CATCH COMPOSITION AND ABUNDANCE OF ELASMOBRANCHS BASED ON THE MEDITS PROGRAM

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Abstract

Species composition and distribution from international trawl surveys are analysed in relation to geographical areas and depth. Data were gathered in six campaigns carried out in 1994-99 along the whole European Mediterranean coasts with standardised gear and methodology. Depths from 10 to 800 m were explored. For fortyfive species, the biomass indexes, standing stocks and frequencies of occurrence are reported.

Keywords : elasmobranchii, trawl surveys, demersal, stock assessment, biomass

Sharks and rays occupy, an high level in the trophic webs and are characterised by a K strategy (1). This determines an high sensibility to even relatively low fishing pressure (2), but in the Mediterranean very few assessments and standardised data are available (3,4).

Material and methods

Six bottom trawl surveys, from Alboran to Aegean Sea, were carried out between April and June (1994–99) within the MEDITS International program (5). Biomass indices (BI; kg/km^2) and standing stocks (swept area method assuming a full catchability) were estimated from the database produced by IFREMER. The BI were referred to 4 arbitrary geographical areas identified by using a land-oriented criterion: *Western* (*WA*; Morocco, Spain and France coasts), *Western Central* (*WCA*; Tyrrhenian, Corsica, Sardinia and Sicily coasts), *Eastern Central* (*ECA*; Adriatic, Ionian and Albanian), and *Eastern* (*EA*; Aegean Sea). The BI by dept strata were pooled in 4 levels (– = less than 0.1, + = between 0.1 and1, o = between 1 and 10, O = more than 10 kg/km^2).

Results and discussion

Overall, 6336 tows were performed and 45 species of elasmobranchs identified (Tab.1) : 18 sharks, 2 angelsharks, 4 stingrays, 3 skates, 14 rays, 3 electric rays and 1 rabbitfish. Single or sporadic captures were recorded e.g. for *Dasyatis violacea, Hexanchus griseus, Mustelus asterias, Raja batis*. For some species, these figures reflect a true rarity (*Rhinoptera marginata*) or population reduction (*Squatina spp.*), but in other cases (*Galeus atlanticus*) some misclassification problem cannot be excluded.

Scyliorhinus canicula, Raja clavata, Galeus melastomus and *Squalus acanthias* showed both high occurrence (>5% of the hauls) and abundance (> 10 kg/km^2 or > 10% of relative biomass). Three faunistic groups can be identified in regard to depth distribution : *a)* well represented on all depths such as *R. clavata* and *S. canicula*; *b)* with preference for the shelf such as *Dasyatis pastinaca* and *M. mustelus* and *c)* for the slope such as *C. granulosus* and *Etmopterus spinax*. Only an handful of species have abundance levels of practical interest and just some are actually commercialised, but the large-sized species (*Mustelus* and *Squalus spp.*) show signs of depletion although it were evidenced zones of relatively high density (likely dangerous hauls usually not explored by fishermen). From the geographical point of view, some species are abundant in all areas (*S. canicula, R. clavata, Torpedo marmorata, R. asterias, C. monstrosa*), while others are most common in the west (*T. nobiliana, R. alba, Oxynotus centrina*) or in the east (*S. acantias, R. radula, R. naevus, R. brachiura*); some species are localised into restricted areas (*Hexachus griseus* and *Raja miraletus* in the Tyrrhenian, *M. mustelus* in the Adriatic Sea, or *R. brachiura* and *R. undulata* in the Aegean Sea). Globally speaking the eastern basins (Adriatic and Aegean Seas) show higher standing stocks, mainly due to the wider continental shelf. The good catches of *R. clavata*, the most abundant ray in the Mediterranean, seems to reflect mainly an higher ecological performance than a true resilience to exploitation; in fact, concentrations (up to 100 kg/km^2) likely closer to the "virgin" conditions are found only locally in the Gulf of Lion, Corsica, Sardinia and Greece waters. It is worth noting that up 64% of the total biomass is located in the Aegean Sea, where trawling deeper than 400 m is practically absent. These preliminary results are only a first step toward a future assessment aimed at the management of the elasmobranchs stocks. Nevertheless, also the analysis of MEDITS data evidences clear signs of sufferance for most of sharks and rays and the risks of local extinction for some once common species (*Squatina spp.*).

Tab.1 – List of the elasmobranchs species caught in the MEDITS surveys, their occurrence, biomass, depth distribution and densities.

Species	Frequency of occurence		Standing stock biomass positive		Depth distribution (m)					biomass index by geographical area (kg/km^2)				
	hauls	%	tons	%	0-50	50-100	100-200	200-500	500-800	WA	WCA	ECA	EA	Overall
Centrophorus granulosus	116	2%	1528	3%		-		o	O	2,7	5,5	0,1	3,1	2,9
Centrophorus uyato	19	0%	318	1%		-		+	o	1,0	1,7			0,6
Chimaera monstrosa	524	8%	2056	4%			-	o	O	8,5	3,3	1,4	4,5	4,0
Dalatias licha	152	2%	780	1%				+	o	3,3	2,8	0,8	0,2	1,5
Dasyatis centroura	1	0%	6	0%	+							0,0		0,0
Dasyatis pastinaca	49	1%	778	1%	o	o	+			0,1	2,9	0,2	1,9	1,5
Dasyatis tortonesi	2	0%	24	0%		+	+						0,1	0,0
Dasyatis violacea	2	0%	5	0%	+	-				0,0	0,0			0,0
Etmopterus spinax	1173	19%	2248	4%			+	o	o	9,2	6,5	0,9	3,1	4,3
Galeorhinus galeus	5	0%	126	0%	+	-		+	+	0,1	0,2	0,1	0,4	0,2
Galeus atlanticus	1	0%	1	0%					-	0,0				0,0
Galeus melastomus	1702	27%	6891	12%			+	O	O	48,5	16,7	3,0	3,3	13,3
Heptranchias perlo	12	0%	723	1%			+	o	o	0,7	3,9		0,7	1,4
Hexanchus griseus	12	0%	440	1%		-		+	o	0,0	3,1			0,8
Hexanchus vitulus	1	0%	49	0%				+					0,3	0,1
Mustelus asterias	5	0%	87	0%	+	+						0,7		0,2
Mustelus mustelus	111	2%	2645	5%	O	o	+	+	+	0,1	1,1	18,7	0,3	5,1
Mustelus punctulatus	1	0%	2	0%		-						0,0		0,0
Myliobatis aquila	37	1%	626	1%	o	+					0,3	4,3	0,1	1,2
Oxynotus centrina	36	1%	380	1%		+	o	+	+	0,6	1,9		0,4	0,7
Raja alba	9	0%	125	0%	-		o	-	-		0,8		0,0	0,2
Raja asterias	252	4%	1575	3%	o	o	o	o	+	2,2	3,5	1,3	4,4	3,0
Raja batis	2	0%	14	0%		+			-	0,2	0,0			0,0
Raja brachyura	21	0%	532	1%	+	+	o	o	-		0,4		2,8	1,0
Raja circularis	12	0%	29	0%		-		-	+	0,2	0,0	0,1		0,1
Raja clavata	1000	16%	8151	15%	o	O	O	O	o	4,6	14,9	7,9	27,0	15,7
Raja fullonica	7	0%	3	0%				-	-		0,0	0,0	0,0	0,0
Raja melitensis	20	0%	705	1%		+	+	o	o		4,9		0,0	1,4
Raja miraletus	422	7%	1729	3%	o	o	o	o	-	1,3	6,4	2,0	2,7	3,3
Raja montagui	107	2%	882	2%	+	+	o	o	-	0,9	2,4	0,1	2,7	1,7
Raja naevus	42	1%	348	1%	+	+	o	+		0,3	0,0	0,1	1,8	0,7
Raja oxyrinchus	301	5%	1899	3%		+	o	O	o	1,0	8,1	0,3	3,7	3,7
Raja polystigma	171	3%	568	1%	o	o	o	o		2,4	2,6	0,0	0,2	1,1
Raja radula	21	0%	181	0%	o	+	+				0,0	0,2	0,9	0,3
Raja undulata	6	0%	13	0%	+	-	-						0,1	0,0
Rhinoptera marginata	2	0%	1	0%		-						0,0		0,0
Scyliorhinus canicula	1761	28%	8396	15%	o	O	O	O	o	19,3	14,4	11,8	19,8	16,2
Scyliorhinus stellaris	34	1%	301	1%	+	o	+	+	+		0,7	1,2	0,2	0,6
Squalus acanthias	327	5%	6682	12%	O	o	o	O	o	0,3	1,2	31,3	14,1	12,9
Squalus blainvillei	196	3%	1490	3%	+	+	o	o	+		6,6	1,3	2,1	2,9
Squatina aculeata	1	0%	0,3	0%				-					0,0	0,0
Squatina squatina	2	0%	14	0%		+		-			0,1			0,0
Torpedo marmorata	317	5%	1239	2%	o	o	o	o	-	4,3	3,3	0,9	1,9	2,4
Torpedo nobiliana	73	1%	531	1%	+	+	+	o	+	2,1	2,1	0,0	0,5	1,0
Torpedo torpedo	28	0%	38	0%	+	-	+	-		0,0	0,2	0,0	0,0	0,1
TOTALS	6336		55158							114	122	89	103	106

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