

COMPARISON OF DISCARDED, ESCAPED AND LANDED FISH USING DIAMOND AND SQUARE MESH CODENDS

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Abstract

We compared 20 mm diamond-shaped codend with 20 mm square-shaped codend. Sampling was conducted with a chartered commercial trawler in the Gulf of Lion during July and August 2000. The codend covered method was used. Number and weight landed, discarded and escaped of twelve commercially important species were studied. Our results suggested great differences between the two codends in the number and weight of fish escaped and discarded. Landed weight only differed between 0.01 and 8.0 % for all species studied, excluding under-sized fish sold.

Keywords : trawl codend selectivity, square mesh, diamond mesh, fisheries, Gulf of Lions

The total annual catch in Catalonia (Spain) is approximately 50,000 t, 70 % of which is caught by bottom trawl fishery. Catches have been decreasing since 1994 and now mainly consist of under-sized fish. The multi-specific character of this fishery makes it difficult to manage, but some size selectivity experiments with diamond and square mesh codends suggest that changing the shape of the mesh codend could aid the escape of under-sized fish and (also very important) reduce the number of discards (1,2).

The aims of this study were :

- 1) to evaluate the number and weight of discarded, escaped and landed fish, and
- 2) to compare the selectivity of diamond and square mesh codends.

Sampling took place in the Gulf of Lions between July and August 2000 in a chartered commercial trawler. We made eight hauls with every mesh codend at depths between 50 and 350 metres. The hauls lasted between 3 and 4 hours and the towing speed was 3.8 knots. Codend selectivity was calculated through the covered codend method (3).

Catches were sorted for every mesh codend and separated into three categories : landed, discarded and escaped fish. Each category was sorted by species. The total number and weight per species and individual lengths (to the nearest mm) were recorded. In this paper, we describe the results for twelve commercially important species : *Merluccius merluccius*, *Micromesistius poutassou*, *Trisopterus minutus capelanus*, *Mullus barbatus*, *Sardina pilchardus*, *Engraulis encrasicolus*, *Scomber scombrus*, *Trachurus trachurus*, *Trigla lyra*, *Eutrigla gurnardus*, *Phycis blennoides* and *Lepidorhombus bosci*.

The analysis of every category suggested that, with diamond mesh, discards were between 20.0 and 75.8% of the total number retained, and between 4.2 and 47.3% of the total weight retained. Square mesh reduced the number of discards in both total number and weight retained to 0-13.3% and 0-7.3 %, respectively.

In other words, the number of escapes with square mesh was over 50 % more than with diamond mesh.

Total number and weight landed with diamond mesh were 12.0-72.7% and 39.2-96.1%, respectively; and with square mesh, 5.3-63.6% and 15.7-94.0%. We observed that less fish were landed with square mesh, but if we took away the under-sized fish landed with diamond mesh, and then compared the diamond-mesh fish again with the fish landed with square mesh, the difference was only about 5% for the total weight landed.

Comparison of the under-sized fish landed with every type of mesh showed big differences for the most commercial species like hake (*Merluccius merluccius*) and red mullet (*Mullus barbatus*). The total number of under-sized hake landed was 60.2% with diamond mesh and 13.6% with square mesh, whereas the weight of under-sized hake landed was 11.0% and 5.3%, respectively. The total number of under-sized red mullet landed was 54.0% with diamond mesh and 10% with square mesh; and the weight of under-sized red mullet landed was 11.4% with diamond mesh and 5.2% with square mesh.

The results of the present study show that :

- (1) square mesh allows significantly more individuals to escape through the mesh;
- (2) consequently, the number of individuals discarded decreases with a square mesh codend;
- (3) the weight of fish landed is similar for the two types of mesh when the under-sized fish landed are excluded; and
- (4) the under-sized fish sold decrease if we use the square mesh codend.

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