SEX-RATIO BY LENGTH-CLASS OF BLUEFIN TUNA (Thunnus thynnus L.) CAUGHT BY MALTESE LONGLINERS

A. Fenech1, J.M. de la Serna2, J.Mª Ortiz de Urbina2

SUMMARY

This article reports bluefin tuna sex-ratio by length-class for the Maltese longline fishery in the Mediterranean Sea. Observed pattern agrees with those obtained by several authors.

1 Malta Centre for Fisheries Sciences (Marsaxlok, Malta). Andreina.farrugia@magnet.mt
2 Tuna Department. Spanish Institute of Oceanography (IEO- CO Málaga. Spain).
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.

MATERIAL AND METHODS

In the framework of Project COPEMED, 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.

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 are very similar to those 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.

LITERATURE CITED


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

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

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