PRELIMINARY DATA ON AGE DETERMINATION OF THE BLUEFIN TUNAS *(THUNNUS THYNNUS L.)* CAUGHT IN THE ADRIATIC SEA

Vjekoslav Ticina* and Ivo Kacic

Institute of oceanography and fisheries, Set. I. Mestrovica 63, 21000 Split, Croatia

Abstract

Age determination of the bluefin tuna *(Thunnus thynnus L.)* was done using cross section of the first spin in the first dorsal fin. The age is determined in the 100 specimens with various fork lengths. The range of the fork lengths of the sampled specimens was between 50 and 127 centimeters. Six different age-classes are found in the sample.

Key-words: fishes, biometrics, Adriatic sea

Introduction

The age of bluefin tuna can be determined in different ways. Some different methods for this purpose can be used. Usually, rhythmic markings on caudal vertebrae and in the otoliths were used (1, 2 and 3). Scales are not very useful, due to the small differences between summer and winter rings. Since Compean-Jimenez and Bard (4, 5) and Cort (6, 7) found that well-defined growth marks were evident on the first dorsal spines of bluefin tuna, we chose the first dorsal spine as a source for age estimation. Also, we found this method the most appropriate for our sample because there was a little damage to the sampled fish. Thus, the commercial value of the sampled fish did not decrease.

Scaccini (8), Morovic (9), Vilicic (10), Alegria-Hernandez (11,12) and Ticina (13) reported that mainly small and juvenile specimens of bluefin tuna were caught in the Adriatic sea by purse-seiners. However, the age composition of these fish have not been determined. The objectives of our study were to estimate the age of bluefin tunas caught in the Adriatic, from growth bands on dorsal spine sections.

Material and methods

The random sampling of the bluefin tuna for age determination was done at sea from March to October of 1993 and 1994 year. Specimens used for the analyses were taken from different catches of the bluefin tuna obtained by purse-seine in the Adriatic sea. First spines of the first dorsal fins were cut near the spine base, using a fine saw (Fig. 1.). We collected 100 first dorsal spines from the specimens with various fork lengths.
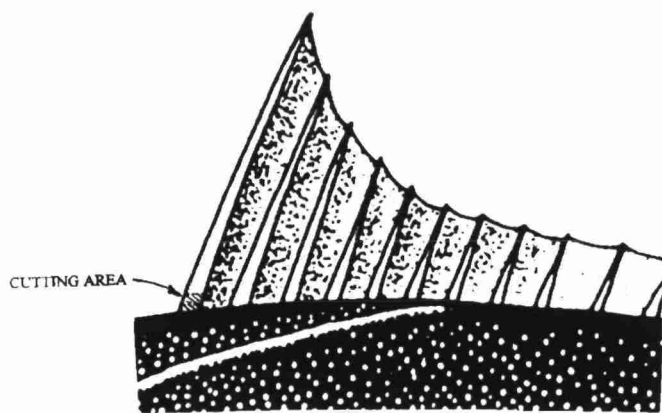

Figure 2. Cross section of the first dorsal spine of bluefin tuna (*Thunnus thynnus* L.)

Results

Fork lengths of the specimens of the sampled bluefin tunas were between 50 and 127 centimeters. Length structure of the sample, grouped in the 5 cm classes, is shown on the Figure 3. After age reading analysis, six different age-classes are found in the sample.
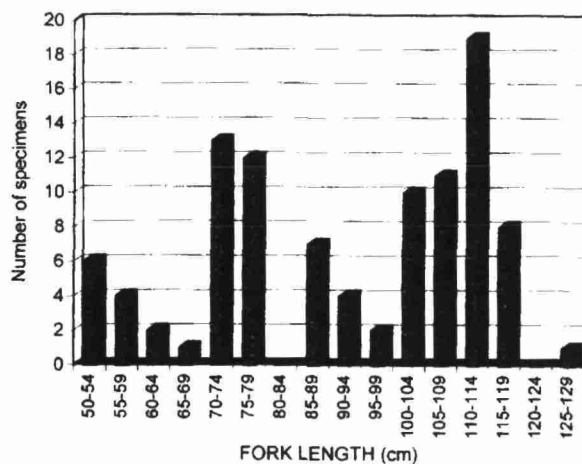

Figure 1. Sampling of the first dorsal spine.

Figure 3. Length structure of the sample.

Cross sections of the dorsal spines were done using a slow rotation fine saw. After that, cross sections were ground until a thickness of 0.5 mm was reached and washed in the 95 % ethyl alcohol. Binocular microscope was used for age reading.

Typical growth patterns on bluefin tuna spines included a narrow translucent zone, which we assumed to be a winter slow-growth stage, and wider opaque zones which probably represents fast growth during summer (Fig. 2). On the basis of these differences in the skeletal structure of the spines, the age of different specimens was determined. In addition, the diameter of the spine was measured, with tolerance +/- 0.01 mm.

In the first class we found fish till one year old (A=0+) with fork length less than 58 cm and weight till 3.5 kg. Diameter of the spine was less than 3.15 mm.

In the second class we found fish till two years old (A=1^0 and A=1+) with fork length more than 60 and less than 75 cm. This specimens weighted from 4.5 to 8.5 kg. Diameter of the spine was 3.60 - 4.54 mm.