International Council for the Exploration of the Sea

C.M. 1977/ G:13

Demersal Fish (Southern) Committee

Length Distributions of the Fishes Discarded in the Bottom Trawl Fishery off Nw Africa. Digitalization sponsored

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by

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Summary

The bottom trawl fishery off Northwest Africa between Cape Bojador and Cape Balnc is specially directed to the catch of cephalopods. The information about the "by catch" and discardings produced in this fishery are fragmentary. For this reason, and trying to establish their importance, the laboratory of the Spanish Institute of Oceanography at the Canary Islands, is carrying out a research program on this subject. The present paper includes preliminary results of three cruises done in different seasons and areas. The species composition, proportion and length frecuencies distributions of the main fishes discanded are presented and discussed. The results shows how, in general, the Sparids, the Horse Mackerels and the Stingfishes are the most frequent in the discardings.

Introduction.- Within the fisheries research program of the laboratory of the Spanish Institute of Oceanography at the Canary Islands, began in early 1976 a subprogram, for the study of the importance of discardings in the cephalopods fushery. This is developed along the coasts of Northwest Africa, mainly between Cape Bojador and Cape Blanc. The number of studies made about the cephalopods fishery has been large, and the situation of this fishery is always studied with care in the different CECAF Working Parties on Ressources Evaluation. The catch of cephalopods in this area is done by the mayority of the trawlers working here. These fleets concentrate their efforts in four main fishing zones. In a previous paper (Bravo de-La-

1/ Instituto Español de Oceanografía. Laboratorio de Canarias. Av. Jose Antonio 3. <u>SANTA CRUZ DE TENERIFE (SPAIN)</u> guna, M.A.R. Fernandez and J.C. Santana, 1976), these have been described in detail. At present, the main fishing grounds are located in the zone of "Villa Cisneros" (between 23°04'N and 24°N) and "Cabo Barbas" (between 22°06'N and 21°50'N).

The little information about the "by catch" and discardings of this cephalopods fishery, is limited to faunistics lists of the "by catch" of restricted areas. For this reason and trying to know the quantitative and qualitative composition of the discardings, their proportion in relation with the total catch and the lengths distributions of the fishes rejected into the sea, quaterly trips were programmed on board of commercial fishing vessels. Some of the information obtained with this program has been included in two previous papers (Bravo de Laguna, J., M.A.R. Fernandez and J.C. Santana, 1976; _____, 1977). The first of them presents information obtained with the first cruise, done in January-February 1976 in the four main fishing zones. The second one, is related specifically with the Sparids and contains informations about three cruises done between January 1976 and May 1977.

In the present paper we present the quantitative and qualitative composition, as well as the length distributions of the main fish species rejected into the sea during the cruises FLIPPER 7701, FLIPPER 7705 and FLIPPER 7601. All the information relates to the zones "Villa Cisneros" and "Cabo Barbas".

<u>Method</u>.- Samplings were made on board of commercial fishing vessels. The first cruise, FLIPPER 7601, was made with a stern trawler of 37 meters L.O.A.,426 T.R.B. and 1100 H.P., in January-February 1976. The characteristics of the trawl stations made in the two zones and the preliminay results are included in a previous papers (Bravo de-Laguna, J., M.A.R. Fernandez and J.C. Santana, 1976).

The second cruise, FLIPPER 7701, was also done with a stern trawler. The main characteristics were: 35.5m.L.O.A., 287 T.R.B. and 1170 H.P..During this cruise, 19 hauls were made in "Villa Cisneros", at depths comprised between 22 and 33 meters, and 19 hauls in "Cabo Barbas" between 57 and 110 meters depth.

The third cruise, FLIPPER 7705, was also made on a stern trawler exclusively in the zone of "Villa Cisneros". There,23 hauls were realised between 13 and 30 meters depth. The positions of the trawl stations of the last two cruises are shown on map 1.

-2-

The fishing gears employed in all the trawl stations were the standard ones used by the Spanish cephalopods fishing fleet (40 mesh size in the cod end).

After each haul, the commercial catch was quick freezed and the rest rejected into the sea. From these discardings, a certain quantity, proportional to the total catch was sampled. The speciemens of the samples were classified, weighed, counted and measured by species. Measurements of the total length were taken to the nearest half cen timeter. Afterwards, total discardings by species were calculated and accumulated by fishing zones.

<u>Results</u>.- Tables Ia and Ib show the results obtained in "Villa Cisneros" and "Cabo Barbas" respectively. While for the first zone exist data of the three cruises, in the second zone there are only informations of the first two. The reason is that the FLIPPER 7705 covered exclusively the shallow waters of "Villa Cisneros". These two tables include the total catch and the C.P.U.E., in kilograms, of commercial catch, fishes and invertebrates discarded, as well as their percentages in relation with the total catch and total discardings.

Tables IIa and IIb contain the percentages of the main fish species discarded in relation with the total catch, the total catch without the invertebrates, the total discardings and with the discardings excluding the invertebrates. The species selected for the two tables were those that represent more than the 1% of the fishes rejected into the sea. Due to the great importance of the Sparids, they have been studied in a separate paper (Bravo de Laguna ,J., M.A.R. Fernandez and J.C. Santana, 1977).

<u>Discussion</u>.- The percentages of the commercial catch and the two components of the discradings, in relation with the commercial catch, were almost constant during the first two cruises done in "Villa Cisneros" (Table Ia). The fish yields of the FLIPPER 7601 (62.5 Kg/hour) and FLIPPER 7701 (65.7 Kg/hour) were very similar. The percentages of fishes and invertebrates, related to the total discardings, did not change much from the first to the second cruise. The species composition was almost the same but the proportion of the different species of fishes in the discardings changed between both cruises. While in the first one - FLIPPER 7601 - Uranoscopus scaber (9.7%), Trachinus araneus (8.2%) and Trachurus trachurus (7.7%) were the species most discarded, during the second - FLIPPER 7701 -, the Sardina pilchardus (46.1%) was the species most rejected into the sea. Trachinus araneus (13.2%) and Trachurus trachurus

- 3 -

(8.4%) follow it in quantity. These are the two species that most regulary were discarded.

Two modes, in 12.5 and 21.5 centimeters, were found in the lengths frequencies distributions of Serdina pilchardus discarded. The Sardines caught were of lengths comprised between 10 and 25 centimeters (Fig.1). A similar situation presented the lengths distribution of Trachinus araneus where two modes of 10 and 21 centimeters were found. In this species the lengths most discarded were between 8.5 and 13 centimeters, and between 18,5 and 23 centimeters. The rejections into the sea of Horse Mackerels were mainly of lengths comprised between 13 and 16 centimeters (Fig.3).

The third cruise- FLIPPER 7705 - was made in shallower waters. Here the commercial catches and discardings (29.9%) of fishes were small compared with the catches of invertebrates (50% of total catch). The species composition was almost the same as that in the other two cruises but here, the fish species most discarded were Sardina pilchardus (24.4%), mainly between 20 and 23 centimeters, and Trachinus draco 412.7%) of lengths principally between 18 and 23 centimeters.

The differences between the results of the first two cruises, and the third one, are probably related to the position of the fishing grounds, within "Villa Cisneros", and their state of exploitation. The yields of commercial catches in shallow waters (35.3%) are the lowest of the whole zone. The fishery for cephalopods began here, during the sixtieth decade, with intense fishing operations, where yields of 250 Kg/hour were common. Afterwards, the decrease of the commercial catch was continuous, reaching the actual situation where the invertebrates no cephalopods contribute in a 50% of the total catch.

In the zone of "Cabo Barbas", the percentages of the commercial catch, fishes and invertebrates in relation with the total catch and discardings, were practically the same during the first two cruises. The most discarded species fo fishes in both cruises were Trachurus trachurus (32.1% and 47.2% of the discardings), Sparidae (10.4% and 12.3%) and Uranoscopus scaber (10.5% and 5.8%). Torpedo marmorata (17%) and Torpedo torpedo (14%) contribuited much to the discardings of the first cruise. During the second, Trachinus draco (9.8%) and some flatfishes, like Citharus macrolepidotus (4.6%), Arnoglossus blachei (1.5%) and Solea vulgaris (2.6%) were with Trigla lucerna (4.2%), an important part of the fishes rejected into the sea.

- 4 -

The Trachurus trachurus most discarded were of total lengths comprised between 14 and 19 centimeters. The mode of the lengths frequencies distribution was almost the same as that in the third cruise done at "Villa Cisneros". The total lengths of fishes discarded in both zones are generally smaller in "Cabo Barbas". The diversity of species is also lower in this fishing zone.

<u>Conclusions</u>.- 1.- The percentages of the commercial catch and discardings of fishes and invertebrates remained almost constant, in the same seasons and fishing zones.

2.- In the zone of "Villa Cisneros", and in shallow waters, the fish species most discarded were Sardina pilchardus, mainly between 20 and 23 centimeters of total length, and Trachinus draco (mainly of 18 to 23 cm.).

3.- In the same zone, but in deeper waters, the fishes most frequently discarded are Trachinus araneus - mainly between 8.5 and 13 centimeters of total lengthand Trachurus trachurus of 13 to 16 centimeters.

4.- In the fishing zone "Cabo Barbas", the most discarded species in the different cruises were Trachurus trachurus - between 14 and 19 centimeters- and Uranoscopus scaber.

5.- In:general, Trachurus trachurus (13 to 19.5 centimeters), Trachinus draco (12 to 23 centimeters) and Trachinus araneus (8.5 to 23 centimeters) are the fishes, excluding the Sparids, most discarded.

References

BRAVO DE-LAGUNA, J., M.A.R. FERNANDEZ and J.C. SANTANA, 1976. - Discardings of fishes in the cephalopods fishery off West Africa. <u>ICES C.M. 1976/K:32</u> ----, 1977. - Discardings of Sparids in the bottom trawl fishery off Northwest Africa. ICES C.M. 1977/G:13

- 5 -



	COM	WERGIAL CA	ATCH	OTH	R FISHES		INVERTEBRATES			
Start york	Cr.1	Cr.2	Gr.3	Cr.1	Cr.2	Gr.3	Gr.1	Cr,2	Cr.3	
Total catch	13491.0	5881.4	5178.5	9981.5	6901.5	10259.8	2749.0	1213.4	12907.5	
Kg/hour	67.4	56.1	35.3	62.5	65.7	52.8	13.7	11.6	88.1	
% T.C.	46.9	42.0	20.1	43.5	49.3	29.9	9.5	8.7	50.0	
% T.C Inv.	51.9	46.0	40.1	48.1	53.9	59.9	-	-	-	
% Discard.	-	-	-	82.0	85.0	37.5	18.0	14.9	52.5	

a)

a)

b)

	COMMERCI	AL CATCH	OTHER FI	SHES	INVERTEBRATES		
	Cr.1	Cr.2	Cr.1	Cr.2	Cr.1	Cr.2	
Total catch	5071.5	5741.9	4491.2	4370.5	2354.1	2141.5	
Kg/ hour	98.6	57.1	87.3	43.4	45.8	21.3	
% T.C.	42.6	46.9	37.7	35.7	19.7	17.4	
% T.CInv.	53.0	56.8	47.0	43.2	1.0	-	
% Discardings	-		65.6	E7.1	34.4	32.9	

Table I - Results by groups of the cruises Flipper 7601 (Cr.1), Flipper 7701 (Cr.2) and Flipper 7705 (Cr.3) in a) "Villa Cisneros" and b) "Cabo Barbas". Total catch in kilo -- grams, catch per hour trawling (Kg/hour), percentages of the total catch (% TC), of the total catch excluding invertebrates (% TC-Inv.) and of the discardings (% Discard.).

	% Total catch			% Tat.C Inv.			% Discardings			% Disc Inv.		
	Cr.1	Cr.2	Cr.3	Cr.1	Cr.2	Cr.3	Cr.1	Cr.2	Cr.3	Cr.1	Cr.2	Cr.3
Sardina pilchardus	1.5	22.7	7.3	1.6	24.9	14.6	2.8	39.2	9.1	3.4	46.1	24.4
Caranx rhonchus	-	0,2	1.6	-	0.3	3.2	-	0.4	2.0	-	0.5	5.4
Trachurus trachurus	3.4	4.1	1.6	3.7	4,5	3.2	6.3	7.2	2.0	7.7	8.4	5.4
Plectorhinchus mediterraneus	1.5	0.1	-	1.7	0,2	-	2,9	0.2	-	3.5	0.3	-
SPARIDAE	18,1	8.7	11.5	20.1	9,5	23.0	34.2	15.0	14.4	41.7	17.7	38.4
Trachinus draco	0.2	2,4	3.8	0.2	2,6	7.6	0.4	4.2	4.8	0.5	4.9	12.7
Trachinus araneus	3.6	6.5	0.03	4.0	7.1	0.1	6.7	11.2	0.04	8.2	13.2	0.1
Uranoscopus scaber	4.2	-	0,02	4.7	-	0.05	8.0	-	0.03	9.7	-	0.1
Callionymus lyra	1.1	0,2	0,2	1.2	0.2	0.4	2.0	0.3	0.2	2.4	0.4	0,6
Trigla lucerna	0.9	1.0	0.6	1.0	1.1	1.2	1.6	1.8	0.7	2.0	2.1	5.0
Solea vulgaris	0.2	0.1	1.3	0,2	0.1	2.5	0.3	0.2	1.6	0.4	0.2	4.2
DicoJogoglossa cuneata	-	0.1	0.6	-	0.1	1.2	-	0.2	0.8	-	0,2	2.0
Microchirus ocellatus	- 3	0.5	0.03	-	0.6	0.1 .	-	0.9	0.03	-	1.0	0.1
OTHER FISHES	7.4	2.7	1.3	9.7	2.8	2.7	16.8	4.3	1.8	20.5	5.0	4.6

% T.Catch %T.C.-In. % Discard. % Ds.-In. ' Cr.2 Cr.1 Cr.1 Cr.1 Cr.2 Cr.2 Cr.1 Cr.2 Torpedo torpedo 5.3 6.6 9.2 14.0 -17.0 Torpedo marmorata 6.4 8.0 11.1 --Trachurus trachurus 12.1 16.8 15.1 20.4 21.1 31.7 32.1 47.2 5.0 1.5 2.3 Trachurus trecae -_ 1.0 --SPARIDAE 3.9 4.4 4.9 5.3 6.8 8.2 10.4 12.3 Trachinus draco -3.5 -4.2 -6.6 -9.8 Trachinus araneus 1.3 0.03 1.6 0.03 2.3 0.05 3.5 0.08 Uranoscopus scaber 2.1 4.9 3.9 2.5 6.9 3.9 10.5 5.8 Callionymus lyra 0.4 0.5 0.7 1.0 ----Trigla lucerna 0.3 1.5 0.4 1.8 0.6 2.8 0.9 4.2 Citharus macrolepidotus 1.0 1.6 1.3 2.0 1.3 3.1 2.7 4.6 Arnoglossus blachei 0.02 0.5 0.02 0.6 0.03 1.0 0.05 1.5 Solea vulgaris 0.9 0.6 0.7 1.1 1.0 1.8 1.5 2.6 OTHER FISHES 2.5 3.6 3.0 4.3 4.6 6.4 6.3 9.6

Table II - Percentages of the different species of fishes in relation with the total catch, the total catch excluding the invertebrates (TC - Inv.), the discardings, the discardings excluding the invertebrates (Disc.-Inver.) and the total catch of fishes in a) "Villa Cisneros" and b) "Cabo Barbas".



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