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# SIZE FREQUENCY COMPOSITION OF THE ALBACORE CATCHES IN THE TYRRHENIAN SEA IN THE PERIOD 1998-2001.

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*SUMMARY*

*The albacore fishery has been conducted for a long time in the Tyrrhenian Sea, particularly with driftnets. The progressive adoption of the regulatory measures for this gear, before the ban in 2002, had changed the importance of this fishery in the area, creating a dramatic drop in the total catches, which is not a reflection of the availability of the stock. The driftnet data reported in this paper have a particular importance, because they could be the last for this species for this area.*

*RÉSUMÉ*

*Depuis de nombreuses années la pêche de germon est pratiquée en mer Tyrrhénienne, notamment à l'aide de filets dérivants. L'adoption progressive de mesures de réglementation pour cet engin, avant l'interdiction de 2002, a modifié l'importance de cette pêcherie dans la région et a engendré une spectaculaire diminution des prises totales, ce qui ne reflète pas la disponibilité du stock. Les données relatives aux filets dérivants soumises dans ce document revêtent une importance particulière étant donné qu'il pourrait s'agir des dernières données pour cette espèce dans cette région.*

*RESUMEN*

*Durante mucho tiempo se ha desarrollado una pesquería de atún blanco en el mar Tirreno, sobre todo con redes de deriva. La adopción progresiva de medidas de regulación para este arte, antes de que se instaurara su prohibición en 2002, había afectado ya a la importancia de esta pesquería en la zona, dando lugar a una drástica caída de las capturas totales, descenso que no supone un reflejo de la disponibilidad del stock. Los datos de redes de deriva que se presentan en este documento revisten una importancia especial, dado que podrían ser los últimos para esta especie en esta zona.*

*KEY WORDS*

*Thunnus alalunga, Albacore, Mediterranean fishery.*

## 1. INTRODUCTION

As reported in several previous papers, the albacore (*Thunnus alalunga*) fishery has been a traditional activity in the central and southern Tyrrhenian Sea since long time (Arena & Di Natale, 1987; Di Natale, 1990, 1999; Di Natale *et al*., 1988, 1992, 1995a, 1995b, 1995c, 1998). Usually, driftnets mostly carried out the albacore fishery, but this gear was strictly regulated in the last years and there is a total ban since January 1, 2002. The longline fishery has a minor importance in this area, while the pole and line fishery was carried out sometimes only in the 1970s.

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The dramatic change in the albacore fishing activity, related to the progressive driftnet ban adopted by the EC is creating a completely new situation, and several new difficulties were noticed in collecting landing data in the most recent years.

As a matter of fact, the data collection in the last years is becoming a sort of historical source for the future analysis, due to the fact that this fishery will certainly change from 2002.

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## 2. METHODS

The methodology adopted to collect the size frequencies of the albacore (*Thunnus alalunga*) along all the coasts of the southern and central Tyrrhenian Sea (Italian Regions: Sicily, Calabria, Basilicata, Campania and Lazio) was basically the same adopted in the past in various projects (Di Natale, 1990, 1999; Di Natale *et al.*, 1998).

The basic structure of the landing ports was kept in the same manner (Ponza in the Central Tyrrhenian Sea, Lipari and Milazzo in the Southern Tyrrhenian Sea). In all the places, the landing control was carried out regularly (two weeks per month).

The length data were grouped per gear and related to the area, by classes of 2 cm FL, like for the previous statistics, to make them comparable with the older ones.

## 3. THE DATA

In 1998 it was possible to obtain 298 length data, 109 from the driftnet fishery and 189 from the longline fishery. The mean length (FL) was 74.5 cm for the driftnet catches and 69.1 cm for the longline catches; in total, the mean length was 71.2 cm. The mode **(Table 1a and 1b)** was between 70 and 71.9 cm for both gears and in total.

In 1999, the data collection system reported 406 length data, 168 from the driftnet fishery and 238 from the longline fishery. The mean length (FL) was 72.6 cm for the driftnet catches and 75.6 cm for the longline catches; in total, the mean length was 74.4 cm. The mode **(Table 2a and 2b)** was again between 70 and 71.9 cm for both gears and in total.

In 2000 it was possible to collect 404 length data, 395 from the driftnet fishery and only 9 from the longline fishery, due to a very limited fishing season in autumn. The mean length (FL) was 76.6 cm for the driftnet catches and 80.9 cm for the longline catches; in total, the mean length was 76.7 cm. The mode (Table 3a and 3b) was between 72 and 73.9 cm for the driftnets and in total, while it was between 78 and 79.9 cm for the longline catches.

In 2001 the data collection system reported only 197 length data, 124 from the driftnet fishery and 73 from the longline fishery. The mean length (FL) was 76.1 cm for the driftnet catches and 78.4 cm for the longline catches; in total, the mean length was 77.6 cm. The mode (Table 4a and 4b) was between 76 and 77.9 cm for all the gears and in total, while there was a second mode between 80 and 81.9 cm for the longline catches.

## 4. DISCUSSION

From the above-mentioned data sets, it appears quite clear that the situation of the data collection is deteriorating quite quickly in this area, due to the following factors:

- progressive reduction of the driftnet landings till 2001;
- Driftnet ban in 2002;
- High variability in the longline fishing;
- Significant reduction of research funding.

At the same time, the influence of external factors, like the different pattern of the longline fishery in 2000, is clearly affecting the distribution of the sample.

The mean length shows a continuous increasing trend in the last four years, but this not significant, comparing the previous data from the same area, showing yearly variations **(Figure 1)**. As a matter of fact, the albacore stock in the Tyrrhenian sea appears quite stable on the long period, with possible changes in the length composition according to various factors, that will be examined in detail in a next paper.

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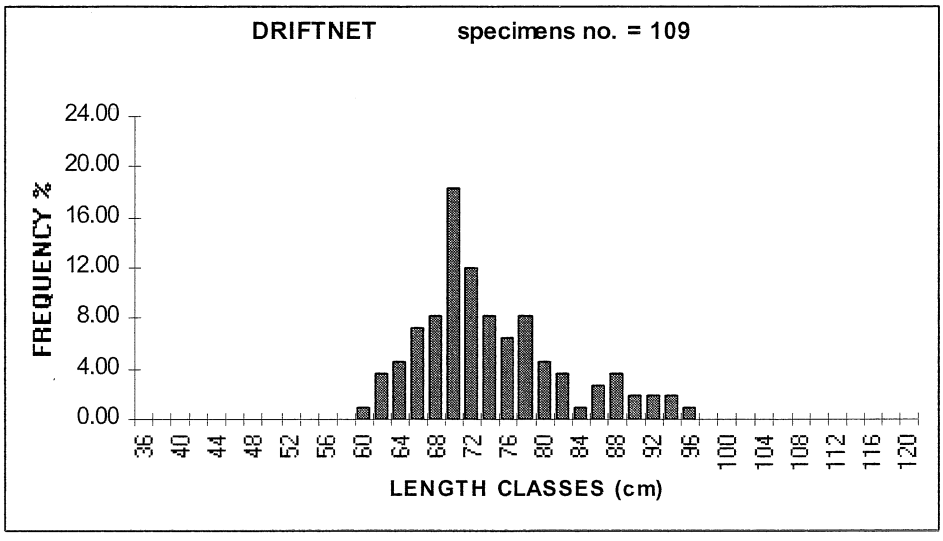
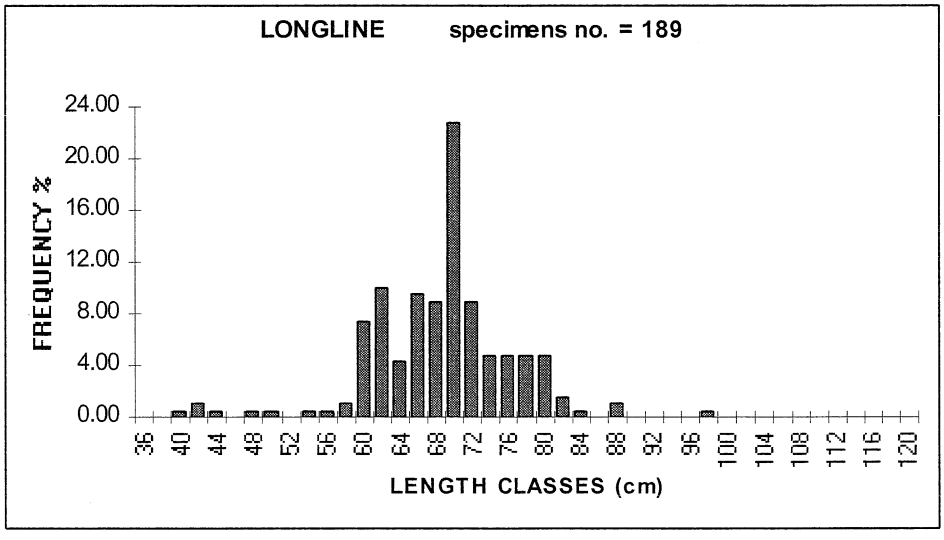
**Table 1a** - Length frequency (FL) of Albacore (Thunnus alalunga) caught by various gears in the year 1998 in the central and southern Tyrrhenian sea.

| LENGTH CLASSES | DRIFTNET | | LONGLINE | | 1998 | |
|---|---|---|---|---|---|---|
| (cm) | no. | % | no. | % | no. | % |
| 36-37,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 38-39,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 40-41,9 | | 0.00 | 1 | 0.53 | 1 | 0.34 |
| 42-43,9 | | 0.00 | 2 | 1.06 | 2 | 0.67 |
| 44-45,9 | | 0.00 | 1 | 0.53 | 1 | 0.34 |
| 46-47,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 48-49,9 | | 0.00 | 1 | 0.53 | 1 | 0.34 |
| 50-51,9 | | 0.00 | 1 | 0.53 | 1 | 0.34 |
| 52-53,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 54-55,9 | | 0.00 | 1 | 0.53 | 1 | 0.34 |
| 56-57,9 | | 0.00 | 1 | 0.53 | 1 | 0.34 |
| 58-59,9 | | 0.00 | 2 | 1.06 | 2 | 0.67 |
| 60-61,9 | 1 | 0.92 | 14 | 7.41 | 15 | 5.03 |
| 62-63,9 | 4 | 3.67 | 19 | 10.05 | 23 | 7.72 |
| 64-65,9 | 5 | 4.59 | 8 | 4.23 | 13 | 4.36 |
| 66-67,9 | 8 | 7.34 | 18 | 9.52 | 26 | 8.72 |
| 68-69,9 | 9 | 8.26 | 17 | 8.99 | 26 | 8.72 |
| 70-71,9 | 20 | 18.35 | 43 | 22.75 | 63 | 21.14 |
| 72-73,9 | 13 | 11.93 | 17 | 8.99 | 30 | 10.07 |
| 74-75,9 | 9 | 8.26 | 9 | 4.76 | 18 | 6.04 |
| 76-77,9 | 7 | 6.42 | 9 | 4.76 | 16 | 5.37 |
| 78-79,9 | 9 | 8.26 | 9 | 4.76 | 18 | 6.04 |
| 80-81,9 | 5 | 4.59 | 9 | 4.76 | 14 | 4.70 |
| 82-83,9 | 4 | 3.67 | 3 | 1.59 | 7 | 2.35 |
| 84-85,9 | 1 | 0.92 | 1 | 0.53 | 2 | 0.67 |
| 86-87,9 | 3 | 2.75 | | 0.00 | 3 | 1.01 |
| 88-89,9 | 4 | 3.67 | 2 | 1.06 | 6 | 2.01 |
| 90-91,9 | 2 | 1.83 | | 0.00 | 2 | 0.67 |
| 92-93,9 | 2 | 1.83 | | 0.00 | 2 | 0.67 |
| 94-95,9 | 2 | 1.83 | | 0.00 | 2 | 0.67 |
| 96-97,9 | 1 | 0.92 | | 0.00 | 1 | 0.34 |
| 98-99,9 | | 0.00 | 1 | 0.53 | 1 | 0.34 |
| 100-101,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 102-103,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 104-105,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 106-107,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 108-109,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 110-111,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 112-113,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 114-115,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 116-117,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 118-119,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 120-121,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| TOTAL | 109 | | 189 | | 298 | |
| mean FL (cm) | 74.54 | | 69.1 | | 71.16 | |

**Table 1b -** Length frequency (FL) of Albacore (Thunnus alalunga) caught by various gears in 1998 in the central and southern Tyrrhenian sea.



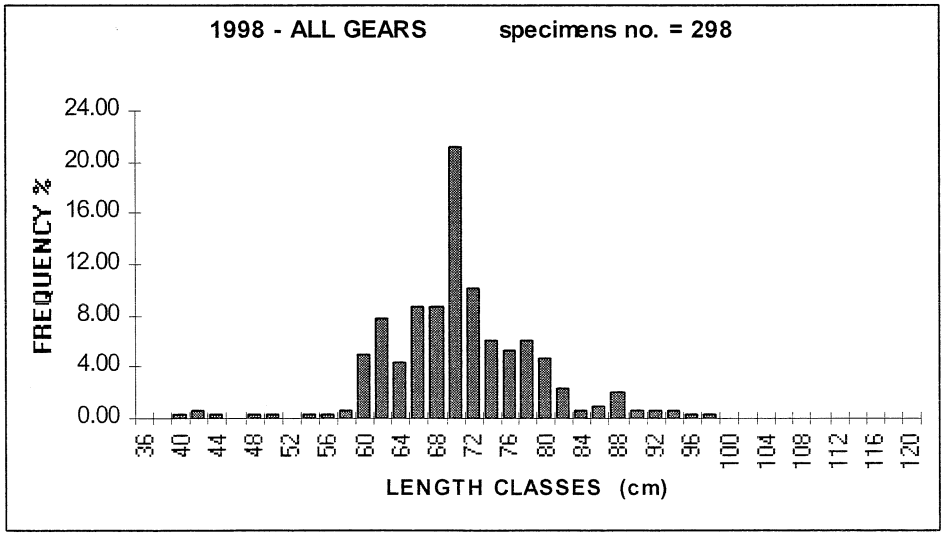
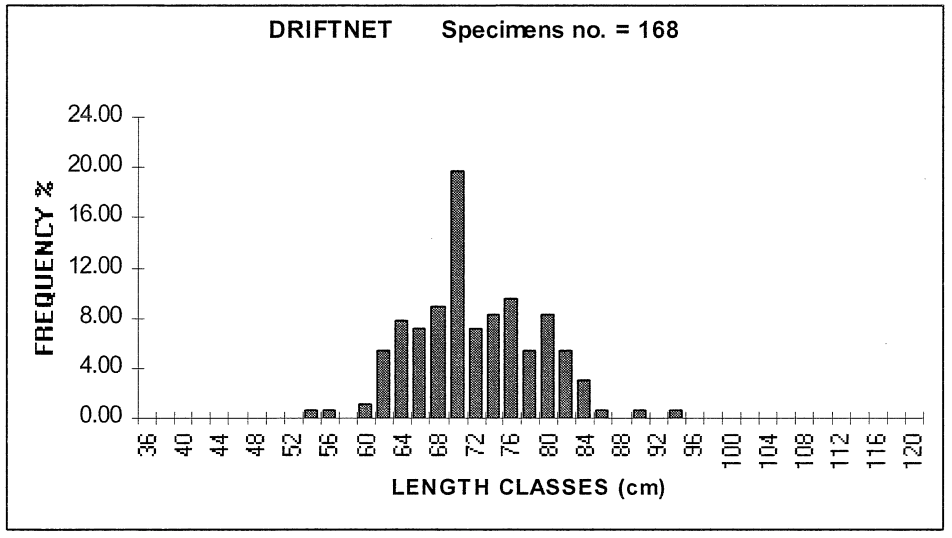
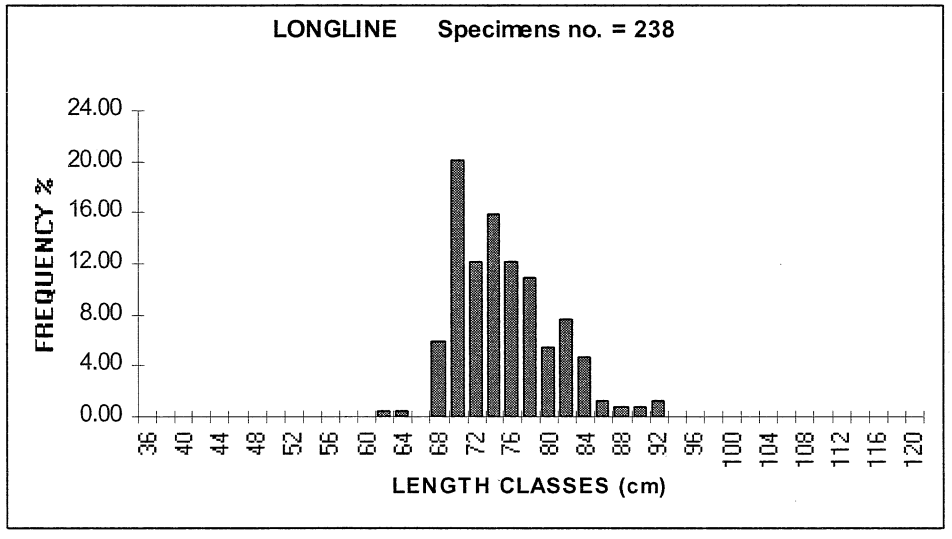



**Table 2a** - Length frequency (FL) of Albacore (Thunnus alalunga) caught by various gears in 1999 in the central and southern Tyrrhenian sea.

| LENGTH CLASSES | DRIFTNET | | LONGLINE | | 1999 | |
|---|---|---|---|---|---|---|
| (cm) | no. | % | no. | % | no. | % |
| 36-37,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 38-39,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 40-41,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 42-43,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 44-45,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 46-47,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 48-49,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 50-51,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 52-53,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 54-55,9 | 1 | 0.60 | | 0.00 | 1 | 0.25 |
| 56-57,9 | 1 | 0.60 | | 0.00 | 1 | 0.25 |
| 58-59,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 60-61,9 | 2 | 1.19 | | 0.00 | 2 | 0.49 |
| 62-63,9 | 9 | 5.36 | 1 | 0.42 | 10 | 2.46 |
| 64-65,9 | 13 | 7.74 | 1 | 0.42 | 14 | 3.45 |
| 66-67,9 | 12 | 7.14 | | 0.00 | 12 | 2.96 |
| 68-69,9 | 15 | 8.93 | 14 | 5.88 | 29 | 7.14 |
| 70-71,9 | 33 | 19.64 | 48 | 20.17 | 81 | 19.95 |
| 72-73,9 | 12 | 7.14 | 29 | 12.18 | 41 | 10.10 |
| 74-75,9 | 14 | 8.33 | 38 | 15.97 | 52 | 12.81 |
| 76-77,9 | 16 | 9.52 | 29 | 12.18 | 45 | 11.08 |
| 78-79,9 | 9 | 5.36 | 26 | 10.92 | 35 | 8.62 |
| 80-81,9 | 14 | 8.33 | 13 | 5.46 | 27 | 6.65 |
| 82-83,9 | 9 | 5.36 | 18 | 7.56 | 27 | 6.65 |
| 84-85,9 | 5 | 2.98 | 11 | 4.62 | 16 | 3.94 |
| 86-87,9 | 1 | 0.60 | 3 | 1.26 | 4 | 0.99 |
| 88-89,9 | | 0.00 | 2 | 0.84 | 2 | 0.49 |
| 90-91,9 | 1 | 0.60 | 2 | 0.84 | 3 | 0.74 |
| 92-93,9 | | 0.00 | 3 | 1.26 | 3 | 0.74 |
| 94-95,9 | 1 | 0.60 | | 0.00 | 1 | 0.25 |
| 96-97,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 98-99,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 100-101,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 102-103,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 104-105,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 106-107,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 108-109,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 110-111,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 112-113,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 114-115,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 116-117,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 118-119,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 120-121,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| TOTAL | 168 | | 238 | | 406 | |
| mean FL (cm) | 72.57 | | 75.75 | | 74.43 | |

**Table 2b** - Length frequency (FL) of Albacore (Thunnus alalunga) caught by various gears in 1999 in the central and southern Tyrrhenian sea.



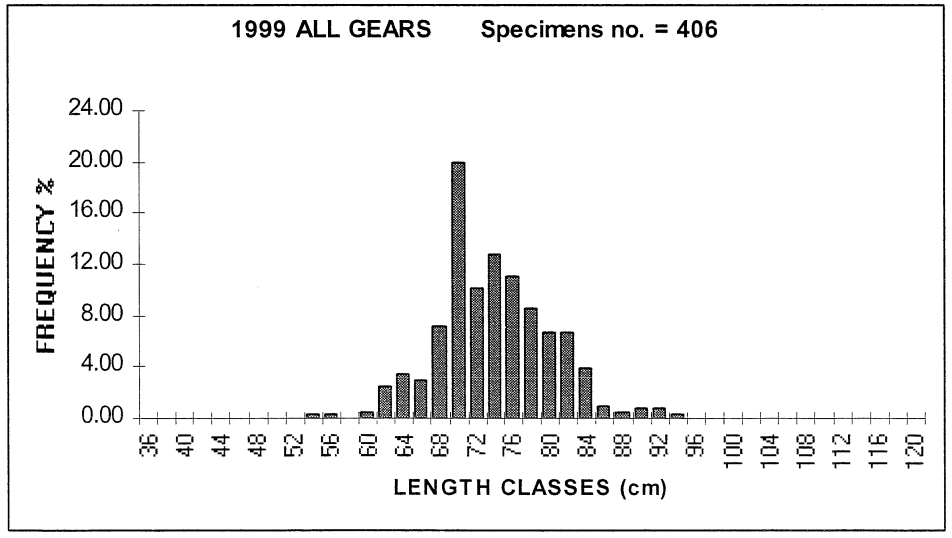
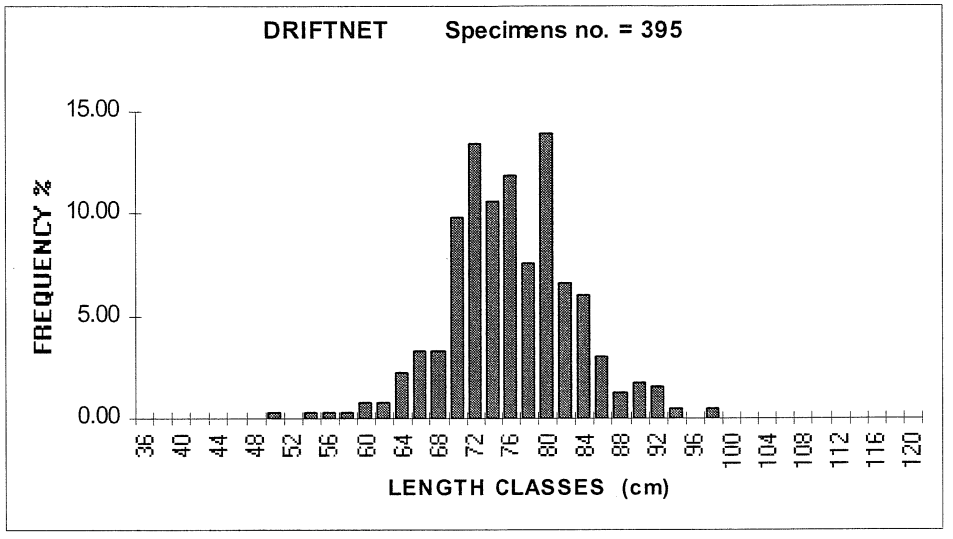
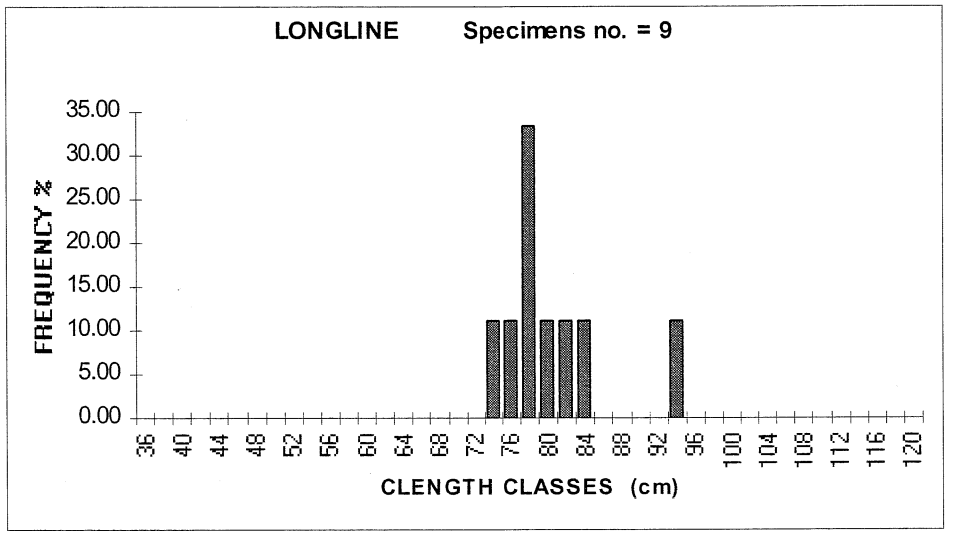



**Table 3a** - Length frequency (FL) of Albacore (Thunnus alalunga) caught by various gears in the year 2000 in the central and southern Tyrrhenian sea.

| LENGTH CLASSES | DRIFTNET | | LONGLINE | | 2000 | |
|---|---|---|---|---|---|---|
| (cm) | no. | % | no. | % | no. | % |
| 36-37,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 38-39,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 40-41,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 42-43,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 44-45,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 46-47,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 48-49,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 50-51,9 | 1 | 0.25 | | 0.00 | 1 | 0.25 |
| 52-53,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 54-55,9 | 1 | 0.25 | | 0.00 | 1 | 0.25 |
| 56-57,9 | 1 | 0.25 | | 0.00 | 1 | 0.25 |
| 58-59,9 | 1 | 0.25 | | 0.00 | 1 | 0.25 |
| 60-61,9 | 3 | 0.76 | | 0.00 | 3 | 0.74 |
| 62-63,9 | 3 | 0.76 | | 0.00 | 3 | 0.74 |
| 64-65,9 | 9 | 2.28 | | 0.00 | 9 | 2.23 |
| 66-67,9 | 13 | 3.29 | | 0.00 | 13 | 3.22 |
| 68-69,9 | 13 | 3.29 | | 0.00 | 13 | 3.22 |
| 70-71,9 | 39 | 9.87 | | 0.00 | 39 | 9.65 |
| 72-73,9 | 53 | 13.42 | | 0.00 | 53 | 13.12 |
| 74-75,9 | 42 | 10.63 | 1 | 11.11 | 43 | 10.64 |
| 76-77,9 | 47 | 11.90 | 1 | 11.11 | 48 | 11.88 |
| 78-79,9 | 30 | 7.59 | 3 | 33.33 | 33 | 8.17 |
| 80-81,9 | 55 | 13.92 | 1 | 11.11 | 56 | 13.86 |
| 82-83,9 | 26 | 6.58 | 1 | 11.11 | 27 | 6.68 |
| 84-85,9 | 24 | 6.08 | 1 | 11.11 | 25 | 6.19 |
| 86-87,9 | 12 | 3.04 | | 0.00 | 12 | 2.97 |
| 88-89,9 | 5 | 1.27 | | 0.00 | 5 | 1.24 |
| 90-91,9 | 7 | 1.77 | | 0.00 | 7 | 1.73 |
| 92-93,9 | 6 | 1.52 | | 0.00 | 6 | 1.49 |
| 94-95,9 | 2 | 0.51 | 1 | 11.11 | 3 | 0.74 |
| 96-97,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 98-99,9 | 2 | 0.51 | | 0.00 | 2 | 0.50 |
| 100-101,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 102-103,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 104-105,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 106-107,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 108-109,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 110-111,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 112-113,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 114-115,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 116-117,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 118-119,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 120-121,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| TOTAL | 395 | | 9 | | 404 | |
| mean FL (cm) | 76.59 | | 80.89 | | 76.69 | |

**Table 3b** - Length frequency (FL) of Albacore (Thunnus alalunga) caught by various gears in the year 2000 in the central and southern Tyrrhenian sea.



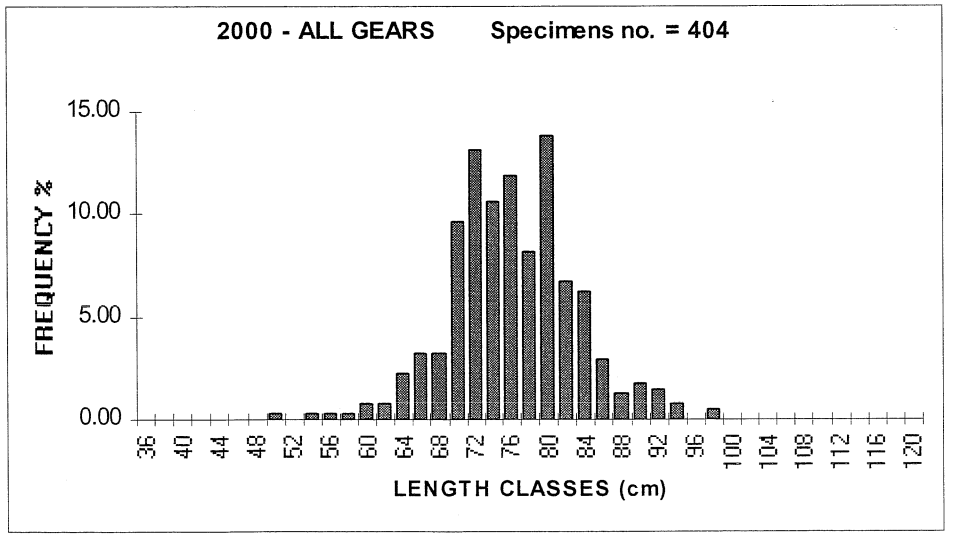



**Table 4a** - Length frequency (FL) of Albacore (Thunnus alalunga) caught by various gears in the year 2001 in the central and southern Tyrrhenian sea.

| LENGTH CLASSES | DRIFTNET | | LONGLINE | | 2001 | |
|---|---|---|---|---|---|---|
| (cm) | no. | % | no. | % | no. | % |
| 36-37,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 38-39,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 40-41,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 42-43,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 44-45,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 46-47,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 48-49,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 50-51,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 52-53,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 54-55,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 56-57,9 | | 0.00 | 1 | 1.37 | 1 | 0.51 |
| 58-59,9 | | 0.00 | 1 | 1.37 | 1 | 0.51 |
| 60-61,9 | 2 | 1.61 | | 0.00 | 2 | 1.02 |
| 62-63,9 | 4 | 3.23 | 2 | 2.74 | 6 | 3.05 |
| 64-65,9 | 8 | 6.45 | 4 | 5.48 | 12 | 6.09 |
| 66-67,9 | 6 | 4.84 | 3 | 4.11 | 9 | 4.57 |
| 68-69,9 | 10 | 8.06 | 6 | 8.22 | 16 | 8.12 |
| 70-71,9 | 10 | 8.06 | 4 | 5.48 | 14 | 7.11 |
| 72-73,9 | 7 | 5.65 | 2 | 2.74 | 9 | 4.57 |
| 74-75,9 | 10 | 8.06 | 4 | 5.48 | 14 | 7.11 |
| 76-77,9 | 19 | 15.32 | 7 | 9.59 | 26 | 13.20 |
| 78-79,9 | 8 | 6.45 | 6 | 8.22 | 14 | 7.11 |
| 80-81,9 | 6 | 4.84 | 7 | 9.59 | 13 | 6.60 |
| 82-83,9 | 9 | 7.26 | 5 | 6.85 | 14 | 7.11 |
| 84-85,9 | 10 | 8.06 | 4 | 5.48 | 14 | 7.11 |
| 86-87,9 | 4 | 3.23 | 3 | 4.11 | 7 | 3.55 |
| 88-89,9 | 2 | 1.61 | 2 | 2.74 | 4 | 2.03 |
| 90-91,9 | 2 | 1.61 | 3 | 4.11 | 5 | 2.54 |
| 92-93,9 | 3 | 2.42 | 3 | 4.11 | 6 | 3.05 |
| 94-95,9 | 4 | 3.23 | 2 | 2.74 | 6 | 3.05 |
| 96-97,9 | | 0.00 | 2 | 2.74 | 2 | 1.02 |
| 98-99,9 | | 0.00 | 1 | 1.37 | 1 | 0.51 |
| 100-101,9 | | 0.00 | 1 | 1.37 | 1 | 0.51 |
| 102-103,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 104-105,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 106-107,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 108-109,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 110-111,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 112-113,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 114-115,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 116-117,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 118-119,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| 120-121,9 | | 0.00 | | 0.00 | 0 | 0.00 |
| **TOTAL** | 124 | | 73 | | 197 | |
| mean FL (cm) | 76.14 | | 78.41 | | 77.64 | |

**Table 4b -** Length classes (FL) of Albacore (Thunnus alalunga) caught by various gears in the year 2001 in the central and southern Tyrrhenian sea.