

LENGTH-WEIGHT RELATIONSHIPS FOR BLUEFIN TUNA (*Thunnus thynnus* L.) CAUGHT FROM THE LIBYAN TRAP FISHERY IN 1999-2002

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SUMMARY

This paper reports length-weight relationships for the bluefin tuna (Thunnus thynnus L.) in the Mediterranean. The estimated equations that are based on data from the Libyan trap fishery during 1999 to 2002, allow conversions from fork length to round weight.

RESUMÉ

(Relation taille poids du thon rouge (Thunnus thynnus L.) capture pour le pêcherie de madrague des Libya en 1999-2002). Le présent document fournit une série de rapports longueur-poids pour le thon rouge de la Méditerranée. Les équations estimées qui sont basées sur les données des pêcherie libyenne de madrague au long de 1999 a 2002, permettent de convertir la longueur à la fourche en poids totale.

RESUMEN

(Relación talla-peso del atún rojo (Thunnus thynnus L.) capturado por las almadrabas de Libia durante el periodo 1999-2002). Este documento presenta una serie de relaciones talla-peso para el atún rojo en el Mediterráneo. Las ecuaciones estimadas que se basan en datos de la pesquería libia de almadraba de 1999 a 2002, permiten realizar conversiones de longitud a la furca a peso vivo.

KEYWORDS

Bluefin tuna, length-weight relationships, trap fishing

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1 Introduction

The study of large pelagic fish blue is progressing in Libya within the framework of the Project 'Research on fishing biology of bluefin tuna (*Thunnus thynnus* L.) and swordfish (*Xiphias gladius* L.) in the Mediterranean Sea', funded by FAO-COPEMED program and Marine Biology Research Centre of Libya. This study program is aiming to investigate several parameters such as fisheries data on catch and effort, biological data and stock evaluation of bluefin tuna based on ICCAT methodology.

Following ICCAT recommendations to improve knowledge of bluefin tuna caught in the Mediterranean Sea sampling was carried out at Libyan trap fishery to determinate length-weight relationships of bluefin tuna. Four traps operate in the Libyan coast in recent years: Gazira, Zreg, Zeletin and Garabulli from east to west respectively. These traps usually catch adult bluefin tuna in its spawning migration from west to east Mediterranean Sea (COPEMED 2000).

Previously published length-weight relationships include conversions among different measures of size (upper jaw-fork length, pectoral fin-fork length) and weights (round weight, dressed weight). These estimates are based on data from east Atlantic (Rey and Cort, unpublished; cited in ICCAT 1990) and Mediterranean landings (Arena, unpublished; cited in ICCAT 1990). Rodríguez-Roda (1980) estimated equations based on data from Spanish traps. Recently, Hattour (2003) published relationships of bluefin from purse seine Tunisian fishery.

The aim of this paper is to give information on length-weight relationship of bluefin tuna caught in Libyan traps.

2 Material and methods

In order to determinate length-weight relationships bluefin tuna sampling was carried out at Libyan trap fishery from 1999 to 2002. A total of 790 measurements (both sexes) of length and live weight were obtained from the trap catches. The fork length (LF) cm was measured by a calibrator and the weight by a scale of 0.5 kg precision.

The length-weight relationship was determined from the exponential model of the classical equation length-weight relationship $W = a L^b$. The model was fitted to the observation and the model parameters were estimated for each year.

3 Results

Table 1 present details and parameter estimates of the fitted models for predicting bluefin tuna length-weight relationship for the Libyan trap fishery in the Mediterranean. Graphic representation of the estimated length-weight relationships for years 1999 to 2002 are given in **Figure 1**.

Several authors have proposed length-weight relationships that allow estimates of round weight from fork length in the Atlantic and Mediterranean stocks. Rey y Cort (unpublished) and Rodríguez-Roda (1980) estimated equations based on data from Spanish traps. Hattour (2003) published relationships of bluefin from purse seine at Tunisia. **Figure 2** presents length-weight relationship for bluefin tuna from the Libyan trap fishery in 1999-2002 together with above mentioned authors relationships.

Figure 3 shows female and male length-weight relationship for bluefin tuna from the Libyan trap fishery in the Mediterranean in 2002.

Literature cited

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Table 1. Parameters of the equation $W = aL^b$, used for predicting bluefin tuna length-weight relationship for the Libyan trap fishery in the Mediterranean.

Year	Sample size	Length range (cm)	a	b	R ²
1999	255	100-315	$2 \cdot 10^{-4}$	2,5434	0,8699
2000	153	115-250	$2 \cdot 10^{-5}$	2,9957	0,9147
2001	122	118-238	$5 \cdot 10^{-5}$	2,7802	0,8776
2002	260	110-260	$3 \cdot 10^{-5}$	2,8608	0,9526
All years	790	100-315	$4 \cdot 10^{-5}$	2,8214	0,9038

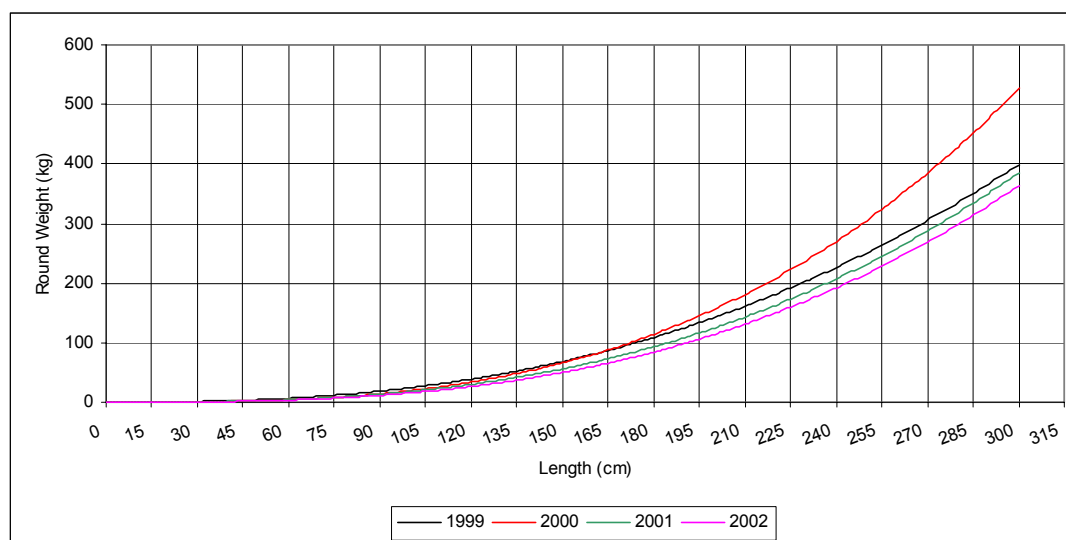


Figure 1. Length-weight relationship for bluefin tuna from the Libyan trap fishery in the Mediterranean in years 1999 - 2002.

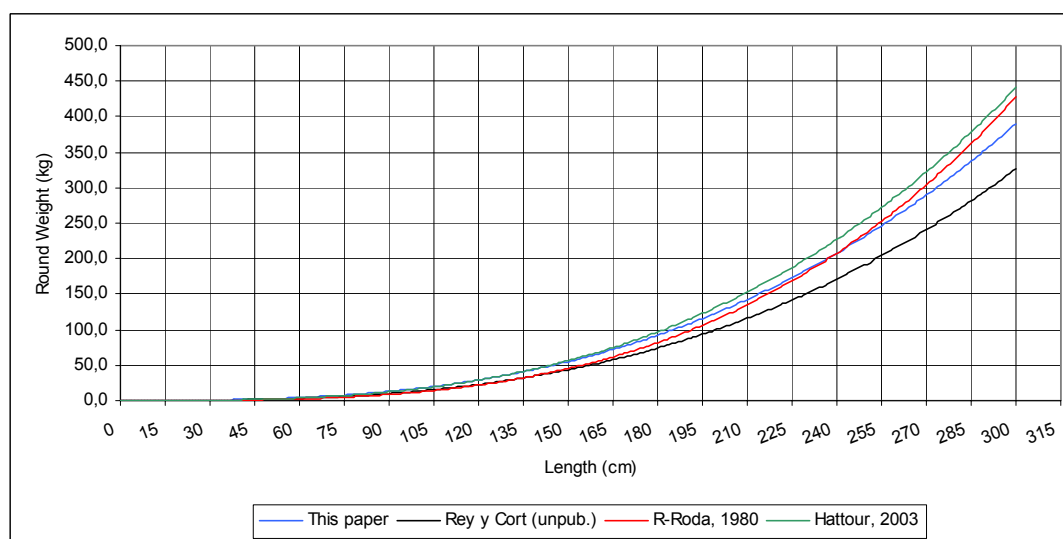


Figure 2. Length-weight relationship for bluefin tuna from the Libyan trap fishery in the Mediterranean (1999-2002), Spanish trap fishery by Rey y Cort (unpublished) and by Rodríguez-Roda (1980) and Tunisian purse seine fishery by Hattour (2003).

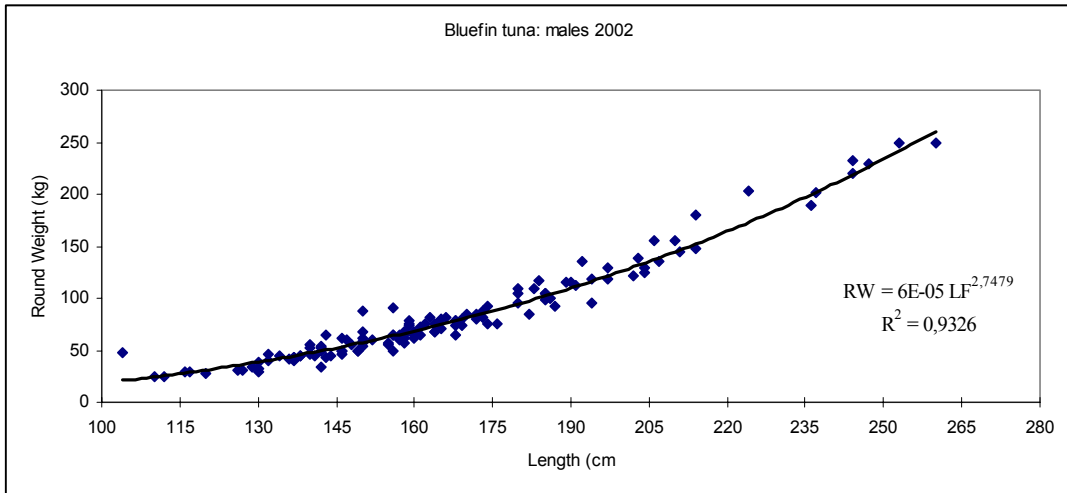
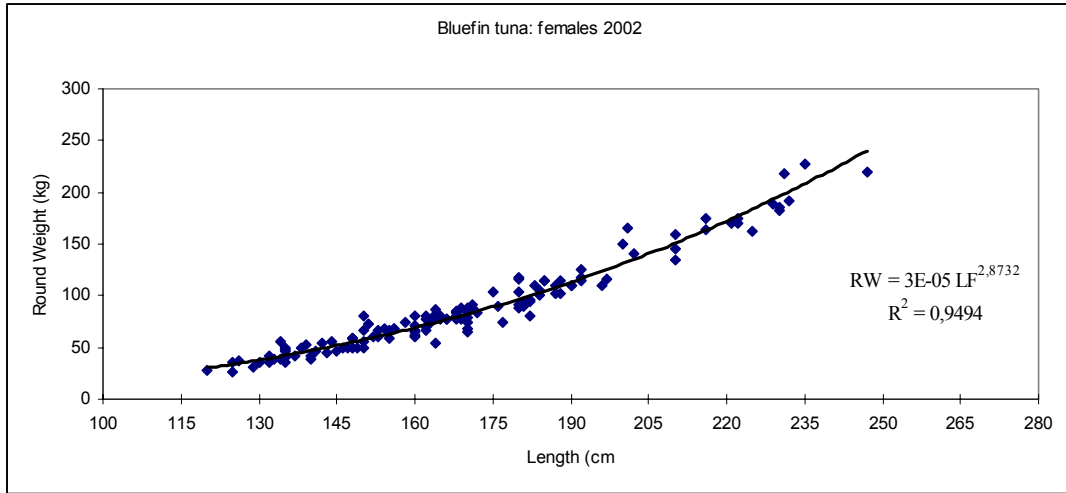


Figure 3. Length-weight relationship for bluefin tuna from the Libyan trap fishery in the Mediterranean in 2002 by sex.