

# RAPIDO TRAWL FISHERY IN THE NORTH-CENTRAL ADRIATIC SEA

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## Abstract

This study gives a description of the catches produced by the commercial rapido trawl fleet of Ancona harbour (north-central Adriatic), mainly targeting the common sole, *Solea solea*. Observations onboard were carried out for two years. Catch data showed that the discarded part was greater than the retained one. Discard of commercial species was greater than discard of non-commercial ones, and both of them were dominated by few species.

**Keywords:** *Adriatic Sea, Fisheries, Demersal.*

## Introduction

The rapido trawl fishery has been going on for over 40 years in the western side of the north-central Adriatic Sea where it is carried out all year round on the soft bottoms outside 3 nm offshore. Ancona is an important port for this fishery with a fleet of 10-11 rapido vessels (average  $Loa = 27.7 \pm 0.4$  m) targeting flatfish (*Solea* spp., *Psetta maxima*, *Scophthalmus rhombus*). The rapido trawl is a modified beam trawl, with a rigid mouth fitted with iron teeth (7-10 cm long) along the lower part [1]. A nylon net bag having a codend mesh size ranging from 48 to 52 mm (stretched) is tied to the frame. Ancona vessels typically use 4m-wide rapido trawls and tow 4 gears simultaneously at a speed of 11-13 km h<sup>-1</sup>. Due to the lacking information on this activity, a two-year study was carried out to increase the knowledge on the quali-quantitative composition of the catches.

## Materials and Methods

Data were collected onboard of randomly chosen professional vessels of the Ancona fleet. A total of 235 hauls were sampled from summer 2000 to spring 2002, without any interference with the fishers' *modus operandi*. The overall catch was subdivided in retained fraction (target species, *Solea solea*, and kept-by-catch), discard of commercial species (discard C; damaged or smaller than the legally sized specimens), discard of non-commercial species (discard NC; species without any commercial value) and debris (dead shells, wood, stones, anthropic matter, waste, etc.) [2]. The retained fraction was analysed onboard: number of specimens, total weight and size of each individual were recorded for each species. The discard was weighed onboard and a sample was taken and later examined in the laboratory. Discard C and discard NC were determined to the species level; number of individuals and total weight of each taxon were recorded and the specimens of the commercial species measured. Debris was subdivided in categories which were weighed separately. In data analysis, catch (retained and discarded fractions) and debris were treated separately, computing seasonal values for each of them as kg km<sup>-2</sup>.

## Results

A total of 188 taxa (58 fishes, 26 crustaceans, 67 molluscs, 14 echinoderms, 23 others) were recorded in the study period. Discard NC included the highest number of taxa, followed by discard C and the retained fraction. Seasonal CPUE ranged from  $1080.0 \pm 96.5$  to  $456.4 \pm 53.8$  kg km<sup>-2</sup> (Tab. 1). The retained fraction was always lower than the discard and did not show a clear seasonal trend. *S. solea* made up from 3 to 18% of the catch, while *Bolinus brandaris*, *Chelidonichthys lucernus*, *Melicertus kerathurus*, *Sepia officinalis* and *Squilla mantis* dominated the kept-by-catch (Tab. 1). Discard C was the most important fraction of the catch, except in fall '01 and spring '02. The most abundant species were the gastropod *Aporrhais pespeleceni*, the bivalve *Ostrea edulis* and the decapod *Liocarcinus depurator* which together made up more than 80% in weight of this fraction in each season (Tab. 1). These species were generally discarded for their low commercial value with respect to the work required for their sorting and, in the case of *O. edulis*, for subsequent sanitary processes. The remaining portion of discard C was mainly constituted by small specimens of *B. brandaris*, *S. mantis* and *C. lucernus*. As concerns this last species, 94% of individuals caught during the overall period were smaller than the size at first maturity (24.0 cm TL; [3]), and most of them 67% were discarded. Discard NC was the second most important fraction with the highest values in fall '01 and spring '02 (Tab. 1). The main species were the bivalves *Anadara demiri*, *Anadara inaequalis*, *Corbula gibba*, the echinoderm *Astropecten irregularis* and the decapod *Goneplax rhomboides* (Table 1). Huge amounts of debris were caught in all seasons, sometimes exceeding the total catch (Tab. 1). It included 34 taxa (28 molluscs, 5 echinoderms, 1 phanerogam)

and other materials, such as stones, waste, etc. Dead shells of gastropods and bivalves, belonging to the local thanatocoenoses, always made up the largest portion, constituting 55-86% of the seasonal catches of this fraction.

Tab. 1. Composition of the seasonal catches (kg km<sup>-2</sup>). Wi = winter; Sp = spring, Su = summer; Fa = fall.

		Su '00	Fa '00	Wi '01	Sp '01	Su '01	Fa '01	Wi '02	Sp '02	
Retained	<i>Solea solea</i>	38.0	66.7	111.6	61.8	53.3	46.3	23.9	24.0	
	% on total	7	9	18	6	11	5	5	3	
	Kept by catch									
	<i>Bolinus brandaris</i>	9.5	16.4	2.3	2.5	3.8	16.2	0.1	38.4	
	<i>Chelidonichthys lucernus</i>	14.1	8.1	2.5	0.4	8.8	6.8	8.5	3.1	
	<i>Melicertus kerathurus</i>	1.7	8.1	2.0	2.5	3.8	13.1	8.6	0.1	
	<i>Sepia officinalis</i>		1.8	16.9	16.9	11.8	3.2	4.7	2.8	
	<i>Squilla mantis</i>	38.8	59.6	13.7	14.4	49.9	44.9	2.7	6.1	
	Others	26.4	22.9	25.7	15.7	37.0	20.8	31.9	25.0	
	Total Weight	90.5	116.9	63.1	52.4	115.1	105.0	56.5	76.5	
	% on total	18	16	11	5	23	12	12	9	
Discarded	Discard C									
	<i>Aporrhais pespeleceni</i>	82.8	151.1	192.1	684.7	54.9	122.3	101.0	165.7	
	<i>Bolinus brandaris</i>	8.2	4.0	2.4	2.3	3.1	14.0	0.6	28.6	
	<i>Chelidonichthys lucernus</i>	1.8		0.2	1.8	8.5	7.5	2.1	0.4	
	<i>Liocarcinus depurator</i>	97.5	2.1	38.8	16.9	44.8	0.3	167.0	105.4	
	<i>Ostrea edulis</i>	55.8	174.7	43.9	54.7	96.8	68.0	13.8	33.8	
	<i>Squilla mantis</i>	3.4	4.4	0.7	1.1	5.7	6.5	0.2	0.7	
	Others	10.5	15.6	8.2	25.2	7.7	18.5	6.9	12.0	
	Total Weight	260.8	347.5	286.2	768.9	221.5	237.1	291.6	346.6	
	% on total	51	49	48	72	45	27	62	40	
	Discard NC									
	<i>Anadara demiri</i>	1.2	3.3	1.4	7.8	20.4	56.8	10.3	65.6	
	<i>Anadara inaequalis</i>	25.5	95.5	28.2	51.1	24.8	369.5	14.9	202.1	
	<i>Astropecten irregularis</i>	25.3	36.4	46.1	22.8	18.2	15.2	5.8	12.9	
	<i>Corbula gibba</i>	20.1		21.7	74.6	6.1	14.1	6.2	77.7	
	<i>Goneplax rhomboides</i>	11.0	10.3	13.7	12.9	16.9	6.9	12.3	1.5	
	Others	40.4	34.3	24.8	27.6	21.5	24.3	34.9	57.0	
	Total Weight	123.5	179.8	136.2	197.0	107.9	486.8	84.5	416.8	
	% on total	24	25	23	18	22	55	18	48	
Total	Total Weight	512.8	710.9	597.1	1080.1	497.8	875.2	456.4	863.9	
Debris	Total Weight	554.0	808.8	584.0	543.9	364.8	396.3	274.0	435.1	

## Conclusions

The rapido trawls were efficient in the exploitation of common sole and most of the other accessory species, being their discard negligible in most of cases. This was due to the fact that all the caught specimens of these species were marketable, independently from the size. Moreover, the rare individuals damaged by the gear were also easily sold. A noticeable discard was detected only for *C. lucernus*, especially when considerable amounts of small and often damaged specimens were caught and discarded because of their very low commercial value. The remaining part of discard C mainly included organisms which remained alive when rejected at sea, such as *A. pespeleceni* and *O. edulis*. Discard NC consisted of few dominant species of molluscs and decapods, and also in this case most of them were still alive when rejected. Debris showed to be noteworthy in this kind of fishery, affecting sometimes the fishermen's habits as regards the choice of the fishing zone and haul duration.

## References

- 1 - Pranovi F., Raicevich S., Franceschini G., Torricelli P. and Giovanardi O., 2001. Discard analysis and damage to non-target species in the rapido trawl fishery. *Mar. Biol.*, 139: 863-875.
- 2 - Alverson D.L., Freeberg M.H., Pope J.G. and Murawski S.A., 1994. A global assessment of fishery bycatch and discard. *FAO fish. Tech. Pap.*, 339. 233 pp.
- 3 - Frogliola C., 1984. Presupposti bio-ecologici e tecnici per una nuova regolamentazione della pesca a strascico entro le tre miglia dalla costa. Report for the Merchant Marine Ministry, Gen. Dir. Fisheries. 104 pp.