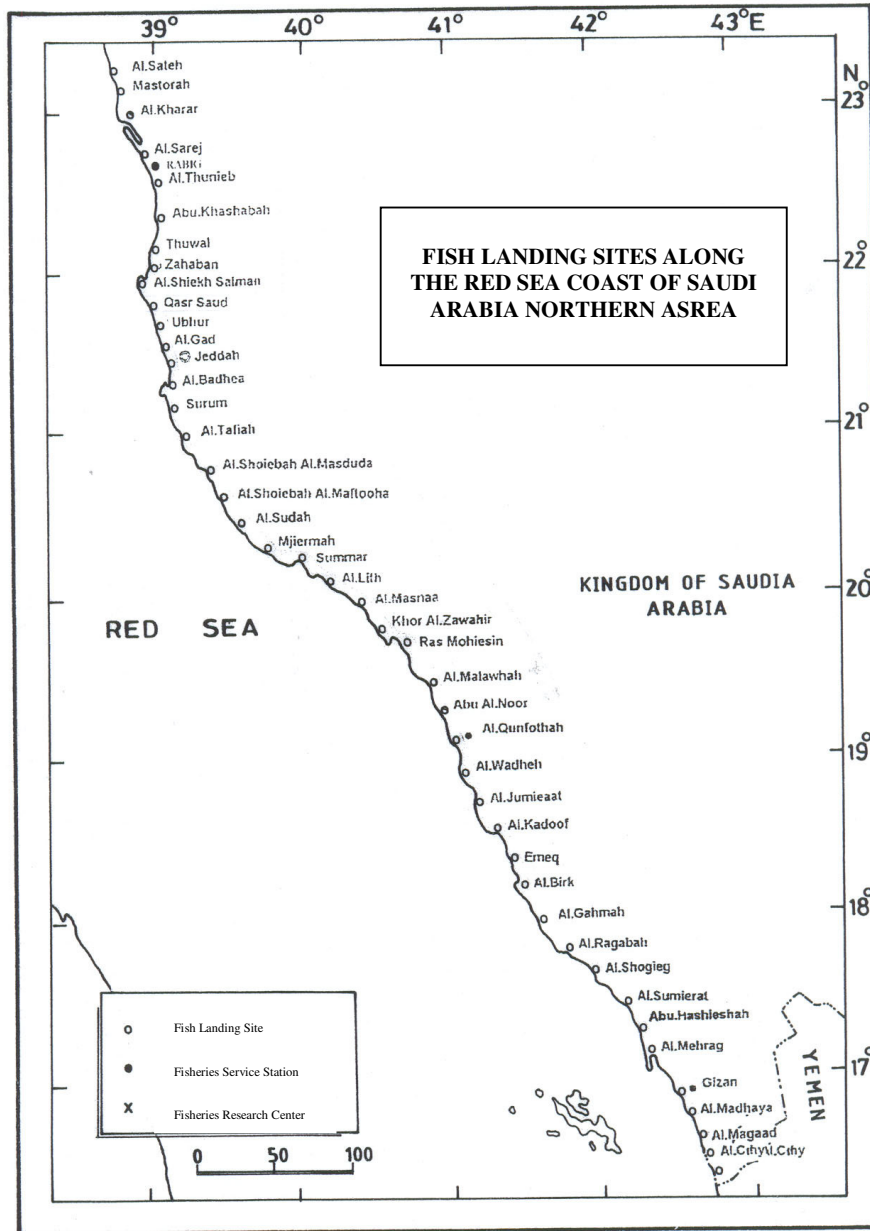
The annual average catch from hand liner boats reached 380 tons, and 9 tons through gill nett boats, 2 tons by other means, and 1 ton by traps. The range of hand liner is between 195 in 1995 to 554 tons in 1996 for hand line boats. The figures (25, 26, 27, 28) illustrate trends of catch *P. areolatus* by different types of gears, with clear sloping in all methods, but inclination of slope is not matching in case of hand line boats, with a domination of quantity of fishes caught in 1997 by other means. This may be due to increase in the number of trips. While peaks of catch for hand line or gill netter or trap boats are during 1996. Fig (29) shows quantities of catch by the different finishing gears.

Table (1): Catches of *Plectropomus pessuliferus* and *Plectropomus areolatus* by traditional fishing boats for 1995-2002 period at the Red sea coast in the KSA. Unit :Mt

	Ple pes	Ple areol	Plec pess&areo	Total Fishes
1995	300	200	499	15419
1996	543	601	1144	15388
1997	331	480	812	17416
1998	416	408	824	17435
1999	393	444	837	17701
2000	377	363	740	14820
2001	305	341	646	17382
2002	406	299	705	15745
Total	3070	3136	6206	131307
Average	384	392	776	16413
%	2.3%	2.4%	5%	100%

TRENDS IN CATCHES OF *PLECTROPOMUS PESSULIFERUS* (FOWLER) AND *PLECTROPOMUS AREOLATUS* (RUPPEL) IN THE RED SEA COAST OF SAUDI ARABIA FROM 1995 TO 2002





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Table (2): Catches of traditional fishing boats for 1995-2002 periods in the KSA Area: all Red sea areas Species: *Plectropomus pessuliferus* and *Plectropomus areolatus*.

	Northern	Northern	Central	Central	Southern	Southern	Total Area	%
1995	288	58%	188	38%	23	5%	499	8%
1996	728	64%	388	34%	27	2%	1144	18%
1997	326	40%	428	53%	57	7%	812	13%
1998	311	38%	398	48%	116	14%	824	13%
1999	393	47%	355	42%	89	11%	837	13%
2000	334	45%	320	43%	86	12%	740	12%
2001	326	50%	263	41%	57	9%	646	10%
2002	311	44%	291	41%	103	15%	705	11%
Total	3016	49%	2631	42%	559	9%	6206	100%
Average	377	49%	329	42%	70	9%	776	

Table (3): Catch of traditional fishing boats for 1995-2002 period in the KSA Species: *Plectropomus pessuliferus* and *Plectropomus areolatus*.

	Hand line	Hand line%	Gillnet	Gillnet %	Trap	Trap %	Others	Others %	Total
1995	450	90%	15	3%	9	2%	25	5%	499
1996	1054	92%	48	4%	13	1%	28	2%	1144
1997	716	88%	27	3%	1	0%	67	8%	812
1998	705	86%	0	0%	1	0%	118	14%	824
1999	745	89%	0	0%	1	0%	91	11%	837
2000	645	87%	4	1%	1	0%	89	12%	740
2001	581	90%	5	1%	1	0%	59	9%	646
2002	586	83%	7	1%	5	1%	107	15%	705
Total	5483	88%	107	2%	32	1%	584	9%	6206
Average	685	88%	13	2%	4	1%	73	9%	776

TRENDS IN CATCHES OF *PLECTROPOMUS PESSULIFERUS* (FOWLER) AND *PLECTROPOMUS AREOLATUS* (RUPPEL) IN THE RED SEA COAST OF SAUDI ARABIA FROM 1995 TO 2002

Table (4): Catch of *Plectropomus pessuliferus* for 1995-2002 period at the Red sea coast in the KSA.

	Northern	Central	Southern	Total Area	%
1995	124	153	22	300	10%
1996	317	199	27	543	18%
1997	110	164	57	331	11%
1998	133	168	116	416	14%
1999	165	139	89	393	13%
2000	135	156	86	377	12%
2001	117	131	57	305	10%
2002	140	163	103	406	13%
total	1240	1272	558	3070	100%
Average	155	159	70	384	
%	40.4%	41.4%	18.2%	100%	

Table (5): Catch of *Plectropomus pessuliferus* for 1995-2002 period at the Red sea coast in the KSA.

	Hand line	Gill net	Trap	others	Total
1995	255	11.83	8.9	24	300
1996	500	8.71	6.4	28	543
1997	262	8.54	1.1	60	331
1998	298	0.10	0.2	117	416
1999	301	0.08	1.0	91	393
2000	287	0.82	0.5	88	377
2001	245	0.40	1.3	58	305
2002	296	1.69	2.3	106	406
Total	2445	32.16	21.6	571	3070
Average	306	4	3	71	384
%	79.6%	1.0%	0.7%	19%	100%

TRENDS IN CATCHES OF *PLECTROPOMUS PESSULIFERUS* (FOWLER) AND *PLECTROPOMUS AREOLATUS* (RUPPEL) IN THE RED SEA COAST OF SAUDI ARABIA FROM 1995 TO 2002

Table (6): Catch of *Plectropomus areolatus* for 1995-2002 period at the Red sea coast of the KSA.

	Northern	Central	Southern	Total Area	%
1995	166	34	1	201	7%
1996	411	189	0	601	19%
1997	216	264	0	480	16%
1998	178	230	0	408	13%
1999	228	216	0	444	14%
2000	199	164	0	363	12%
2001	209	132	0	341	11%
2002	171	128	0	299	10%
Total	1778	1359	1	3138	102%
Average	222	170	0	392	
%	57%	43%	0%	100%	

Table (7): Catch of *Plectropomus areolatus* for 1995-2002 period at the Red sea coast of the KSA

	Hand line	Gillnet	Trap	others	Total
1995	195	2.9	0.4	1.3	200
1996	554	39.6	6.4	0.5	601
1997	454	18.5	0.1	7.9	480
1998	406	0.2	0.3	0.8	408
1999	444	0.0	0.0	0.4	444
2000	358	3.4	0.2	1.0	363
2001	336	4.6	0.2	0.2	341
2002	290	5.2	3.0	0.7	299
Total	3038	74.4	11	13	3136
Average	380	9	1	2	392
%	97%	2%	0.3%	0.4%	100%

Table (8): Number of traditional fishing trips for1995- 2002 period in the Red sea in the KSA Area: Red sea

Coastal areas	Northern	%	Central	%	Southern	%	Total area	%
1995	86192	14%	168811	10%	64815	11%	319818	11%
1996	77992	13%	191832	12%	73597	13%	343421	12%
1997	70294	12%	217435	13%	73597	13%	361326	13%
1998	75849	12%	225243	14%	78096	13%	379188	13%
1999	73511	12%	211196	13%	84125	14%	368832	13%
2000	74960	12%	223327	14%	65364	11%	363651	13%
2001	72050	12%	219843	13%	73275	12%	365168	13%
2002	76484	13%	184502	11%	75395	13%	336381	12%
Total	607332	100%	1642189	100%	588265	100%	2837786	100%
Average	75917		205274		73533		354723	
%	21%		58%		21%		100%	

Table (9): Number of traditional fishing trips for1995- 2002 period in the Red sea in the KSA Area : Red sea

Fishing Trips	Hand lines	%	Gillnet	%	Trap	%	others	%	Total
1995	205886	10%	78218	13%	25597	14%	10117	17%	319818
1996	236964	12%	76801	13%	21445	12%	8211	14%	343421
1997	249108	12%	78744	13%	22480	12%	10994	18%	361326
1998	266959	13%	81173	14%	25587	14%	5469	9%	379188
1999	274821	14%	64460	11%	22571	12%	6980	12%	368832
2000	268853	13%	64073	11%	23944	13%	6781	11%	363651
2001	268222	13%	69241	12%	21818	12%	5887	10%	365168
2002	228589	11%	80021	14%	21893	12%	5878	10%	336381
Total	1999401	###	592732	100%	185335	100%	60317	100%	2837786
Average	249925		74092		23167		7540		354723
%	70%		21%		7%		2%		100%

TRENDS IN CATCHES OF *PLECTROPOMUS PESSULIFERUS* (FOWLER) AND *PLECTROPOMUS AREOLATUS* (RUPPEL) IN THE RED SEA COAST OF SAUDI ARABIA FROM 1995 TO 2002

Table (10): Annual Average catch of P. species in the coastal areas of the Red sea for 1995-2002 period mt Catch efforts kg/trip.

Coastal areas		<i>P. pessuliferus</i>	<i>P. areolatus</i>	Total	<i>P. pessuliferus</i>	<i>P. areolatus</i>	Total
	Northern	155	222	377	2.0	2.9	5.0
Central	159	170	329	0.8	0.8	1.6	
Southern	70	0.1	70	0.9	0.0	0.9	
Total	384	392	776	1.1	1.1	2.2	

Table (11): Annual Average catch of P. species for fishing boats in the coastal areas at the Red sea coast for 1995-2002 period mt Catch efforts kg / trip.

Fishing boats		<i>P. pessuliferus</i>	<i>P. areolatus</i>	Total	<i>P. pessuliferus</i>	<i>P. areolatus</i>	Total
	Hand line	306	380	686	1.2	1.5	2.7
Gill net	4	9	13	0.1	0.1	0.2	
Trap	3	1	4	0.1	0.1	0.2	
others	71	2	73	9.5	0.2	9.7	
Total	384	392	776	1.1	1.1	2.2	

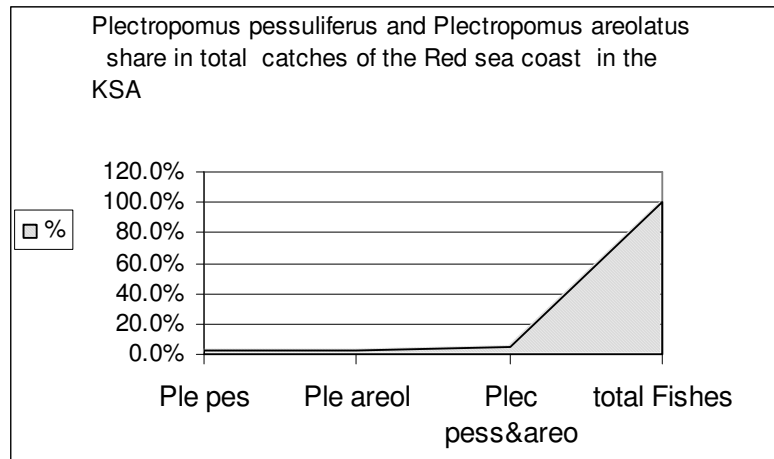


Figure (1): Proportion of catches for Plectropomus pessuliferus and Plectropomus areolatus to total fishes at the Red sea coast

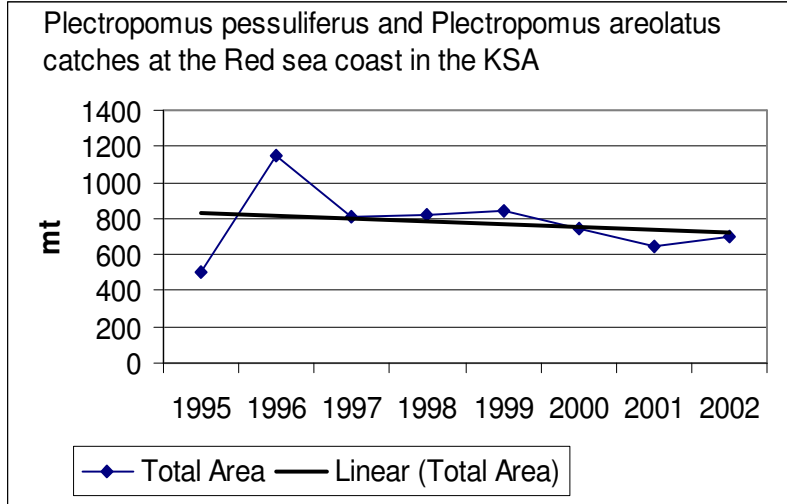


Figure (1-a): Plectropomus pessuliferus and Plectropomus areolatus landings

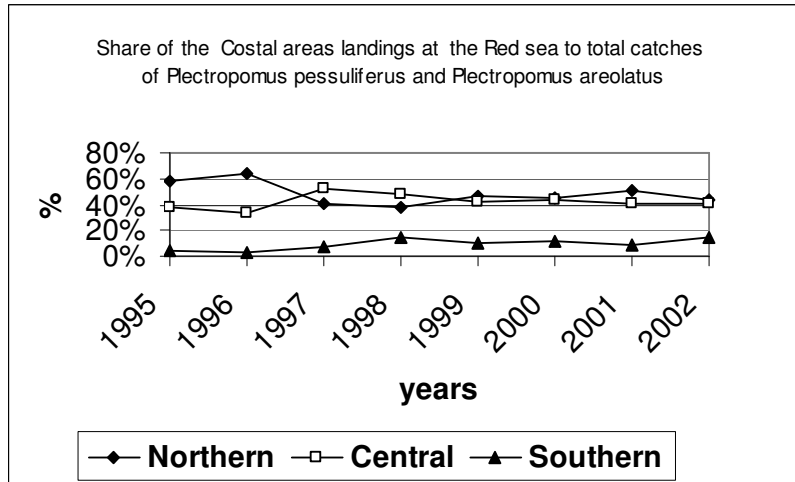


Figure (2): Proportions of the catches of *Plectropomus pessuliferus* and *Plectropomus areolatus* by coastal areas

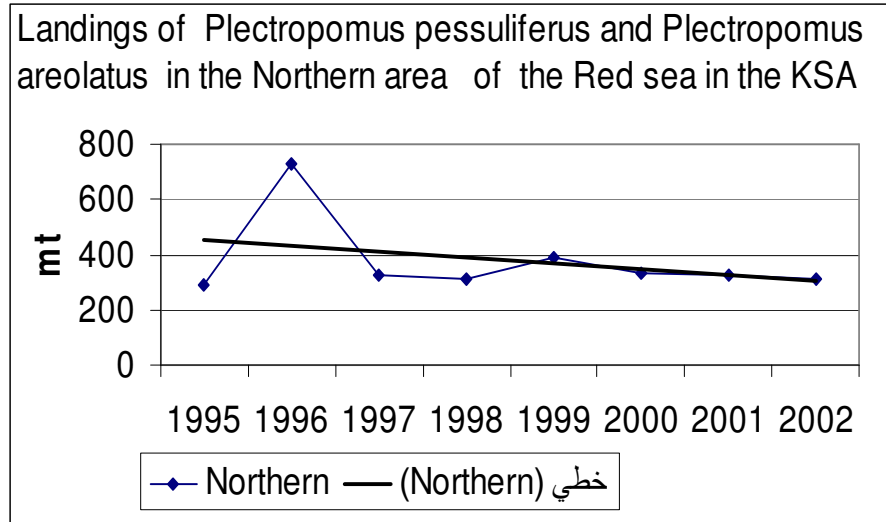


Figure (3): Northern area landings of *Plectropomus pessuliferus* and *Plectropomus areolatus*

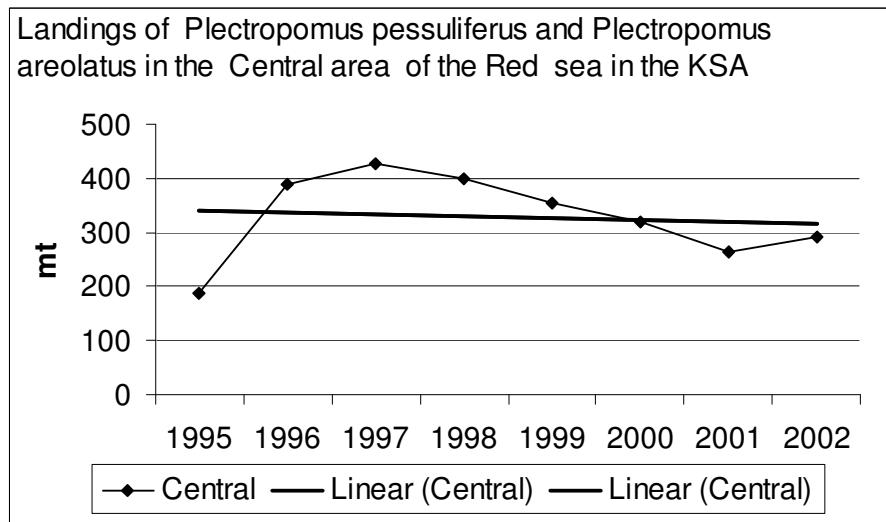


Figure (4): Central area landings of *Plectropomus pessuliferus* and *Plectropomus areolatus*.

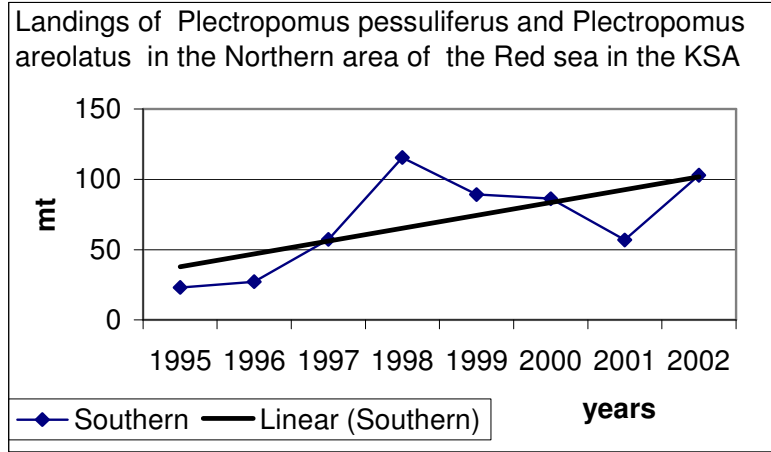


Figure (5): Southern area landings of *Plectropomus pessuliferus* and *lectropomus areolatus*

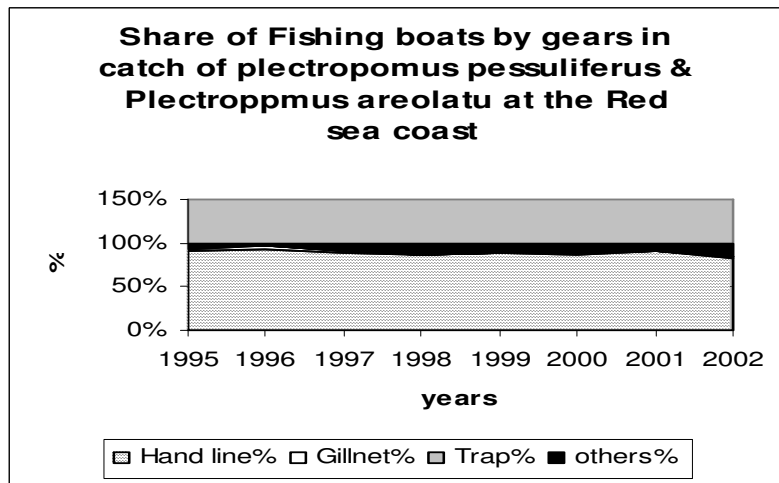


Figure (6): Proportion of fishing boats catch by gear type

TRENDS IN CATCHES OF *PLECTROPOMUS PESSULIFERUS* (FOWLER) AND *PLECTROPOMUS AREOLATUS* (RUPPEL) IN THE RED SEA COAST OF SAUDI ARABIA FROM 1995 TO 2002

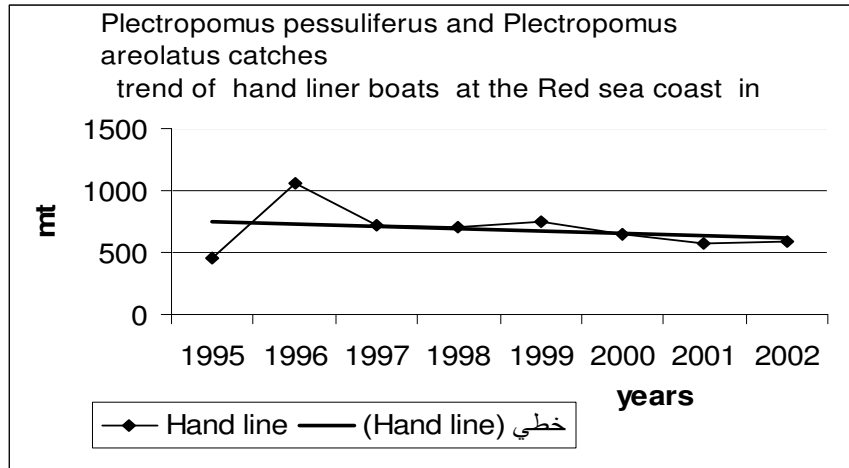


Figure (7): *Plectropomus pesseliferus* and *Plectropomus areolatus* catch trends.

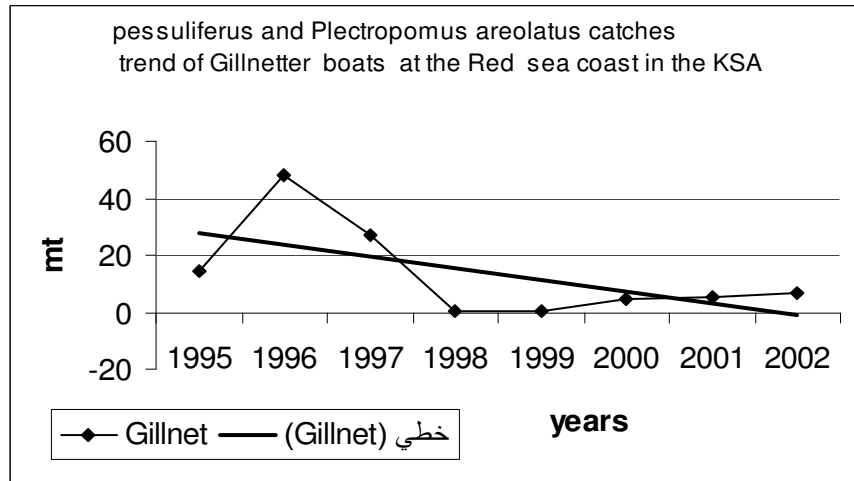


Figure (8): *Plectropomus pesseliferus* and *Plectropomus areolatus* catch trends

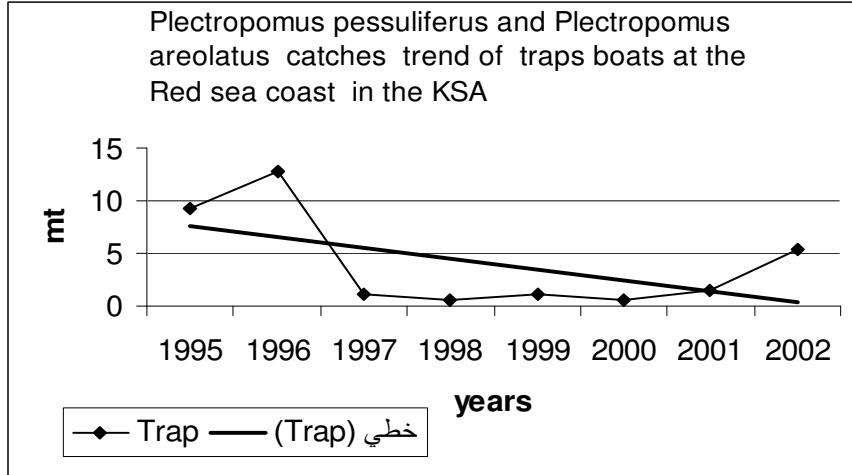


Figure (9): *Plectropomus pessuliferus* and *Plectropomus areolatus* catch trends.

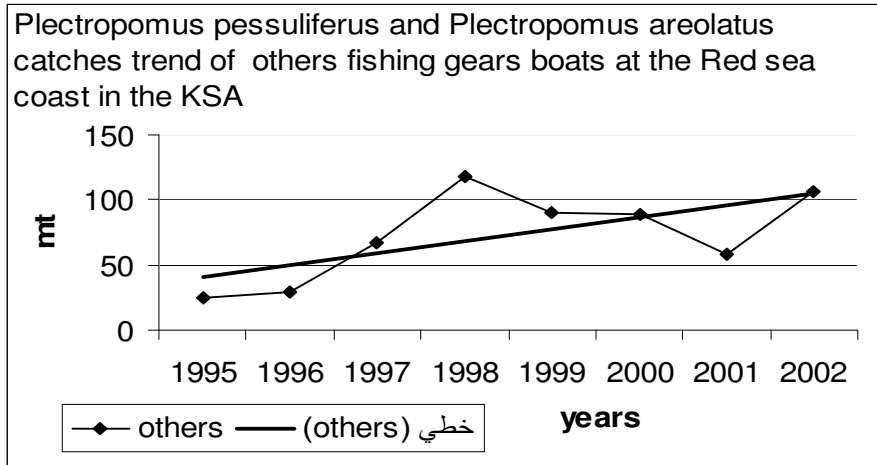


Figure (10): *Plectropomus pessuliferus* and *Plectropomus areolatus* catch trends

TRENDS IN CATCHES OF *PLECTROPOMUS PESSULIFERUS* (FOWLER) AND *PLECTROPOMUS AREOLATUS* (RUPPEL) IN THE RED SEA COAST OF SAUDI ARABIA FROM 1995 TO 2002

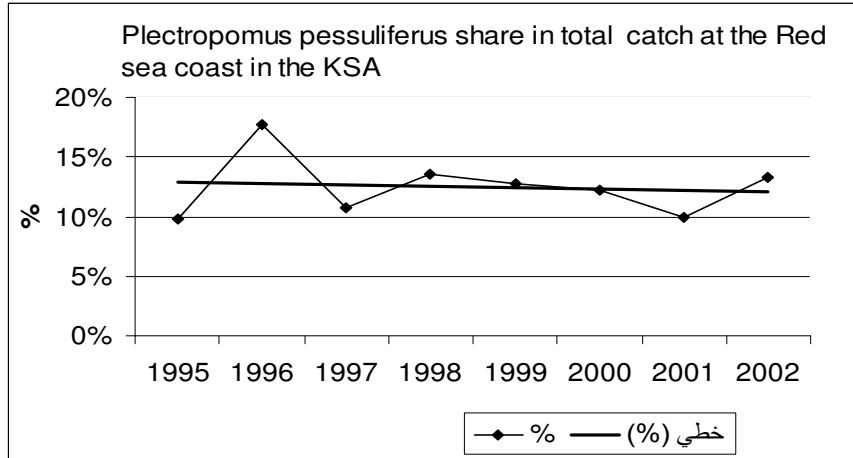


Figure (11): *Plectropomus pessuliferus* share in total fish Catch

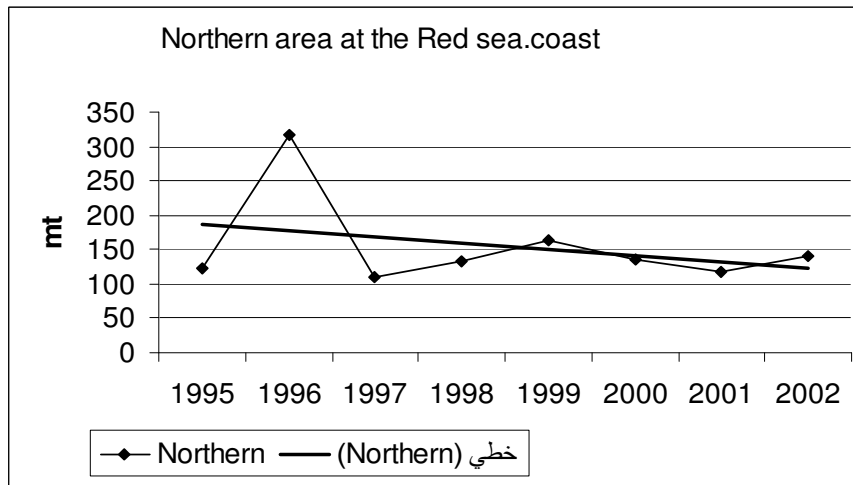


Figure (12): Catch trends of *Plectropomus pessuliferus* in the Northern area

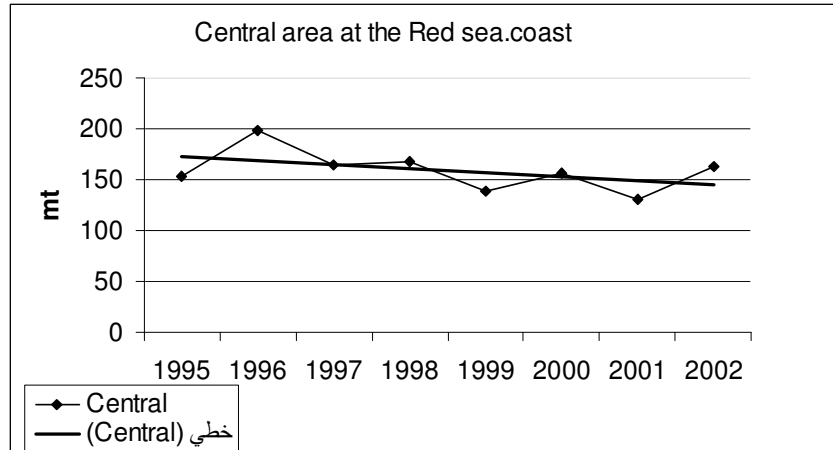


Figure (13): Catch trends of *Plectropomus pessuliferus* in the Central area

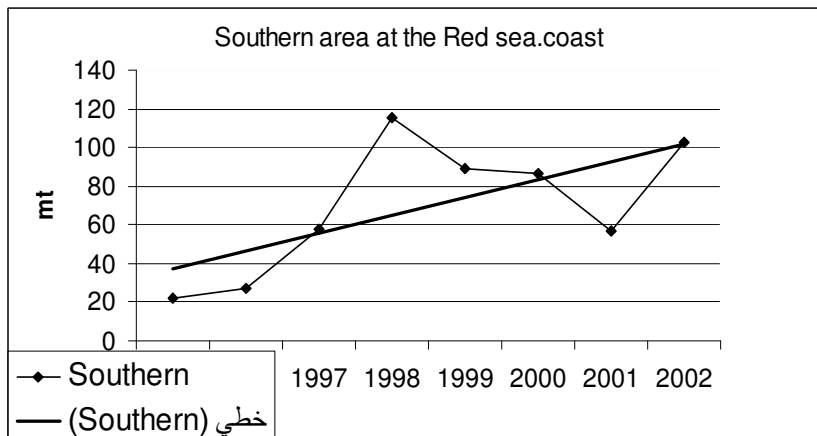


Figure (14) Catch trends of *Plectropomus pessuliferus* in the Southern area.

TRENDS IN CATCHES OF *PLECTROPOMUS PESSULIFERUS* (FOWLER) AND *PLECTROPOMUS AREOLATUS* (RUPPEL) IN THE RED SEA COAST OF SAUDI ARABIA FROM 1995 TO 2002

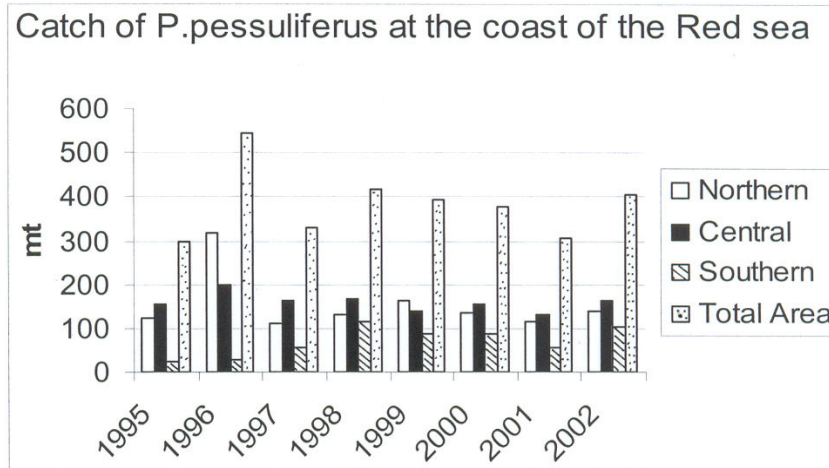


Figure (15): Catch of *P. pessuliferus* at the Red sea coast in the KSA

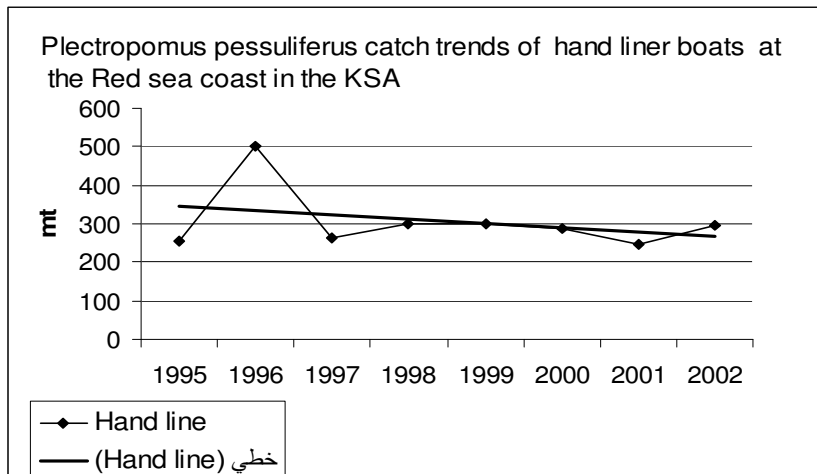


Figure (16): Catch trends of *Plectropomus pessuliferus*

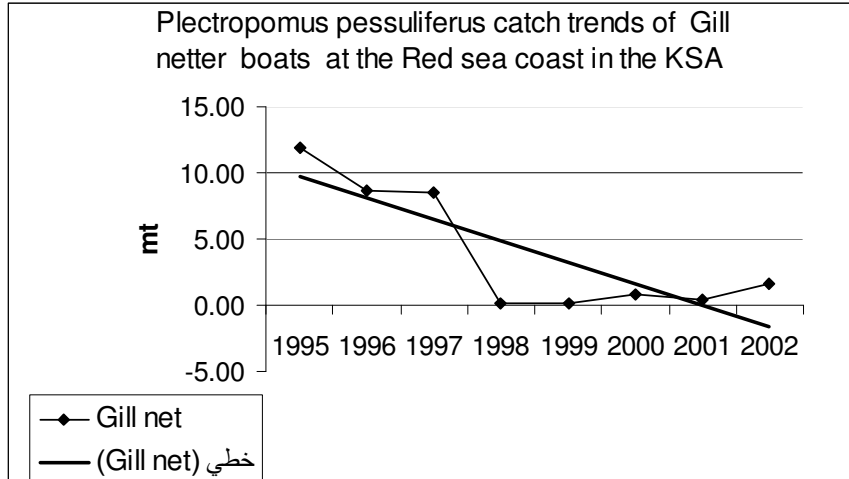


Figure (17): Catch trends of *Plectropomus pessuliferus*

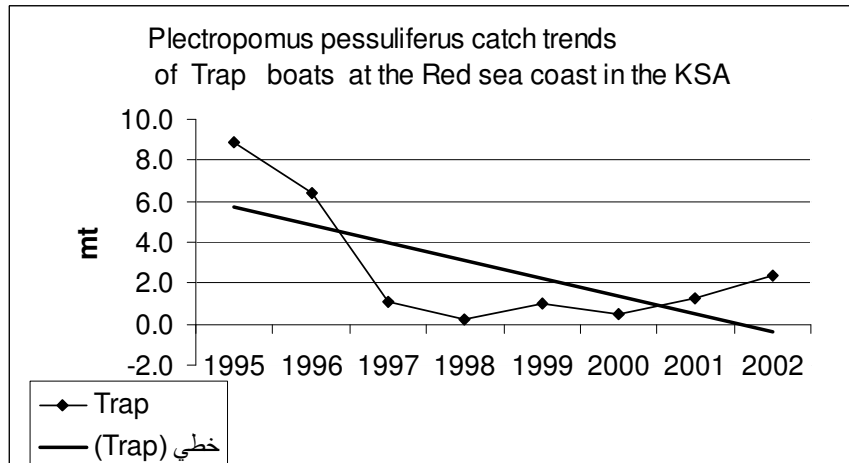


Figure (18): Catch trends of *Plectropomus pessuliferus*

TRENDS IN CATCHES OF *PLECTROPOMUS PESSULIFERUS* (FOWLER) AND *PLECTROPOMUS AREOLATUS* (RUPPEL) IN THE RED SEA COAST OF SAUDI ARABIA FROM 1995 TO 2002

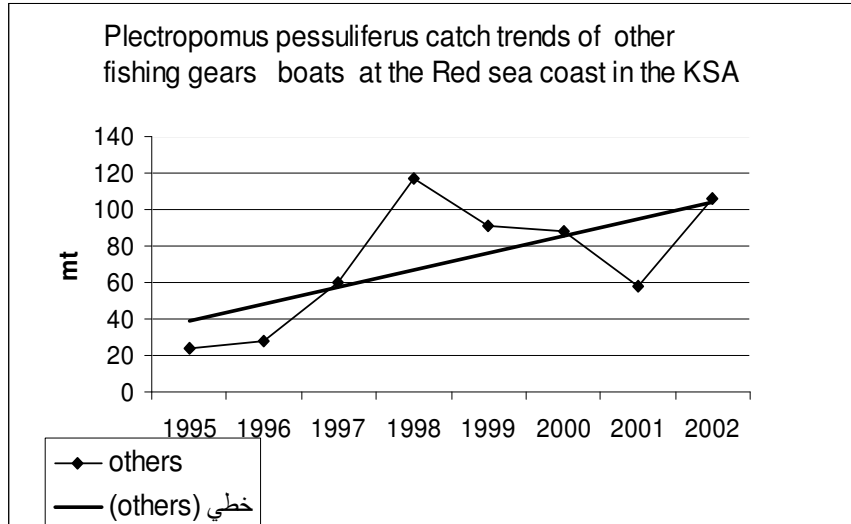


Figure (19): Catch trends of *Plectropomus pessuliferus*

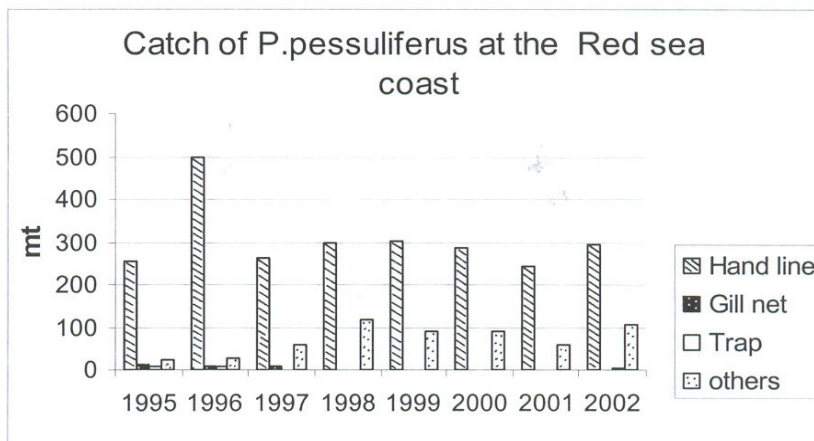


Figure (20): Catch of *P. pessuliferus* at the Red sea coast in the KSA

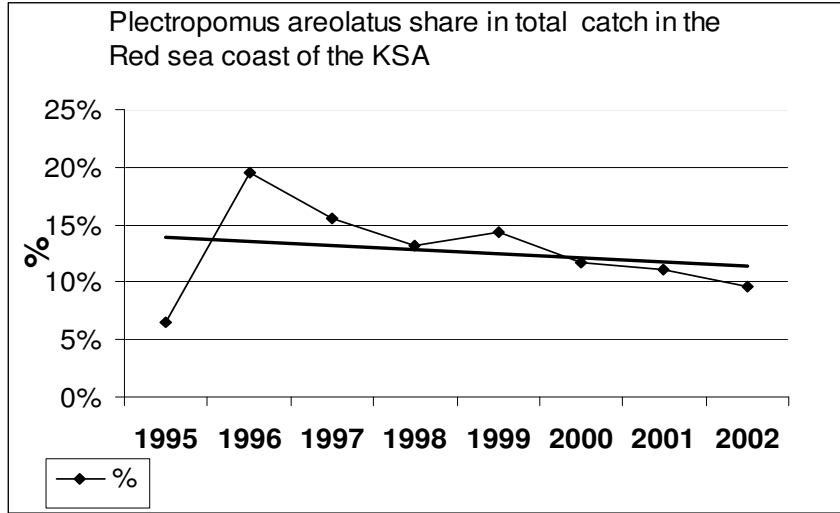


Figure (21): *Plectropomus areolatus* share in total fish Catch

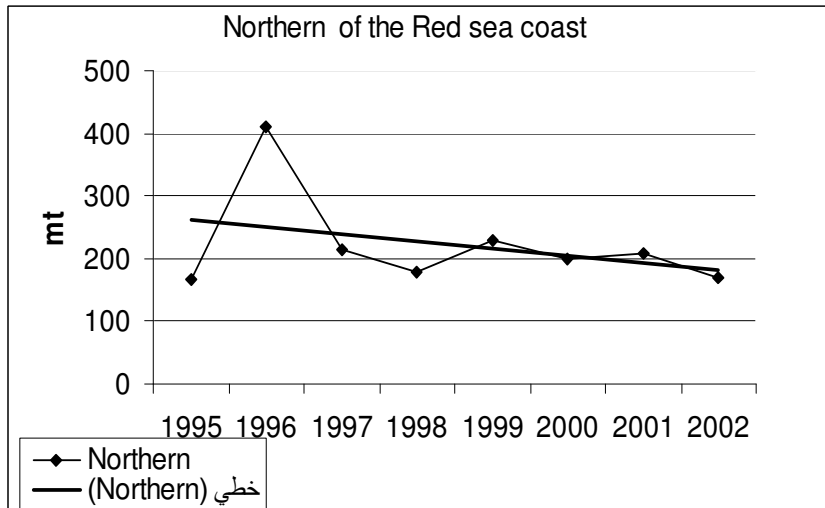


Figure (22): Catch trends of *Plectropomus areolatus* in the Northern area.

TRENDS IN CATCHES OF *PLECTROPOMUS PESSULIFERUS* (FOWLER) AND *PLECTROPOMUS AREOLATUS* (RUPPEL) IN THE RED SEA COAST OF SAUDI ARABIA FROM 1995 TO 2002

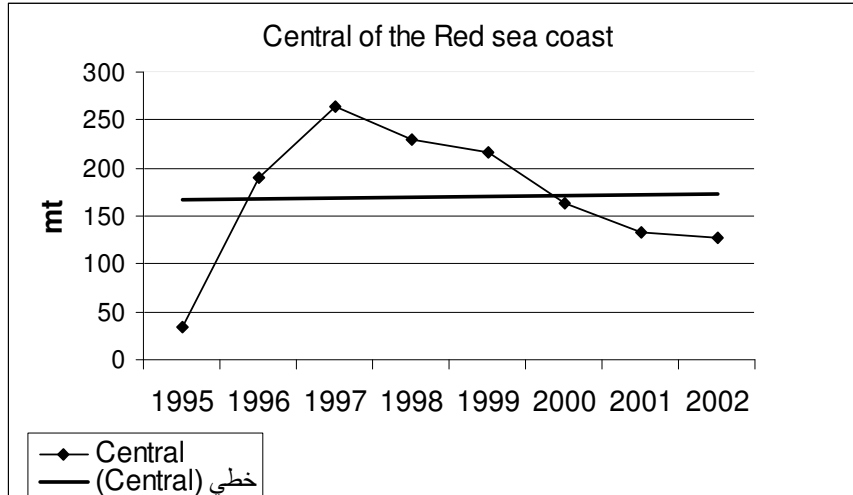


Figure (23): Catch trends of *Plectropomus areolatus* in the Central area

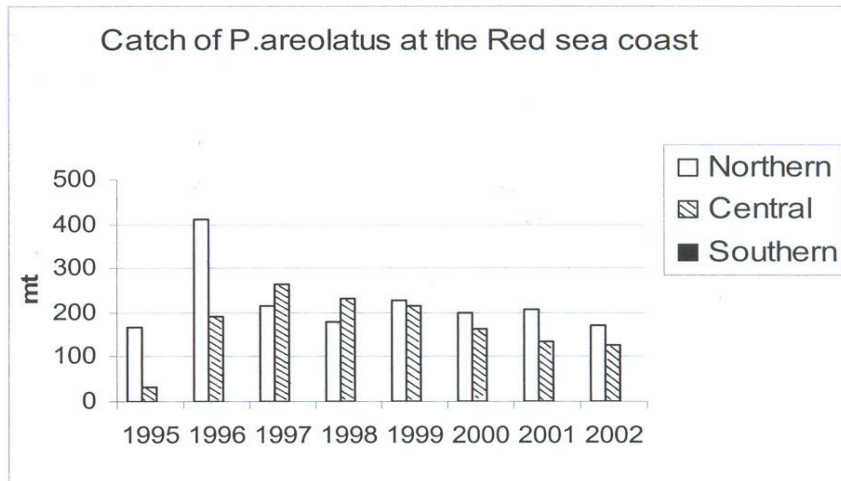


Figure (24): Catch of *P. areolatus* at the Red sea coast in the KSA

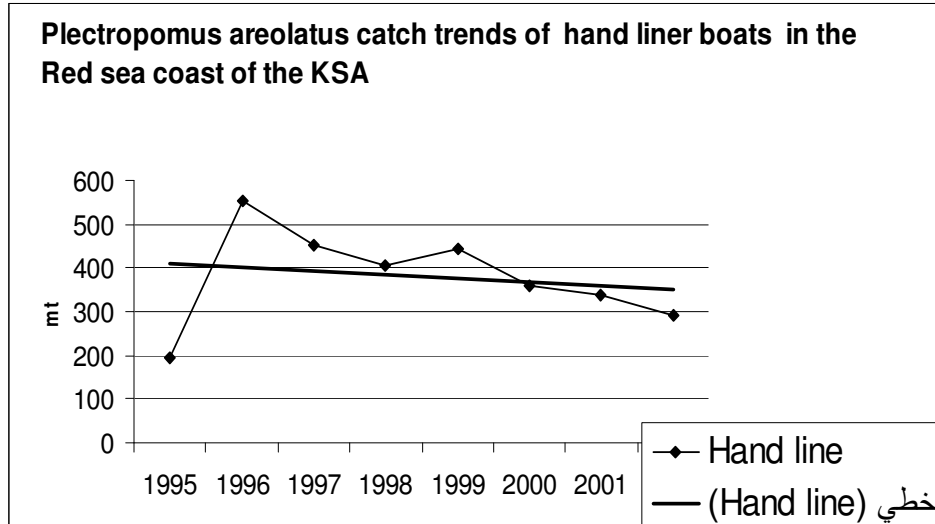


Figure (25): Catch trends of *Plectropomus areolatus*.

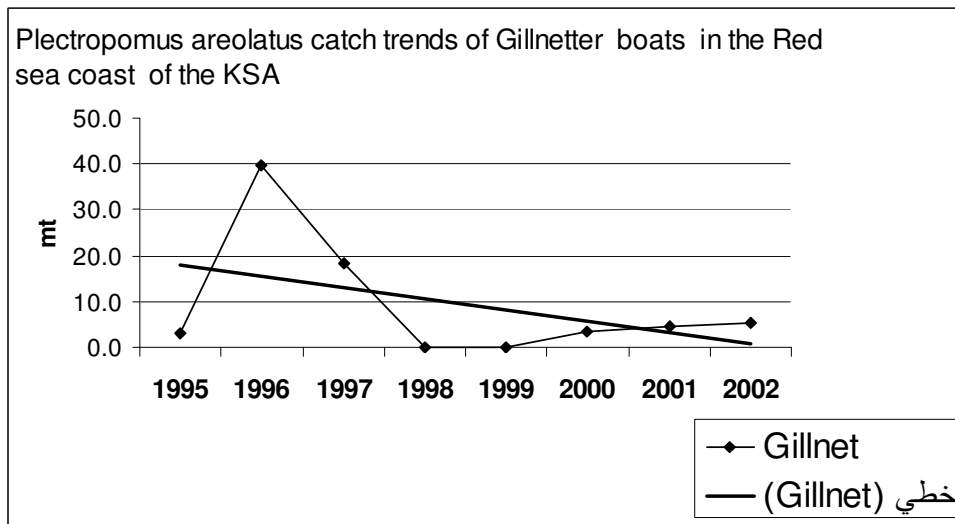


Figure (26): Catch trends of *Plectropomus areolatus*

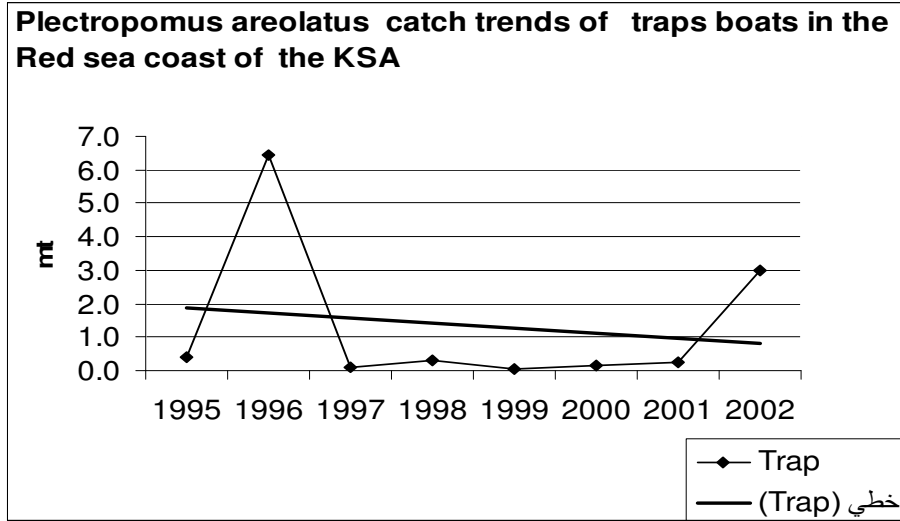


Figure (27): Catch trends of *Plectropomus areolatus*

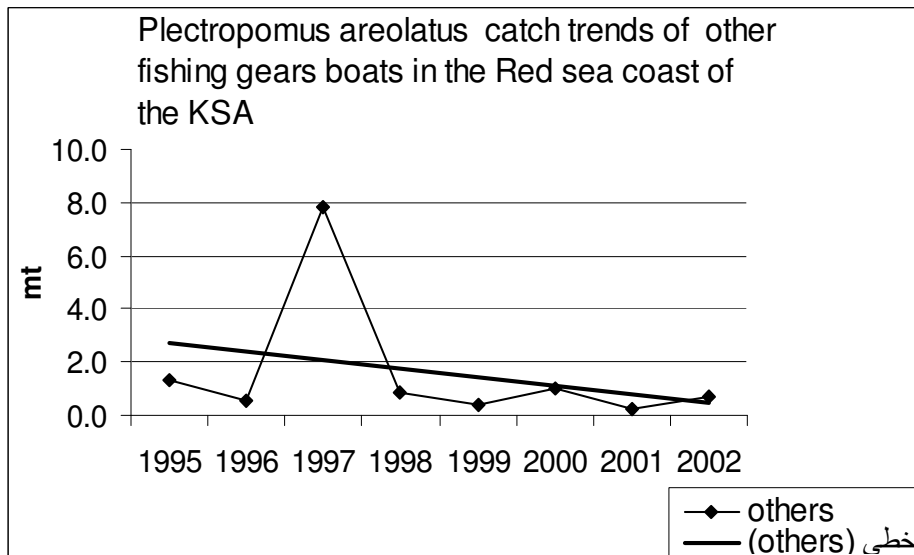


Figure (28): Catch trends of *Plectropomus areolatus*

Catch of *P. areolatus* at the Red sea coast

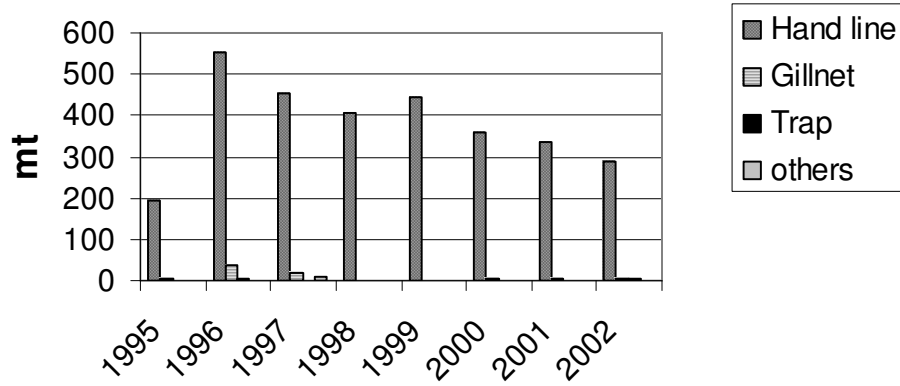


Figure (29): Catch of *P. areolatus* at the Red sea coast in the KSA

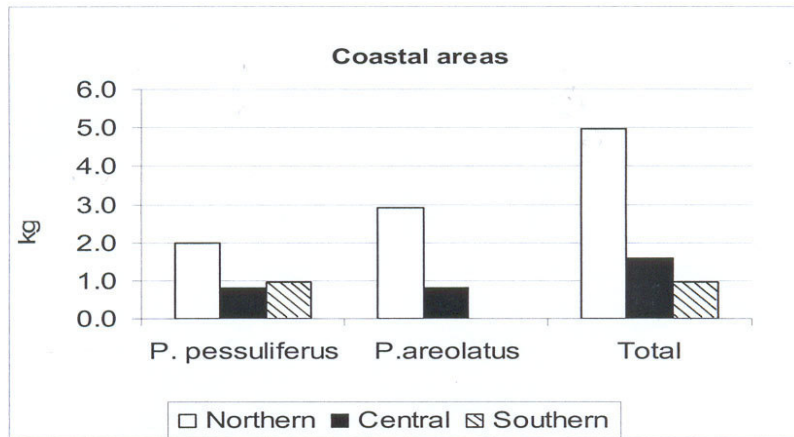


Figure (30): Catch effort of species at the coastal areas at the Red sea coast for 1995-2002 period

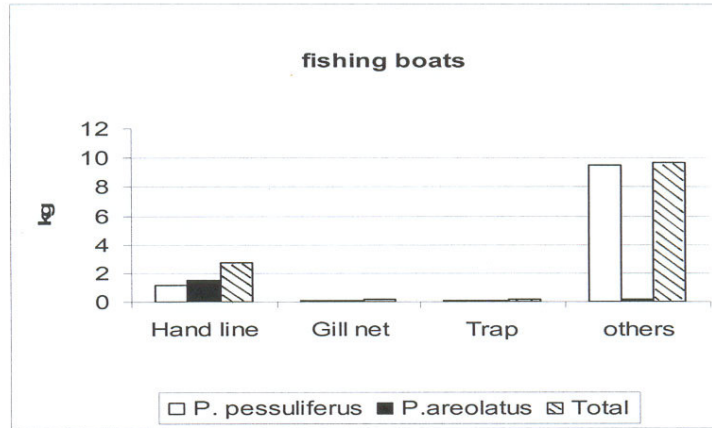


Figure (31): Catch effort of species for the fishing boats at the Red sea coast for 1995-2002 period

CONCLUSION

It is clear that annual catch rates of *P. pessuliferus* and *P. areolatus* are nearly similar reaching 384 for *P. pessuliferus* and 392 metric tons for *P. areolatus*, which is comprise 49.5% and 50.5% respectively i.e. the difference of metric ton annually (1%). The yield per trip was 1.1 kg per day during the year for both species. The central coastal area came first as *P. pessuliferus* catch with annual yield of 159 metric tons, followed by the northern area with a difference of 4 tons, while the lowest in yield was the Southern area but as for the yield per trap the Southern area comes second to the North with a rate of 0.9 kg/trip and the central area with 0.8 kg/trip.

For *P. areolatus* its annual average catch reached 222 metric tons in the North, 170 metric tons in the Center, with 3 kg/trip for the north and 0.8 kg/trip for the central area the same as in the case of *P. pessuliferus*. Northern area comes first with a total catch of both *P. pessuliferus* and *P. areolatus* with 5 kg/trip in spite of the lower number of trips

(21%) compared to the number of trips in the central area with 58%. The central area comes second with 1.6 kg/trip and the last is the Southern. The average catch along the coast for both species is 2.2 kg/trip table (10) and fig (30).

As for the catch by taken different fishing gears, hand line boats comes first with 306 metric tons for *P. pessuliferus* and 380 mt. tons for *P. areolatus* annually; and *P. pessuliferus* with other means was second (71 tons); while catching of *P. areolatus* by gill nett boats was second with annual yield of 9 tons, and catching by tarps boat comes last.

As for catch effort with other means come first with 9.5 kg/trip for *P. pessuliferus* and this may be due to reduction in number of trips, which represent 2% of the total annual trips for *P. pessuliferus*.

As for *P. areolatus* the catch effort by hand line boats was the first, followed by catching with other means, with 1.5 and 0.2 kg/trip, and then the catch by gill nett boats and traps with equal quantities 0.1 kg/trip. Catch with other means reached 9.7 kg/trip coming in the first place for both species, and

catch effort of hand liner boats is second giving 2.7 kg/trip, while that for gill netter and trap boats was similar (0.2 kg/trip), table (11) fig. (31).

Following the catch effort from 1995 to 2002 it is clear that it is nearly fixed at 1 kg/trip, except in 1996 when it raised to 2 kg/trip due to high increase in yield. We recommend not to increase number of trips by boats in the central area.

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