

original scientific article
received: 2003-10-06

UDK 597.3(262)(091)

RECORDS OF THE BLUNTNOSE SIX-GILL SHARK, *HEXANCHUS GRISEUS* (BONNATERRE, 1788) (CHONDRICHTHYES: HEXANCHIDAE) IN THE MEDITERRANEAN SEA: A HISTORICAL SURVEY

Christian CAPAPÉ & Olivier GUÉLORGET

Laboratoire d'ichtyologie, Université Montpellier II, Sciences et Techniques du Languedoc, F-34 095 Montpellier cedex 05, France
E-mail: capape@univ-montp2.fr

Joan BARRULL & Isabel MATE

Laboratorio Vertebrats, Seccio Ictiologia, Museu de Zoologia, E-08080 Barcelona, Apartat de Correus 593, Spain

Farid HEMIDA, Rabea SERIDJI & Jalil BENSACI

Laboratoire Halieutique, Faculté des Sciences Biologiques, Université des Sciences et Techniques Houari Boumediène, BP 32, El Alia,
16111 Bab Ezzouar, Algiers, Algeria

Mohamed Nejmeddine BRADAI

Institut National des Sciences et Technologies de la Mer, Centre de Sfax, BP 1035, 3018 Sfax, Tunisia

ABSTRACT

*Captures of the bluntnose sixgill shark *Hexanchus griseus*, based on a literature review and on original data collected from different areas, especially off the coasts of France, Spain, Italy, Malta and Tunisia, offered an opportunity to enlarge and improve upon current knowledge about some aspects of its distribution in the Mediterranean Sea. At present time, the relative abundance of *H. griseus* in this sea and particularly along the Algerian coast could be pro parte explained by migrations from the eastern Atlantic through the Strait of Gibraltar into the Mediterranean Sea. Furthermore, it appears that *H. griseus* probably lives and reproduces off the Maghrebine shore.*

Key words: Chondrichthyes, Hexanchidae, *Hexanchus griseus*, distribution, Mediterranean Sea

SEGNALAZIONI DI SQUALO CAPOPIATTO, *HEXANCHUS GRISEUS* (BONNATERRE, 1788) (CHONDRICHTHYES: HEXANCHIDAE) IN MEDITERRANEO: REVISIONE STORICA

SINTESI

*Catture di squalo capopiatto *Hexanchus griseus*, basate su dati di letteratura e dati originali provenienti da diverse aree, specialmente da acque al largo di Francia, Spagna, Italia, Malta e Tunisia, offrono l'opportunità per allargare e migliorare l'attuale conoscenza di alcuni aspetti della distribuzione di tale specie in Mediterraneo. Allo stato attuale, l'abbondanza relativa di *H. griseus* in questo mare e specialmente lungo le coste algerine può essere pro parte spiegata grazie alle migrazioni dall'Atlantico orientale al Mediterraneo attraverso lo stretto di Gibilterra. Pare inoltre che *H. griseus* viva e si riproduca al largo della costa magrebina.*

Parole chiave: *Hexanchus griseus*, revisione storica, distribuzione, Mediterraneo

INTRODUCTION

The bluntnose six-gill shark, *Hexanchus griseus*, is widely distributed in temperate and tropical waters and occurs in both eastern and western Atlantic, Pacific and Indian Oceans and in the Mediterranean Sea (Compagno, 1984). In this sea, the species is reported in ichthyological treatises (Cadenat & Blache, 1981; Boeseman, 1984; Fischer *et al.*, 1987; Moreno, 1995; Notarbartolo di Sciara & Bianchi, 1998) or papers (Capapé, 1989; Quignard & Tomasini, 2000). It is also reported from restricted areas in the western Mediterranean basin, off Spain (Lozano Rey, 1928; Barrull & Mate, 1996a, b, 2002; Barrull *et al.*, 1999), France (Moreau, 1881; Capapé *et al.*, 2000), Italy (Arcidiacono, 1931; Tortonese, 1956; Bini, 1967; De Maddalena, 2001), Croatia (Šoljan, 1975), Greece (Economidis, 1973; Economidis & Bauchot, 1976), as well as the eastern basin, off Israel (Ben-Tuvia, 1971; Golani, 1996, 1997) and Lebanon (Mouneirne, 1977).

Off the Maghrebine shore, *H. griseus* was considered to be a rare species off both the Algerian (Dieuzeide *et al.*, 1953) and Tunisian coasts (Capapé, 1989; Bradai, 2000). However, the research conducted at fishing sites located along the Algerian coast offered the opportunity to report herein abundant captures of *H. griseus*.

Mediterranean distribution of the bluntnose six-gill shark is dealt in this paper, based on a literature review and original data collected from different areas, especially off the coasts of France, Spain, Italy, Malta, Algeria and Tunisia.

MATERIAL AND METHODS

Both literature and original records collected from different areas of the Mediterranean Sea are given (Tab. 1) and, whenever possible, sex, total length in millimetre following Compagno (1984), total weight in kg, method of capture, capture date, fishing site and/or area, the country and the reference with name(s) of author(s) in case of previous data.

With special regard to the Algerian coast (Tab. 1: records No. 113 and 114), investigations were conducted from 1996 to 2000. All the observed specimens were caught by longline at a depth between 30 and 700 m (Figs. 1, 2). Unfortunately, the fishermen eviscerated them when landed on the boat deck. The specimens were sexed.

The relationship total weight vs. total length was studied for both males and females concerning the specimens of other Mediterranean areas. The linear regression was expressed in decimal logarithmic coordinates. Correlations were assessed by least-squares regression.

RESULTS

Off the Mediterranean coasts, to our knowledge, 114 records of *H. griseus* have been reported to date (Tab. 1). One hundred and one records were made in the western basin and 13 in the eastern one. Eleven countries were concerned by these records: Spain (41), Italy (25), France (18), Tunisia (11), Turkey (4), Algeria (2),

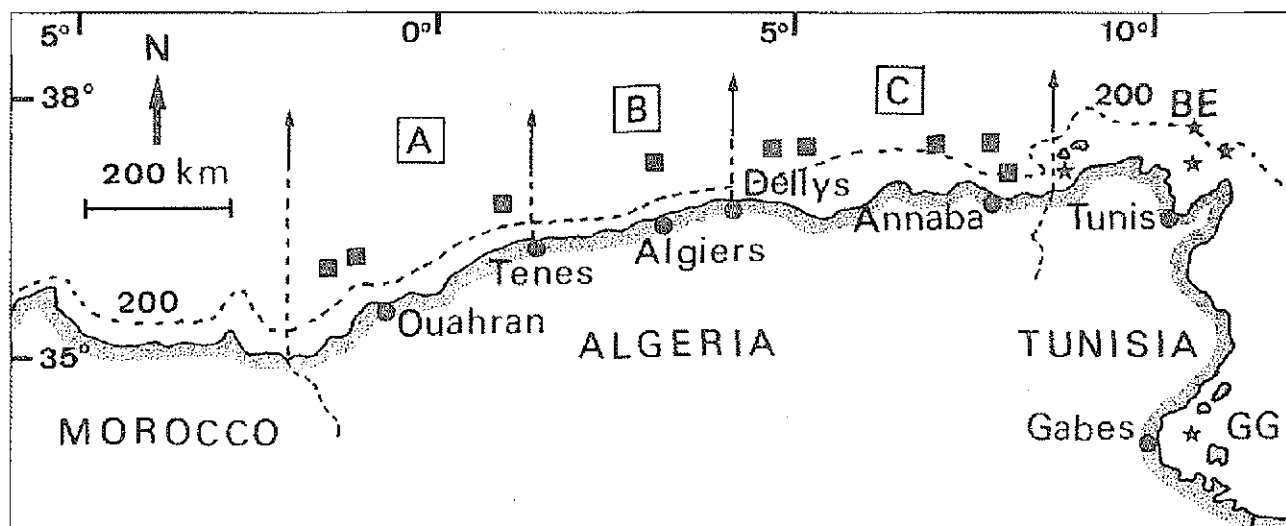


Fig. 1: Map of the Maghrebine shore, indicating the places where one or more captures were made off the Algerian (black squares) and Tunisian coasts (black stars). A: Eastern area; B: Central area; C: Western area; BE: Bank of Esquerquis; GG: Gulf of Gabes.

Sl. 1: Zemljevid magrebske obale z oznakami, kjer so v bližini alžirske (črni kvadrati) in tunizijske obale (črne zvezdice) ujeli enega ali več morskih psov šesteroškrgarjev. A: vzhodno območje; B: osrednje območje; C: zahodno območje; BE: Banc des Esquerquis; GG: Gabeški zaliv.

Monaco (2), Malta (2), Greece (2), Israel (2) and Croatia (5). Seventy-seven fishing sites were reported. In all, 202 specimens were sexed, 128 of which were females and 74 males. The sharks were captured by trawling (33), longlines (19), anglers (4), gill-nets (5), seining (1). Moreover, five specimens were beaching and six floating. Eight captures were made at depths less than 100 m, a single between 3.6 and 5.4 m, eight ranged from 100 to 200 m depth, and 16 from 500 m to 2000 m maximum. The smallest specimen (Tab. 1: No. 6), a female 556 mm TL, was caught off Marbella (Lozano Rey, 1928). The largest specimens were two males (Tab. 1: No. 86 and 87), both having 5 m TL and weighing 600 kg and 500 kg respectively. They were caught off the Island of Minorca and off Bosa, Sardinia. Among these records, the females were globally larger than the males.

Free-swimming specimens recorded off the Mediterranean coasts by Lozano Rey (1928), Capapé *et al.* (2000) and Barrull & Mate (2000) are included in Table 1 (No. 35 and 58). They exhibited an unhealed scar on the ventral surface and a residual internal vitelline vesicle. They suggested that birth occurred between 556 and 603 mm TL in the Mediterranean Sea.

The relationship total weight vs total length for both males and females from the Mediterranean coast (Fig. 3) is: $\log TW = 3.137 \log TL - 8.6133$; $r = 0.957$; $n = 29$.

The heaviest specimen was a male, 4000 mm TL, caught off Izmir, Turkey (Tab. 1: No. 57), weighing 1000 kg according to Mater *et al.* (2000). However, this weight suggests an overestimation because specimens of larger size, 5000 mm TL (Tab. 1: No. 88 and 89), did not exceed 600 kg.

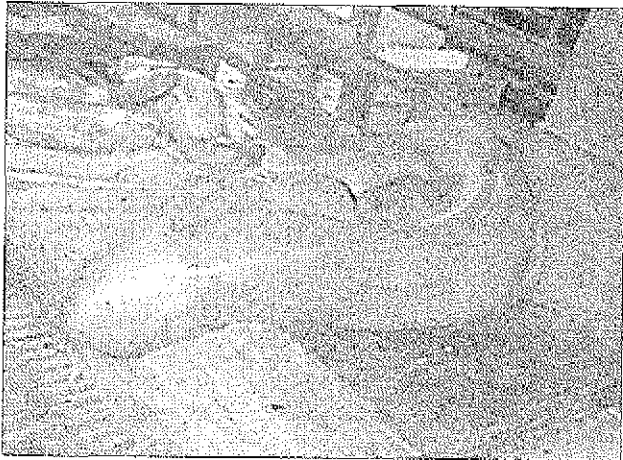


Fig. 2: *Hexanchus griseus* male, 1300 mm total length, captured off central Algerian area and observed at the Algiers fish market. (Photo: F. Hemida)

Sl. 2: Samec morskega psa šesteroškrgarja *Hexanchus griseus*, celotna dolžina 1300 mm, ujet v vodah blizu osrednje alžirskega območja in opažen na alžirski ribji tržnici. (Foto: F. Hemida).

In Tunisian waters, the female caught at the level of Bank of Esquerquis (Tab. 1: No. 38) was 4650 mm TL and contained 57 ripe oocytes in the ovaries; the female caught in the Gulf of Gabes (Tab. 1: No. 63) was 3940 mm TL and contained 100 ripe oocytes.

The two females from Tunisian waters were caught in April and probably at the time of ovulation. The neonates were captured off Sete, southern France, and off Catalonia, northern Spain, between November and April.

DISCUSSION

Records of bluntnose six-gill sharks were more numerous in the western Mediterranean basin than in its eastern part. This suggests that in the latter area, the species was less abundant and/or the waters were less exploited and/or information reported to a lesser extent.

Formerly, the species had been abundant in the northern Mediterranean, especially along the French coast, where a decline of these populations has actually been observed off Sète (Capapé *et al.*, 2000) and off the marine area of Nice. Information provided by fishermen showed that the species was rarely caught in the latter area in recent times, and specific six-gill shark fishing was cancelled. However, the species continued to be regularly and commonly caught off the coast of Croatia (Jardas, *pers. comm.*), off Italy (Barrull & Mate, 2000; Tab. 1) and off Spain (Barrull & Mate, 1996, 2000; Tab. 1).

By contrast, the bluntnose sixgill shark had been considered a rare species off the Algerian coast (Dieuzeide *et al.*, 1953), but this opinion has not been corroborated to date. At present, the relative abundance of the species in Algerian waters is probably due to the development of fishery activities in the area and the research conducted since 1996 on Algerian elasmobranch species (Hemida, 1998; Hemida & Labidi, 2001; Hemida & Capapé, 2002). This phenomenon could not be conjunctural and fortuitous. Captures were significantly more abundant in both western and eastern areas than in the central area (Fig. 1). Furthermore, *H. griseus* is commonly caught off Annaba, city located 100 km from the Tunisian border, according to information provided by fishermen. The captures extended in the Tunisian adjacent waters suggest that off the Maghrebine shore, a consequent *H. griseus* population could live and reproduce.

H. griseus lived in deep sea waters generally from 50 to 2000 m and approached the coast; some captures were made at lower depths between 50 and 100 m (Tab. 1).

Along the Maghrebine shore, *H. griseus* specimens were caught on sandy, muddy, but also detritic and rocky bottoms. This explained why the species were commonly caught by trawlers and longlines in both Algerian and Tunisian waters.

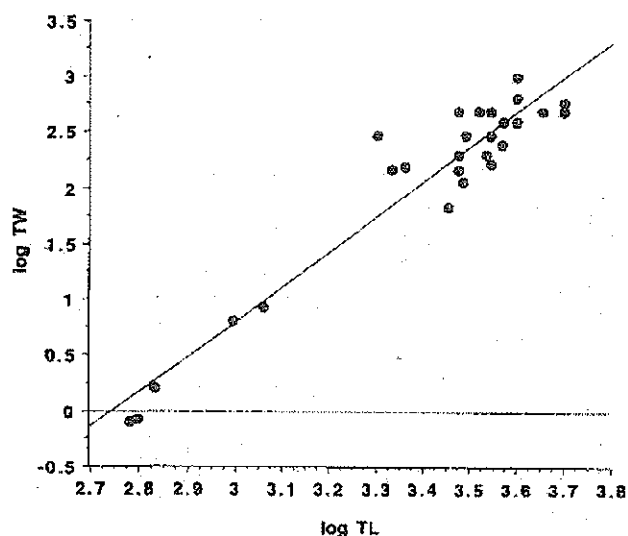


Fig. 3: Relationships total weight (TW) vs. total length (TL) expressed in logarithmic co-ordinates for both females and males from Mediterranean areas.

Sl. 3: Razmerje med celotno težo (TW) in celotno dolžino (TL), izraženo v logaritmičnih koordinatah tako za samice kot za samce morskih psov šesteroškrgarjev iz sredozemskih voda.

The *H. griseus* specimens reported in Table 1 were particularly from France, Spain, Croatia, Italy, Algeria and Tunisia. However, misidentifications with its closely related species, the bigeyed sixgill shark *H. nakamurai*, cannot be excluded even though they remain questionable. Compagno (1984) wrote that *H. nakamurai* is "widely but spottily distributed in warm temperate and tropical seas" and reported the species "off Gibraltar". The presumable occurrence of *H. nakamurai* in the Mediterranean Sea was based on a stuffed specimen deposited in the Museum of Natural History of Florence (Italy) and referenced 6028. It was a male measuring 980 mm TL (Tortonese, 1985; Vanni, 1992). Barrull & Mate (2002) gave a photograph of the specimen (*H. vitulus*; p. 262) and wrote that it was previously acquired by the Museum of Natural History of Florence from a high school, "Istituto Superiore Femminile", located in Florence. Barrull & Mate (2002) stated that the Mediterranean origin of this specimen remained doubtful. However, Barrull & Mate (2002) reported that a *H. nakamurai* was caught by longline off the Greek coast in 2001. It was a male measuring 1000 mm and weighed approximately 3 kg. At present time, this single record does not allow to state that a *H. nakamurai* population permanently lives and reproduces in the Mediterranean Sea. It could be considered only an occasional visitor to the Mediterranean Sea, as was the case of other elasmobranch species (Pastore & Tortonese, 1986; Hemida *et al.*, 2002).

branch species (Pastore & Tortonese, 1986; Hemida *et al.*, 2002).

In the Bay of Biscaye, Vaillant (1901) reported that TL ranged from 680 to 736 mm for near term embryos in a gravid female, Desbrosses (1938) recorded a free swimming specimen and two near term embryos having 720 mm and 670 mm TL respectively. Off California, Ebert (1986) wrote that near-term embryos TL ranged from 680 to 736 mm. Size at birth showed a large range, whatever the area. However, Bigelow & Schroeder (1948) reported free swimming specimens from 429 to 720 mm TL, but they probably collected both *H. griseus* and *H. nakamurai*, since the illustration they supplied concerned a bigeyed sixgill shark. Moreover, size at birth occurred at about 430 mm TL in *H. nakamurai* according to Compagno (1984).

A literature review shows that *H. griseus* could reproduce once per year (Risso, 1810; Canestrini, 1861 [in Tortonese, 1956]) or twice per year (Ninni, 1912). The two females from Tunisian waters were caught in April and were probably in the time of ovulation. The neonates were captured off Sete (southern France) and off Catalonia (northern Spain) between November and April. According to Desbrosses (1938), females expelled foetuses between October and May.

The records reported from the Algerian coast and the Mediterranean records summarized in Table 1 reveal a non negligible density population of *H. griseus*. A decrease of stocks seems most probably due to fishing pressures. The species was not recorded in the Red Sea (Gohar & Mazhar, 1964; Compagno, 1984; Golani, 1997), but was reported from the eastern Atlantic, both north and south from the Strait of Gibraltar. Moreover, it is considered to be relatively common in the eastern tropical Atlantic (Fischer *et al.*, 1981). *H. griseus*, which migrated from Atlantic areas and entered the Mediterranean Sea through the Strait of Gibraltar, could be a hypothesis to partially explain the present abundance of *H. griseus* off the Algerian coast and in other Mediterranean areas as it was probably the case of other shark species recorded in the same area (Hemida *et al.*, 2002).

ACKNOWLEDGEMENTS

The authors thank Dr Guy Oliver from the University of Perpignan (France) for providing information on *Hexanchus griseus* captures off the Mediterranean coast of France. They are also grateful to two anonymous referees for helpful and useful comments on the manuscript. They are indebted to one of the referees who supplied them with an interesting record of *H. griseus* in the Italian waters which, however, they omitted to cite.

Tab. 1: Historical records of *Hexanchus griseus* in the Mediterranean sea (M - male, F - female).Tab. 1: Zgodovinski podatki o pojavljanju morskega psa šesteroškrgarja *Hexanchus griseus* v Sredozemskem morju (M - samec, F - samica).

No.	N	Sex	TL (mm)	Weight (kg)	Depth (m)	Capture method	Fishing site	Country	Fishing date	Reference
1	1	F	?	?	?	?	Rimini- Ravenna	Italy	15/03/1876	Vanni (1992)
2	1	F	?	?	?	Longline	Naples	Italy	16/02/1886	Carruccio (1896)
3	1	F	?	?	?	?	Nice	France	02/01/1903	Vanni (1992)
4	1	F	?	?	?	?	Island of Elba	Italy	08/02/1911	Vanni (1992)
5	1	?	2970	?	1000	Longline	Monaco	Monaco	02/01/1912	Roule (1912)
6	1	F	556	?	?	?	Marbella	Spain	before 1916	Lozano Rey (1928)
7	1	F	4000	?	?	?	Garraf	Spain	03/12/1932	Sagarra (1932)
8	1	?	±3500	?	?	?	Gulf of Kvarner	Croatia	1935	Barrull & Mate (2000)
9	3	?	?	?	?	Gill-net	Gulf of Aigues-Mortes	France	1941/1948	Granier (1964)
10	1	F	650	?	?	?	Nice	France	spring 1889	Bigelow & Schroeder (1948)
11	19	F	<1200	?	?	Trawling	Sete	France	1950-1955	Euzet (1960)
12	15	M	<1600	?	?	Trawling	Sete	France	1950-1955	Euzet (1960)
13	1	M	2430	86	200	Longline	Southern Adriatic	Croatia	before 1955	Kirinčić & Lepetić (1955)
14	1	M	?	135	500	Longline	Southern Adriatic	Croatia	before 1955	Kirinčić & Lepetić (1955)
15	1	M	?	150	600	Longline	Southern Adriatic	Croatia	before 1955	Kirinčić & Lepetić (1955)
16	1	F	3800	290	700	Longline	Southern Adriatic	Croatia	before 1955	Kirinčić & Lepetić (1955)
17	1	F	2920	135	?	?	Nice	France	before 1956	Tortonese (1956)
18	1	F	1140	8.6	30	Trawling	Agde	France	04/04/1961	Quignard et al. (1962)
19	1	?	?	?	?	?	Caprera (Sardinia)	Italy	1960	Giudici & Fino (1989)
20	1	M	2550	?	500	Trawling	Port-Vendres	France	02/04/1965	Laubier et al. (1966)
21	1	M	4150	?	58	Trawling	Palavas-les-Flots	France	01/04/1966	Laubier et al. (1966)
22	1	M	±2800	?	?	?	Canet de Mar	Spain	sixties end	Mas (1997)
23	>3	?	<2110	?	?	?	Coast of Israel	Israel	1971	Ben-Tuvia (1971)
24	>3	?	3300	?	750	?	Coast of Israel	Israel	1971	Gilat & Gelman (1984)
25	?	?	?	?	80-130	?	Gulf of Gabes	Tunisia	1971	Ktari-Chakroun & Azouz (1971)
26	3	?	?	?	450-700	Trawling	Blanes	Spain	1972-1974	Matallanas (1979)
27	1	?	1170	?	?	?	Gulf of Thermaïkos	Greece	22/04/1974	Economidis & Bauchot (1976)
28	1	F	3000	?	?	?	La Seyne-sur-Mer	France	08/1976	Capapé (1977)
29	1	M	2650	?	?	?	La Seyne-sur-Mer	France	08/1976	Capapé (1977)
30	1	F	>3000	?	60	Gill-net	Gulf of Gabes	Tunisia	05/04/1977	Unpubl. data
31	1	M	1090	?	60	Gill-net	Gulf of Gabes	Tunisia	06/1978	Unpubl. data
32	1	?	?	?	501	?	Dènia-Island of Eivissa	Spain	before 1981	Matallanas et al. (1981)

33	1	?	?	?	418	?	Island of Mallorca	Spain	before 1981	Matalanas <i>et al.</i> (1981)
34	1	?	3050	177	?	Longline	Cape of Begur	Spain	1977-1980	Barrull & Mate (2000)
35	1	F	560	?	365	Trawling	Barcelona	Spain	15/11/1982	Barrull & Mate (2000)
36	1	F	970	?	<50	Trawling	Sitges	Spain	01/07/1983	Barrull & Mate (2000)
37	?	?	?	?	100-700	?	Vilanova i la Geltrú - Sitges	Spain	before 1984	Del Cerro & Portas (1984)
38	1	F	4650	?	>400	Trawling	Bank of Esquerquis	Tunisia	03/1986	Unpubl. data
39	1	?	4150	?	?	Trawling	Fuengirola	Spain	spring 1986	Pinto (1994)
40	25y ⁻¹	?	?	±200	<1200	Longline	Nice	France	summer	Delattre & Maigret (1986)
41	3	?	<5000	?	<1500	Longline	Off Corsica	France	1986	Miniconi (1987)
42	1	M	3000	?	?	Gill-net	Gulf of Gabes	Tunisia	08/06/1987	Unpubl. data
43	1	M	3300	?	?	Trawling	Gulf of Tunis	Tunisia	19/08/1987	Unpubl. data
44	1	M	2800	?	600	Longline	Off Tabarka	Tunisia	20/07/1988	Unpubl. data
45	1	F	625	0.86	50	Trawling	Sète	France	01/1989	Capapé <i>et al.</i> (2000)
46	1	?	±1700	?	?	?	Balearic Isles	Spain	1990	Barrull & Mate (2000)
47	1	F	4100	?	?	?	Malta	Malta	02/1990	Barrull & Mate (2000)
48	1	F	4100	?	?	?	La Valette	Malta	04/1990	Barrull & Mate (2000)
49	1	F	3500	500	?	?	Off Istanbul	Turkey	19/12/1990	Mater <i>et al.</i> (2000)
50	1	M	4000	?	?	?	Blanes	Spain	27/12/1990	Barrull & Mate (2000)
51	1	M	±2500	?	?	?	Island of Mallorca	Spain	1989-1991	Barrull & Mate (2000)
52	1	?	2500	?	?	?	Ragusa	Italy	19/03/1991	Barrull & Mate (2000)
53	1	F	4000	?	?	Floating	Palamos	Spain	14/09/1991	Unpubl. data
54	1	F	3420	200	?	Beaching	Livorno	Italy	17/02/1992	Barrull & Mate (2000)
55	1	F	2000	?	?	Longline	Blanes	Spain	17/07/1992	Barrull & Mate (2000)
56	1	?	±3500	168	?	?	Cala Ratjada (Mallorca)	Spain	13/08/1992	Barrull & Mate (2000)
57	1	?	±4000	1000	< 2000	?	Izmir	Turkey	23/01/1993	Mater <i>et al.</i> (2000)
58	1	F	603	0.785	50	Trawling	Sète	France	04/1993	Capapé <i>et al.</i> (2000)
59	1	M	±3500	?	?	Trawling	Off Mao (Menorca)	Spain	19/06/1993	Unpubl. data
60	1	?	2150	150	?	Angler	Cosenza	Italy	17/08/1993	Barrull & Mate (2000)
61	1	M	2850	68.5	?	Trawling	Sant Carles de la Ràpita	Spain	19/04/1994	Barrull & Mate (2000)
62	1	M	2000	?	137	Longline	Gulf of Gabes	Tunisia	29/04/1994	Unpubl. data
63	1	F	3940	?	137	Longline	Gulf of Gabes	Tunisia	29/04/1994	Unpubl. data
64	1	F	3000	200	?	Floating	Cambriils	Spain	25/05/1994	Barrull & Mate (2000)
65	1	M	650	?	?	?	Llançà	Spain	20/08/1994	Barrull & Mate (2000)

66	1	M	680	?	?	?	Llança	Spain	17/03/1995	Barrull & Mate (2000)
67	1	F	2900	?	?	Floating	Sant Antoni de Calonge	Spain	25/08/1995	Barrull & Mate (2000)
68	1	F	2500	?	?	Beaching	Tarragona	Spain	24/09/1995	Barrull & Mate (2000)
69	1	F	1030	?	?	?	Llança	Spain	15/03/1996	Barrull & Mate (2000)
70	1	F	860	?	?	?	Llança	Spain	22/03/1996	Barrull & Mate (2000)
71	1	F	?	?	?	?	Tropea	Italy	05/05/1996	Barrull & Mate (2000)
72	1	M	844	?	?	?	Roses	Spain	29/11/1996	Barrull & Mate (2000)
73	1	M	2500	?	50	Seining	Sea of Marmara	Turkey	20/02/1997	Kabasakal (1998)
74	1	M	2800	±200	?	Beaching	Alberese	Italy	21/07/1997	Barrull & Mate (2000)
75	1	?	±2000	300	?	Longline	Amantea	Italy	summer 1997	Barrull & Mate (2000)
76	1	F	>3000	>500	?	Trawling	Port de Soller (Mallorca)	Spain	16/07/1998	Barrull & Mate (2000)
77	1	?	3500	?	?	?	Island of Formentera	Spain	08/1998	Barrull & Mate (2000)
78	1	F	?	?	?	Trawling	Sari-Solenzara (Corsica)	France	08/1998	Barrull & Mate (2000)
79	1	F	3000	?	?	Trawling	Porto Empedocle (Sicily)	Italy	10/08/1998	Barrull & Mate (2000)
80	1	M	2500	?	?	Trawling	Portopalo (Sicily)	Italy	18/08/1998	Barrull & Mate (2000)
81	1	M	2300	?	?	Trawling	Portopalo (Sicily)	Italy	18/08/1998	Barrull & Mate (2000)
82	1	?	3500	300	?	Gill-net	Cala Ratjada (Mallorca)	Spain	20/09/1998	Unpubl. data
83	1	F	1700	?	3.6-5.4	Longline	Bianes	Spain	10/11/1998	Barrull & Mate (2000)
84	1	M	2500	>170	<1000	Angler	Gulf of Mazarron	Spain	02(?)/1999	Barrull & Mate (2000)
85	1	M	3500	500	?	Beaching	Island of Eivissa	Spain	12/03/1999	Barrull & Mate (2000)
86	1	?	±4000	?	?	?	Island of Favignana	Italy	03/06/1999	Barrull & Mate (2000)
87	1	F	3650	?	?	Floating	Ravallo	Italy	06/06/1999	De Maddalena (1999)
88	1	M	5000	600	?	Trawling	Island of Menorca	Spain	15/07/1999	Unpubl. data
89	1	M	5000	500	?	Floating	Bosa (Sardinia)	Italy	01/08/1999	Unpubl. data
90	1	?	4500	500	?	?	Naples	Italy	05/08/1999	Unpubl. data
91	1	?	2300	?	?	?	Izmir	Turkey	19/12/1999	Mater <i>et al.</i> (2000)
92	1	?	±1500	?	>200	Trawling	Sète	France	Winter 2000	Unpubl. data
93	1	M	2650	?	?	?	Palamos	Spain	02/2000	Unpubl. data
94	1	F	630	?	600-800	Trawling	Barcelona	Spain	10/02/2000	Unpubl. data
95	1	?	2500	160	?	Longline	Island of Tavolara	Italy	02/05/2000	Unpubl. data
96	1	?	3700	250	?	Trawling	Island of Elba	Italy	08/2000	Unpubl. data

97	1	?	3500	300	?	Angler	Gulf of Santa Eufemia	Italy	16/09/2000	Unpubl. data
98	2	?	?	50-90	?	Longline	Monaco	Monaco	2001	Unpubl. data
99	1	F	3110	<300	135-138	Trawling	Mataro	Spain	22/01/2001	Unpubl. data
100	1	F	992	5.50	528	Trawling	Barcelona	Spain	21/02/2001	Unpubl. data
101	1	?	4000	650	500	Trawling	Off southeast Sardinia	Italy	03/2001	Unpubl. data
102	1	F	676	1.64	528	Trawling	Barcelona	Spain	27/03/2001	Unpubl. data
103	1	?	?	500	?	Trawling	Off Ragusa (Sicily)	Italy	07/07/2001	Unpubl. data
104	1	F	4000	350	600-700	Angler	Catanzaro	Italy	06/08/2001	Unpubl. data
105	1	?	4000	400	?	Floating	Eivissa (Balearic Isles)	Spain	21/08/2001	Unpubl. data
106	2	?	<3000	±150	?	Trawling	Gulf of Aranci (Sardinia)	Italy	12/09/2001	Unpubl. data
107	1	F	3000	?	315-387	Trawling	Off Kelibia (Cape Bon)	Tunisia	10/2001	Unpubl. data
108	1	F	3000	?	584	Trawling	Barcelona	Spain	05/10/2001	Unpubl. data
109	1	F	±4000	±400	?	?	Gulf of Corinth	Greece	28/12/2001	Unpubl. data
110	1	?	± 2000	?	?	Beaching	Carro	France	01/2002	Unpubl. data
111	1	?	3750	400	?	?	Brucoli (Sicily)	Italy	03/03/2002	Unpubl. data
112	1	M	2270	?	220	Trawling	Gulf of Gabes	Tunisia	20/05/2002	Unpubl. data
113	65	F	940-4125	12-332	110-400	Longline	Algerian coast	Algeria	2000-2002	Unpubl. data
114	30	M	1280-3300	12-300	110-400	Longline	Algerian coast	Algeria	2000-002	Unpubl. data

ZGODOVINSKI PREGLED PODATKOV O POJAVLJANJU MORSKEGA PSA ŠESTEROŠKRGARJA *HEXANCHUS GRISEUS* (BONNATERRE, 1788) (CHONDRICHTHYES: HEXANCHIDAE) V SREDOZEMSKEM MORJU

Christian CAPAPÉ & Olivier GUÉLORGET

Laboratoire d'Ichtyologie, Université Montpellier II, Sciences et Techniques du Languedoc, F-34 095 Montpellier cedex 05, France
E-mail: capape@univ-montp2.fr

Joan BARRULL & Isabel MATE

Laboratorio Vertebrats, Seccio Ictiologia, Museu de Zoologia, E-08080 Barcelona, Apartat de Correus 593, Spain

Farid HEMIDA, Rabea SERIDJI & Jalil BENSACI

Laboratoire Halieutique, Faculté des Sciences Biologiques, Université des Sciences et Techniques Houari Boumediene, BP 32, El Alia, 16111 Bab Ezzouar, Algiers, Algeria

Mohamed Nejmeddine BRADAÏ

Institut National des Sciences et Technologies de la Mer, Centre de Sfax, BP 1035, 3018 Sfax, Tunisia

POVZETEK

Podatki o morskem psu šesteroškrjarju *Hexanchus griseus* iz literature in izvornih zapisov iz različnih območij, še posebno pa iz obrežnih voda Francije, Španije, Italije, Malte in Tunizije, so v dobri meri pripomogli k boljšemu poznavanju nekaterih vidikov razširjenosti tega morskega psa v Sredozemskem morju. Trenutno bi lahko relativno številčnost morskega psa šesteroškrjarja v tem morju pripisali njegovim selitvam iz vzhodnega Atlantika skozi Gibraltarska vrata v Sredozemsko morje, poleg tega pa vse kaže, da *H. griseus* dejansko živi in se tudi razmnožuje v bližini magrebskih obrežij.

Ključne besede: Chondrichthyes, Hexanchidae, *Hexanchus griseus*, razširjenost, Sredozemsko morje

REFERENCES

- Arcidiacono, F. (1931):** La pesca del pesce vasca (*Hexanchus griseus* L.) nella marina di Riposto. Boll. Pesca Piscic. Idrobiol., 7(4), 608-612.
- Barrull, J. & I. Mate (1996a):** Els taurons dels Països Catalans. Portic Natura, Barcelona, 183 pp.
- Barrull, J. & I. Mate (1996b):** La pesca de tiburones en aguas de Catalunya. Quercus, 126, 24-25.
- Barrull, J. & I. Mate (2000):** Biología de la canabota *Hexanchus griseus* (Bonnaterre, 1788) en el Mar Mediterraneo. Bol. Asoc. Esp. Elasm., 3, 13-20.
- Barrull, J. & I. Mate (2002):** Tiburones del Mediterraneo. Els llibres del Set-Ciències. Arenys de Mar, Spain, 290 pp.
- Barrull, J., I. Mate & M. Bueno (1999):** Observaciones de tiburones (Chondrichthyes, Euselachii) en aguas de Catalunya (Mediterraneo NO), con algunos aspectos de su ecología. Sci. Gerud., 24, 127-151.
- Ben-Tuvia, A. (1971):** Revised list of the Mediterranean fishes of Israël. Isr. J. Zool., 20, 1-39.
- Bigelow, H. B. & W. C. Schroeder (1948):** Sharks. In: Fishes of the Western North Atlantic. Mem. Sears Fnd. Mar. Res. (1)1, 56-576.
- Bini, G. (1967):** Atlante dei Pesci delle Coste Italiane. 1. Leptocardi - Ciclostomi - Selaci. Mondo Sommerso Editrice, Milano, 106 pp.
- Boeseman, M. (1984):** Hexanchidae. In: Whitehead, P. J. P., M.-L. Bauchot, J. C. Hureau, J. Nielsen & E. Tortonese (eds.): Fishes of the North-eastern Atlantic and the Mediterranean. UNESCO, Paris, Vol. 2., p. 72-75.
- Bradaï, M. N. (2000):** Diversité du peuplement ichtyque et contribution à la connaissance des sparidés du golfe de Gabès. Ph.D. Thesis. University of Sfax, Tunisia, 600 pp.
- Cadenat, J. & J. Blache (1981):** Requins de Méditerranée et d'Atlantique (plus particulièrement de la côte occidentale d'Afrique). Faune tropicale, ORSTOM, 21, 1-330.
- Capapé, C. (1977):** Liste commentée des Sélaciens de la région de Toulon (de la Ciotat à Saint-Tropez). Bull. Mus. Hist. Natl. Marseille, 37, 5-9.
- Capapé, C. (1989):** Les Sélaciens des côtes méditerranéennes: aspects généraux de leur écologie et exemples de peuplements. Océanis, 15(3), 309-331.
- Capapé, C., J. A. Tomasini & J. P. Quignard (2000):** Les elasmobranches pleurotrèmes de la côte du Languedoc (France méridionale): observations biologiques et démographiques. Vie Milieu, 50, 123-133.
- Carruccio, A. (1896):** Note anatomo-zoologica sulle mascelle di un *Hexanchus griseus* adulto preso a Porto d'Anzio. Boll. Soc. Rom. Stu. Zool., 5(5-6), 165-178.
- Compagno, L.V.J. (1984):** FAO species catalogue. Vol. 4. Sharks of the world. An annotated and illustrated catalogue of shark species known to date. Part 1. Hexanchiformes to Lamniformes. FAO Fisheries Synopsis (125), 4(1), 1-249.
- Delattre, G & J. Maigret (1986):** L'exploitation des requins sur les côtes françaises de Méditerranée (quartier de Nice). Rapp. Comm. int. Mer Médit., 30(2): p. 238.
- Del Cerro, L. & F. Portas (1984):** Contribució al coneixement de la ictiofauna de la comarca del Garraf (Catalunya). Bull. Soc. Cat. Ictio. Herp., 6, 4-25.
- De Maddalena, A. (1999):** Tubarao-albafar, *Hexanchus griseus* (Bonnaterre, 1788), encontrado na costa do Mar Liguria. Elasm-Info, 8, 4-5.
- De Maddalena, A. (2001):** Squali delle acque italiane. Guida sintetica al riconoscimento. Ireco, Formello, 72 pp.
- Desbrosses, P. (1938):** Croissance et migration du requin gris, *Hexanchus griseus* (Bonnaterre, 1788) Rafinesque 1810. Rev. Trav. Inst. Pêch. marit., 11(1), 53-57.
- Dieuzeide, R., M. Novella & J. Roland (1953):** Catalogue des Poissons des côtes algériennes. Bull. Stn. Aquic. Pêch. Castiglione (n.s.), 4, 1952 [1953], 1-135.
- Economidís, P. S. (1973):** Catalogue des Poissons de la Grèce. Heli. Oceanol. Limnol., 11, 421-600.
- Economidís, P. S. & M. L. Bauchot (1976):** Sur une collection de poissons des mers helléniques (mers Egée et Ionienne) déposée au Muséum national d'Histoire naturelle. Bull. Mus. Hist. Natl. Paris, 3ème sér. Zool., 274, 871-903.
- Ebert, D. A. (1986):** Biological aspects of the sixgill shark, *Hexanchus griseus*. Copeia, 1986, 131-135.
- Euzet, L. (1960):** Recherches sur les Cestodes Tétraphyllides des Sélaciens des côtes de France. Natur. Monspel., série Zool., 3, 7-262.
- Fischer, W., G. Bianchi & W. B. Scott (1981):** Fiches FAO d'identification des espèces pour les besoins de la pêche. Atlantique centre-est; zones de pêche 34, 47 (en partie). Canada Fond de Dépôt, Ottawa. Ministère des Pêcheries et Océans Canada, en accord avec l'organisation des Nations-Unies pour l'Alimentation et l'Agriculture. Vol. 165, pag. var.
- Fischer, W., M. L. Bauchot & M. Schneider (1987):** Fiches FAO d'identification des espèces pour les besoins de la pêche. Méditerranée et mer Noire. Zone de pêche 37. Volume II. Vertébrés. CEE-FAO, Rome, p. 761-1530.
- Gilat, E. & A. Gelman (1984):** On the sharks and fishes observed using underwater photography during a deep-water cruise in the Eastern Mediterranean. Fish. Res., 2, 257-271.
- Giudici, A. & F. Fino (1989):** Squali del Mediterraneo. Edizioni Atlantis, Roma (Italy), 175 pp.
- Gohar, H. A. F. & F. M. Mazhar (1964):** The Elasmobranchs of the north-western Red Sea. Publ. Mar. Biol. Stn. Al-Ghardaqa, 13, 3-144.
- Golani, D. (1996):** The marine ichthyofauna of the Eastern Levant. History, inventory and characterization. Isr. J. Zool., 42, 15-55.
- Golani, D. (1997):** Handbook of the Fishes of Israel (in Hebrew). Keter Publishing House, Jerusalem, 269 pp.

- Granier, J. (1964):** Les Euselaciens dans le golfe d'Aigues-Mortes. Bull. Mus. Hist. Natl. Marseille, 24, 33-52.
- Hemida, F. (1998):** The shark and skate fishery in the Algerian basin: biological and technological aspect. Shark News, 12, p. 14.
- Hemida, F. & C. Capapé (2002):** Observations on a female bramble shark, *Echinorhinus brucus* (Bonnaterre, 1788) (Chondrichthyes: Echinorhinidae), caught off the Algerian coast (southern Mediterranean). Acta Adriat., 43(1), 103-108.
- Hemida, F. & N. Labidi (2001):** Nouvelle liste commentée des requins de la côte algérienne. Rapp. Comm. int. Mer Médit., 36, p. 273.
- Hemida, F., R. Seridji, N. Labidi, J. Bensaci & C. Capapé (2002):** New data on *Carcharhinus* spp (Chondrichthyes: Carcharhinidae) from off the Algerian coast (southern Mediterranean). Acta Adriat., 43(2), 83-93.
- Kabasakal, H. (1998):** The first record of the bluntnose six-gill shark [*Hexanchus griseus* (Bonnaterre, 1788)] in the Sea of Marmara. Acta Adriat., 39(1), 67-70.
- Kirinčić, J. & V. Lepetić (1955):** Recherches sur l'ichtyobenthos dans les profondeurs de l'Adriatique méridionale et possibilité d'exploitation au moyen des palangres. Acta Adriat., 7(1), 1-113.
- Ktari-Chakroun, F. & A. Azouz (1971):** Les fonds chaulutables de la région sud-est de la Tunisie (golfe de Gabès). Bull. Inst. Océanogr. Pêche Salammbô, 2(1), 5-47.
- Laubier, L., C. Maillard & G. Oliver (1966):** Contribution à l'étude des parasites du "griset": *Hexanchus griseus* (Bonnaterre, 1788). Vie Milieu, 17, 1197-1199.
- Lloris, D. & J. Rucabado (1998):** Guide FAO d'identification des espèces pour les besoins de la pêche. Guide d'identification des ressources marines du Maroc. FAO, Rome, 263 pp.
- Lozano Rey, L. (1928):** Ictiología Ibérica (Fauna Ibérica). Peces (Generalidades, Ciclostomos y Elasmobranchios). Mus. Nac. Cien. Nat., 1, 1-692.
- Mas, X. (1997):** Memorial dels pescadors i dels peixos. Converses amb Francesco Isern. Tres-cents anys de tradició marinera al litoral del Maresme. Mataró: Caixa d'Estalvis Lajetana, 286 pp.
- Matalanas, J. (1979):** Contribucion al estudio de la ictiofauna de la zona explotada por las barcas de pesca de Blanes (Mar Catalán). Boll. Soc. Hist. Nat. Baleares, 23, 127-145.
- Matalanas, J., M. Ibanez, M. D. San Millan & G. Riba (1981):** Catálogo de los Peces Marinos de la Colección del Museo Nacional de Ciencias Naturales de Madrid. Tra. Depart. Zool., Univ. autonom. Barcelona, 1, 1-139.
- Mater, S., M. Kaya & M. Bilecenoglu (2000):** Check-list of marine fishes of Turkey - Part I (Classes Chondrichthyes and Holocephali). <http://bornova.ege.edu.tr/~mbilecen/chondlist.html>
- Miniconi, R. (1987):** Requins de Corse. Courrier du Parc, 37, 1-50.
- Moreau, E. (1881):** Histoire naturelle des Poissons de la France, J. Masson éditeur, Paris, France, 482 pp.
- Moreno, J. M. (1995):** Guia de los tiburones de aguas ibéricas, Atlantico Nororiental y Mediterraneo. Ed. Piramide, Madrid, Spain, 310 pp.
- Mouneimne, N. (1977):** Liste des poissons de la côte du Liban (Méditerranée orientale). Cybium, 3, 37-66.
- Ninni, A. P. (1912):** Catalogo dei pesci del mare Adriatico. Venezia, 217 pp.
- Notarbartolo Di Sciarra, G. & I. Bianchi (1998):** Guida degli squali e delle razze del Mediterraneo. Franco Muzzio, Padova, 388 pp.
- Pastore, M. & E. Tortonese (1985):** Prima segnalazione in Mediterraneo dello squalo *Rhizoprionodon acutus* (Rüppell). Thalassia Salentina, 14, 11-15.
- Pinto, F. J. (1994):** Tiburones del Mar de Alboron. Servicio de publicaciones, Centro de ediciones de la Diputación de Málaga, Málaga.
- Quignard, J. P., A. Raibaut & J. P. Trilles (1962):** Contribution à la faune ichtyologique sétoise. Natur. Monspel., série Zool., 4, 61-85.
- Quignard, J. P. & J. A. Tomasini (2000):** Mediterranean fish biodiversity. Biol. Mar. Medit., 7(3), 1-66.
- Risso, A. (1810):** Histoire naturelle des poissons du département des Alpes Maritimes. Paris, (Reprint, 1966, Asher, Amsterdam), XXXVI + 388 pp.
- Roule, L. (1912):** Notice sur les Sélaciens conservés dans les collections du Musée océanographique. Bull. Mus. Oceanogr. Monaco, 243, 1-36.
- Sagarra, I. (1932):** El *Hexanchus griseus* a Garraf. Bull. Inst. Catal. Hist. Nat., 32, 187 pp.
- Šoljan, T. (1975):** I pesci dell'Adriatico. Mondadori, Verona, 522 pp.
- Tortonese, E. (1956):** Leptocardia, Ciclostoma, Selaci. In: Fauna d'Italia, 2. Calderini editore, Bologna, 1-332.
- Tortonese, E. (1985):** Gli squali mediterranei del genere *Hexanchus* (Chondrichthyes). Atti Soc. Ital. Sci. nat. Milano, 126(3-4), 137-140.
- Vaillant, L. L. (1901):** Sur un grisét (*Hexanchus griseus*) du golfe de Gascogne. Bull. Mus. Hist. Natl. Paris, 7, 202-204.
- Vanni, S. (1992):** Cataloghi del Museo di Storia Naturale dell'Università di Firenze. Sezione di Zoologia "La Specola". XI. Chondrichthyes. Atti Soc. Tosc. Sci. Nat. Mem., Ser. B, 99, 85-114.