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Short Communication

Occurrences of the large male smoothhound, *Mustelus mustelus* (Linnaeus, 1758) in the Sea of Marmara

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ABSTRACT

On 18 December 2023 and 17 August 2024, two male specimens of *Mustelus mustelus* (1321 mm and 1425 mm TL) were caught during scientific bottom trawling in the northern Sea of Marmara, the first off, the coast of Prince Islands and the second off Ambarlı. The results of the present study showed that male *M. mustelus* can grow extremely large (at least 292 mm) than previously published total length (TL) data for specimens caught in Turkish waters. The smaller size of male smoothhounds caught in Turkish waters in recent years is, of course, causing a phenomenon well known to the new generation of shark researchers in Türkiye, known as the "shifting baseline syndrome". Currently, *M. mustelus* is not a protected shark species in Turkish waters but is also one of the most sought-after sharks by commercial fishermen. In conclusion, to avoid capturing mega-spawning specimens of *M. mustelus* in commercial fisheries, an upper size limit can be implemented as a first step towards effectively conserving the species.

Keywords: *Mustelus mustelus*, Megaspawner, Shifting baseline, Conservation

Introduction

The smoothhound, *Mustelus mustelus* (Linnaeus, 1758), is a relatively large shark species in the family Triakidae of the order Carcharhiniformes (Ebert et al., 2021). In the eastern Atlantic, the distribution of *M. mustelus* extends from the waters around the British Isles to Morocco, the Canary Islands, the Azores and Madeira in the north, and from Angola to South Africa in the south (Ebert et al., 2021). It is one of the well-known members of the Mediterranean shark fauna (Barone et al., 2022), which also occurs in Turkish waters over a wide range from the eastern Mediterranean to the Sea of Marmara (Bilecenoğlu, 2024).

Although the size (total length, TL) of *M. mustelus* is reported to be 2000 mm in several references (e.g. Ninni, 1923; Reiner, 1996), much of the contemporary general ichthyological or shark-specific literature reports the TL of the smoothhound to be ≤1750 mm (e.g. Bauchot, 1987; De Maddalena et al., 2001; Ebert et al., 2021). Furthermore, the largest sizes (TL ranging from 1650 to 1750 mm) for *M. mustelus* have been attributed exclusively to females, and despite the largest males are commonly reported to be around 1100 mm (De Maddalena et al., 2001; Ebert et al., 2021), males can grow up to 1445 mm in the Mediterranean Sea (Saïdi et al., 2008) or 1450 mm TL in South African waters (Smale & Compagno, 1997).

In the present paper, the authors report on capturing very large male smoothhounds in the Sea of Marmara and provide detailed morphometric measurements of the specimens examined. They also review the available literature on the maximum size of *M. Mustelus*'s from the perspective of the “shifting baseline syndrome” (SBS) (Pauly, 1995) and “let the mega spawners live” (LML) concepts (Froese, 2004).

Materials and Methods

The male smoothhounds examined in this study were caught using bottom-trawl gear (codend mesh size 14 mm and maximum mesh size 22 mm) and towed according to MEDITS standards (Anonymous, 2017). Bottom-trawl hauls were conducted aboard the *R/V Yunus-S*, a 510 hp stern trawler operated by Istanbul University, and the towing duration was 30 minutes. The bottom trawl stations where the studied smoothhounds were caught are shown in Figure 1. In order to keep the captured smoothhounds alive, they were gently removed from the codend and not gaffed to avoid injury, following the best practice procedure for shark handling (FAO & ACCOBAMS, 2018). As Ellis et al. (2017) suggested, a survival tank was equipped with a large volume container and a seawater hose with an adjustable nozzle, and captured specimens were held in the tank before examination and released alive following videography and measurements. Species identification was followed by Ebert & Stehmann (2013), Ebert et al. (2021) and Barone et al. (2022). 65 morphometric distances were measured either with a tape measure to the nearest 0.5 mm (for distances> 10 cm) or with a vernier calliper to the nearest 0.05 mm (for distances ≤ 10 cm) following the methodology outlined in Ebert et al. (2021). Total length (TL) is the distance between the tip of the snout and the tip of the upper lobe of the caudal fin lying in the natural position (Ebert et al., 2021), and TL measurements were documented by videography. Video evidence of the specimens examined is available on request from the first author.

Results and Discussion

On 18 December 2023 a male smoothhound (specimen 1, 1321 mm TL) was caught off the southwestern sector of Prince Islands over a muddy-sandy bottom at the depths of 24-28 m between the following coordinates: start of the towing: 40º56'33” N 29º1'48” E; end of the towing: 40º55'56” N 29º1'15” E. On 17 August 2024 the second male (specimen 2, 1425 mm TL) was caught off Ambarlı coast also over a muddy-sandy bottom at the depths of 126-132 m between the following coordinates: start of the towing: 40º55'861” N 28º25'595” E; end of the towing: 40º55'337” N 28º27'364” E. Total weights of specimens 1 and 2 were 6850 g and 8000 g, respectively. Morphometric measurements of the specimens are presented in Table 1. The following description is based on the examined smoothhounds: Specimens 1 and 2 were large sharks with relatively slender bodies and short heads, in which the mean prepectoral length is 18.8% in TL; eyes large, in which the mean length of eye is 2% in TL, and mean interorbital space is 6.5% in TL; a moderately long snout, in which the mean preoral snout is 5.4% in TL; mean length of anterior margins of the moderately large pectoral fins constitute 13% of TL and mean length of posterior margins constitute 12.6% of TL. Molar-like low-crowned teeth are arranged on the upper and lower jaws, and the joint of the Meckelian cartilages of the lower jaw constitutes a prominent angle. Posterior edges of the first and second dorsal fins are not fringed. Dorsal colouration of the examined smoothhounds was uniformly brownish grey, without white or dark spots, and ventral surfaces whitish; narrow dark grey bands are visible on the posterior edges of dorsal and caudal fins; pale grey colouration is visible posteriorly on the ventral surfaces of pectoral and pelvic fins. Photographs of the examined smoothhounds are presented in Figure 2. Detailed morphometric measurements of the examined specimens are presented in Table 1. The above description is consistent with the descriptions given in Ebert & Stehmann (2013), Ebert et al. (2021) and Barone et al. (2022), thus the examined males were positively identified as *Mustelus mustelus*.

Despite the slight differences, most of the morphometric measurements of the examined smoothhounds (Table 1) fell within the ranges given in Ebert & Stehmann (2013) for *M. mustelus*. Nevertheless, two of the morphometric measurements given in the present study, which are mean eye length (EYL) to TL and interorbital space (INO) to TL, were found to be quite different from the published ratios (Ebert & Stehmann, 2013). Contrary to Ebert & Stehmann (2013) stating that mean EYL is 2.3 to 4 % of TL, the same ratio is 2% of TL in the examined specimens. Furthermore, despite Ebert & Stehmann (2013) reporting that INO is 3.7-4.8% of TL, the same ratio is 6.5% of TL in the examined smoothhounds. Allopatric or geographically distant populations of the same fish species may tend to show morphometric distances at the opposite margins of the well-accepted proportions ranges, as Cailliet et al. (1986) proposed. Therefore, the differences seen in the present proportions of EYL-TL and INO-TL can be considered admissible by the allopatry.

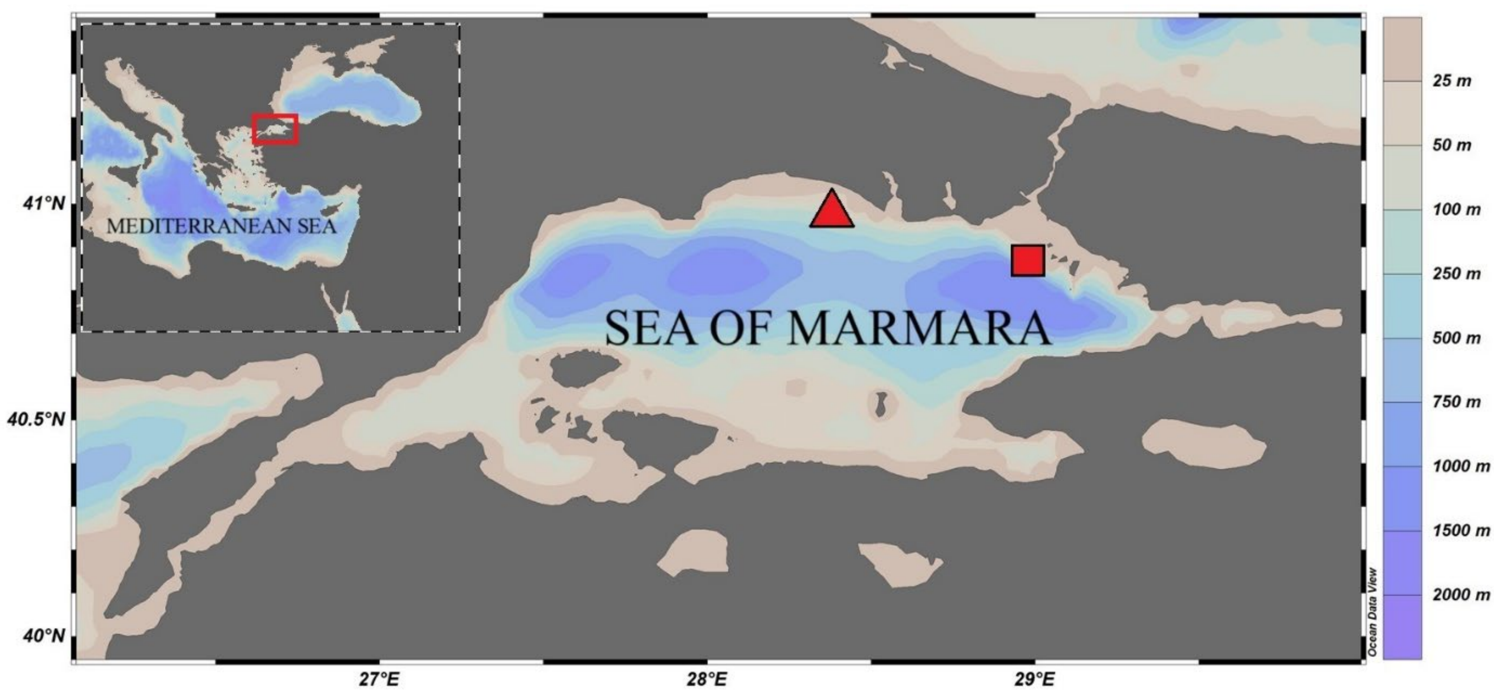

Figure 1. Map showing the approximate localities where the examined male smoothhounds were caught (▲, specimen 1 and ■, specimen 2). Red rectangle in the small map showing the geographical position of the Sea of Marmara in the Mediterranean ecosystem

Figure 2. The largest male specimens of *Mustelus mustelus* were caught and released in the Sea of Marmara. Side views of (a) specimen 1, 1321 mm TL and (b) specimen 2, 1425 mm TL, and (c) ventral view of specimen 2. Arrows denote the claspers, which were remarkably more extended than the pelvic fins and hardened

The largest sizes of *M. mustelus* published in various references from 1923 to 2021 are reviewed in Table 2. Regardless of sex, the TL of *M. mustelus* specimens varied between 1500 mm and 2000 mm, with the largest sizes mainly attributed to female smoothhounds. Despite reports of large smoothhounds of 2000 mm TL (Ninni, 1923; Reiner, 1996), the TL of the most significant confirmed female of *M. mustelus* was reported to be 1732 mm, caught in South African waters (Goosen & Smale, 1997). This female was considered the species' most significant (record size) specimen ever recorded in the 20th century (De Maddalena et al., 2001). On the other hand, based on the literature (Compagno, 1984; Smale & Compagno, 1997; Goosen & Smale, 1997; Ebert et al., 2021), the maximum TL of males is smaller than that of females. *M. mustelus* is a viviparous shark. Therefore, females require more volume in the abdominal cavity to maintain developing embryos during pregnancy (Ebert et al., 2021), resulting in larger sizes than males. Furthermore, Smale & Compagno (1997) reported that the TL of the most prominent male was 1450 mm in South African waters, while Saïdi et al. (2008) reported a male of 1445 mm TL from the Gulf of Gabès (southern Tunisia, south-central Mediterranean Sea). Therefore, based on the available data in the scientific literature, one of the present male smoothhounds, which was 1425 mm TL, is probably one of the largest males of *M. mustelus* ever recorded in Turkish waters. However, the present study's authors do not exclude the possibility of unpublished males being captured that may be longer than the male smoothhounds examined.

Table 1. Morphometric measurements and percent TL of mean of respective distances of examined males. Distances in bold represent the morphometric percentages used to describe *Mustelus mustelus* in Ebert & Stehmann (2013).

Measurement (mm)	Specimen 1	Specimen 2	Mean	% TL of mean	Published descriptive % of TL§
Total Length (TL)	1321	1425	1373	100	
Precaudal-Fin Length (PCL)	1050	1132.7	1091.33	79.5	N/R
Pre-Second Dorsal Fin Length (PD2)	804	867.3	835.65	60.9	N/R
Pre-First Dorsal Fin Length (PD1)	350	377.6	363.78	26.5	N/R
Prepectoral-Fin Length (PP1)	**249**	**268.6**	**258.80**	**18.8**	**17-21**
Prepelvic-Fin Length (PP2)	569	613.8	591.40	43.1	N/R
Snout-Vent Length (SVL)	631	680.7	655.84	47.8	N/R
Preanal-Fin Length (PAL)	876	945.0	910.48	66.3	N/R
Interdorsal Space (IDS)	**302**	**325.8**	**313.89**	**22.9**	**18-25**
Dorsal Caudal-Fin Space (DCS)	138	148.9	143.43	10.4	N/R
Pectoral-Fin Pelvic-Fin Space (PPS)	270	291.3	280.63	20.4	N/R
Pelvic-Fin Anal-Fin Space (PAS)	251	270.8	260.88	19	N/R
Anal-Fin Caudal-Fin Space (ACS)	**108**	**116.5**	**112.25**	**8.2**	**6.3-8.8**
Head Length (HDL)	229	247.0	238.01	17.3	N/R
Prebranchial Length (PG1)	196	211.4	203.72	14.8	N/R
Prespiracular Length (PSP)	116	125.1	120.57	8.8	N/R
Preorbital Length (POB)	**82**	**88.5**	**85.23**	**6.2**	**5.9-8**
Prenarial Length (PRN)	43	46.4	44.69	3.3	N/R
Preoral Length (POR)	**71.5**	**77.1**	**74.31**	**5.4**	**5.3-7.4**
Eye Length (EYL)*	**26.5**	**28.6**	**27.54**	**2**	**2.3-4**
Eye Height (EYH)	13.5	14.6	14.03	1	N/R
Interorbital Space (INO)*	**85.8**	**92.6**	**89.18**	**6.5**	**3.7-4.8**
Spiracle Length (SPL)	7.9	8.5	8.21	0.6	N/R
Eye-Spiracle Space (ESL)	12.5	13.5	12.99	0.9	N/R
Nostril Width (NOW)	18.9	20.4	19.64	1.4	N/R
Internarial Space (INW)	**29.3**	**31.6**	**30.45**	**2.2**	N/R
Mouth Width (MOW)	72.5	78.2	75.35	5.5	N/R
Mouth Length (MOL)	**42.3**	**45.6**	**43.97**	**3.2**	N/R
Intergill Length (ING)	64.1	69.1	66.62	4.9	N/R
First Gill Slit Height (GS1)	25.9	27.9	26.92	2	N/R
Second Gill Slit Height (GS2)	27.1	29.2	28.17	2.1	N/R
Third Gill Slit Height (GS3)	28.9	31.2	30.04	2.2	N/R
Fourth Gill Slit Height (GS4)	37.5	40.5	38.98	2.8	N/R
Fifth Gill Slit Height (GS5)	16.9	18.2	17.57	1.3	N/R
Pectoral-Fin Anterior Margin (P1A)	**172**	**185.5**	**178.77**	**13**	**13-17**
Pectoral-Fin Base (P1B)	53.9	58.1	56.02	4.1	N/R
Pectoral-Fin Inner Margin (P1I)	91.3	98.5	94.89	6.9	N/R
Pectoral-Fin Posterior Margin (P1P)	**166**	**179.1**	**172.53**	**12.6**	**8.2-14**
Pelvic-Fin Anterior Margin (P2A)	**93.9**	**101.3**	**97.60**	**7.1**	**6.5-9.9**
Pelvic-Fin Length (P2L)	121.6	131.2	126.39	9.2	N/R
Pelvic-Fin Base (P2B)	69.8	75.3	72.55	5.3	N/R
Pelvic-Fin Inner Margin (P2I)	61	65.8	63.40	4.6	N/R
Anal-Fin Anterior Margin (ANA)	82.8	89.3	86.06	6.3	N/R
Anal-Fin Length (ANL)	101.9	109.9	105.91	7.7	N/R
Anal-Fin Base (ANB)	67	72.3	69.64	5.1	N/R
Anal-Fin Inner Margin (ANI)	31.7	34.2	32.95	2.4	N/R
First Dorsal-Fin Length (D1L)	190	205.0	197.48	14.4	N/R
First Dorsal-Fin Anterior Margin (D1A)	140	151.0	145.51	10.6	N/R
First Dorsal-Fin Height (D1H)	113.45	122.4	117.92	8.6	N/R
First Dorsal-Fin Base (D1B)	130.8	141.1	135.95	9.9	N/R

First Dorsal-Fin Inner Margin (D1I)	63.1	68.1	65.58	4.8	N/R
First Dorsal-Fin Posterior Margin (D1P)	139	149.9	144.47	10.5	N/R
Second Dorsal-Fin Length (D2L)	139.5	150.5	144.99	10.6	N/R
Second Dorsal-Fin Anterior Margin (D2A)	109	117.6	113.29	8.3	N/R
Second Dorsal-Fin Height (D2H)	106.26	114.6	110.44	8	N/R
Second Dorsal-Fin Base (D2B)	101.3	109.3	105.29	7.7	N/R
Second Dorsal-Fin Inner Margin (D2I)	39.1	42.2	40.64	3	N/R
Second Dorsal-Fin Posterior Margin (D2P)	98	105.7	101.86	7.4	N/R
Dorsal Caudal-Fin Margin (CDM)	262	282.6	272.31	19.8	N/R
Preventral Caudal-Fin Margin (CPV)	97	104.6	100.82	7.3	N/R
Subterminal Caudal-Fin Margin (CST)	44.1	47.6	45.84	3.3	N/R
Terminal Caudal-Fin Lobe (CTL)	95.7	103.2	99.47	7.2	N/R
Clasper Outer Length (CLO)	119.2	128.6	123.89	9	N/R
Clasper Inner Length (CLI)	157	169.4	163.18	11.9	N/R
Clasper Base Width (CLB)	14.9	16.1	15.49	1.1	N/R

§Ebert & Stehmann (2013); *morphometric percentages slightly differing than those given in Ebert & Stehmann (2013);
N/R, not reported in Ebert & Stehmann (2013)

Table 2. A review of reported sizes of *Mustelus mustelus* was published in several references in chronological order. N/R, not reported

Reference	Maximum TL (mm)	Maximum TL of males	Region
Ninni (1923)	2000	N/R	Sea of Marmara
Compagno (1984)	1640	1100	Worldwide
Branstetter (1984)	1500	N/R	Northeastern Atlantic Ocean and Mediterranean Sea
Bauchot (1987)	1600	N/R	Mediterranean Sea
Akşıray (1987)	1500	N/R	Turkish seas
Reiner (1996)	2000	N/R	Eastern-central Atlantic Ocean
Smale & Compagno (1997)	1650	1450	South African waters
Goosen & Smale (1997)	1732	1280	South African waters
De Maddalena et al. (2001)	1650	N/R	Adriatic Sea
Saïdi et al. (2008)	1650	1445	Mediterranean Sea
Ebert & Stehmann (2013)	1500	N/R	North Atlantic Ocean
Ebert et al. (2021)	1750	1100	Worldwide
Present study	---	1321	Sea of Marmara
Present study	---	1425	Sea of Marmara

Contrary to previous literature where the maximum size of *M. mustelus* was reported to be 2000 mm TL (Ninni, 1923; Reiner, 1996), contemporary literature reports the maximum size of the species in its global range to be 1750 mm TL (Ebert et al., 2021), and even smaller for Turkish waters (975 mm TL in Filiz & Mater, 2002; Filiz, 2009; 1133 mm TL in Eronat & Özaydın, 2014). Furthermore, the contemporary maximum TL information for males caught in Turkish waters (577 mm TL in Filiz & Mater, 2002; 852 mm TL in Filiz, 2009; 915 mm TL in Eronat & Özaydın, 2014) was remarkably smaller than the TLs reported globally (1100 mm, Ebert et al., 2021), for Tunisian waters (1445 mm, Saïdi et al., 2008) or South African waters (1450 mm, Smale & Compagno, 1997). The apparent smaller size of male smoothhounds caught in Turkish waters in recent years naturally raises a well-known phenomenon among the new generation of shark researchers in Türkiye, known as the "Shifting Baseline Syndrome" (SBS), first proposed by Pauly (1995). In short, SBS is a phenomenon that occurs when past information or historical experience is missing or forgotten and causes members of the new generation of researchers to accept current data, such as TL measurements, stock size or species composition, as usual (Pauly, 1995). From this perspective, the contemporary size data reported for males of *M. mustelus* caught in Turkish waters is a typical example of SBS. The maximum TL of *M. mustelus* reported in Eronat & Özaydın (2014) is 79.5% of the TL (1425 mm TL) of specimen 2 caught in the Sea of Marmara. Therefore, the present results indicate that male *M. mustelus* can grow at least 292 mm larger than previously published TL data for specimens caught in Turkish waters.

According to Serena (2005), males of *M. mustelus* mature between 700 mm and 960 mm TL in the Mediterranean. Considering the TLs (1321 mm and 1425 mm) and the very long and hard claspers of the present males (Figure 2), it is obvious that they are mature males. Furthermore, as the TLs of specimen 1 and specimen 2 were 132.6% and 148.4% longer than the maximum TL (960 mm; Serena, 2005) for mature males, respectively, the present male smoothhounds can also be described as "mega spawners", defined as specimens of any fish species that are larger than the length at first maturity (Froese, 2004). Based on the definition of a mega spawner fish (Froese, 2004), e.g. optimum length (the size of the fish slightly larger than the length at first maturity) plus 10%, based on the above-mentioned percentage differences (132.6% and 148.4%) of the present male smoothhounds, they can also be described as very large mega spawners of male *M. mustelus* in the Mediterranean Sea. In line with the concept of "let the mega-spawners live" (LML) proposed by Froese (2004), the present male smoothhounds were kept in a survival tank supplied with fresh seawater prior to the measurements, and they were handled carefully throughout the process and released alive.

Conclusion

The present study shows that males of *Mustelus mustelus* can grow extremely large compared to those reported in the available literature. According to Froese (2004), the goal of the current management regime should be to implement a fishing strategy that results in 0% (none) of the megaspawners being caught in fisheries or being injured or killed in case of unintentional capture. Currently, *M. mustelus* is not a protected shark species in Turkish waters and one of the most sought-after sharks by commercial fishermen. However, *M. mustelus* is listed in Appendix III of the Barcelona Convention and therefore the exploitation of this species needs to be regulated throughout its Mediterranean range (GFCM, 2018). Combining this regulatory requirement proposed in the Barcelona Convention with the above-mentioned LML concept, monitoring the spatial and temporal distribution of mega-spawning males and females of *M. mustelus* throughout the Turkish seas and implementing a rational strategy for managing this shark in commercial fisheries are clear and unavoidable requirements. Therefore, in order to avoid the killing of mega-spawning specimens of *M. mustelus* in commercial fisheries, an upper size limit can be implemented as a first step towards the effective conservation of the species.

Compliance with Ethical Standards

Conflict of interest: The author(s) declare no actual, potential, or perceived conflict of interest for this article.

Ethics committee approval: Since the captured sharks are not included in the list of protected species and were released alive, ethics committee approval is not required.

Data availability: This work has been supported by the "Integrated Marine Pollution Monitoring (DEN-İZ) 2023-2025 Programme" carried out by the Ministry of Environment, Urbanization and Climate Change / General Directorate of Environmental Impact Assessment, Permit and Inspection and coordinated by TUBITAK-Marmara Research Center.

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Disclosure: -

References

Akşıray, F. (1987). Türkiye Deniz Balıkları ve Tayin Anahtarı, 2nd edn. Publication No. 3490. Istanbul: Istanbul University, 811 p.

Anonymous (2017). MEDITS-Handbook, Version n. 9, MEDITS Working Group, 106 p.

Barone, M., Mazzoldi, C., Serena, F. (2022). Sharks, rays and chimaeras in Mediterranean and Black Seas – Key to identification. FAO, 87 p. https://doi.org/10.4060/cc0830en

Bauchot, M.-L. (1987). Requins. In Fiches FAO d'identification des espèces pour les besoins de la pêche. (Révision 1). Méditerranée et mer Noire. Zone de pêche 37. Vol. II. Vertebrates. Fischer, W., Schneider, M., Bauchot, M.-L., Eds.; FAO, Roma, pp. 767-843.

Bilecenoğlu, M. (2024). Diversity of fishes along the coasts of Türkiye. Turkish Journal of Zoology, 48(SI-1), 589-616. https://doi.org/10.55730/1300-0179.3197

Branstetter, S. (1984). Triakidae. In Fishes of the North-eastern Atlantic and the Mediterranean. Whitehead, P. J. P., Bauchot, M.-L., Hureau, J.-C., Nielsen, J., Tortonese, E., Eds.; UNESCO, Paris. Vol. I, pp. 117-121.

Cailliet, G.M., Love, M.S., Ebeling, A.W. (1986). Fishes. A Field and Laboratory Manual on Their Structure, Identification, and Natural History. Wadsworth Publishing Company, Belmont, 194 p.

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 2- Carcharhiniformes. *FAO Fisheries Synopsis*, 125(4/2), FAO, Rome, pp. 251-655.

De Maddalena, A., Piscitelli, L., Malandra, R. (2001). The largest specimen of smooth-hound, *Mustelus mustelus* (Linnaeus, 1758), recorded from the Mediterranean Sea. *Bilješke - Notes*, 84, 8 p.

Ebert, D.A., Stehmann, M.F.W. (2013). Sharks, batoids, and chimaeras of the North Atlantic. FAO Species Catalogue for Fishery Purposes. No. 7. FAO, Rome, 523 p.

Ebert, D.A., Dando, M., Fowler, S. (2021). Sharks of the World: A Complete Guide. Princeton University Press, Princeton, 608 p.

Ellis, J.R., McCully Phillips, S.R., Poisson, F. (2017). A review of capture and post-release mortality of elasmobranchs. *Journal of Fish Biology*, 90(3), 653-722.
https://doi.org/10.1111/jfb.13197

Eronat, E.G.T., Özaydın, O. (2014). Length-weight relationship of cartilaginous fish species from Central Aegean Sea (Izmir Bay and Sığacık Bay). *Ege Journal of Fisheries and Aquatic Sciences*, 31(3), 119-125.
https://doi.org/10.12714/egejfas.2014.31.3.01

FAO, ACCOBAMS (2018). Good practice guide for the handling of sharks and rays caught incidentally in Mediterranean pelagic longline fisheries.
http://www.fao.org/3/i9152en/I9152EN.pdf

Filiz, H. (2009). Diet composition of smooth-hound, *Mustelus mustelus* (Linnaeus, 1758), in Aegean Sea, Turkey. *Belgian Journal of Zoology*, 139(1), 81-84.

Filiz, H., Mater, S. (2002). A preliminary study on length-weight relationships for seven elasmobranch species from north Aegean Sea, Turkey. *Ege Journal of Fisheries and Aquatic Sciences*, 19(3-4). 401-409.

Froese, R. (2004). Keep it simple: three indicators to deal with overfishing. *Fish and Fisheries*, 5(1), 86-91.
https://doi.org/10.1111/j.1467-2979.2004.00144.x

GFCM (2018). GFCM Data Collection Reference Framework (DCRF). Version: 23.2., FAO, Rome, 190 p.

Goosen, A.J.J., Smale, M.J. (1997). A preliminary study of age and growth of the smoothhound shark *Mustelus mustelus* (Triakidae). *South African Journal of Marine Science*, 18(1), 85-91.
https://doi.org/10.2989/025776197784161072

Ninni, E. (1923). Primo contributo allo studio dei pesci e della pesca nelle acque dell'Impero Ottomano. Premiate Officine Grafiche Carlo Ferrari, Venezia, 187 p.

Pauly, D. (1995). Anecdotes and the shifting baseline syndrome of fisheries. *Trends in Ecology & Evolution*, 10(10), 430.
https://doi.org/10.1016/S0169-5347(00)89171-5

Reiner, F. (1996). Catálogo dos peixes do arquipélago de Cabo Verde. Instituto Portugués de Investigção Marítima, Lisboa, 339 p.

Saïdi, B., Bradaï, M.N., Bouaïn, A. (2008). Reproductive biology of the smooth-hound shark *Mustelus mustelus* (L.) in the Gulf of Gabès (south-central Mediterranean Sea). *Journal of Fish Biology*, 72(6), 1343-1354.
https://doi.org/10.1111/j.1095-8649.2008.01801.x

Serena, F. (2005). Field identification guide to the sharks and rays of the Mediterranean and Black Sea. FAO Species Identification Guide for Fishery Purposes. FAO, Rome, 97p.

Smale, M.J., Compagno, L.J.V. (1997). Life history and diet of two southern African smoothound sharks, *Mustelus mustelus* (Linnaeus, 1758) and *Mustelus palumbes* Smith, 1957 (Pisces: Triakidae). *South African Journal of Marine Science*, 18(1), 229-248.
https://doi.org/10.2989/025776197784160992