

REVISION ON INVESTIGATION WORK REGARDING  
THE BLUEFIN TUNA, *THUNNUS THYNNUS* (L.), AGE

by

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ABSTRACT

- This work summarises available informations in the scientific litterature dealing with the growth of bluefin tuna, *Thunnus thynnus*. Rough results were obtained by using VON BERTALANFFY equation. -

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REVISION DES TRAVAUX DE RECHERCHE  
SUR L'AGE DU THON ROUGE (*THUNNUS THYNNUS* L.)

- Ce travail est une synthèse des données disponibles dans la littérature sur la croissance du thon rouge. Les résultats obtenus sont fondés sur l'utilisation de l'équation de VON BERTALANFFY. -

MOTS-CLES : Thon rouge - âge - croissance.

KEY-WORDS : Bluefin tuna - age - growth.

## INTRODUCTION

The study of the bluefin tuna age has maintained quite a large interest for some time. The first experiences performed by SELLA (1929) opened the ground to a wide subject of which, up to this date, nothing definite has been possible to adopt regarding the use of this important parameter as a base for a fishing regulating standard upon this sort, the resources of which are being found at a critical stage, after the fifteen last years, due to constant and progressive catch that has caused the end of traditional fisheries in the Atlantic Ocean as well as the alarming decrease of levels of many others.

The use of vertebrates for the age studies were quite satisfactory for fourteen year aged fishes though outstanding bias appear to exist amongst different authors probably due to diverse interpretations of the vertebrate rings.

The major problem seems to be concerning fishes beyond the age of fourteen years where the search, by means of vertebrate methods, becomes intricate due to its difficult interpretation which leads to the necessity of looking for new methods, such as the employment pretation which leads to the necessity of looking for new methods, such as the use of otolites (NICHY and BERRY, 1976). This particular methods, involve as well new doubts regarding the interpretation of that zone corresponding to the focus and real nature of the first winter ring.

The last systems used in the investigation of the bluefin tuna age are based on chemical tagging with tetracycline through the alimentary canal via and subsequent examination of hard parts with ultraviolet light. The results, in connection with this kind of investigation, which was begun by Canadian scientists (BUTLER, 1977), have not yet been published, but this can be the possible solution to avoid the problems that may arise produced by both vertebrates and otolites when studying the growing up of the bluefin tuna fish.

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## RESULTS

In this work , the results obtained by different authors, in the study of the bluefin tuna fish age, by using methods of vertebrates and otolites and applying to them the VON BERTALANFFY equation, are duly shown.

The table shows the results obtained for each author on the left column by reading the vertebrates in every case, with the exception of CADDY, DICKSON and BUTLER (1976) who have used otolites.

## DISCUSSION

By graphically representing the VON BERTALANFFY equation, it can be noticed that there exists a good fitting, up to fourteen years covering all curves, except for RODRIGUEZ RODA (1964) and the CADDY, DICKSON and BUTLER (1976) curve of females. In the first of these cases, it appears that this can be due to a wrong interpretation of the rings right after the third age, for there exists a disarrangement of one year difference if compared with the rest of the authors the fishes show a rather apparent larger growth. In the second case, and due to the particular demographic structure of the Canadian Fishery, where the tuna overpasses the age of fifteen years, the authors must have used for their arrangements the data regarding the first ages, by MAHTER and SCHUCK, quoted by CADDY, DICKSON and BUTLER (1976).

In the particular case of WESTMAN and GILBERT, a work quoted by RODRIGUEZ RODA (1964) it can be assumed that the bias of the age 5 could be due to a misprint. Both in this case as in HAMRE's (1958), the VON BERTALANFFY equation has not been applied because the ages subject to studies seems to be incomplete and would not provide us with a realistic image.

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TABLE I RESUME DES ETUDES SUR LA CROISSANCE DU THON ROUGE EN ATLANTIQUE (CORT, ms)  
SUMMARY OF BLUEFIN TUNA GROWTH STUDIES IN ATLANTIC OCEAN

		SELLA 1929	MATHER III & SCHUCK, 1960		RODRIGUEZ- RODA, 1964		MATHER III & SCHUCK, 1960		HAMRE, 1958	WESTMAN & GILBERT, 1941		MATHER & JONES, 1972		CADDY, DICKSON BUTLER, 1976		BERRY & LEE, 1977				
		$r^2=0,9986$ $L_{\infty}=449,68$ $a=21,52$ $k=0,044$ $b=0,957$ $t_0=-2,0882$	1,0 374,49 24,34 0,07 0,94 -1,47	0,993(r) 355,84 31,87 0,09 0,91 -0,89		0,99 381 25,26 0,07 0,93 -1,34					1,0 448,59 25,08 0,0528 0,95 -1,524		$L_{\infty}=286,64$ $L_{\infty}=277,35$ $k=0,134$ $0,116 = k$ $a=24,29$ $k=0,068$ $t_0=0,3278$ $t_0=0,7999$		$r^2=0,99$ $L_{\infty}=368,39$ $a=24,29$ $k=0,068$ $t_0=1,485$					
AGE	Equation	Von Bert		von B.		von B.		von B.				von B.		AGE	0	0				
		von B.		von B.		von B.		von B.				von B.			von B.	von B.	von B.			
1	64	63,5	57	59,5	55,3	55,7	55,9	57,6	-	-	65	-	56	56	1	46,7	52,2	57,3	57,4	
2	81,5	82,3	77	80,8	79	81,5	76,5	79,4	-	-	85	-	76	76,2	2	76,8	76,9	77,3	78	
3	97,5	100,3	95	100,6	116,2	105,1	90,5	99,8	-	-	105,2	-	95	95,3	3	103,1	98,8	95,6	97,1	
4	118	117,5	114	119,1	130,1	126,7	118,8	118,8	-	-	117,6	-	113,5	113,5	4	126,1	118,4	113,9	115	
5	136	133,9	133	136,4	146,9	146,4	135	136,6	135	-	147,8	137,8	131	130,7	5	146,3	135,8	132,2	131,7	
6	153	149,7	149	152,5	165,1	164,4	155,4	153,1	153	-	148,3	-	147,5	147,1	6	163,9	151,3	148,7	147,3	
7	169	164,3	163	167,5	178,1	180,9	161,6	168,5	161	-	157,5	-	163	162,6	7	179,3	165,1	163,5	161,9	
8	182	179,2	177	181,5	192,9	196	174,4	182,8	180	-	-	-	177,5	177,3	8	192,7	177,4	176,5	175,5	
9	195	193	190	194,5	206,5	209,7	186,1	196,2	198	-	-	-	191	191,2	9	204,5	188,3	186,9	188,2	
10	206	206,2	201	206,7	220,3	222,3	203,4	208,7	207	-	-	-	204,5	204,5	10	214,8	198,1	200	200,1	
11	216	218,8		218,1	232	233,8	224,5	220,4	221	-	-	-	217	217	11	223,8	206,8	-	211,2	
12	227	230,9		228,6	244	244,3	233,7	231,2	228	-	-	-	229	228,9	12	231,7	214,5	-	221,6	
13	239	242,5		238,5	255	253	244,3	241,4	239	-	-	-	240	240,2	13	238,6	221,4	-	231,3	
14	154	253,6		247,7		262,7	248	250,8					251	251	14	244,6	227,5	-	240,3	
15														261	15	249,9	232,9			
16														270,8	16	254,5	237,8			
17														279,9	17	258,5	242,1			
18														288,6	18	262,1	246			
19														296,8	19	265,1	299,4			
20														304,6	20	267,8	252,5			
21														312	21	270,2	255,2			
																22	272,3	257,6		
																23	274,1	259,8		
																24	275,6	261,7		
																25	277	263,4		