COMPARISON OF DISCARDS OBTAINED USING DIFFERENT MESH SIZES AND SHAPES IN THE CODEND OF THE TRAWL

Jorge Baro [1]*, Teresa Garcia [1] and Jose miguel Serna [1]
[1] Instituto Espñaol de Oceanografía. Centro Oceanoghráfico de Málaga - jorgebaro@ma.ieo.es

Abstract
In this work a comparison of the discards rates among trawl gears using different type of codend is presented. Sampling took place during 6 months in 2008 on-board four commercial trawlers in northern Alboran Sea using three different types of meshes in the codend (40-mm diamond- and square-mesh and 50 mm diamond-mesh). Our results showed that discards rates varied between type of meshes but no differences were found between vessels.
Keywords: Alboran Sea, Deep Waters, Fisheries

At a world level between 17.9 and 39.5 million tons of marine organism are discarded [1]. Mediterranean trawl fisheries are highly diverse in terms of species and many of them are discarded for economic (low commercial value) or legal reasons (minimum landing sizes) [2, 3]. Discards are important for stock management because contribute to fishing mortality and they also represent and economic and ecological impact. The use of bigger mesh size than traditional or more selective shapes in the codend can contribute to reduce the discards and hence the impact of fishing in the ecosystem.

Sampling took place between May and October 2008 on-board four selected commercial trawlers representative of the studied area in terms of size, engine power, fishing capacity and construction characteristics. The overall objective of the surveys was to compare profitability of trawl fishing in northeast Alboran Sea between 600 and 800 m depth, using three different types of meshes in the codend (40-mm diamond- and square-mesh and 50 mm diamond-mesh) under commercial condition. The weights of landed and discarded organism were estimated by on-board observers for 451 trawl daylight hauls following commercial fishing procedures. The average duration of the trawls was 3.5 hours. All species captured were weighted and counted. Two-way analysis of the variance, (ANOVA) was used to test differences in the pattern of the yields (kg/hauls) between fishing vessels and type of meshes.

Discarded rates ranged from 4.4% and 16% of the total catch depending on the vessels and the type of codend. Fishes were the most important group in terms of weight discarded for all the vessels (41.7%-65.9% of the total), followed by crustaceans (11.8%-23.11) and molluscs (8.5%-11.16%) (Table 1). Main discarded fishes were Condricthyans and Macroruidae: *Nezumia aequalis, Chimaera monstrosa, Torpedo nobiliana, Etmopterus spinax, Dalatias licha, Trachyrhynchus trachyrhynchus, Galeus melastomus* and *G. atlanticus.* The crustaceans *Dardanus arrosor*, other Paguridae and *Polycheles typhlops* and the molluscs *Octopus defilippi Neorossia caroli, Eledone cirrhosa* and *Pteroctopus tetracirrhus* were the main species discarded in these two groups.

Tab. 1. Discards (g/haul) by group of species and type of meshes in the codend (40SQ: 40 mm square-mesh; 50D: 50 mm diamond m-mesh; 40D 40 mm diamond mesh)

	Fishes	Crustaceans	Molluscs	Echinoderms
40C	16883	87	135	103
50R	19420	124	164	106
40R	10940	124	231	98

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Discards rates were significant different between type of meshes of the codend ($p<0.05$), although there were not observed differences between the discards between vessels. In general highest rates of discards were recorded for the 50 mm diamond-mesh codend (Table 2)

Tab. 2. Discarded rates (in percentages) by vessels and type of meshes in the codend (40SQ: 40 mm square-mesh; 50D: 50 mm diamond m-mesh; 40D 40 mm diamond mesh)

	40C	50R	40R
Vessel 1	10,78	15,30	8,70
Vessel 2	10,57	16,24	4,44
Vessel 3	10,20	8,62	5,60
Vessel 4	12,78	11,36	4,37

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