

SEX-RATIO BY LENGTH-CLASS OF BLUEFIN TUNA (*THUNNUS THYNNUS* L.) CAUGHT BY MALTESE LONGLINERS

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SUMMARY

This article reports bluefin tuna sex-ratio by length-class for the Maltese longline fishery in the Mediterranean Sea.

RÉSUMÉ

Le présent article décrit le sex-ratio du thon rouge par classe de taille pour la pêcherie palangrière maltaise qui opère en mer Méditerranée.

RESUMEN

Este documento presenta la ratio de sexos del atún rojo por clases de talla para la pesquería de palangre de Malta en el mar Mediterráneo.

KEY WORDS

Bluefin tuna, sex ratio, longlining.

1. INTRODUCTION

Several studies regarding bluefin tuna in the Atlantic and in the Mediterranean Sea have focussed on this biological parameter: Rodríguez-Roda (1964), Azevedo and Gomes (1985), Rey and Alot (1987), Rey *et al.* (1987), Arena (1963, 1979), de la Serna *et al.* (1992). The general conclusions for the aforementioned studies are that differences in the mortality ratios as well as differences in growth rates by sex result in different percentages of males and females by length-class. Furthermore, as regards bluefin tuna, these percentages are higher for females belonging to smaller length-classes and lower for females belonging to higher length-classes.

2. MATERIAL AND METHODS

In the framework of the COPEMED Project, information on catch, effort, fishing location, size composition and sex identification from the Maltese longline fishery directed to bluefin tuna in the Mediterranean was collected by observers on board the vessels targeting bluefin tuna. To conduct this preliminary analysis information on 359 fish was recorded for the years 1999, 2000 and 2001.

3. RESULTS AND DISCUSSION

Sex ratio by length-class is shown in **Table 1** and **Figure 1**. **Figure 1** includes approximate 95% confidence levels based on a binomial approximation (Collet, 1991). A preliminary analysis of sex-ratio shows that patterns for the Maltese longline fisheries in the Mediterranean area differ from those

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observed by several authors. In general, the proportion of females is lower than the proportion of males for several length classes (up to 170 cm), above these length-classes, the proportion of females becomes higher (up to 230) and after the proportion of males is higher. This general pattern is thought to relate to differences in growth rates and maturation rates among sexes: at present, it is accepted that bluefin tuna females become mature before males.

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Table 1.- Sex- ratio by length-class for Maltese longline fishery directed to bluefin tuna in the Mediterranean Sea.

Length-class	Sex-ratio (proportion of females)		
	prop. Fem.	ll95%	up95%
100	0.40	0.05	0.85
110	0.33	0.07	0.70
120	0.44	0.14	0.79
130	0.33	0.07	0.70
140	0.47	0.21	0.73
150	0.44	0.20	0.70
160	0.40	0.12	0.74
170	0.43	0.10	0.82
180	0.56	0.30	0.80
190	0.69	0.41	0.89
200	0.50	0.26	0.74
210	0.49	0.32	0.66
220	0.57	0.37	0.75
230	0.55	0.40	0.70
240	0.46	0.29	0.63
250	0.45	0.27	0.64
260	0.24	0.07	0.50
270	0.31	0.09	0.61
280			
290	0.00		0.84

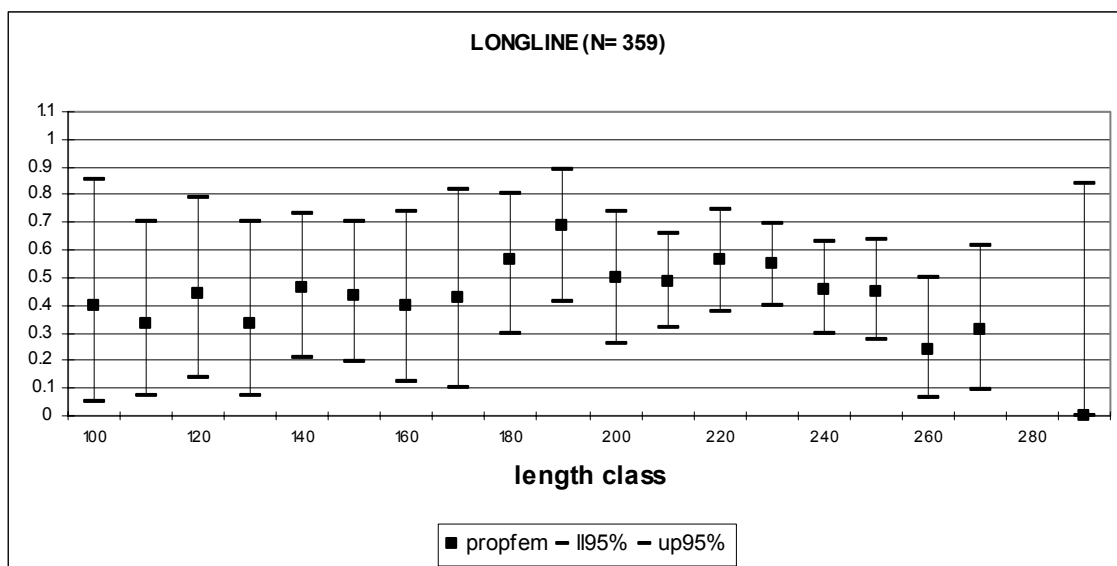


Figure 1.- Sex- ratio by length-class and approximate 95% confidence limits for the Maltese longliners directed to bluefin tuna in the Mediterranean Sea.