ISSN: 0001-5113
AADRAY

ACTA ADRIAT.,
45 (2): 187-196, 2004

UDC: 597.32 (560)(262.5)
Preliminary communication

Preliminary observations on the reproductive biology and diet of the Bluntnose sixgill shark, *Hexanchus griseus* (Bonnaterre, 1788) (Chondrichthyes: Hexanchidae), in Turkish Seas

Hakan KABASAKAL

Ichthyological Research Society, Atatürk Mahallesi, Menteşoğlu Caddesi, Idil Apt., No. 30, D. 4, Ümraniye, TR 34764 Istanbul, Turkey
E-mail: hakankabasakal@hotmail.com

A search through field surveys and literature revealed that 39 bluntnose sixgill sharks, Hexanchus griseus*, were captured in the Black, Marmara, and Aegean Seas between 1974 and 2003. One of the specimens was captured in the prebosphoric waters of the southwestern Black Sea, 27 in the Sea of Marmara, and 11 in the Aegean Sea.* H. griseus *is hereby recorded for the first time in the southwestern Black Sea. Available information suggests that* H. griseus *gives birth from October to the end of February in the northern Aegean and Sea of Marmara. The main prey of the listed sixgill sharks were teleosteans.*

Key words: Chondrichthyes, Hexanchidae, *Hexanchus griseus*, sixgill shark, reproductive biology, diet, Turkish seas

INTRODUCTION

The bluntnose sixgill shark, *Hexanchus griseus*, is a very large species. Its total length attains at least 4.8 m (COMPAGNO, 1984). It is a wide-ranging, benthic, or pelagic shark in temperate and tropical seas, and lives over continental and insular shelves and upper slopes from the surface to at least 1875 m (BOESEMAN, 1984; COMPAGNO, 1984). Its presence in the Mediterranean Sea and adjacent waters is well documented in general ichthyological works (for example, CARUS, 1889-1893; RIEDL, 1983; BOESEMAN, 1984; BAUCHOT, 1987; BARRULL & MATE, 2000) and many regional works such as QUIGNARD & CAPAPÉ (1972) in Tunisia; RISSO (1810) and MOREAU (1881) in France; NINNI (1912) and ŠOLJAN (1948) in the Adriatic; TORTONESE (1956) and BINI (1967) in Italy; BEN-TUVIA (1971) in Israel; and PAPACONSTANTINOU (1988) in Greece. Most of these studies concentrate on the western and central Mediterranean. A historical survey of Mediterranean reports since 1892 (CAPAPÉ *et al*., 2003) showed that *H. griseus* was captured in restricted areas, more often in the western than in the eastern basin. Recently, CAPAPÉ *et al.* (2004) reviewed records of specimens collected off the coasts of France, Spain, Italy, Malta, Algeria, and Tunisia, to increase our current knowledge on the reproductive biology of the Mediterranean *H. griseus*.

The presence of *H. griseus* in Turkish waters has been known since the begining of the twentieth century. In his pionneering study, DEVEDJIAN (1926) reported on sixgill sharks landed at the Istanbul fish market but the report did not give detailed information on the capture site of the landed sharks. Although *H. griseus* has been mentioned in general ichthyological works on Turkish marine fishes (GELDİAY, 1969; AKŞIRAY, 1987; MERİÇ, 1995; MATER & MERİÇ, 1996; BİLECENOĞLU *et al*., 2002) and studies dealing with elasmobranchs of Turkish seas (KABASAKAL, 1998, 2002, 2003), its historical and contemporary presence in this area has not yet been investigated. The aim of the present study is to provide preliminary data from previous and current records, and biological properties of *H. griseus* captured in Turkish seas.

MATERIALS AND METHODS

The study is based on a literature review and observations conducted in the Sea of Marmara, and along the Turkish shores of the Aegean and Black Seas (Fig. 1). Data were taken from scientific and popular literature such as newspapers and fishing magazines, interviews with local fishermen, particularly trawlers, gill and trammel netters, and purse seiners, and examinations of landed sixgill sharks. Whenever possible, the following data were recorded: total length (TL) and weight; sex; date, location, and depth of capture; biological condition. Teeth samples were collected from specimens 6 (Fig. 2) and 14 (Fig. 3) and kept in the personnal collection of the author.

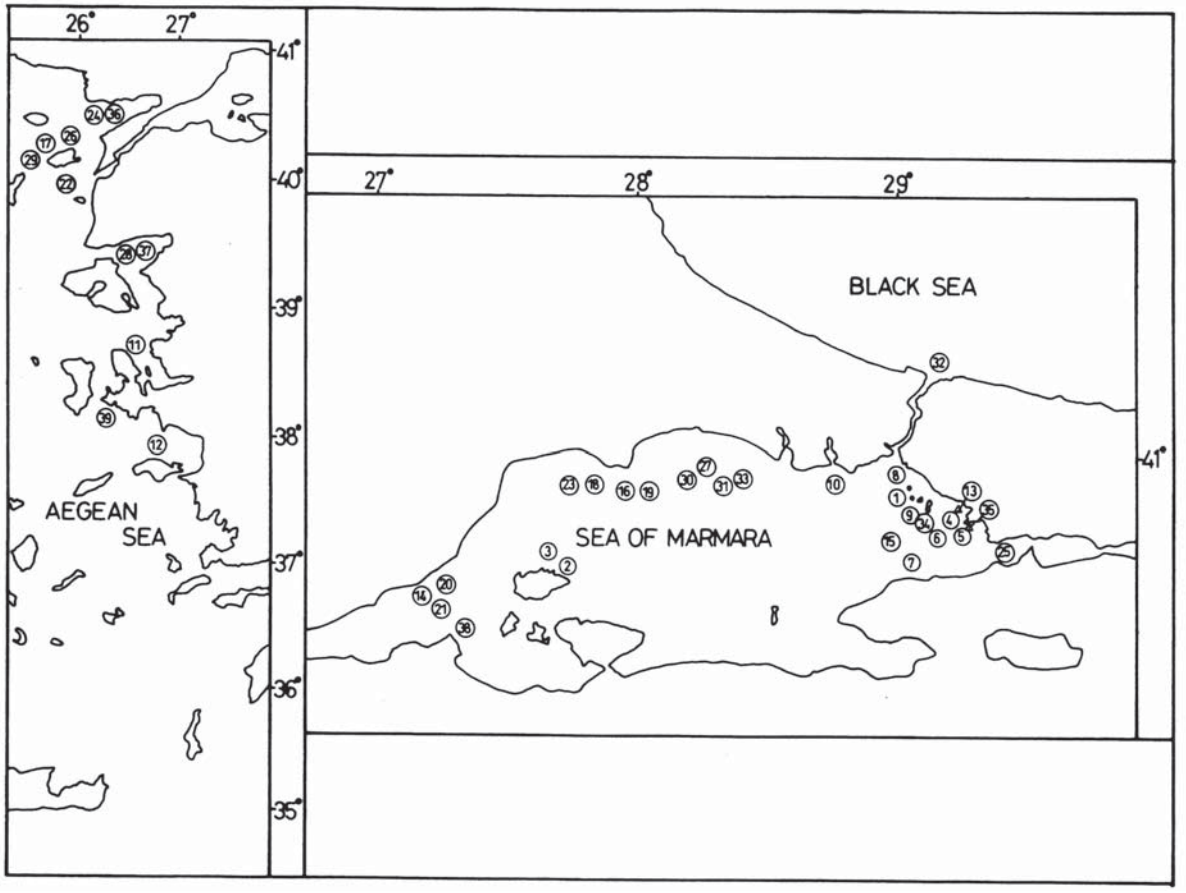

Fig. 1. Map of the study area; circled numbers indicate sampling locations and numbers of specimens listed in Table 1

Fig. 2. A female Hexanchus griseus *(Bonnaterre, 1788) of 450 cm total length (no. 6), on display at a fish market in Istanbul*

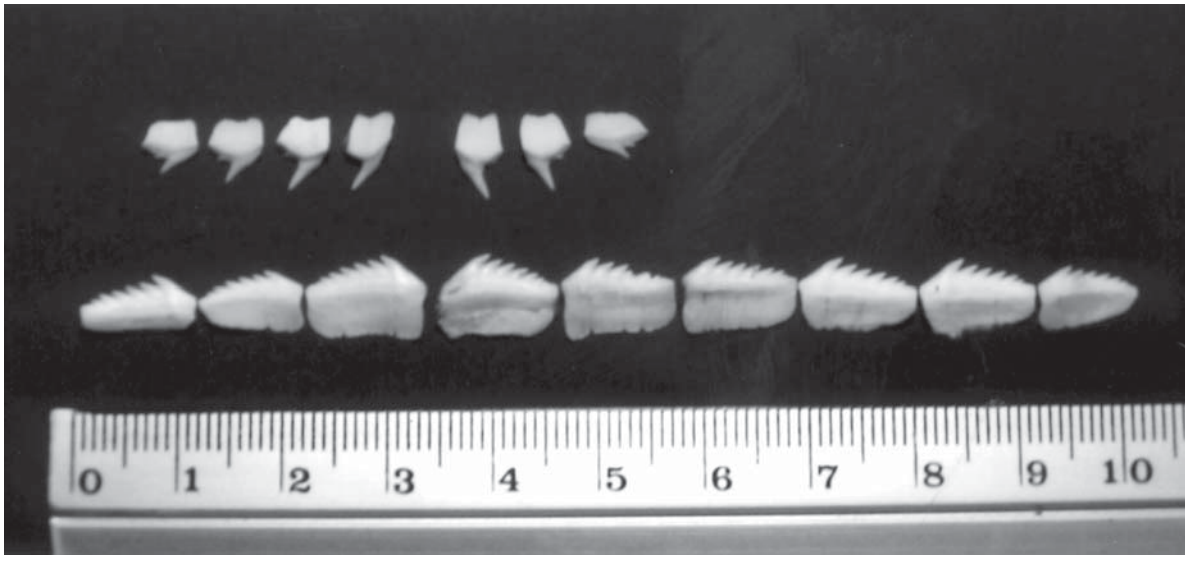

Fig. 3. Functional teeth removed from the upper and lower jaws of specimen 14 (126 cm TL)

RESULTS

Publications and personal communications revealed the capture of 39 *H. griseus* in the Black, Marmara, and Aegean Seas between 1974 and 2003 (Table 1). One specimen was captured in the prebosphoric waters of south-western Black Sea, 27 were captured in the Sea of Marmara, and 11 were captured in the Aegean. Total lengths ranged 66-550 cm and weights 1.2-1000 kg. Eight specimens were male, 18 female, and 13 of unknown sex. The total length of the males ranged 250-400 cm and of the females 66-550 cm. Eleven specimens were captured in shelf waters, nine above the continental slope, one between the continental shelf and slope, and the rest unknown. Twelve specimens were captured by gill netters, 10 by purse seiners, five by otter trawlers, and two by shark netters.

Table 1. Captures of Hexanchus griseus in Turkish waters

No.	TL (cm)	Wt (kg)	Sex	Date of capture	Location of capture	Depth (m)	Remarks	References
1	?	?	♀	26 Nov 1974	Prince Islands	ca. 200	Captured by purse seiner; nearly 100 embryos in uterus, their condition unknown	AGOP SAVUL, pers. comm.
2	350	?	?	1987	Off Marmara Island	ca. 350	Captured by shark net	ARDA DINÇ, pers. comm.
3	400	?	?	1988	Off Marmara Island	ca. 300	Captured by shark net	ARDA DINÇ, pers. comm.
4	300	?	♂	Jan 1989	Tuzla coast	150	Captured by purse seine	KENAN BALCI , pers. comm.
5	300	?	♂	Nov 1989	Tuzla coast	ca. 175	A few kg bluefish, *P. saltator*, found in stomach; claspers almost calcified	KENAN BALCI , pers. comm.
6	450	450	♀	Dec 1989	Tuzla coast	ca. 250	Captured by purse seiner; nearly 25 kg horse mackerel found in stomach (Fig. 2)	KENAN BALCI , pers. comm.
7	500	?	♀	May 1990	Yalova coast	?	Captured by gill net; remains of dog-fish (*Squalus* spp.), hake and dolphin found in stomach	KENAN BALCI , pers. comm.
8	250	?	♀	Dec 1990	Fenerbahçe coast	50	Captured by purse seine	AGOP SAVUL, pers. comm.
9	350	500	♀	19 Dec 1990	Heybeliada coast	?	---	MATER *et al.,* 2000
10	?	?	?	1991	Mimarsinan coast	120-350	Captured by trammel net over conti-nental slope	MERIÇ, 1995
11	400	1000	♂	23 July 1993	Karaburun coast	?	---	MATER *et al.,* 2000
12	400	800	♀	10 July 1994	Kuşadası	?	---	RAMAZAN ÇAVUŞ, pers. comm.
13	300	?	♀	Feb 1995	Tuzla coast	175	Captured by purse seine; nearly 10 kg teleost remains, mainly horse mackerel, found in stomach.	AGOP SAVUL, pers. comm.
14	126	10	♀	March 1996	Hoşköy coast	ca 100	Captured by trammel net; teeth preserved in personnal collection of author (Fig. 3)	KABASAKAL, pers. obs.
15	400	ca. 350	?	11 Sep 1996	Yalova-Esenköy coast	150	Captured by trammel net	AGOP SAVUL, pers. comm.
16	450	500	♀	9 Dec 1996	Tekirdağ coast	ca. 350	2 embryos found in uterus; 23 kg horse mackerel, *Trachurus* spp., found in stomach	AGOP SAVUL, pers. comm.

Table 1. cont'd

No.	TL (cm)	Wt (kg)	Sex	Date of capture	Location of capture	Depth (m)	Remarks	References
17	350	310	?	1997	Off Gökçeada	400	Captured by otter trawl	RAMAZAN ÇAVUŞ, pers. comm.
18	200	?	?	11 Feb 1997	Tekirdağ coast	?	Captured by trammel net	KENAN BALCI , pers. comm.
19	400	350	♀	18 Feb 1997	Tekirdağ coast	175	Nearly 30 kg horse mackerel, *Trachurus* spp., a few hake, *M. merluccius*, and some cans found in stomach	AGOP SAVUL, pers. comm.
20	250	?	♂	20 Feb 1997	Hoşköy coast	50	Captured by purse seine; first record from Marmara Sea	KABASAKAL, 1998
21	450	?	♀	27 Feb 1997	Hoşköy coast	ca. 120	Captured by purse seine; 33 embryos averaging 62.6 cm TL found in uterus; nearly 30 kg horse mackerel and some plastic remains found in stomach	KABASAKAL, pers. obs.
22	360	?	♂	1998	Çanakkale coast	?	Captured by otter trawl	KABASAKAL, pers. obs.
23	?	700	?	19 July 1998	Northern Sea of Marmara	?	Captured by trammel net	AGOP SAVUL, pers. comm.
24	400	?	♂	20 July 1998	Bay of Saros	250	Captured by otter trawl; claspers fully calcified	ATIF MALKOÇOĞLU, pers. comm.
25	550	?	♀	13 Dec 1998	Bay of İzmit	ca. 175	Captured by trammel net	AGOP SAVUL, pers. comm.
26	66	1.2	♀	Oct 1999	Off Gökçeada	380	Captured by otter trawl; unhealed umblical scar on ventral surface	KABASAKAL, pers. obs.
27	?	?	♀	20 Oct 1999	Northern Sea of Marmara	?	A few anchovies, *Engraulis encrasicolus*, found in stomach	AGOP SAVUL, pers. comm.
28	400	650	?	6 Jan 2000	Altınoluk coast	?	Captured by gill net	MURAT GÖKMEN, pers. comm.
29	400	500	?	6 July 2000	Off Gökçeada	ca. 400	Captured by purse seine	RAMAZAN ÇAVUŞ, pers. comm.
30	500	600	?	14 July 2000	Northern Sea of Marmara	?	---	AGOP SAVUL, pers. comm.
31	500	300	♀	18 July 2000	Northern Sea of Marmara	?	Remains of dogfish (*Squalus* spp.), hake, and horse mackerel found in stomach	KABASAKAL, pers. obs.
32	?	600		5 February 2001	Southwestern Black Sea	?	Captured by a purse-seiner in prebosphoric waters of Black Sea	KABASAKAL, pers obs.
33	450	?	♀	7 Feb 2001	Tekirdağ coast	?	Captured by purse seine	KABASAKAL, pers. obs.
34	250	?	♂	23 Sep 2001	Büyükada	200-300	Captured by gill net; claspers not calcified	ERTUĞRUL SAY, pers. comm.
35	315	650	♀	6 Jan 2002	Tuzla coast	ca 150	Captured by otter trawl	KABASAKAL, pers. obs.
36	400	?	♀	24 Aug 2002	Bay of Saros	?	---	MESUT OCAK, pers. comm.
37	?	565	?	25 Dec 2002	Bay of Edremit	?	Captured by gill net	İRFAN KOZHAN, pers. comm.
38	300	200	♂	2003	Karabiga coast	?	Captured by trammel net	SABRI KARAKAYA, pers. comm.
39	350	280	?	14 Oct 2003	Didim coast	?	Captured by trammel net	CENGIZ SULUK, pers. comm.

Brief biological examinations were performed on some of the captured sharks. Three females (nos. 1, 16, and 21) contained 100, two, and 33 embryos, respectively. The total length of females 16 and 21 was 450 cm. The average total length of the 33 embryos in the uterus of female 21 was 62.6 cm. The total length of the smallest free swimming specimen was 66 cm (female 26), and a healing umblical scar was visible on its ventral surface, in agreement with CAPAPÉ *et al.* (2004) who suggested that size at birth in the Mediterranean ranges 55.6-68 cm.

The claspers of male 33 (TL 250 cm) were uncalcified and soft, of male 5 (TL 300 cm) almost calcified, and of male 24 (TL 400 cm) fully calcified. Based on the size and rigidness of the claspers and the condition of the testes, CAPAPÉ *et al.* (2004) suggested that males reach adulthood at 300 cm

Food remains were found in the stomachs of nine specimens (nos. 5, 6, 7, 13, 16, 19, 21, 27 and 31). Teleosts (*Pomatomus saltator*, *Merluccius merluccius*, *Engraulis encrasicolus*, and *Trachurus* spp.) were the major prey. Dogfish (*Squalus* spp.), dolphin (species unidentified), cans, and plastic remains were also found.

DISCUSSION AND CONCLUSIONS

The presence of *H. griseu*s in the Black Sea was reported only by GELDİAY (1969) who did not report the fishing site where the specimen(s) were captured. However, this record is considered "questionable" in the most recent checklist of Turkish marine fishes (BİLECENOĞLU *et al.*, 2002) and AKŞIRAY (1987) and BOESEMAN (1984) reported that *H. griseus* was not recorded in the Black Sea. While the capture of shark 32 in 2001 extends the Mediterranean distribution of *H. griseus* to at least the southwestern area of the Black Sea, it is too early to determine whether the pontic distribution of the bluntnose sixgill shark covers the entire Black Sea.

H. griseus was recorded in the Sea of Marmara for the first time by KABASAKAL (1998). Our review of literature and field surveys revealed the capture of another 26 sixgill sharks in this sea, the most recent in 2002 (no. 35). AKYÜZ (1957) reported on *H. griseus* in the Bay of Iskenderun on the Anatolian coast of the northeastern Mediterranean and BOESEMAN (1984) includes the Anatolian coast of the eastern Mediterranean within the Mediterranean distribution of *H. griseus*. However, this species was not recorded in a recent study of the elasmobranch fishes of the Bay of Iskenderun (BAŞUSTA *et al.*, 1998).

H. griseus lives at depths of 100-2000 m (BOESEMAN, 1984; COMPAGNO, 1984; TORTONESE, 1956). In addition, young *H. griseus* occur in coastal waters (COMPAGNO, 1984). During the present reasearch, fishing depths of 21 specimens were recorded; the shallowest was 50 m for two small sharks of 250 cm (nos. 8 and 20), one male and one female. Examination of the reproductive organs of these sharks revealed that both were immature. These findings correlate well with information on the coastal occurrence of young sixgill sharks. However, one newborn (66 cm; no. 26) and one young shark (250; no. 34) were captured over the continental slope. The female newborn bore a healing umblical scar and was captured at a depth of 380 m. A second female (126 cm; no. 14) was captured at a depth of about 100 m. Therefore, *H. griseus* probably gives birth over the upper zones of the continental slope, and young sharks migrate to shallow nursery areas to avoid larger predator sharks (CASTRO, 1993). The remaining specimens were captured in deep water over the continental shelf and slope at a maximum depth of 400 m.

H. griseus is a very large shark attaining a length of nearly 5 m (BOESEMAN, 1984; COMPAGNO, 1984). The largest specimens reported from the Mediterranean by CAPAPÉ *et al.* (2003) were two males, both 500 cm, weighing 500 and 600 kg. The largest shark recorded in the present research was 550 cm, larger than the earlier reported maximum. The heaviest shark weighed 1000 kg; however, according to CAPAPÉ *et al.* (2003), this weight suggests overestimation because larger specimens of 500 cm, recorded off Naples and Sardinia, did not exceed 600 kg.

H. griseus is an aplacental viviparous species with litters ranging 20-108 pups (BOESEMAN,

1984; COMPAGNO, 1984; EBERT, 2001). In the Bay of Biscay, VAILLANT (1901; in CAPAPÉ *et al*., 2004) counted 108 near-term embryos in a female of 480 cm. BOLIVAR (1907; in CAPAPÉ *et al*., 2004) found 47 fetuses in a female of 480 cm. COMPAGNO (1984) reported that female sixgill sharks are sexually mature at 450-482 cm. CAPAPÉ *et al*. (2004) noted that female sixgills entering the maturation stage were 300-350 cm, and all females over 400 cm were adult. BOESEMAN (1984) and TORTONESE (1956) reported that parturition occurs from October to May. In the present study, two of the three females containing embryos were 450 cm (the length of the third is unknown). These females were captured in November, December and February. The smallest free swimming specimen was captured in October and still had a healing umblical scar. In light of this information, it can be suggested that *H. griseus* gives birth from October to the end of February in the northern Aegean and Sea of Marmara and that the remaining six females with total lengths of at least 450 cm (nos. 6, 7, 21, 25, 31, and 33) can be considered sexually mature.

H. griseus feeds on sharks, such as *Squalus* spp., rays, bony fishes, crustaceans, and marine mammals (BOESEMAN, 1984; COMPAGNO, 1984; EBERT, 1994). Bony fishes (*P. saltator*, *M. merluccius*, *E. encrasicholus,* and *Trachurus* spp.) were the main prey items found in the stomach contents of nine specimens. Remains of dogfish (*Squalus* spp.) and dolphin (species unidentified), as well as cans and plastic, were also found in some stomachs. *S. blainvillei* (50 cm) was found in the stomach of a 211 cm specimen from the coast of Israel (BEN-TUVIA, 1971). BARRULL & MATE (2000) reported that the stomach of a sixgill shark captured in the Catalan Sea contained remains of *Scyliorhinus canicula*, *Galeus melastomus*, *M. merluccius,* and *Phycis blennoides*. Stomach contents of 23 specimens captured in eastern Sicilian waters contained mainly bony fishes (60.87%), cephalopods (13.04%), decapod crustaceans (8.7%), chondrichthyans (4.35%), and echinoderms (4.35%; A. DE MADDALENA, pers. comm.). According to EBERT (1994), the diet of *H. griseus* off the South African coast is related to the length of the shark and marine mammals and teleosteans are the major prey of sixgill sharks over 200 cm. Teleosteans were the main prey of the eight sixgill sharks with a length of ≥300 cm whose stomach contents were examined in this study.

Like many other shark species, study of *H. griseus* has been neglected in favor of more commercially important bony fishes. *H. griseus* is not consumed by humans in Turkey but incidentally captured specimens are generally landed for display. These landings provide valuable opportunities to examine this apex predator but also create artificial fishing pressure on the species. Improving the management of fisheries, as well as encouraging fishermen to release accidentally captured sixgill sharks, would be the first step towards conservation of *H. griseus* in Turkish waters.

ACKNOWLEDGMENTS

The author wishes to thank fishermen Ramazan ÇAVUŞ, Kenan BALCI, Arda DINÇ, Mesut OCAK, İrfan KOZHAN, Sabri KARAKAYA, and Cengiz SULUK for their kind cooperation in the field surveys as well as giving permission to inspect their fishing records. Special thanks to Mr. Agop SAVUL for permitting us to study his archive on fisheries, and to Dr. Alessandro DE MADDALENA, Milano, Italy, for sharing his knowledge on sixgill sharks captured in the eastern Sicilian waters.

REFERENCES

AKŞIRAY, F. 1987. Türkiye Deniz Balıkları ve Tayin Anahtarı. 2nd ed. Publication no. 3490, Istanbul University, Istanbul, 811 pp.

AKYÜZ, E. 1957. Observations on the Iskenderun red mullet (*Mullus barbatus*) and its environment. GFCM Proceedings and Technical Papers, 4: 305-326.

BARRULL, J. & I. MATE. 2000. Biología de la cañabota *Hexanchus griseus* (Bonnaterre, 1788) en el mar Mediterráneo. Bol. Asoc. Esp. Elasmo., 3: 13-20.

BAŞUSTA, N., Ü. ERDEM & C. ÇEVİK. 1998. An investigation on Chondrichthyes in İskenderun Bay. Celal Bayar University. Journal of Sciences and Arts, The Series of Natural Sciences (Biology), 1: 63-69.

BAUCHOT, M.-L. 1987. Requins. In: W. Fischer, M. Schneider, M.-L. Bauchot (Editors). Fiches FAO d'Identification des Espèces pour les Besoins de la Pêche. (Rev. 1). Méditerranée et Mer Noire. Zone de Pêche 37. Vol. II. Vertébrés. FAO, Rome, pp. 767-843.

BEN-TUVIA, A. 1971. Revised list of the Mediterranean fishes of Israel. Israel J. Zool., 20: 1-39.

BİLECENOĞLU, M., E. TASKAVAK, S. MATER & M. KAYA. 2002. Checklist of the marine fishes of Turkey. Zootaxa 113. Magnolia Press, Auckland, 194 pp.

BINI, G. 1967. Atlante dei Pesci delle Coste Italiane. Vol. I. Leptocardi-Ciclostomi-Selachi. Mondo Sommerso (Editor). Rome, 206 pp.

BOESEMAN, M. 1984. Hexanchidae. In: P.J.P. Whitehead, M.-L. Bauchot, J.-C. Hureau, J. Nielsen and E. Tortonese (Editors). Fishes of the North-eastern Atlantic and the Mediterranean, Vol. I, UNESCO, Paris, pp. 72-75.

BOLIVAR, I. 1907. Indicacion de algunos peces notables de la Coruna. Boll. Soc. Esp. Hist. Nat., 7: 206-209.

CAPAPÉ, C., O. GUÉLORGET, J. BARRULL, I. MATE, F. HEMİDA, R. SERIDJI, J. BENSACI & M.N. BRADAÏ. 2003. Records of the bluntnose sixgill shark, *Hexanchus griseus* (Bonnaterre, 1788) (Chondrichthyes: Hexanchidae) in the Mediterranean Sea: A historical survey. Annales Ser. Hist. Nat., 13(2): 157-166.

CAPAPÉ, C., F. HEMIDA, O. GUÉLORGET, J. BARRULL, I. MATE, J. BEN SOUISSI & M.N. BRADAÏ. 2004. Reproductive biology of the bluntnose sixgill shark *Hexanchus griseus* (Bonnaterre, 1788) (Chondrichthyes: Hexanchidae) from the Mediterranean Sea: A review. Acta Adriat., 45(1): 95-106.

CARUS, J.V. 1889-1893. Prodromus Faunae Mediterraneae. Vol. II. Brachiostomata, Mollusca, Tunicata, Vertebrata. E. Schweizerbart'sche Verlagshandlung, Stuttgart. 854 pp.

CASTRO, J.I. 1993. The shark nursery of Bulls Bay, South Carolina, with a review of the shark nurseries of the southeastern coast of the United States. Env. Biol. Fish., 38: 37-48.

COMPAGNO, L.J.V. 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 Fish. Synop., 4: 1-249.

DEVEDJİAN, K. 1926. Pêche et Pêcheries en Turquie. Imprimerie de l'Administration de la Dette Publique Ottomane, Istanbul, 480 pp.

EBERT, D.A. 1994. Diet of the sixgill shark *Hexanchus griseus* off southern Africa. African J. Marine Sci., 14: 213-218.

EBERT, D.A. 2001. Cow sharks. California's Living Marine Resources: A Status Report, California Department of Fish and Game, pp. 470-471.

GELDİAY, R. 1969. Important fishes found in the Bay of Izmir and their possible invasions. Ege University, Faculty of Sciences, Monographs, Izmir, 135 pp.

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.

KABASAKAL, H. 2002. Elasmobranch species of the seas of Turkey. Annales, Ser. Hist. Nat., 12: 15-22.

KABASAKAL, H. 2003. Historical and contemporary records of sharks from the Sea of Marmara, Turkey. Annales Ser. Hist. Nat., 13: 1-12.

MATER, S. & N. MERİÇ. 1996. Deniz Balıkları. In: A. Kence, C.C. Bilgin (Editors). Türkiye Omurgalılar Tür Listesi, Tübitak, Ankara, pp. 129-172.

MATER, S., M. KAYA & M. BİLECENOĞLU. 2000. Check-list of marine fishes of Turkey - Part I (Classes Chondrichthyes and Holocephali). http://bornova.ege.edu.tr/~mbilecen/chondlist.html.

MERİÇ, N. 1995. A study on existence of some fishes on the continental slope of the Sea of Marmara. Tr. J. of Zoology, 19: 191-198.

MOREAU, E. 1881. Histoire Naturelle des Poissons de la France. Vol. II. Masson, Paris. 479 pp.

NINNI, E. 1912. Catalogo dei Pesci del Mare Adriatico. Carlo Bertotti, Venezia, 271 pp.

PAPACONSTANTINOU, C. 1988. Fauna Graeaciae IV. Check-list of Marine Fishes of Greece. Hellenic Zoological Society, Athens, 257 pp.

QUIGNARD, J.-P. & C. CAPAPÉ. 1972. Complement à la liste commentée des selaciens de Tunisie. Bull. Inst. Océanogr. Pêche, Salammbô, 2: 445-447.

RIEDL, R. 1983. Fauna und Flora des Mittelmeeres. Verlag Paul Parey, Hamburg & Berlin, 836 pp.

RISSO, A. 1810. Ichthyologie de Nice ou Histoire Naturelle des Poissons. F. Schoell, Paris, 388 pp.

ŠOLJAN, T. 1948. Ribe Jadrana, Fauna i Flora Jadrana, 1. Institut za Oceanografiju i Ribarstvo, Split. 428 pp.

TORTONESE, E. 1956. Fauna d'Italia. Leptocardia, Ciclostomata, Selachii. Calderini, Bologna, 334 pp.

TORTONESE, E. 1985. Gli squali Mediterranei del genero Hexanchus (Chondrichthyes). Atti della Società Italiana Scienze naturali e Museo civico di Storia naturale di Milano, 126: 137-140.

VAILLANT, L.L. 1901. Sur un griset (Hexanchus griseus) du golfe de Gascogne. Bull. Mus. Hist. Nat. Paris, 7: 202-204.

Received: 17 March 2004
Accepted: 13 September 2004

Preliminarna opažanja o biologiji reprodukcije i ishrani psa glavonje, *Hexanchus griseus* (Bonnaterre, 1788) (Chondrichthyes: Hexanchidae), u turskim morima

Hakan KABASAKAL

Ihtiološko istraživačko udruženje, Atatürk Mahallesi, Menteşoğlu Caddesi, Idil Apt., No. 30, D. 4, Ümraniye, TR 34764 Istanbul, Turska
E-mail: hakankabasakal@hotmail.com

SAŽETAK

Iz rezultata terenskih istraživanja i podataka iz literature proizlazi da je u Crnom, Mramornom i Egejskom moru, između 1974. i 2003. ulovljeno ukupno 39 primjeraka psa glavonje, *Hexanchus griseus*. Jedan primjerak uhvaćen je u predbosporskim vodama jugozapadnog Crnog mora, 27 u Mramornom i 11 u Egejskom moru. *H. griseus* prvi je nalaz te vrste za jugozapadni dio Crnog mora. Iz dostupnih saznanja dade se naslutiti da *H. griseus* rađa od listopada do kraja veljače u sjevernom Egejskom i Mramornom moru. Glavni plijen navedenih primjeraka psa glavonje bili su teleostei.

Ključne riječi: Chondrichthyes, Hexanchidae, *Hexanchus griseus*, pas glavonja, biologija razmnožavanja, ishrana, turska mora