TRAWL FISHERY DISCARD IN THE SICILIAN CHANNEL

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Abstract.
The amount and composition of by-catch discarded by shrimp trawl fishery in two zones of the Sicilian Channel was studied between January and August 1993. The total catch in weight was composed of 55% landed and 45% discard. Bony fish were the largest component of the discards in both zones followed by cartilaginous fish. The weight of discard produced per kilo of pink shrimp was 3.8 and 0.8 in north and south area respectively.

Keywords: Trawl surveys, demersal, Sicilian Channel

Introduction.

Most fisheries catch a consistent number of non-target species which form the by-catch. Part of this by catch is retained, the rest is discarded. Between 17.9 and 39.5 million tons of marine organisms are discarded each year in commercial fisheries all over the world (1). The highest quantities of discards are from the Northwest Pacific region and tropical shrimp trawl fisheries. Among the many fisheries producing discards, demersal trawl fishery, being less selective than other fisheries and for the particular mode of action, results in the greatest level of discards (3). Such a kind of fishery is one of the most practised in Sicily. The main target species of the Sicilian Channel trawl fishery are *Aristaeomorpha foliacea, Aristeus antennatus* and the deep-water pink shrimp *Parapeneus longirostris*. This fishery also produces important by-catches of *Merluccius merluccius, Nephrops norvegicus, Mullus barbatus* and *M. surmuletus*. The aims of this study were to measure the composition and biomass discarded by the pink shrimp trawl fishery operating in the Sicilian Channel.

Material and Methods

Evaluation of discard production was carried out in the Sicilian Channel by observers on board of commercial trawlers to obtain more realistic estimates than those obtained from randomial surveys (3). The two zones of the Channel considered in the study were north (near Cap Bon) and south zone (near Pelagian Islands). Two different professional trawlers of the Mazara fleet were used for a spring survey in south and three season surveys (winter, spring, summer) in north. A total of 118 hauls, carried out from January to August 1993, were conducted on pink shrimp ground, from 151 to 462 m of depth. The organisms caught were divided by fishermen in two fractions, commercial and discard, and identified to the lowest possible taxon by researchers. All the species or taxa of the commercial and discard fractions were weighed before storing or discarding.

Results

The average catch over all the trips was 64 kg/hour in north and 99 kg/hour in south. Bony fish were the largest fraction of the total catch in weight (68%), followed by crustaceans (22%), cephalopods (4%) and cartilaginous fish (4%). The total catch was composed of 55% landed and 45% discard. In the north area, 58% of the landed catch was represented by bony fish and 29% by crustaceans; on the contrary, in the south area, crustaceans were 78% of the landings, 99.6% of which was pink shrimp, and bony fish were only 17%. In both areas, bony fish were the largest component of the discards, reaching 96% in the south area (fig. 1). 194 taxa were recorded : 85 bony fish, 36 crustaceans, 23 cartilaginous fish, 19 cephalopods, and 31 among bivalves, gastropods, sponges, cnidaria, echinoderms and brachiopods. Of those: 53 bony fish, 28 crustaceans, 13 cartilaginous fish, 6 cephalopods, and all the other taxa were completely discarded. 55 of the total taxa were present in both landings and discard. In the north area bony fish component of the discard consisted mainly of silvery pout *Gadiculus argenteus* and undersize specimens of hake *Merluccius merluccius*, followed by shortnose greeneye *Chlorophthalmus agassizi* and Atlantic horse mackerel *Trachurus trachurus*. In the south area, blue whiting *Micromesistius poutassou* dominated the discarded fish, followed by hake and Atlantic horse mackerel. Among cartilaginous fish, almost all skates were discarded in both areas, the gray skate *Raja batis* being the species most discarded. Most of the crustaceans discarded consisted on pandalids *Plesionika* sp., true crabs (Brachiura) and pink shrimp. Most of the cephalopods discarded belonged to the family Sepiolidae. Pink shrimp in both zones were discarded in a percentage lower than 1% of the total commercial pink shrimp caught; 25% and 81% of hake were discarded in north and south area respectively. The weight of discard produced per kilo of pink shrimp was 3.8 kg in north zone and 0.8 kg in south zone.

Discussion

Discard from trawlers represents a high incidence anthropic source of alteration for marine ecosystems. In the Mediterranean, an intense fishing activity producing great quantities of discard is represented by shrimp trawling. This fishery mainly acts on pink shrimp *P. longirostris*, the most interesting demersal resource of the epibathyal layer (between 200 and 450 m), especially in the Sicily Channel and in the Ionian Sea where it is particularly abundant (2). Pink shrimp is exploited all year round in these areas and almost the whole catch is marketable, the biggest specimens being of greater commercial value. During the usual fishing operations, Sicilian fishermen tend to maximise trawling time, as in other fisheries (4), in order to increase the total catch. Longer trawl hauls increase the amount of discard fraction, cause more damage to organisms and increase sorting time per haul which consists in higher mortality of discard species because of the exposure on the deck for a long time, particularly in summer time. By the results appears that about half of the total trawl catch is thrown back into the sea as dead or alive organisms. Moreover, data suggested a discard to shrimp weight ratio of 2.5:1 that is lower than those reported in literature for the same area and for shrimp world fisheries (1). The greatest majority of the by-catch is discarded, as is usual for Mazara's off-shore fisheries practicing trips of 18-20 days. This big amount of discard results in a high mortality and wastage of precious resources often returned to the sea to feed birds, epipelagic organisms and benthic scavengers. This produces also an increase of opportunistic small sized and fast growing species at the expense of large size more sensitive and vulnerable species. No significant differences in composition and weight between the two areas have been recorded. Seasonal pattern resulted in a higher discard in summer because of the high number of recruits caught (2) that usually are discarded. The only exceptions are juveniles of hake a part of which is sorted as marketable. The great quantity of discards produced by trawl fishery may have considerable impact on marine ecosystems, as it represents additional food for scavengers and could alter the composition and behaviour of communities living in the exploited grounds.

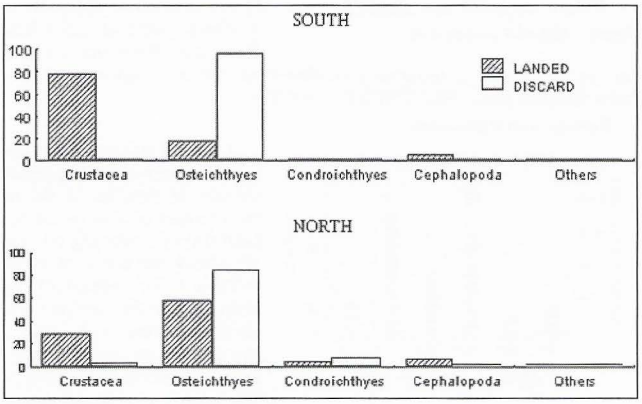

Fig. 1. Percent distribution of the five groups recorded in the two fractions of the total catch per area.

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