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TERM EMBRYO OF *MOBULA MOBULAR* (BONNATERRE, 1788)
FROM THE NORTHERN TYRRHENIAN SEA

(*Chondrichthyes Mobulidae*)

Abstract. — Morphometrics and a brief morphological description are given of a term embryo of *Mobula mobular*, born from a specimen caught in the northern Tyrrhenian Sea in late spring 1986.

Riassunto. — *Embrione a termine di Mobula mobular (Bonnaterre, 1788) catturato nell'Alto Tirreno (Chondrichthyes Mobulidae).*

Vengono presentati i rilevamenti biometrici e una breve descrizione del neonato, partorito da un esemplare catturato al largo di Livorno.

Key words: Mobulidae, *Mobula mobular*, reproduction, Mediterranean.

During the night of 20 June 1986 an adult female specimen of *Mobula mobular*, her disc 3.4 m wide, was caught in the northern Tyrrhenian Sea, about 18 km southeast of Gorgona Island. The ray was captured at the surface, with purse seine, amidst a school of anchovies (*Engraulis encrasicolus*). On being hauled on board it gave birth to a male term embryo (fig. 1). The young was immediately frozen and deposited in the collections of the Zoological Museum « La Specola » of the University of Florence (catalogue number MZUF 5548); the adult specimen was not preserved.

Proportional dimensions of the preserved specimen, in thousandths of disc width, are listed in table 1. Measurements were taken according to NOTARBARTOLO DI SCIARA (1987), where methods are described in detail. It was determined that the specimen was a term embryo by its large size, the complete reabsorption of the external yolk sac, the healed aspect

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Fig. 1. — *Mobula mobular*, term embryo caught near Gorgona Island (MZUF 5548): dorsal (top) and ventral (bottom) views.

of its umbilicus, its full pigmentation, and the lack of white marks on its dorsal side.

General morphological features of this specimen are in accordance with those described for *M. mobular* in NOTARBARTOLO DI SCIARA (1987): coloration on the dorsal side purplish black with a faded light blaze between the spiracles, its concavity rostral, and two lighter areas on the « shoulders »; bright white spot on apex of dorsal fin; ventral side uniform white; spine at the base of tail, embedded in a small cartilaginous support, its anterior end just underneath the insertion of the dorsal fin; skin smooth to the touch, except for an oval area on the back, along the mid-line of the body, anterior to the origin of the dorsal fin, where denticles are concentrated; dense cover of fine pores both on dorsal and ventral sides, arranged in long transverse lines on the pectorals' surfaces; spiracle slits dorsal to plane of pectoral fins; claspers small and soft, shorter than pelvic fins. The spiral intestine has 51 turns. The tail is broken.

Data on size at birth for *M. mobular* are lacking (KREFFT & STEHMANN, 1979). The size of the described specimen, however, is most likely a good approximation of size at birth. With a disc 1659 mm wide and a weight of 35 kg, this is the largest *Mobula* embryo on record (NOTARBARTOLO DI SCIARA, 1987).

It is not apparent from the literature whether *M. mobular* in the Mediterranean has a restricted reproductive season. RISSO (1810) observed what he believed to be term embryos in French waters in September, whereas TORTONESE (1957) described a rather undeveloped embryo (its disc 224 mm wide) from a female caught near Palermo during this month. A somewhat more advanced foetus, with a disc width of 61 cm, was found in Tunisian waters in January (CAPAPÉ & ZAOUALI, 1976). Our observation suggests that *M. mobular* in the northern Mediterranean are born in summer. This is further corroborated by the observation of one of us (F.S.) of another large female, which was caught and towed inside the Livorno harbor the 11th July 1986, where she was seen giving birth to a large, viable young.

The developmental history of the dorsal coloration pattern of *M. mobular* is peculiar. A half-developed embryo (its disc 61 cm wide) showed a crescent-shaped white band between the spiracles, its concavity anterior, and two symmetrical shoulder marks posterior to it, against a dark background (CAPAPÉ & ZAOUALI, 1976). A similar pattern is present in *M. japonica* embryos in an analogous developmental stage. At birth the white marks are disappeared in both *M. japonica* and *M. mobular*, but a faint trace of them remains and can be seen throughout life in particular lighting conditions (NOTARBARTOLO DI SCIARA, 1987).

TABLE I. — Measurements of *Mobula mobular*, term embryo caught near Gorgona Island (MZUF 5548), in thousandths of disc width. Toothrows were counted on the labial side.

disc width (1659 mm)	1000
disc length	477
anterior projection	328
from midpoint of rostral margin to posterior margin of pelvics	480
predorsal distance	402
dorsal fin base length	46
dorsal fin vertical height	38
precloacal distance	405
first gill opening length	46
second gill opening length	46
third gill opening length	48
fourth gill opening length	47
fifth gill opening length	36
first interbranchial distance	99
fifth interbranchial distance	46
from midpoint of rostral margin to first interbranchial	104
from midpoint of rostral margin to fifth interbranchial	187
pelvic fin length	100
cephalic fin length	110
cephalic fin width	57
diameter of eye	22
cranial width	135
preoral length	36
head length	127
mouth width	100
internarial distance	94
upper toothband length	75
lower toothband length	75

no. rows, upper toothband	149
no. rows, lower toothband	145
weight (Kg)	35

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