

SUBSCRIPT OBJECTIVE 4

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OBJECTIVE 4 : BIOLOGICAL PARAMETERS

C.- SEX-RATIO

MAROC (INRH)

The data gathering in terms of size and sex of the swordfish has been carried out monthly in the Port of Tanger, where a part of the catch was eviscerated in the marketplace. These data concern 325 specimens. The sex-ratio expressed here by the proportion of female by length class is shown in **figure (1)**.

It can be noted that the number of males is greater when it comes to sizes under 135 cm. The proportion of males and females tends to balance in sizes comprised between 135 and 140 cm. Beyond these sizes, females become notably predominant. The global sex-ratio is slightly in favor of males (52%). These results are similar to those obtained during the past two years.

Size	F	M	%
90	1	1	50%
95	0	2	0%
100	2	7	22%
105	1	11	8%
110	4	12	25%
115	5	18	22%
120	7	21	25%
125	10	12	45%
130	14	15	48%
135	11	11	50%
140	10	8	56%
145	14	10	58%
150	5	13	28%
155	11	6	65%
160	10	4	71%
165	8	5	62%
170	6	3	67%
175	10	4	71%
180	8	2	80%
185	7	2	78%
190	5	1	83%
195	2	0	100%
200	3	0	100%
205	2	0	100%
210	-	-	-
215	-	-	-
220	1	0	100%
225	0	0	-
230	0	0	-
235	0	0	-
240	0	0	-
245	0	0	-
250	0	0	-
255	0	0	-
260	0	0	-
265	0	0	-
270	0	0	-
275	0	0	-
280	0	0	-
285	0	0	-
290	0	0	-
295	0	0	-
300	0	0	-
Total	157	168	48%

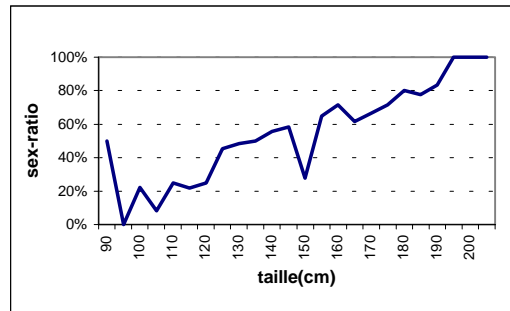


Figure 1. Sex-ratio based on the size of the swordfish caught in the Straits of Gibraltar during Year 2000.

SPAIN (IEO)

During Year 2000, we have continued with systematic samples of size with sex identification in bluefin tuna caught by trap-net, fishing rod, longline and encircling net. The aim was to optimize our knowledge of the sex-ratio by length class obtained in the previous two years, as well as its variability depending on the gear, area and period of that parameter. When it comes to the swordfish, the present commercial strategy does not usually allow the sex identification, since the specimens caught by surface longliners are not eviscerated neither on board nor in the most part of the ports. The same circumstance applies to the long-finned tuna. Totally, 1668 specimens of bluefin tuna captured by all gears were sexed. In **figure 2**, the percentages of females by length class obtained by each fishing gear are presented.

Talla	H	M	I	%
110	0	0	0	-
115	0	0	0	-
120	1	0	0	100%
125	0	0	0	-
130	4	2	7	67%
135	10	5	15	67%
140	8	3	13	73%
145	16	6	20	73%
150	8	3	11	73%
155	9	3	5	75%
160	5	2	10	71%
165	31	20	25	61%
170	38	26	49	59%
175	94	28	51	77%
180	37	25	57	60%
185	61	28	75	69%
190	92	59	105	61%
195	48	31	88	61%
200	45	36	103	56%
205	128	104	166	55%
210	146	97	161	60%
215	86	48	130	64%
220	73	57	158	56%
225	35	31	83	53%
230	12	22	67	35%
235	27	23	89	54%
240	18	59	43	23%
245	1	9	36	10%
250	5	12	32	29%
255	3	16	23	16%
260	0	2	19	0%
265	1	5	15	17%
270	0	3	9	0%
275	0	1	2	0%
280	0	0	1	-
285	0	0	0	-
290	0	1	0	0%
295	0	0	0	-
300	0	0	0	-
Total	1042	767	1668	58%

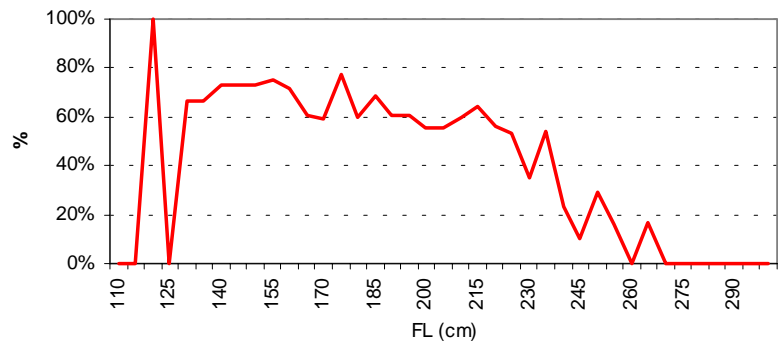


Figure 2. Sex-ratio of bluefin tuna caught by Atlantic trap-net in 2000.

TUNISIA (INSTM)

List of sizes after the determination of sex in bluefin tuna among the landings of purse seiners in Sfax port. It was programmed to perform the same operations with the captures of the Sidi Daoud trap-net, but as a result of the virtually inexistent performance of the trap-net, only ten pieces were noted all over the campaign. As a consequence, we have been limited to the treatment of landings in the port of Sfax.. **Figure 3.**

Size	F	M	%
105	3	0	100%
110	1	0	100%
115	1	0	100%
120	3	0	100%
125	6	0	100%
130	4	0	100%
135	3	0	100%
140	1	1	50%
145	3	0	100%
150	3	2	60%
155	4	0	100%
160	4	1	80%
165	8	1	89%
170	5	2	71%
175	5	1	83%
180	5	2	71%
185	4	2	67%
190	3	1	75%
195	6	4	60%
200	6	2	75%
205	6	1	86%
210	10	1	91%
215	4	0	100%
220	5	2	71%
225	7	3	70%
230	7	2	78%
235	5	1	83%
240	4	2	67%
245	4	2	67%
250	5	1	83%
255	3	1	75%
260	4	2	67%
265	2	1	67%
270	1	0	100%
275	5	2	71%
280	3	1	75%
285	-	-	-
290	0	1	0%
295	-	-	-
300,,320	3	0	100%
Total	156	42	79%

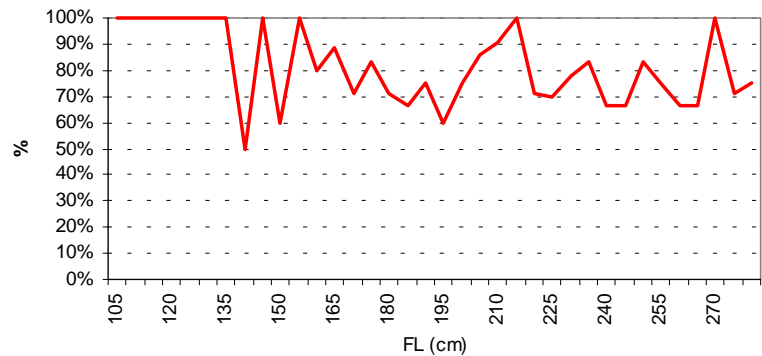


Figure3.- *Thunnus thynnus* : study of sex ratio among landings of the purse seine in the port of Sfax (May-June 2000)

The figure below shows the evidence of the predominance of females in the sampled lot. We cannot advance an explanation to this for the time being, but we will insist on the fact that the number of specimens representing each length class is relatively low. With considerable reservation, I dare to advance that due to the speed of the fish conditioning operation and in order to take samples of female gonads, the technicians in charge of the operation have tended to deal mostly with female fish. This hypothesis is still to be confirmed over the 2001 campaign if everything turns out well.

As a result of this, we intend to be successful in this part with swordfish landings both in Tabarca and Bizerte.

MALTA (NAC)

Sex determination of tuna can only be done by examining internal organs. Thus, information on sex could only be obtained from carcasses which had not been eviscerated. The observers on board were asked to identify the sex of the individual tuna and record the information on the forms indicated above since the tuna are gutted out at sea.

Table 3 gives the number of male and female bluefin tuna observed by the observers on board the fishing vessels. **Figura 4** gives the female percentage by size class of BFT caught by LLHB during the year 2000. **Figure 5** Percentage of females by length class of bluefin tuna caught by trap-net in Malta. (1999-2000)

BFT-LLHB 2000

Size	No.	M	F	%
80	1	1	0	0%
85	1	1	0	0%
90	0	0	0	-
95	0	0	0	-
100	1	1	0	0%
105	3	2	1	33%
110	0	1	1	50%
115	2	2	0	0%
120	3	2	1	33%
125	3	2	1	33%
130	1	1	0	0%
135	2	1	1	50%
140	3	1	2	67%
145	3	1	2	67%
150	6	1	5	83%
155	2	1	1	50%
160	1	0	1	100%
165	4	2	2	50%
170	2	1	1	50%
175	0	1	1	50%
180	4	2	2	50%
185	6	2	4	67%
190	4	2	2	50%
195	5	1	4	80%
200	1	1	0	0%
205	4	2	2	50%
210	11	3	8	73%
215	3	2	1	33%
220	7	2	5	71%
225	3	1	2	67%
230	10	4	6	60%
235	13	8	5	38%
240	10	4	6	60%
245	6	3	3	50%
250	4	3	1	25%
255	6	3	3	50%
260	6	4	2	33%
265	1	1	0	0%
270	4	3	1	25%
275	1	1	0	0%
280	0	0	0	-
285	0	0	0	-
290	0	0	0	-
295	1	1	0	0%
300	0	0	0	-
Total	148	75	77	51%

Table 3 No. of Male and Female BFT observed for Each Size Range

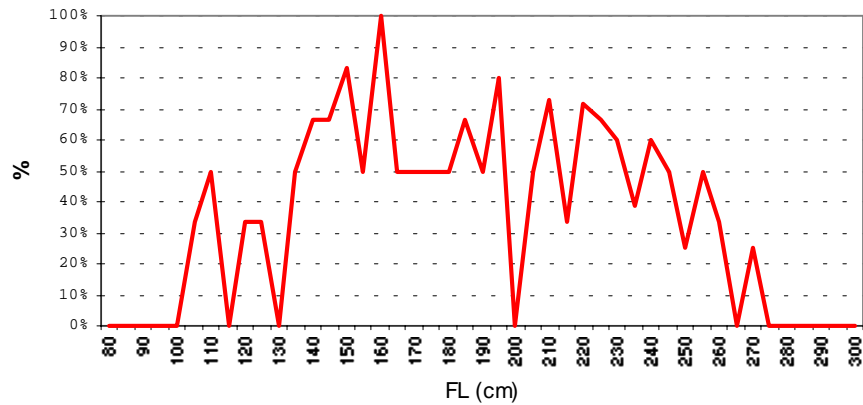


Figure. 4 Female Percentage by Size Class BFT year 2000

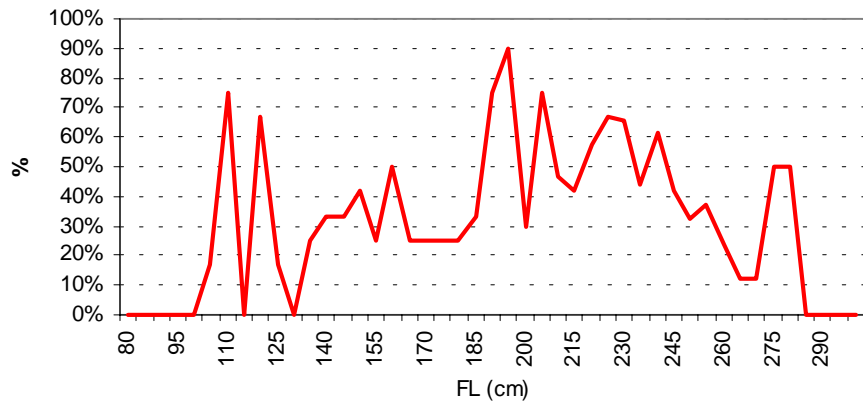


Figure 5 . Percentage of females by length class of bluefin tuna caught by long-line in Malta. (1999-2000)

LIBYA (MBRC)

During Year 200, systematic size samples with sex identification of bluefin tuna caught by Gazera and Zring trap-nets were carried out. **Figure 6** present the percentages of females obtained by length class. From the grouping together of the data gathered from the samples carried out in the same traps in Years 1999 and 2000 (385 specimens), we have obtained **figure 7**, where we can highlight the clear domination of females up to the size 170 cm long LF, from which the percentage of males per size seems to recover its significance. In the conclusions chapter, the observed sex ratio pattern by length class is discussed.

Size	Gazera	Zrig
110	0%	57%
115	100%	40%
120	50%	67%
125	100%	64%
130	66%	78%
135	71%	63%
140	40%	67%
145	50%	55%
150	70%	40%
155	50%	60%
160	66%	50%
165	66%	67%
170	50%	0%
175	100%	0%
180	0%	67%
185	0%	-
190	100%	-
195	-	-
200	75%	-
205	-	-
210	-	-
215	-	-
220	-	-
225	100%	-
230	-	-
235	-	-
240	-	-
245	-	-
250	-	-
255	50%	-
260	-	-
265	-	-
270	-	-
275	-	-
280	-	-
285	-	-
290	-	-
295	-	-
300	-	-

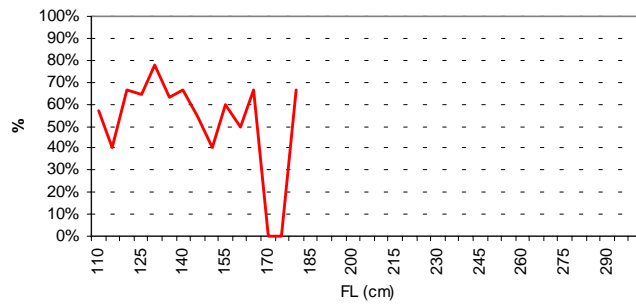
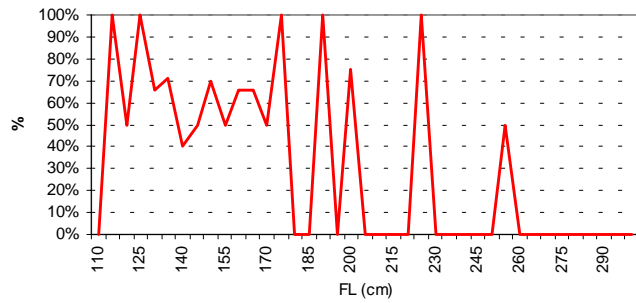


Figura 6.- Percentage of females by length class of bluefin tuna in Gazera and Zrig traps for Year 2000.

Tallas	Total		
	F	M	%
100	1	0	100%
110	5	4	56%
115	14	7	67%
120	19	8	70%
125	22	6	79%
130	24	10	71%
135	28	15	65%
140	22	13	63%
145	20	9	69%
150	21	15	58%
155	24	16	60%
160	14	7	67%
165	9	6	60%
170	7	5	58%
175	6	3	67%
180	2	2	50%
185	1	2	33%
190	4	1	80%
195	1	1	50%
200	3	1	75%
205	0	0	-
210	0	0	-
215	0	0	-
220	1	0	100%
225	2	0	100%
230	0	1	0%
235	0	0	-
240	0	0	-
245	0	0	-
250	0	0	-
255	1	1	50%
260	0	0	-
265	0	0	-
270	0	0	-
275	0	0	-
280	0	0	-
285	0	0	-
290	0	0	-
295	1	0	100%
300	0	0	-
Total	252	133	35%

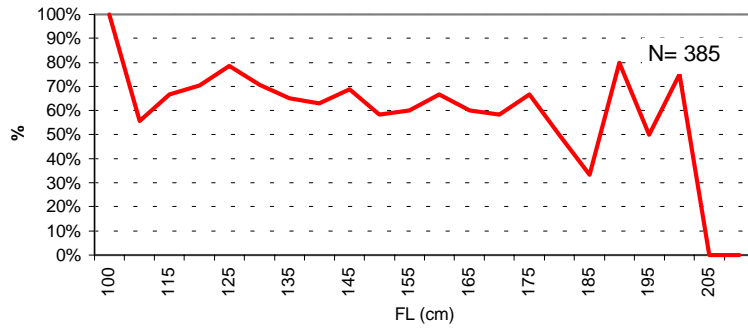


Figura 7.- Percentage of females by length class of bluefin tuna captured by Lybia trap (1999-2000)