ROSE SHRIMP FISHERY'S ASSOCIATED FAUNA IN NOT EXPLOITED GROUNDS ON THE ALBORAN SEA SLOPE (WESTERN MEDITERRANEAN SEA)

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Abstract

We present a quantitative analysis of the composition (commercialised catch and corresponding discard) of trawl catches, in a non exploited fishing ground on the Alboran Sea (Western Mediterranean) between 500-800 m depth. The target species was the Rose shrimp *Aristeus antennatus* Risso, 1816. A sampling programme on board commercial vessels was carried out from September 1997 to May 1998.

Keywords : Decapoda, Alboran Sea, fisheries, demersal, continental slope.

The rose shrimp *Aristeus antennatus* Risso, 1816 is a deep water penaeid of importance to commercial fishing. Its geographical range includes the Mediterranean and the Atlantic coast from Lisbon (Portugal) to the Cape Verde Islands. In the Alboran sea commercial trawling catches are made on the continental slope and around the Alboran island at depths of 500 to 800 m. Rose shrimp is the target species on deep waters, and the typically multi-species Mediterranean fishery becomes an almost mono-species fishery in deep waters (1). The fishing activity was carried out during 5 to 6 day-surveys in the study area. The followed effect of the fishing activity on this not exploited ground over several days was "to clean" them, that is to say, to increase the rose shrimp yields by removing competitors. The purpose of this study was to analyse the *Aristeus* fishery in the Alboran sea from boarding in commercial vessels, considering two fractions in the total catch : commercialised and discarded. The composition of these fractions by number and weight are analysed, together with the discard types observed in this fishery.

Material and methods

The sampling programme was carried out by observers on board during normal fishing activity, from September 1997 to May 1998, in the North Alboran Sea, western Mediterranean. The project's main goal was to study of the faunistic list and yields in bottoms where the trawl fleet does not work regularly. Two commercial trawlers were used equipped with a trawl of 50 mm cod-end mesh size. Only one stratum has been explored, from 500 to 800 m, according with *A. antennatus* distribution. For each haul, date, position, duration, depth and course were noted. The weight of the commercialised and discarded catch was estimated by species using dynamometers (± 5 g). The catch of the total, commercial and discarded fractions by haul was standardised to hourly yields (kg/h and n/h). Size frequency distributions were monthly obtained for commercial species and the most frequent discarded ones. Mean weight and number per fishing hour and standard deviation were calculated for the discarded and commercial species.

Results

A total of 179 hauls were carried out between 500-800 m depth. However, discard fraction only has been studied in 94 hauls. 115 species were identified. The most frequently represented groups were fish, with 55 species, crustaceans with 26, and molluscs with 21. The relative proportion corresponding to the commercial and discard fractions was 65% and 35% respectively. Table I shows the mean weight for the discard and commercial fraction. *Galeus melastomus* was the species with a highest mean weight, followed by *Trachyrrhynchus trachyrrhynchus, Phycis blennoides* and *A. antennatus*. Among the discarded species pointed up the presence of *G. melastomus* and *Nezumia aequalis*, followed by *Etmopterus spinax* and *Hoplostethus mediterraneus*. *Geryon longipes* stands up (or reached the highest values) within the discarded crustaceans group. *A. antennatus* was the most abundant species in number of the commercial fraction.

A few discard types were observed in this fishery. 85 species, with no commercial value, are always discarded. A varying criteria is applied for those species with a low commercial value (*G. longipes, T. trachyrhinchus, H. mediterraneus*), depending on the catch quality. Its price increases when they have been fished recently.

Discussion

Chondrichthyans are a very sensitive group to fish exploitation because of its biology : slow growth, late maturity and low fecundity (2). In this fishing ground, Chondrichthyans yields are clearly higher than those in exploited grounds in the area, where Almeria fleet often works.

Skipper experience supports that *A. antennatus* yields increase with a higher fishing effort while Chondrichthyans decrease eventually. They state that repeating the same haul many times (with one or many ships) could prove this along the same day. This experience was discussed by Massutí (3) for the same area in the 1960s decade. The huge differences when comparing with mean abundances from close exploited fishing grounds (4) seem to confirm this hypothesis. The net effect on the bottom, moving around the mud, leads to *A. antennatus* come up and enter into the nets. This hypotheses and others have been discussed by Sardà (1) and this one does not appear to be the main cause. The removal of demersal fish competitors from the fishing grounds at a higher rate than shrimp could have a real influence on *A. antennatus* yields.

Table 1. Mean weight per fishing hour and standard desviation for discarded and commercial species. Results from 94 hauls in two commercial trawlers in the Alboran Sea.

SPECIES	DISCARD		COMMERCIAL	
FISHES	g/h	sd	g/h	sd
Alepocephalus rostratus	2248.7	6046.8		
Centrolophus niger			14.7	130.8
Centrophorus uyato	5.7	50.3	557.5	1428.5
Chauliodus sloani	12.5	33.7		
Chimaera monstrosa	399.4	1363.6		
C. coelorhynchus	564.4	2584.7		
Conger conger	474.2	967.1	208.2	593.5
Dalatias licha	30.6	124.9	540.7	1588.1
Epigonus denticulatus	3.4	12.5		
Epigonus telescopus	48.7	97.9	22.3	198.5
Etmopterus spinax	3241.3	4414.5		
Gadiculus argenteus	61.2	527.3		
Galeus melastomus	9859.3	16401.3	21583.0	31453.4
Helicolenus dactylopterus	25.0	86.8	1102.6	2084.0
Hoplostethus mediterraneus	3074.5	4332.4	1240.1	2295.3
Hymenocephalus italicus	3.8	12.8		
Lampanyctus crocodilus	1515.8	3203.1		
Lepidopus caudatus	415.1	1715.6		
Lepidotrigla cavillone	6.5	57.8		
Lophius budegassa			773.0	1829.1
Merluccius merluccius	1.2	10.2	2112.0	2386.7
Micromesistius poutassou	709.3	970.5	2492.4	3267.1
Mora moro	2.4	13.3		
Myctophidae	6.9	58.9		
Nezumia aequalis	4589.5	4213.2		
Notacanthus bonapartei	6.7	27.5		
Oxinotus centrina	15.6	88.6		
Pagellus acarne	0.4	3.4	83.2	238.9
Pagellus bogaraveo			271.2	1108.5
Phycis blennoides	154.7	394.3	3927.3	3555.3
Raja circularis	126.6	1125.1		
Raja clavata	93.7	832.6	62.7	316.0
Stomias boa	65.6	128.0	0.0	0.0
Torpedo nobiliana	278.7	2256.4	50.9	322.4
T. trachyrhinchus	667.5	3203.1	6288.2	16773.7
Trachyscorpia cristulata	1.7	14.7	1.7	15.6
Trigloporus lastoviza	26.2	232.6		
Other fishes	7.2	52.8		
CRUSTACEANS				
Aristaeomorfa foliacea			3.8	33.8
Aristeus antennatus	11.9	35.0	3830.5	2917.4
Bathynectes maravigna	3.9	16.3	73.3	651.1
Dardanus arrosor	1.4	9.5		
Geryon longipes	433.0	1380.5	1338.4	1754.6
Nephrops norvegicus	0.4	3.4	37.1	172.4
Pagurus alatus	76.1	146.2		
Pasiphaea multidentata	3.6	7.1	12.6	49.4
Plesionika acanthonothus	5.7	7.5		
Plesionika edwarsii	0.1	0.6	22.9	187.8
Plesionika heterocarpus	0.3	2.5	7.3	38.7
Plesionika martia	28.6	78.3	493.7	675.3
Polycheles typhlops	63.8	105.4		
Rochinia carpenteri	8.6	13.2		
Sergia robusta	2.5	3.9		
Solenocera membranacea	2.8	11.1		
Other crustaceans	4.4	28.2		
CEPHALOPODS				
Ancistroteutis lichtensteini	29.1	64.2		
Bathypolypus sponsalis	14.2	32.0		
Histiotheuthis spp	125.3	433.9		
Todarodes sagittatus	60.6	166.2	695.0	1343.5
Other cephalopods	5.2	31.1		
OTHER INVERTEBR.	157.5	939.6		

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