Bottom catches along continental shelf of W. Mediterranean (Spain) of Curled Octopus (*Eledone cirrhosa* Lam.) Fishery

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Trawl survey studies during the mounths of May-July 1990 were undertaken in the continental shelf of Catalan sea (W. Mediterranean, Fig. 1). Besides quantitative studies of demersal resource characteristics, a preliminary investigation of trawl efficiency was undertaken. Two commercial trawler both of 50 HP, carried out the field work.

The analyses of catches for two gears used in a coastal fishing along W. Mediterranean coast localities was studied. The mean objective was studied the octopus fishery for his control and protection on a scientific basis.

These surveys are situated in two specific areas (Palamos and Tarragona), divided in two strata under bathimetric criteria (30100 m and 101--200 m). Trawling is done during dayliht, and tows were 1/2 hour long. All strata are divided into units of 25 square nautical miles (5*5). The number of hauls in each startum is proportional to its area and selection is made by random sampling. Software used for all data procesing it's compiled under program "CAMP" (SANCHEZ F., 1990) writted in dBase III plus.

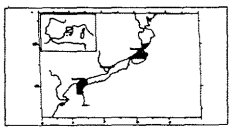

Fig. 1. Area prospected.

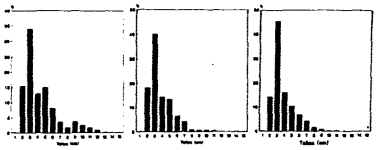

Fig. 2. Length frequency *E. cirrhosa*

The special morphology and oceaonagraphic charactarestics of area studied was determined (LLEONART J. *et al.*, 1988) a very important fishery. The abundance index it's related for the most important species (Table 1.) : Hake and Curled Octopus.

Hake (*Merluccius merluccius*). The stratified abundance index, in kg/haul for the all mounths (Table 2.), show a similar trends under 1 kg/haul, exceptioned in June (110 m depth). The abundance index shows similarity along the survey time. The same circumstances with recruitment index was founded (Table 3).

Curled Octopus (*Eledone cirrhosa*). The abundance index shows great similarity with other species founded in this area. The stratified abundance index show a downward tendency along the mounths (Table 2). In number of individual we founded the same trend. The recruitment index variations (Table 3) showing the same tendency with values varying between 78 and 30 inds. less of 7 cm. The curled octopus population is distributed over the whole continental shelf. Length frequency distribution is given in fig.2. In the experience was mesured 1049 inds. and the lengthweigth relationship obtained was:

$$W = 5.86*10^{**} -3(L^{**}2.39) \qquad R = 0.97$$

Table 1

TOTAL AREA Abundance index (kg/½ hour)			
	May	June	July
E. cirrhosa	1.86	1.76	1.54
M. merluccius	0.51	1.11	0.66
TOTAL FISH.	5.79	8.56	6.80
TOT. CRUSTAC.	0.26	1.38	1.22
TOT. MOLUSCA	2.79	2.24	2.10

Table 2

BIOMASS (kg/½hour) Stratified abundance index				
Strata		30-100m		100-200m
		Weigth	Num.	Weig. Num.
M.m	May	0.39	15	0.56 78
	June	0.45	15	2.12 166
	July	0.52	9	0.73 45
E.c	May	1.46	13	2.08 57
	June	1.98	23	1.43 39
	July	1.00	9	1.82 44

Table 3

Recruitment index
Merluccius merluccius Nº indivs. < 17 cm in 1 hour trawl

Mounth	Strata	Palamós			Tarragona			Total		
		Yst	Syst	N	Yst	Syst	N	Yst	Syst	N
May	Total	195	52.01	14	56	11.81	7	108	20.77	21
June	Total	204	55.92	17	14	2.25	6	79	20.86	23
July	Total	117	10.32	16	17	9.77	8	55	16.24	24

Eledone cirrhosa Nº indivs. <7 cm in 1 hour trawl.

Mounth	Strata	Palamós			Tarragona			Total		
		Yst	Syst	N	Yst	Syst	N	Yst	Syst	N
May	Total	55	11.94	14	92	24.36	7	78	15.91	21
June	Total	65	10.42	17	28	9.00	6	30	4.25	23
July	Total	54	4.86	16	62	31.36	8	59	19.75	24

REFERENCES

LLEONART J., 1988.- La pesqueria de Cataluna. *CEE, DIR.GEN. XIV-B-1*

SANCHEZ F., 1991.- Bottom trawl surveys in the North of Spain. *Inf. Tec. IEO.* Madrid. Spain.

The spawning period of the Sole (*Solea solea* L.), population and distribution ef eggs and larvae of Sole in Izmir Bay

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The sole is one of the important fishes for the Izmir Bay, with a not determined period of spawning (URBAN and ALHEIT, 1988). The spawning periods of the sole were found as February, March, April and May for Villefranche in the Mediterranean (SARDOU, 1970), and as December, January, February, March and April (MATER, 1981) for the Izmir Bay.

In order to determine the spawning period of the sole, this study used the distribution of eggs and larvae aswell as gonadosomatic indexes. The distribution of eggs and larvae according to the physico-chemistry of the stations was also studied (ºC, S‰, O_2, pH).

Sampling was done over a period of one year (1989-90) with monthly intervals. The soles were caught by gill nets, their eggs were collected from plancton using plancton nets, horizontally (during 20 minutes, at a speed of 2 mil/h). Vertical sampling was also done, in January, the highest spawning period. The mesh size of the plancton net is 500 µm (Hensen type). The gonadosomatic index (G.S.I.) was calculated using the following formula:

$$G.S.I. = \frac{\text{Weight of gonad}}{\text{Fish weight (without gonad)}} \times 100$$

The mean diameter of the eggs was calculated as 1.19 mm (1.08 mm - 1.26 mm). Among the stations, the maximum number of eggs was collected in Guzelbahçe and the minimum number in Tuzla (Fig. 1,2).

The spawning period of sole was determined including the months December, January, February and March in Izmir Bay (Fig. 3). It was deduced that the gonads were ready to spawn in these months because most of the eggs were collected in February (47 eggs) and the G.S.I. was highest (6.86) in December (Fig. 4). The G.S.I. of sole and the amount of eggs collected from the plankton during the whole year were in harmony. The temperature of the sea water ranged between 12.5ºC and 14ºC during the spawning period.

MONTH	DECEMBER		JANUARY		FEBRUARY		MARCH		TOTAL	
STATION	Egg	Larva	Egg	Larva	Egg	Larva	Egg	Larva	Egg	Larva
1. Güzelbahçe	22	--	14	--	3	--	3	--	42	1
2. Tuzla	1	--	3	--	--	--	1	--	5	-
3. Kirdeniz	--	--	15	--	3	--	--	--	18	-
4. Uzunada	10	--	3	--	12	--	--	--	25	-
5. GÜlbahçe	--	--	2	--	29	--	--	--	31	-
Total	33	--	37	--	47	--	4	--	125	1

Table 1. The seasonal abundance of the sole *S. solea* eggs and larvae (1989-90), according to stations in Izmir Bay.

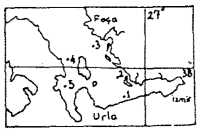

Fig. 1. Izmir Bay and the stations.

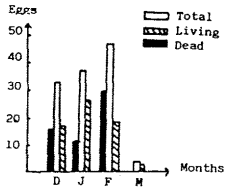

Fig. 2. The seasonal abundance of sole S. solea eggs (1989-90) in Izmir Bay.

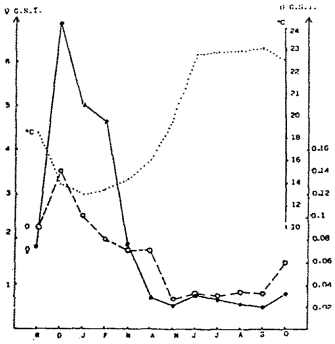

Fig. 3. Gonadosomatic index (G.S.I.) of sole S. solea.

MONTH	Females n	min.-Max. G.S.I.	Mean of G.S.I.	Males n	min.-Max. G.S.I.	Mean of G.S.I.
May	5	0.3-0.8	0.57±0.09	2	0.02-0.03	0.02±0.003
June	7	0.5-1.2	0.8±0.01	8	0.01-0.08	0.03-0.007
July	3	0.4-0.9	0.7±0.15	1	0.03	0.03
August	6	0.4-0.7	0.6±0.05	6	0.02-0.05	0.04±0.01
September	3	0.12-1.05	0.52±0.28	7	0.01-0.06	0.03±0.01
October	6	0.5-1.1	0.81±0.09	16	0.03-0.1	0.06±0.05
November	10	0.4-5.8	1.84±0.6	1	0.09	0.09
December	14	0.6-18.9	6.86±1.4	12	0.1 - 0.2	0.14±0.03
January	6	0.6-18.5	5.03±2.8	1	0.1	0.1
February	15	0.5-18.3	4.65±1.25	10	0.04-0.1	0.085±0.008
March	5	0.4-4.2	1.9±0.75	5	0.06-0.08	0.07±0.005
April	3	0.6-0.8	0.7±0.08	1	--	0.07

Table 2. Minimum, maximum, mean and standard error of mean G.S.I. (between individuals of 20-30 cms).

REFERENCES

MATER S., 1981.- Izmir Korfezi'nde bazi teleost baliklarin pelajik yumurta ve larvalari üzerinde arastirmalar. *Doç. Tezi, E.U. Fen Fak. Hidrobiyoloji Anabilim Dali,* 118 pp., Bornova-IZMIR.

SARDOU J., 1970.- Périodes de ponte de quelques Téléostéens dans la région de Villefranche-sur-mer. *Jour d'Etuds.* Planct. Monaco, C.I.E.S.M., 141-145 pp.

URBAN J. & ALHEIT J., 1988.- Oocyte development cycle of plaice, *Pleuronectes plates-sa* and North Sea sole, *Solea solea* C.M., 1988/G:52, Demersal Fish Committee 1-7 pp.

Rapp. Comm. int. Mer Médit., **33**, (1992).