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**The largest specimen of smooth-hound,  
*Mustelus mustelus* (LINNAEUS, 1758),  
recorded from the Mediterranean Sea**

Alessandro DE MADDALENA<sup>1</sup>, Luigi PISCITELLI<sup>2</sup> and Renato  
MALANDRA<sup>2</sup>

<sup>1</sup>*Italian Great White Shark Data Bank, via V. Foppa 25,  
I-20144 Milano, Italy*

*E-mail: ademaddalena@tiscalinet.it*

<sup>2</sup>*Mercato Ittico, viale Molise 62, 20137 Milano, Italy*

*E-mail: dotlulu@tiscalinet.it*

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*The largest specimen of smooth-hound, *Mustelus mustelus* (LINNAEUS, 1758), captured in the Mediterranean Sea is recorded. The 1650 mm TL specimen is one of the three largest *M. mustelus* reported throughout its range. The pregnant female carrying 17 full-term embryos was caught in an unknown locality of the Adriatic Sea and was brought to the fish market in Milano, Italy. Morphometrics and a description of the specimen and its pups are presented.*

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**Key words:** smooth-hound, *Mustelus mustelus*, reproduction, size, Mediterranean Sea

### INTRODUCTION

The smooth-hound, *Mustelus mustelus* (LINNAEUS, 1758) (Fig.1), is distinguished from its two Mediterranean Sea congeners, the starry smooth-hound, *Mustelus asterias* (CLOQUET, 1821) and the blackspotted smooth-hound, *Mustelus punctulatus* (RISSO, 1826), principally on the basis of having a larger internarial space and uniform coloration.



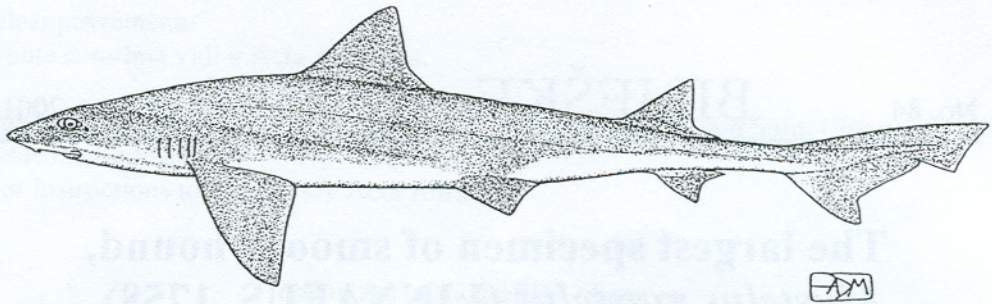


Fig. 1. Smooth-hound, *Mustelus mustelus* (LINNAEUS, 1758). Drawing by A. DE MADDALENA

BAUCHOT (1987) notes that the nostril width is 1.5 to 1.7 times in the internarial space in *M. mustelus*, 1.2 to 1.3 times in *M. asterias*, and 1.1 to 1.3 times in *M. punctulatus*. Moreover, while usually *M. asterias* has a coloration characterized by small white spots and *M. punctulatus* by small black spots, *M. mustelus* is uniformly grey or grey-brown or sometimes has small spots only slightly darker than the rest of the body (COMPAGNO, 1984). *M. asterias* differs from *M. mustelus* and *M. punctulatus* also in having upper-jaw labial folds considerably longer than lower-jaw folds.

The smooth-hound's distribution includes almost all of the eastern Atlantic, from the British Isles to South Africa, and it is present throughout the Mediterranean Sea. *M. mustelus* is found in the waters of the continental shelves and upper slopes to a depth of 350 meters, usually epibenthically, and is most common in depths of 5-50 meters. Its diet is primarily composed of crustaceans with secondary consumption of cephalopods and small bony fishes.

A viviparous species with a yolk-sac placenta, the smooth-hound has a litter size of 2 to 28 (Lo BIANCO, 1909; SMALE and COMPAGNO, 1997). The gestation period is 8 (TORTONESE, 1965) or 9 to 10 (COMPAGNO, 1984; Lo BIANCO, 1909) or 11 months (SMALE and COMPAGNO, 1997) and birthing occurs in March (Lo BIANCO, 1909). The size at birth is about 39 cm TL (COMPAGNO, 1984; SMALE and COMPAGNO, 1997). TORTONESE (1956) and BINI (1967) reported a maximum size of 160cm TL, and WHITEHEAD *et al.* (1984) later increased it to 164 cm TL. More recently SMALE and COMPAGNO (1997) measured South African specimens up to 1650 mm TL and GOOSEN and SMALE (1997) recorded a 1732 mm TL (weight 25 kg) specimen taken at Rooikranz, Western Cape, South Africa (M.J. SMALE, personal communication). Observations and morphometric measurements of a large Adriatic Sea *M. mustelus* are presented herein.



## MATERIAL AND METHODS

The captured specimen was examined, weighed and morphometric measurements made following COMPAGNO (1984). Photographs were taken of the lateral, dorsal, ventral aspects of the specimen and of dermal denticles and teeth. The jaws and the caudal fin of the adult and the embryos have been preserved.

## RESULTS

On 16 March 2000 a large specimen of smooth-hound, *Mustelus mustelus* (LINNAEUS, 1758), was acquired at the fish market in Milano, Italy, where it had been transported following capture at an unknown locality of the Adriatic Sea (Fig.2). The size of the specimen was 1650 mm TL and its weight was 23,5 kg. The smooth-hound's coloration was uniformly grey-brown on the dorsal surface and white ventrally. Upon closer examination, a few small spots, only slightly darker than the rest of the dorsal surface, were observed on the back next the dorsal fins. The specimen, a female, had a considerably distended belly in the pelvic region. Dissection revealed 17 embryos, 9 in the right uterus and 8 in the left uterus, their sizes ranging from 315-370 mm and their weights ranging from 87-149 g (Fig. 3). The dorsal surface of the embryos were uniformly grey-brown in coloration and white ventrally, as was the mother, but all embryonic fins were white-edged except the tips of the second dorsal fin and upper caudal lobe, which were pigmented black. Morphometric measurements of the adult and the embryos are presented in Tables 1 and 2.

Table 1. *Adult smooth-hound, Mustelus mustelus* (LINNAEUS, 1758)

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Sex: female	SPL Spiracle length 7
Weight: 23,5 kg	PIA Pectoral anterior margin 220
Measurements (mm)	D1L First dorsal length 250
TOT Total length 1650	D1B First dorsal base 190
FOR Fork length 1410	D1I First dorsal inner margin 60
POR Preoral length 80	D2L Second dorsal length 170
INW Internarial space 40	D2B Second dorsal base 132
NOW Nostril width 20	D2I Second dorsal inner margin 38
MOW Mouth width 85	CDM Dorsal caudal margin 230
ULA Upper labial furrow length 25	CPV Preventral caudal margin 115
LLA Lower labial furrow length 25	CTR Terminal caudal margin 100
EYL Eye length 30	CST Subterminal caudal margin 55



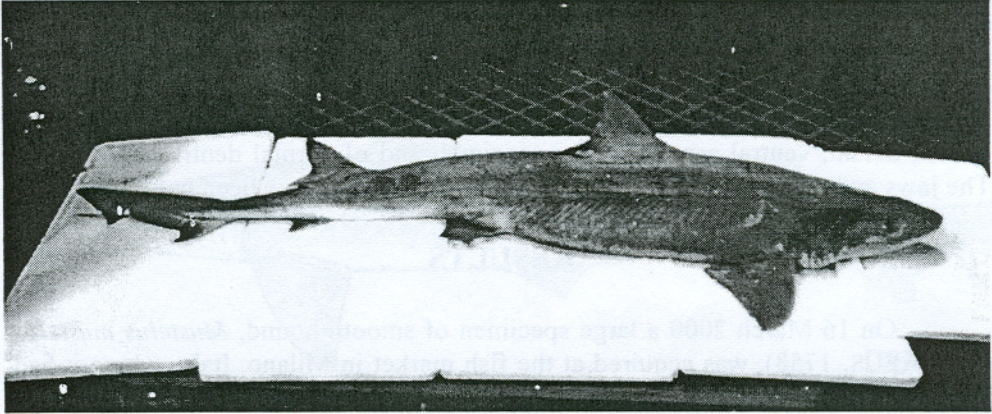


Fig. 2. A female smooth-hound, 1650 mm total length, captured in the Adriatic Sea. Photo by A. DE MADDALENA

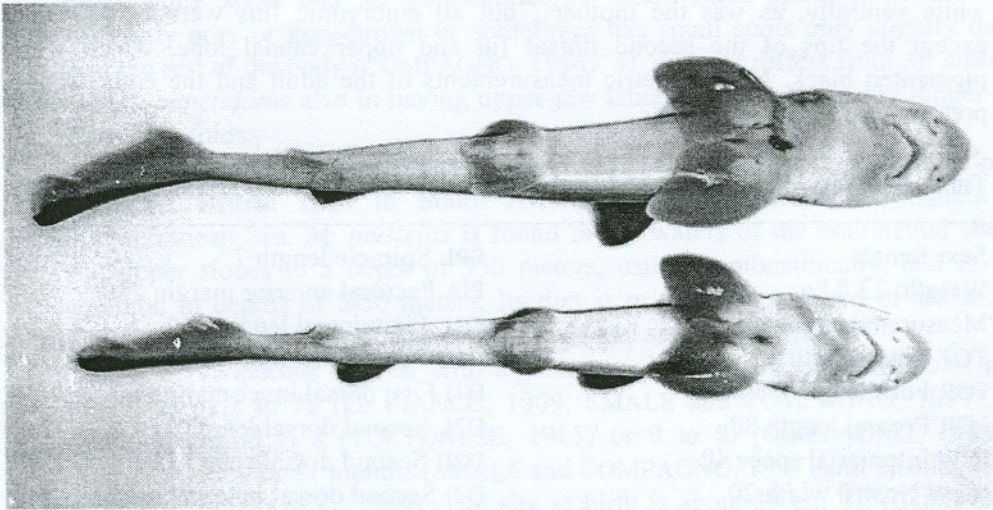


Fig. 3. Two of the 17 full-term embryos from the 1650 mm pregnant female smooth-hound. Photo by L. PISCITELLI



Table 2. Embryonic smooth-hounds, *Mustelus mustelus* (LINNAEUS, 1758)

# Sex TOT (mm) Weigh (g)	
1 M 350 120	9 M 350 120
2 F 315 87	10 M 357 121
3 M 340 100	11 F 368 147
4 F 363 127	12 M 353 113
5 F 340 110	13 M 370 149
6 M 357 120	14 F 350 129
7 M 370 147	15 M 340 106
8 M 345 114	16 M 356 130
	17 F 326 105

## DISCUSSION

The total length of the Adriatic specimen equals the second largest size reported for *M. mustelus*, surpassed only by the 1732 mm TL specimen reported by GOOSEN and SMALE (1997) from South Africa. It is the largest smooth-hound ever reported from the Mediterranean Sea, exceeding maximum lengths listed by TORTONESE (1956), BINI (1967), WHITEHEAD *et al.* (1984), and COMPAGNO (1984). The internarial space (two times the nostril width) exceed the width presented by BAUCHOT (1987) as a key character used in recognition of the species. The size of the embryos indicated they were near at full term and are in accord with the Lo BIANCO's (1909) contention that the birthing occurs in March. The variability noted in the embryo sizes may reflect the fact that *M. mustelus* embryos from the same uterus can be at different developmental stages because the eggs are not fertilized at the same time (TORTONESE, 1956).

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## REFERENCES

- BAUCHOT, M.-L. 1987. Requins. In: W. Fischer, M. Schneider, and M.-L. Bauchot (Editors). Fiches FAO d'identification des espèces pour les besoins de la pêche. (Révision 1). Méditerranée et Mer Noire. Zone de pêche 37, Vol. 2. Vertébrés. CEE, FAO, Rome, pp. 767-843.
- BINI, G. 1967. Atlante dei Pesci delle coste Italiane. Vol.I. Leptocardi, Ciclostomi, Selaci. Mondo Sommerso, Roma, 256 pp.
- 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. Parts 1-2. FAO Fish. Synop., 4(125): 1-655.
- GOOSEN, A.J.J., and M.J. SMALE. 1997. A preliminary study of age and growth of the smooth-hound shark *Mustelus mustelus* (Triakidae). S. Afr. J. Mar. Sci., 18: 85-91.
- Lo BIANCO, S. 1909. Notizie biologiche riguardanti specialmente il periodo di maturità sessuale degli animali del golfo di Napoli. Mitth. Zool. Stat. Neapel, 19, (4): 513-761.
- SMALE, M.J., and L.J.V. COMPAGNO. 1997. Life history and diet of two southern african smoothhound sharks, *Mustelus mustelus* (Linnaeus, 1758) and *Mustelus palumbes* Smith, 1957 (Pisces: Triakidae). S. Afr. J. Mar. Sci., 18: 229-248.
- TORTONESE, E. 1956. Fauna d'Italia, Vol.II - Leptocardia, Ciclostomata, Selachii. Calderini, Bologna, 334 pp.
- TORTONESE, E. 1965. I Pesci e i Cetacei del Mar Ligure. Mario Bozzi, Genova, 216 pp.
- WHITEHEAD, P.J.P., M.L. BAUCHOT, J.C. HUREAU, J. NIELSEN and E. TORTONESE (Editors). 1984. Fishes of the North-Eastern Atlantic and the Mediterranean., Vol.I., UNESCO, Paris.

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# Najveći primjerak psa čukova , *Mustelus mustelus* (LINNAEUS, 1758) uhvaćen u Sredozemlju

Alessandro DE MADDALENA<sup>1</sup>, Luigi PISCITELLI<sup>2</sup> i Renato MALANDRA<sup>2</sup>

<sup>1</sup>Talijanska banka podataka o bijelom psu, via V. Foppa 25, I-20144 Milano, Italija

E-mail: ademaddalena@tiscalinet.it

<sup>2</sup>Riblja tržnica, via Molise 62, 20137 Milano, Italija

E-mail: dotlulu@tiscalinet.it

## SAŽETAK

Zabilježen je najveći primjerak psa čukova, *Mustelus mustelus* (LINNAEUS, 1758) uhvaćenog u Mediteranu. Ukupna dužina tijela (TL) iznosi 1650 mm što znači da ovaj primjerak spada među tri najveća primjerka vrste *M. mustelus*. Ženka sa 17 embrija je uhvaćena na nepoznatoj lokaciji u Jadranskom moru i donesena je na ribarnicu u Milanu. Morfometrija, te opis uzorka i mladunčadi izneseni su u ovom radu.



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Institute of Oceanography and Fisheries  
21000 Split, Croatia  
Tel.: 385+21-385-688  
Fax: 385+21-385-650  
E-mail: marusic@izor.hr

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