

A SCALE OF DAMAGED FISH (SDF)

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Abstract

One of the main issues related to net fisheries is that potentially commercial fish are discarded because they are partly or totally destroyed by scavengers while they remain on the nets in the sea. During trammel net selectivity experiments in Greece in summer 2004, observations on the condition of the fish after retrieval of the nets have been made. A qualitative “scale of damaged fish” (SDF) was created in order to record the condition of the fish according to 5 gradients: from 1: fully destroyed to 5: without any damage. The results related to hake and common pandora are presented.

Keywords: Ionian Sea, Fisheries

Introduction

The Greek fishing fleet is characterized by an enormous number of small-scale coastal vessels, with high diversification of gears and techniques. Trammel nets are one of the most commonly fishing gears used by small scale fisheries along the Greek coasts. However, there are only sporadic attempts to study these fisheries [1], [2], [3]. In several métiers, the extended deployment (in time) of the nets in the water, the way of the fish capture and other characteristics of each haul (such as the depth), can lead to death of the fish in the nets. The fish caught, attract scavengers that feed on them and thus destroy the catch, causing subsequent discarding and uncounted mortality. The aim of this work is to study the discarding practice of trammel nets and introduce a scale of damaged fish.

Material and Methods

Experimental fishing trials with trammel nets of four different mesh size combinations took place in the Ionian Sea (Greece) along the west coasts of Peloponnissos, during June and July 2004. The mesh sizes used for the inner net were: 44, 56, 72 and 80 mm. All nets were made up of sheets of the four mesh sizes joined end to end to make up a fleet and arranged in random order. For each mesh size, a net of 500 m was used. A total of 76 sets of nets were deployed at depths ranging from 10 to 130 m. Normal fishing practices were followed. The nets were set during sunrise and retrieved in the following morning. The soaking time presented a mean value of 21 h (ranged from 12 to 24 h) while for two hauls the soaking time was 46 h. The number of specimens and the total weight per species were recorded and for each fish the total length was measured to the nearest mm.

One of the main problems of net fishery is that an important part of the catch (fish of commercial size) is destroyed by polychaetes or other marine organisms while the net remains into the sea. For the evaluation of the physical damages, the following “scale of damaged fish” (Table 1), was created in order to record the causes and the severity of the damages incurred, in relation to commerciality.

Tab. 1. Description of the Scale of Damaged Fish (SDF)

Scale	Description of damages	Commerciality
5	No damages	Always
4	Few damages, usually eyes and gills are eaten. Some small damages in the flesh caused by bites from cephalopods or other fish	Usually
3	Medium extended damages, eyes, gills and part of the abdominal area eaten. Same damages in the flesh due to bites from cephalopods or other fish	No, private consumption or discarded
2	Extended damages, eyes, gills and part or the whole of the abdominal area eaten. Severe damages in the flesh caused by bites from cephalopods or other fish	No
1	Fully destroyed, only skin and skeleton remain. In many cases, species identification is difficult	No

Results and Discussion

A total of 2.782 individuals were caught belonging to 76 species and weighting 315 Kg. Discarded fish composed 29% by number and 24% by weight of the catch. Discards were species with no commercial value, or commercial species, either because they were small sized or because their physical appearance (damages by other fish, polychaetes, cephalopods or on the winch during hauling) was appalling and they had no commercial value.

According to the scale presented above for the description of fish condition, 4.6, 5.9, 8.6, 8.1 and 72.7% of all the fish caught were classified in the gradients: 1,

2, 3, 4 and 5, respectively. The organisms that cause the damages differ and act in many ways; i.e polychaetes destroy first the eyes and the gills, then enter through the branchial opening and destroy the abdominal region, whereas the cephalopods remove the outer parts of the flesh.

Although detailed data per species are not presented here, significant quantities of commercial species are discarding due to damages caused by other species: 45% of common dentex, 40% of common pandora, 36% of common two-banded seabream, 30% of brown meagre, 20% of hake, 29% of common seabream, (unpublished data). The differences that were observed between the species could be attributed to the resistance of the fish on the net, the time of capture, the visibility of the fish inside the water, etc.

The reason of discarding of the commercial species is almost always not the size but the condition of fish. Given that damages begin after the fish has died on the net, the soaking time is an important factor. A logistic regression analysis with the soaking time as single predictor reveals that this factor is significant in determining the discard probability (p-value=0.01, estimate=0.04, SE=0.01). The discarded common pandora and hake (Fig. 1) were well above the minimum landing size (MLS) and thus potentially marketable.

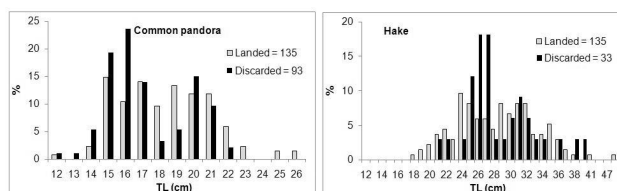


Fig. 1. A) Common pandora and B) hake landings and discards length composition from trammel nets, in Ionian Sea, June-July 2004

By cutting down the time of operation, the number of discards is expected to reduce. In Portugal, the length of time trammel nets and gill nets are permitted to remain in the water is limited in order to reduce spoilage and subsequent discarding of commercial species [4].

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