

A SELECTIVITY STUDY ON THE BOTTOM TRAWL CODEND IN THE SOUTHERN BLACK SEA COAST (SAMSUN SHELF AREA, TURKEY)

M. Zengin ^{1*}, H. Kaykaç ², A. Gümüş ³, S. Süer ³, M. Rüzgar ³, I. Özcan Akpınar ¹ and Z. Tosunoglu ²

¹ Central Fisheries Research Institute, Trabzon, Turkey - muze5961@gmail.com

² Ege University, Faculty of Fisheries, Bornova, Izmir, Turkey

³ Ondokuz Mayıs University, Faculty of Science and Arts, Dept. Biol., Samsun, Turkey

Abstract

In this study, experiments were carried out to test selectivity of trawl codend (40D) used by the commercial trawl fisherman and three meshes different in shape and size (40S, 36S and 40T90) for two target species; whiting (*Merlangius merlangus*) and red mullet (*Mullus barbatus*) in the southern Black Sea, Turkey. Results of the selectivity analysis show that presently used commercial 40 mm nominal mesh size is rather unselective to release sufficient amount of juveniles. The highest selectivity values were obtained in the 40S codend.

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Keywords: Black Sea, Fisheries, Trawl surveys

Introduction

The discard rate in bottom trawl fishing was determined high especially for red mullet and whiting by monitoring studies on trawl fishery in SSA [1]. Mesh size of codend used in bottom trawl nets in the Turkish Black Sea cannot be smaller than 40 mm. The range of age groups for whiting discard was 0-2 yr and 0-1 yr for red mullet [1]. This causes a great economic loss and has impacts indirectly on food web and on the benthic ecosystem. The high discard rate indicates that there is a heavy fishing pressure on red mullet and whiting populations in Southern Black Sea.

Material and Method

Selectivity trials were carried out onboard the commercial trawler (20-27 Aug 2014). Trawling was carried out by using four different codends with a total of 21 valid hauls for red mullet and 20 valid hauls for whiting. We tried four codends different in mesh size and shape: 40 mm-diamond, 40 mm polyethylene material and T-90 (90° rotated 40D) 36 mm-square and 40 mm-square. They were attached to the end of funnel which have 300 meshes in its circumference and made of 40 mm mesh size PE netting. The hooped-covered codend method was used to collect selectivity data [2]. These parameters were calculated by maximum likelihood using the software CC 2000 [3]. Mean selectivity curves using EC Model software were estimated by taking into account the between-haul variation of the selectivity parameters according to [3].

Results and Discussion

Mean selectivity curves for red mullet for all codends are shown in Figure 1.

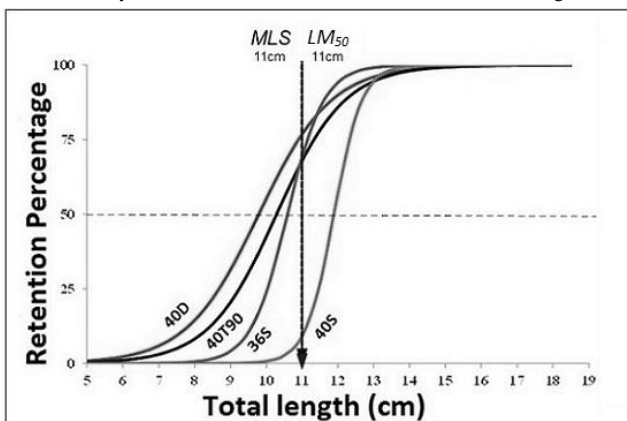


Fig. 1. Mean selection curves for red mullet for all codends.

MLS (minimum landing size) and estimated LM₅₀ (length at first maturity) for red mullet is 11 cm. The highest rate of discard (18.1%) was determined in the conventional gear net (40 mm-diamond mesh 40D) still used by fishermen. The best selectivity results were obtained in the 40S codend. Estimated L₅₀ (50% retention rate) values for 36S, 40S and 40T90 were higher than the values estimated for 40D. Mean selectivity curves for whiting for all codends are shown in Figure 2. MLS for whiting is 13 cm and LM₅₀ is 14 cm. The highest

rate of discard was 29.5% for the conventional gear net (40 mm-diamond mesh) still used by fishermen.

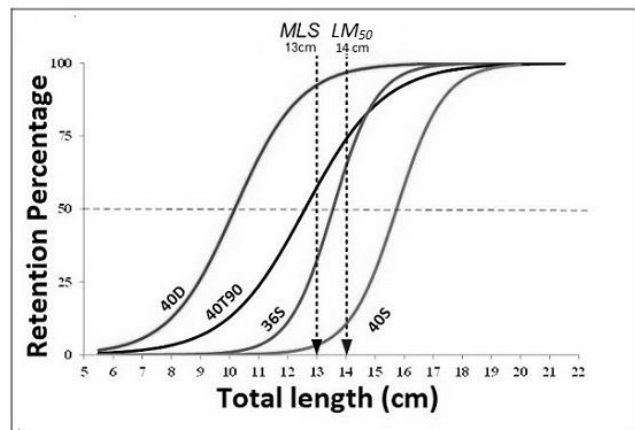


Fig. 2. Mean selection curves for whiting for all codends.

The best selectivity results were obtained in the 40S codend. Estimated L₅₀ (50% retention rate) values for 36S, 40S and 40T90 were higher than the values estimated for 40D. It is reported that commercial trawl codend used in Turkey are rather unselective for these species [4]. Square mesh trawl codend had a positive effect on size selectivity of red mullet and whiting. The full square mesh codend in general improved the selectivity for round fish such as whiting and red mullet. Though the best result of selectivity values were obtained in the 40S codend, the trawl fisherman are not in favor of use of this codend (40S).

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References

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