



1950

**International Commission
for the
Northwest Atlantic Fisheries**



1970

RESTRICTED

Serial No.2392
(D.a. 69)

ICNAF Res.Doc.70/17ANNUAL MEETING - JUNE 1970Portuguese Research Report, 1969

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During 1969 the portuguese fleet operated in I.C.N.A.F. statistical Subareas 1, 2, 3 and 4, fishing mainly for cod. The total landings of that specie - 182,349 metric tons - was lower than in 1968 - 219,365 tons - (table 1, fig. 1). This was due to the decrease of the landings both of the trawlers (side and stern) and of the dory vessels.

The decrease of the trawlers amounted to 24,000 tons, while the figures for dory vessels are somewhat less (13,000 tons).

Best fishing by trawlers occurred in Subarea 3 with 98,832 tons landed; the dory vessels operated mainly in this Subarea (37,468 tons) and also in Subarea 1 where they fished a very low percentage of the whole line fishery (2,429 tons).

Table 1

Subareas	Line (dory vessels)	Side	Trawl Stern	Total	Line + trawl
1	2,429	1,864	11,506	13,370	15,799
2	-	50,239	15,843	66,082	66,082
3	37,468	55,474	5,890	61,364	98,832
4	-	1,636	-	1,636	1,636
TOTAL	39,897	109,213	33,239	142,453	182,349

The data above show the total landings by subareas. With exception of the subarea 1, landings of the side trawl fishery were more important than the stern one; the dory vessel figures represent only about 22% of the total. The trawlers operating in the four subareas fished mainly in the 2 and 3 ones along the four quarters of the year (Table 2 and fig. 2).

Best fishing by dory vessels was in division 3L (32,686 tons) and the lower in the 1A (207 tons). The tables 2 and 4 show also that the side trawlers have fished intensively in Subarea 3 - 55,747 tons (with 36,115 tons in Div. 3L).

By quarters of the year the highest trawler figure was in the 1st, 59,162 tons (51,420 tons landed in subarea 2). Best fishing by dory vessels was in the third Quarter (as last year) with great success in subarea 3 (table 3). The table 4 presents data of the catches by Divisions (trawl and dory vessel) for the I.C.N.A.F. area where the portuguese fleet operated during 1968. We present also the respective fishing efforts as hours fishing and dory-hours.

The present report in addition to reviewing the status of fisheries, presents also data on lengths, ages, maturity and probable age of first maturity obtained from random sampling on-board commercial trawlers before discarding the undersized fish.

Detailed information on the samples for length and age, are included in the I C N A F Sampling Yearbook.

II

Subarea 1

A - Status of the fisheries

The trawlers fished only in Div. 1B, C, D, E during the 2nd quarter of the year (13,370 tons landed); the dory vessels only fished in May and June and the results are somewhat poor - 2,429 tons.

B - Special Research studies

Samples for biological study were collected from the trawler fleet in Div. 1C, 1D, 1E, 1F as follows:

Div.	Samples	Date	Depth	Nº. lengths	Nº. ages
1C	A	7-18 May	200 - 300	182	100
"	B	7-10 June	300	125	75
				<u>307</u>	<u>175</u>
1D	C	4-10 April	300	242	242
"	D	3-30 May	300	920	295
"	E	2-8 June	300 - 500	153	78
				<u>1315</u>	<u>615</u>
1E	F	11-25 April	300	1250	350
"	G	2-19 May	150 - 300	369	219
				<u>1619</u>	<u>569</u>

a) Lengths

The lengths (fig. 3) ranged from 28 to 112 cm classes; Mean lengths where:

A - 62.0 B - 74.2 C - 58.7 D - 68.6 E - 69.5
 F - 58.4 G - 62.5

b) Age compositions

In this subarea the ages ranged from 3 to 12 years (fig. 3).

In div. 1C the IV, and VIII age groups dominated, in May while in June the VI, VII, VIII and IX age groups prevailed.

In Div. 1D the IV, V, VI and VII age groups were the dominant ones in April; in May and June the VI, VII, VIII and IX age groups were dominant.

In Div. 1E the age group VI was the most important in both months studied, followed by the VII and V. Mean ages were:

A - 6.3 B - 7.7 C - 5.7 D - 6.8 E - 6.9
 F - 6.3 G - 6.5

c) Growth

Average (cm) of the cod caught by trawl

Div. 1C

Year class	Age-group	2 nd		Nº. of fish
		May	Quarter June	
1966	III	36.2	-	(4)
1965	IV	45.1	50.5	(55)
1964	V	51.6	57.4	(24)
1963	VI	66.3	67.3	(24)
1962	VII	71.9	72.2	(28)
1961	VIII	74.7	76.3	(48)
1960	IX	76.3	80.4	(34)
1959	X	78.1	80.5	(5)
1958	XI	-	-	-
1957	XII	85.0	89.0	(3)

5

Div. 1D

Year class	Age-group	2 nd			Nº. of fish
		April	May	Quarter June	
1966	III	40.0	40.0	37.0	(2)
1965	IV	48.2	48.0	47.0	(110)
1964	V	53.2	53.4	53.0	(112)
1963	VI	61.7	65.1	66.4	(168)
1962	VII	67.8	72.7	72.6	(113)
1961	VIII	71.0	76.7	76.8	(63)
1960	IX	74.6	79.4	79.5	(39)
1959	X	74.3	77.4	77.0	(4)
1958	XI	-	88.9	91.2	(2)
1957	XII	76.0	86.6	90.9	(2)

Div. 1E

Year class	Age-group	2 nd		Nº. of fish
		April	Quarter May	
1965	IV	63.9	46.5	(4)
1964	V	49.1	50.8	(49)
1963	VI	57.2	58.7	(297)
1962	VII	64.1	65.9	(151)
1961	VIII	71.8	73.4	(56)
1960	IX	76.9	77.1	(11)
1959	X	-	-	-
1958	XI	-	-	-
1957	XII	76.0	76.0	(1)

d) Stage of maturity (fig. 4)

The majority of the fish sampled in Div. 1C, 1D and 1E (males and females) were in the resting or recovering stage; however in June (in Divisions 1C and 1D) about 50% of the females observed were in the post-spawning stage. This stage was also detected in reasonable percentage in the males in June (Division 1C) and May (Division 1D).

e) Age at first maturity

The observations concerning the study of the age at first maturity in Division 1C, 1D and 1E shows a very high percentage of fishes where this objective could not be reached. The highest percentage concerns to immature animals whose otolith were not convenient for recognizing the first maturity. However we observed a low percentage of fishes with 1st maturity at VII years and yet a lower percentage at VI and VIII years.

Subarea 2

A - Status of the fisheries

In this subarea only the trawlers have fished: 50,239 tons landed by side trawler and 15,843 tons by stern trawler. By quarters the best has been the 1st with 51,420 tons (table 2). By divisions (table 4) the fishing was more successful in Division 2J than in 2H (59,869 and 6,213 tons respectively). The catches by stern trawl represents only 25% of the total landed from this subarea; the landings and fishing efforts in subarea 2 are given in tables 2 and 4.

B - Special research studies

The material for research studies has been collected from Division 2J in March and April as follows:

Samples	Date	Depth	Nº. of lengths	Nº. of age
A	29-30 March	300 - 500	246	246
B	1-6 April	300 - 500	550	400

a) Lengths

The lengths (fig. 5) ranged from 28 to 100 cm classes.

Mean lengths were:

A - 52.6 cm B - 54.8 cm

b) Age compositions

As is evident from fig 5 the 1963, 1962, 1961 and 1964 year-classes prevailed in Division 2J (VI, VII VIII and V year-groups).

Mean ages were:

A - 6.7 years and B - 6.6 years.

c) Growth

Fish sampled in March and April in Div. 2J (Figures in brackets are numbers of fish)

Year class	Age-group	1 st Quarter	Nº. of fish	2 nd Quarter	Nº. of fish
		March		April	
1965	IV	34.0	(8)	34.9	(7)
1964	V	40.6	(23)	45.1	(47)
1963	VI	49.2	(101)	51.3	(150)
1962	VII	55.6	(70)	58.4	(117)
1961	VIII	60.9	(25)	63.0	(45)
1960	IX	65.8	(5)	68.5	(21)
1959	X	71.7	(7)	74.0	(6)
1958	XI	72.3	(5)	71.9	(3)
1957	XII	-	-	67.0	(2)
1956	XIII	70.0	(1)	73.0	(1)
1955	XIV	100.0	(1)	85.0	(1)

d) Stage of maturity

In March the males and females observed gave more or less 50% of fishes in the spawning stage and about 25% in the resting or recovering and developing ones; a very low percentage of fishes were in the post-spawning stage. In April the spawning stage prevailed mainly in the males and the resting or recovering and developing were predominant in the females as well as the spawning, this later with a higher percentage relatively to the others two. The post-spawning stage was better represented in the females. (Fig.6).

e) Age at first maturity

The most part of the observed otoliths both from males and females didn't gave any chance to observe the first maturity. However it was possible to read some of them: VII, VI and VII years.

Subarea 3

A- Status of the fisheries

The total of cod landed from subarea 3 amounted to 98,832 tons from which 37,468 tons have been fished by dory vessels and 61,364 tons by trawlers. (tables 3 and 4).

The Division were the trawlers fished more intensively has been the 3L with 40,443 tons landed. The same occurred with the line fishery since the dory vessels fished only in 3L and 3N.

By quarters the best fishery occurred, for dory vessel and trawlers, in the 3rd with 30,678 tons and 24,626 tons respectively, (Tables 2 and 3). The trawlers fished in Divisions 3K, 3L, 3M, 3N and 3Ps with 40,443 tons caught in the 3L; the others divisions didn't present so good landings. The line fleet fished in division 3L (32,686 tons) and also in 3N (4,782 tons).

By months the main catch for trawlers occurred in June with 12,408 metric tons, and the lower in February with 118 only (table 2); the dory vessels fished very well in July (10,955) while May was a poor month (192 tons).

a, b) Length and age compositions

Samples for biological study were obtained from trawl catches in Division 3L, between 5 and 20 of July. The depths oscilated from 200 m to 300 m and the number of lengths observed was 1,784; the fishes aged from this Division was 384.

The lengths ranged from 19 cm to 82 cm classes (fig. 7).

The V, VI and IV year-groups predominated (1964, 1963 and 1965 year-classes) Mean lenght was 49.3 cm and mean age 5.3 years.

c) Growth

The table bellow refers to fish sampled in July (figures in brackets are numbers of fish).

Year class	Age group	3 rd Quarter	Nº. of fish
1966	LLL	33.2	(7)
1965	IV	37.7	(61)
1964	V	47.3	(130)
1963	VI	55.3	(144)
1962	VII	62.8	(36)
1961	VIII	71.5	(2)
1960	IX	88.0	(1)
1959	X	115.0	(1)
1958	XI	82.0	(1)
1957	XII	76.0	(1)

d) Stage of maturity

As shown in fig. 8 the most part of the females sampled in July were in resting or recovering stages (more than 90%). A very low percentage were in the post-spawning stage.

About 65% of the males were in the resting or recovering stages more or less 30% in the develloping one and a very low percentage in the spawning and post-spawning ones.

e) Age at first maturity

Only a very low percentage of the males and females aged, gave possibility to observe rings of first maturity (mainly in the ages VI, VII and VIII). About 90% of the observations were from imature fish or from samples where it was difficult to decide the age at first maturity.

Subarea 4

A- Status of the fisheries

In this subarea only side-trawlers have fished - 1,636 tons - a very low percentage of the total cod landed by the fishery fleet. They caught 1,330 tons in Division 4R and only 306 tons in 4Vn (table 4). March with 1,198 tons, May with 224 tons and September with 205 tons were the only months of fishing.

Table 2 - Cod landings and efforts of Portuguese trawl fleet

Months	Trawl	S U B A R E A S									
		1		2		3		4		1+2+3+4	
		Tons	Hours fishing	Tons	Hours fishing	Tons	Hours fishing	Tons	Hours fishing	TONS	HOURS FISHING
Jan.	Side	-	-	8,284	2,843	1,065	601	-	-	9,349	3,444
	Stern	-	-	9,288	1,874	42	13	-	-	9,330	1,887
	Total	-	-	17,572	4,717	1,107	614	-	-	18,679	5,331
Feb.	Side	-	-	19,269	5,001	85	44	-	-	19,354	5,045
	Stern	-	-	3,764	617	33	13	-	-	3,797	630
	Total	-	-	23,033	5,618	118	57	-	-	23,151	5,675
Mar.	Side	-	-	9,777	2,978	4,643	1,579	1,198	620	15,618	5,177
	Stern	-	-	1,038	250	676	264	-	-	1,714	514
	Total	-	-	10,815	3,228	5,319	1,843	1,198	620	17,332	5,691
1 st Quarter		-	-	51,420	13,563	6,544	2,514	1,198	620	59,162	16,697
Apr.	Side	225	77	4,963	1,915	5,170	3,102	-	-	10,358	5,094
	Stern	5,487	940	1,084	259	145	54	-	-	6,716	1,253
	Total	5,712	1,017	6,047	2,174	5,315	3,156	-	-	17,074	6,347
May	Side	1,219	861	1,350	1,073	6,521	4,342	224	133	9,315	6,409
	Stern	2,924	943	160	118	138	89	-	-	3,221	1,150
	Total	4,143	1,804	1,510	1,191	6,659	4,431	224	133	12,536	7,559
Jun.	Side	420	184	174	176	11,938	8,463	-	-	12,532	8,823
	Stern	3,095	849	21	20	470	341	-	-	3,586	1,210
	Total	3,515	1,033	195	196	12,408	8,804	-	-	16,118	10,033
2 nd Quarter		13,370	3,854	7,752	3,561	24,382	16,391	224	133	45,728	23,939
Jul.	Side	-	-	-	-	9,390	8,161	-	-	9,390	8,161
	Stern	-	-	-	-	2,738	1,946	-	-	2,738	1,946
	Total	-	-	-	-	12,128	10,107	-	-	12,128	10,107
Aug.	Side	-	-	2,455	2,137	6,792	5,357	9	18	9,256	7,512
	Stern	-	-	80	104	1,048	891	-	-	1,128	995
	Total	-	-	2,535	2,241	7,840	6,248	9	18	10,384	8,507
Sep.	Side	-	-	1,140	931	4,373	4,311	205	190	5,718	5,432
	Stern	-	-	293	181	285	307	-	-	578	488
	Total	-	-	1,433	1,112	4,658	4,618	205	190	6,296	5,920
3 rd Quarter		-	-	3,968	3,353	24,626	20,973	214	208	28,808	24,534
Oct.	Side	-	-	2,594	3,236	1,739	2,121	-	-	4,333	5,357
	Stern	-	-	115	128	278	233	-	-	393	361
	Total	-	-	2,709	3,364	2,017	2,354	-	-	4,726	5,718
Nov.	Side	-	-	224	390	3,347	3,172	-	-	3,571	3,562
	Stern	-	-	-	-	37	40	-	-	37	40
	Total	-	-	224	390	3,384	3,212	-	-	3,608	3,602
Dec.	Side	-	-	9	22	411	546	-	-	420	568
	Stern	-	-	-	-	-	-	-	-	-	-
	Total	-	-	9	22	411	546	-	-	420	568
4 th Quarter		-	-	2,942	3,776	5,812	6,112	-	-	8,754	9,888
Total side trawl		1,864	1,122	50,239	20,702	55,474	41,799	1,636	961	109,213	64,584
" stern trawl		11,506	2,732	15,843	3,551	5,890	4,191	-	-	33,239	10,474
TOTAL TRAWL		13,370	3,854	66,082	24,253	61,364	45,990	1,636	961	142,452	75,058

Table 3 - Cod landings and efforts of Portuguese line fleet

Months	SUBAREAS					
	1		3		1,3	
	Tons	Dory- -hours	Tons	Dory- -hours	Tons	Dory- -hours
Jan.	-	-	-	-	-	-
Feb.	-	-	-	-	-	-
Mar.	-	-	-	-	-	-
1 st Quarter	-	-	-	-	-	-
Apr.	-	-	-	-	-	-
May	779	49,642	192	6,591	971	56,233
Jun.	1,647	74,626	5,632	216,721	7,279	291,347
2 nd Quarter	2,426	124,268	5,824	223,312	8,250	347,580
Jul.	3	2,448	10,955	450,289	10,958	452,737
Aug.	-	-	10,227	401,502	10,227	401,502
Sep.	-	-	9,496	305,111	9,496	305,111
3 rd Quarter	3	2,448	30,678	1,156,902	30,681	1,159,350
Oct.	-	-	966	55,756	966	55,756
Nov.	-	-	-	-	-	-
Dec.	-	-	-	-	-	-
4 th Quarter	-	-	966	55,756	966	55,756
TOTAL	2,429	126,726	37,468	1,435,970	39,897	1,562,686

Table 4 - Cod landings (in metric tons) and efforts of Portuguese fishery fleet by divisions

DIV.	DORY VESSEL		T R A W L				TOTAL TRAWL		DORY VESSEL+TRAWL	
	Tons	Dory- -hours	Side Tons	Hours fishing	Stern Tons	Hours fishing	Tons	Hours fishing	Tons	Hours fishing
1A	207	7,788	-	-	-	-	-	-	207	7,788
1B	-	-	-	-	30	55	30	55	30	55
1C	2,009	95,931	791	623	1,358	469	2,149	1,092	4,158	97,023
1D	213	22,997	1,073	499	4,348	1,083	5,421	1,582	5,634	24,579
1E	-	-	-	-	5,023	964	5,023	964	5,023	964
1F	-	-	-	-	747	161	747	161	747	161
Total	2,429	126,716	1,864	1,122	11,506	2,732	13,370	3,854	15,799	130,570
2H	-	-	1,370	742	4,843	1,005	6,213	1,747	6,213	1,747
2J	-	-	48,869	19,960	11,000	2,546	59,869	22,506	59,869	22,506
Total	-	-	50,239	20,702	15,843	3,551	66,082	24,253	66,082	24,253
3K	-	-	12,492	10,335	938	611	13,430	10,946	13,430	10,946
3L	32,686	1,240,364	36,115	28,291	4,328	3,161	40,443	31,452	73,129	1,271,816
3M	-	-	6,652	3,016	624	419	7,276	3,435	7,276	3,435
3N	4,782	195,606	158	126	-	-	158	126	4,940	195,732
3Ps	-	-	57	31	-	-	57	31	57	31
Total	37,468	1,435,970	55,474	41,799	5,890	4,191	61,364	45,990	98,832	1,481,960
4R	-	-	1,330	843	-	-	1,330	843	1,330	843
4Vn	-	-	306	118	-	-	306	118	306	118
Total	-	-	1,636	961	-	-	1,636	961	1,636	961
TOTAL	39,897	1,562,686	109,213	64,584	33,239	10,474	142,452	75,058	182,349	1,637,744

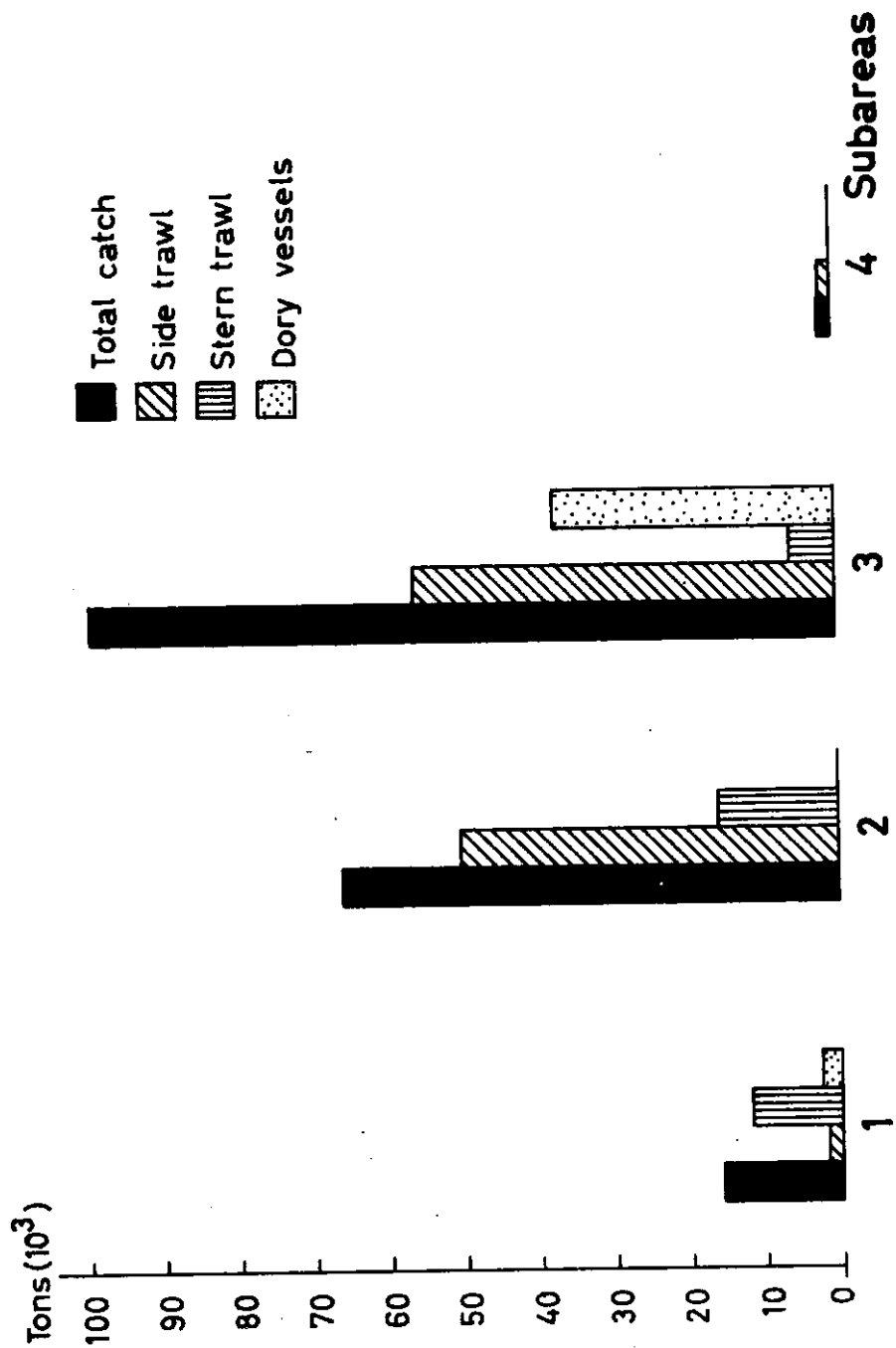


Fig. 1 - Cod catches (in tons) of Portuguese fishery fleet by subareas

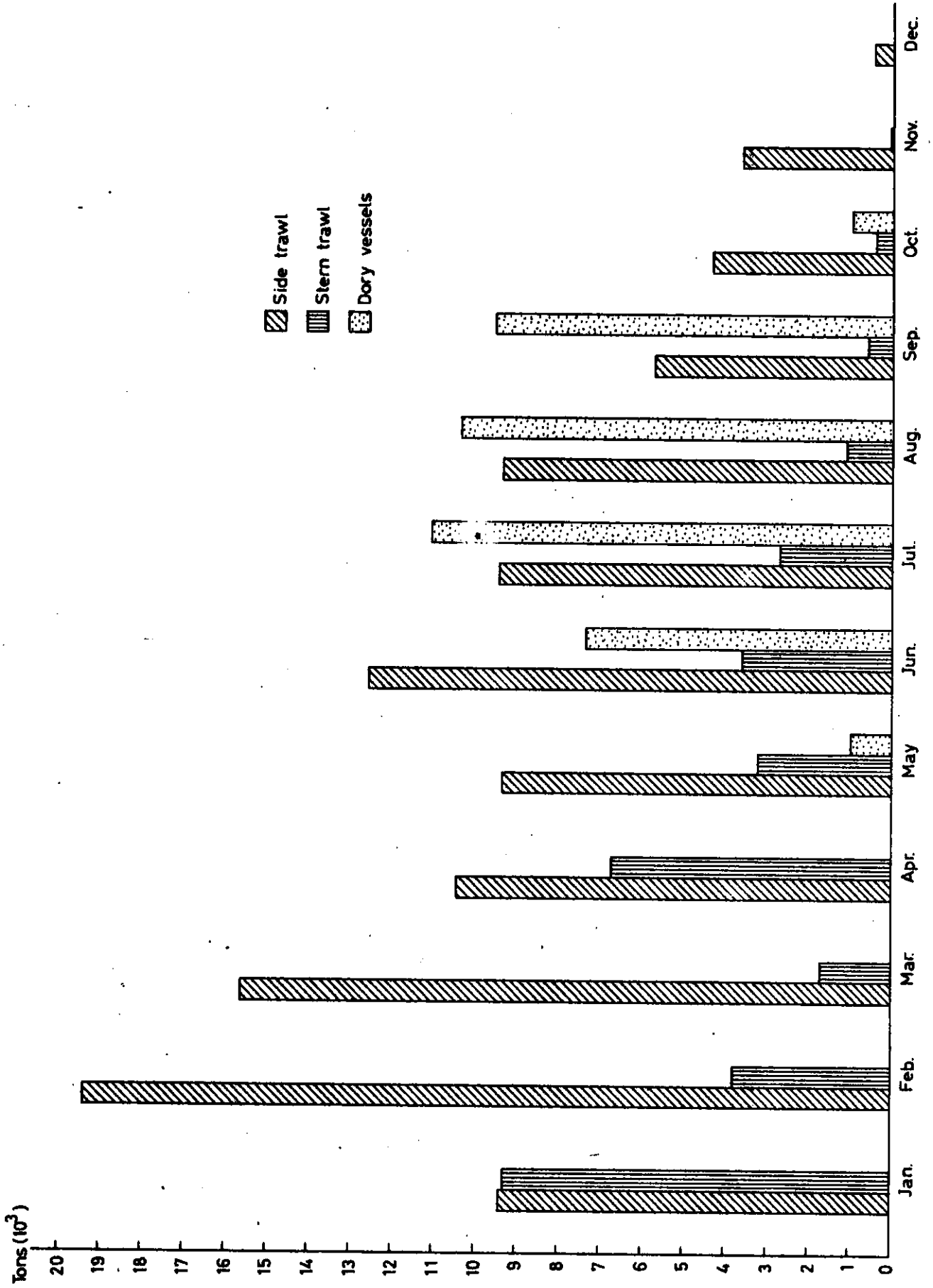


Fig. 2 - Total catches of cod (in metric tons) of Portuguese fishery fleet (trawlers and dory vessels) by months, 1969.

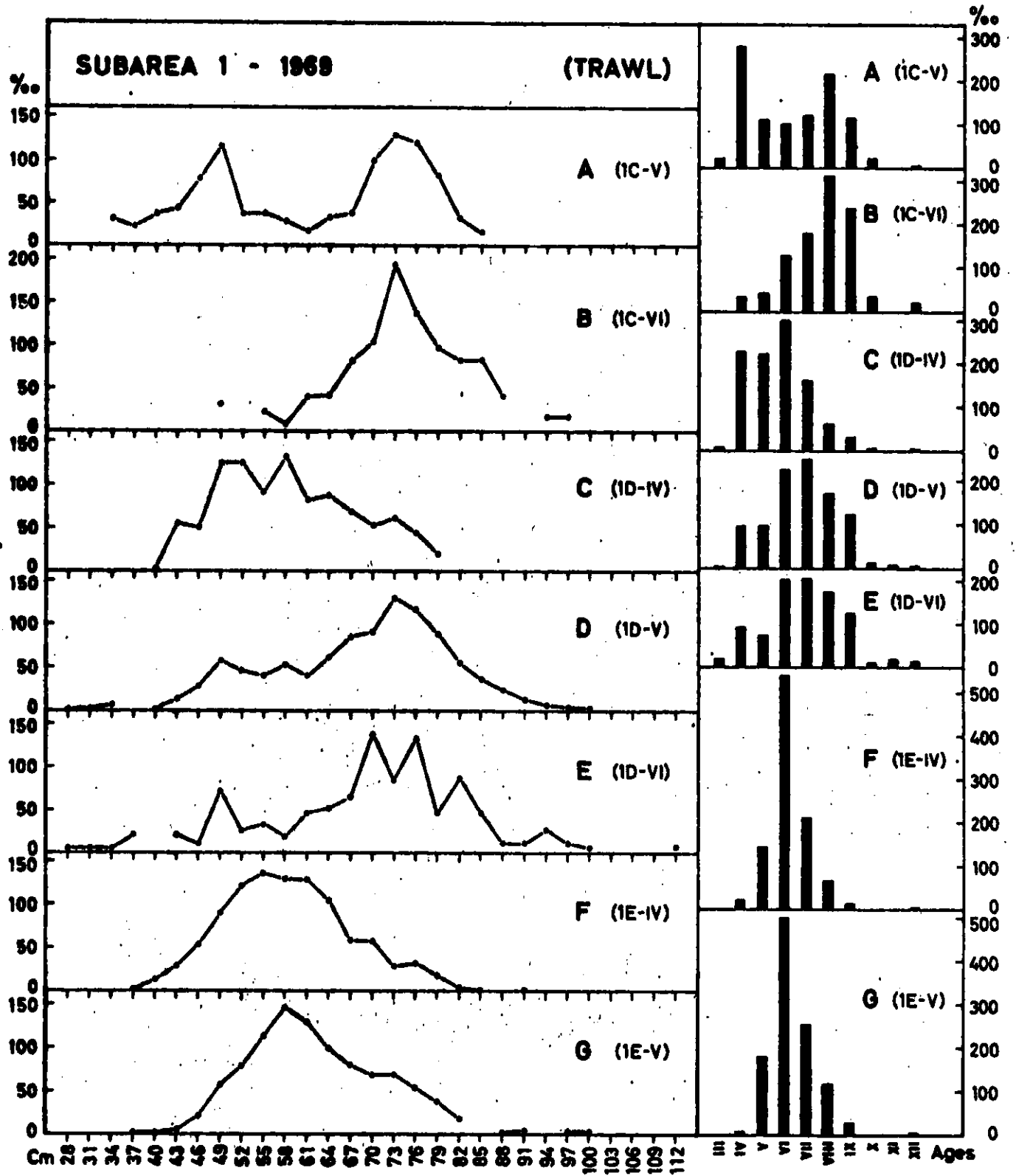


Fig. 3

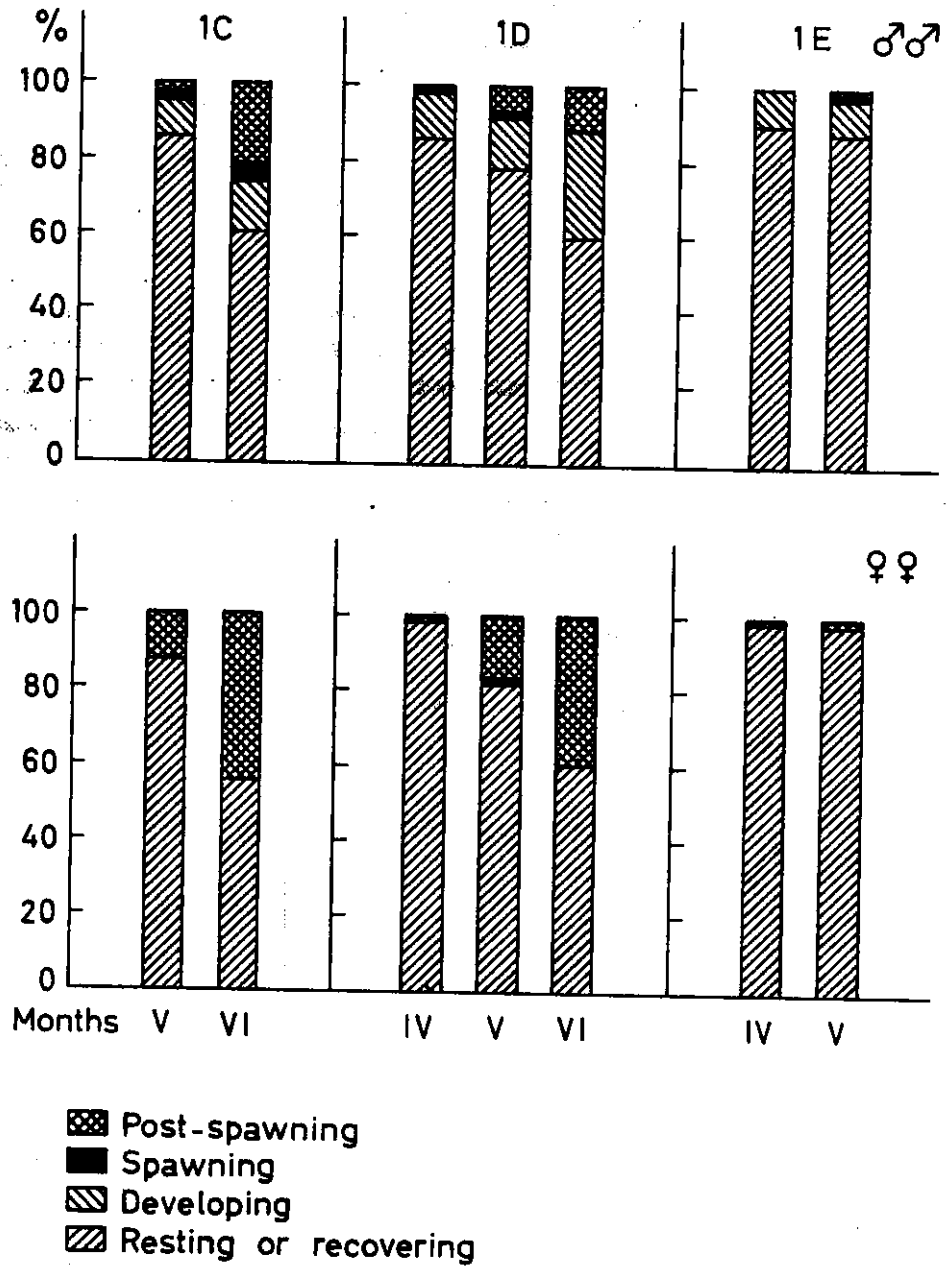


Fig. 4

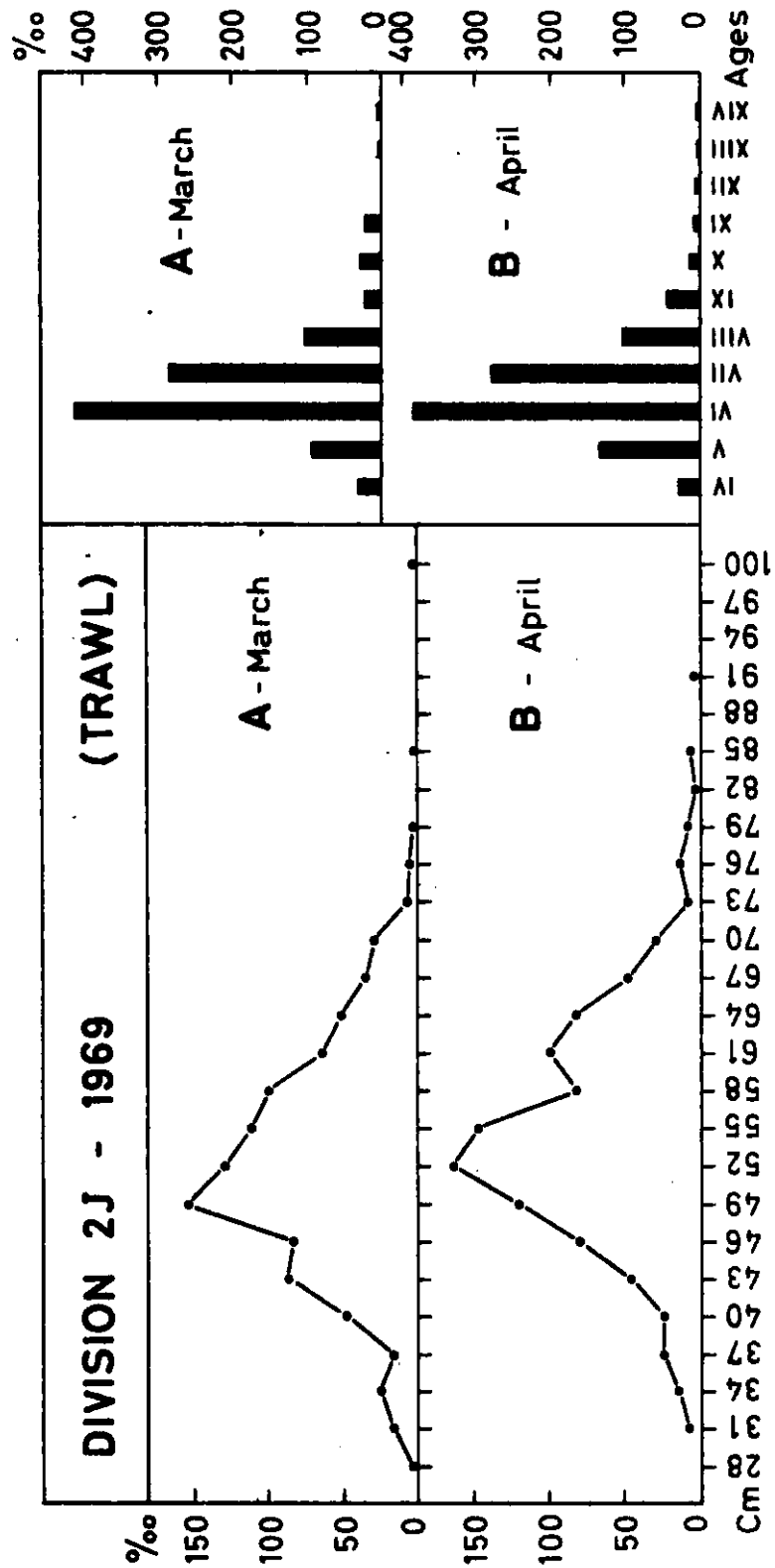
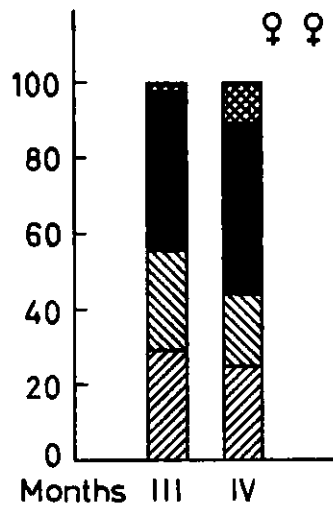
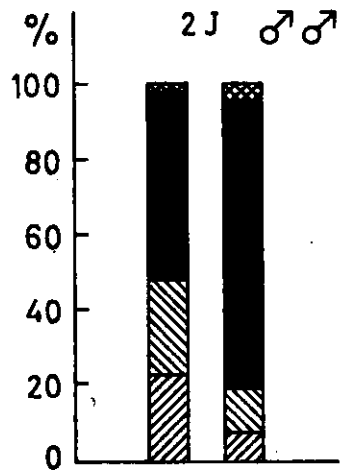


Fig. 5



- ▤ Post-spawning
- Spawning
- ▨ Developing
- ▩ Resting or recovering

Fig. 6

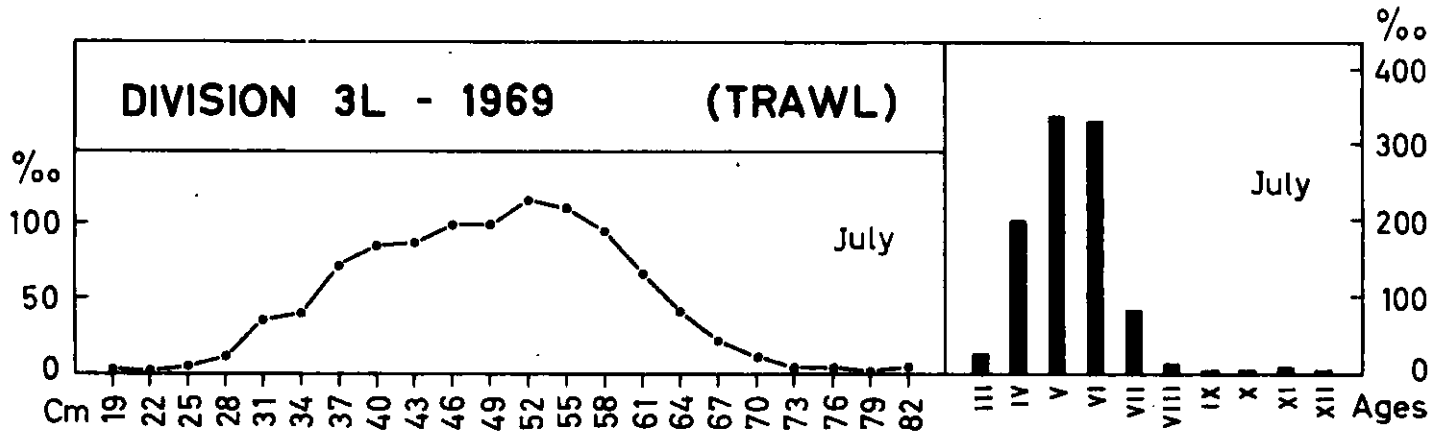
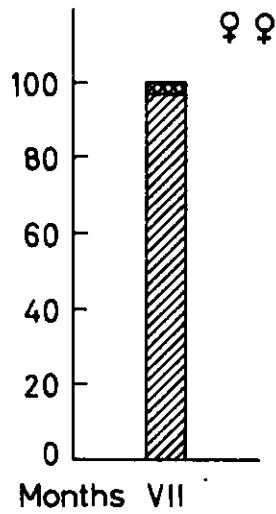
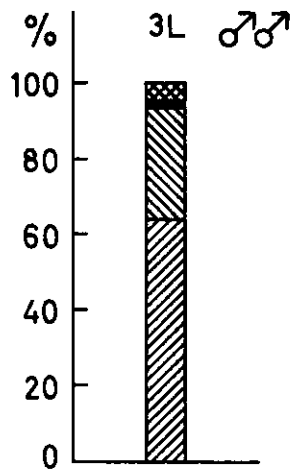


Fig. 7



- ▣ Post-spawning
- Spawning
- ▨ Developing
- ▧ Resting or recovering

Fig. 8