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A TERATOLOGIC CASE IN A SHARK

ABSTRACT

Cranial and vertebral deformities are reported in a foetus of *Carcharhinus signatus* (POEY, 1868); these deformities are considered very interesting on the basis of the bibliographical review edited by DAWSON and the most recent papers, resulting not yet described.

The present description deals with a specim from a species segnalled now for the first time in the Mediterranean sea.

Key words: Teratology, sharks, species from Mediterranea sea.

Ichthyological Teratology enumerates many cases, starting from the 16th century, in which there are indicated for the first time the phenomena of the so called "pug-head", with malformation of pectoral fins and rounding of the cranial profile in *Cyprinus carpio.*

During the 17th century, there were added to the above mentioned case those concerning gibbosity phenomena, pigmentation anomalies and "duplicitas" (doublemonster) in Cyprinidae, Salmonidae and Pleuronectidae.

During the following centuries the number of cases, the variety and the consistency of malformations were observed in a greater number and in different marine species as well as freshwater ones, so that Ichthyology has given a determinant contribution to Teratology.

On the theoretical point of view, this discipline has been particularly considered in order to underline evident correlations between anomalies and hareditariness, between anomalies and development alterations owed to mechanical and traumatic causes, du-

ring ovulation or fetation, finally between anomalies and a kind of causal synergy owing to genetic and environmental factors.

Thanks to C.E. Dawson we have a collection of the various and composite bibliography on the subject, citating 1499 titles (DAWSON, 1964, 1966, 1971; DAWSON et HEAL, 1976).

After Dawson, in the last 10 years, we find in the literature further contributions on the subject by JARDAS and HOMEN (1977), SINDERMANN (1979), MALINS (1984) and BENGTSSON et al. (1985), whose papers mainly concern damages, anomalies or deformations which fish may undergo in environments compromised by the presence of heavy metals or other pollutants. Particularly for the sharks there have been signalled until now 2-3 cases of malformations (pectoral fin, double monster, vertebrae), among 41 titles and the specimens with vertebrae malformations are quite rare and involving 3 species: *Carcharhinus leucas, C. plumbeus* and *Squalus acanthias.*

Our contribution concerns the singular and rare case of monstrosity in the skull and spine of *Carcharhinus signatus* (POEY, 1868) foetus.

The interest about this finding is twofold: it is a case never foud before and concerns a shark new for the Mediterranean sea.

Carcharhinus signatus is a slender species whose biggest size is 2,8 m. Normally its vertebral centres range from 184 to 192 (being its precaudal centres 101-104, according to COMPAGNO, 1984).

In the eastern Atlantic area it is found along Zaire, Cameroon, Ghana, Ivory Coast, Senegal and Angola coasts.

It prefers continental and insular coastal areas between 50 and 100 m of depth, sometimes beyond these limits, both towards the most superficial water and up to 200 m of depth and expecially up to 600 m.

This species is viviparous and able to give birth from 4 to 12 foetuses.

It must be though that the female whose foetus is the object of this paper, migrated into the Ionian sea, coming from the eastern Atlantic area.

Figure n. 1 shows the teeth shape of the subject, whereas figure 2 (a, b, c) shows the total aspect done on the dorsal, ventral and lateral normae.

Table I, shows the measurements which we were able to take on the subject, preserved in formalin.

The malformation which affect the foetus consist mainly of the incomplete development of neurocranium, an anomalous splanchnocranium for the part referring to branchial arcs and an aberration of the numerous vertebral bodies.

Concerning neurocranium, considering the xgraphy plates in dorsal and ventral normae, (Fig. 3 a, b) it lacks prosencephalon and it has the otic and the conseguent occipital regions very much depressed.

Referring to splanchnocranium, the hyomandibularis not distinguishable and the branchial arcs are rudimentary and mainly melted, the 2nd with 3rt and the 4th with 5th.

The spine appears as having a slight kyphosis which affects the first 4 or 5 vertebral bodies up to the 34th; from here on, the vertebral bodies follow one another into a series of scoliokyphosis and scoliolordosis, whose main result can be defined as a kind of "helicoidal" formation up to the last bodies of the caudal fin;

The foetus monstruosity so briefly described is very difficult to explain. The subject, for the dimensions it has and for the absence of a vitelline peduncle (notwhitstanding its umbilicus is not cicatrized yet), can be considered a complete foetus.

The subject has been consegned to the "Talassografico Museum" by some fishermen that have found it in the gulf of Taranto near S. Peter isle, and the scarcity of information concerning the mother and other possible foetuses in the some delivery, gives us no idea about the teratogenic case, suitable to determine the subject such as it appears, if it is of germinal type, i. e. somatic, blastogenic or organogenic type.

In PARENZAN (1962-'63) paper, a case of double monstruosity in a complete foetus of *Prionace glauca* appears as being affected by malformations in the spine, consisting of torsion which are similar to the ones appearing in our subject, even if in a manner similarly not so showy.

Fig. 1 Upper lateral (a) and lower symphysial (b) tooth in *Carcharhinus signatus* foetus

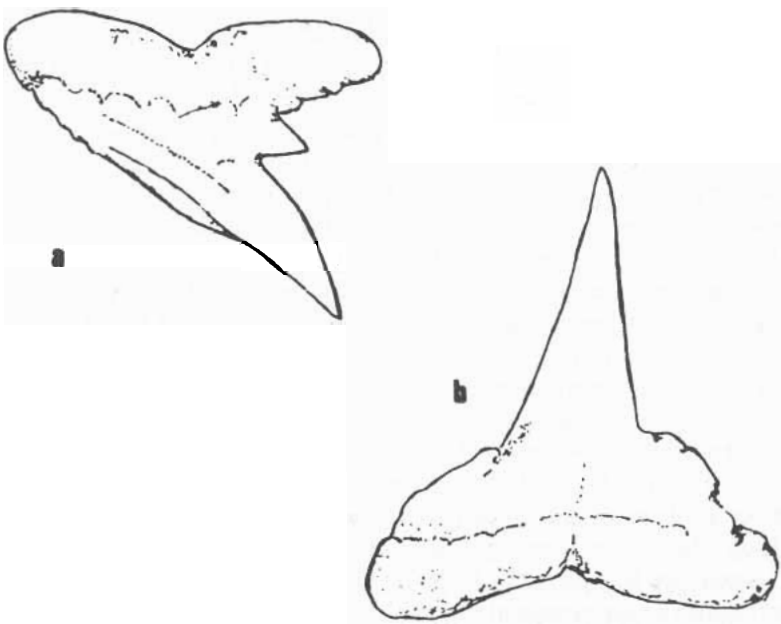

Table I - Some measurements taken on the embryo of *Carcharhinus signatus* (POEY, 1868), according with COMPAGNO, 1984; the values are in mm.

TL	Total length	225
HL	head length	87
SL	Snout length	40
PD	Preoral distance	40
ND	Distance between the snout edge and the nostrils	18
ID	Internasal distance	18
OD	Interocular distance	38
TD	Transverse ocular diameter	11
MW	Mouth width	28
DH	Height of the first dorsal fin	29
DB	Base of the first dorsal fin	29
DL	length of the first dorsal fin	41
2DH	Heigth of the second dorsal fin	11
2DB	Base of the second dorsal fin	19
2DL	Length of the second dorsal fin	28
LPL	Length of the left pectoral fin	52
LPW	Base length of the left pectoral fin	30
RPW	Length of the right pectoral fin	53
RPW	Base length of the right pectoral fin	28

TL in a normal foetus would be of about 229 mm and would represent 17-18% of TL in adult specimen.

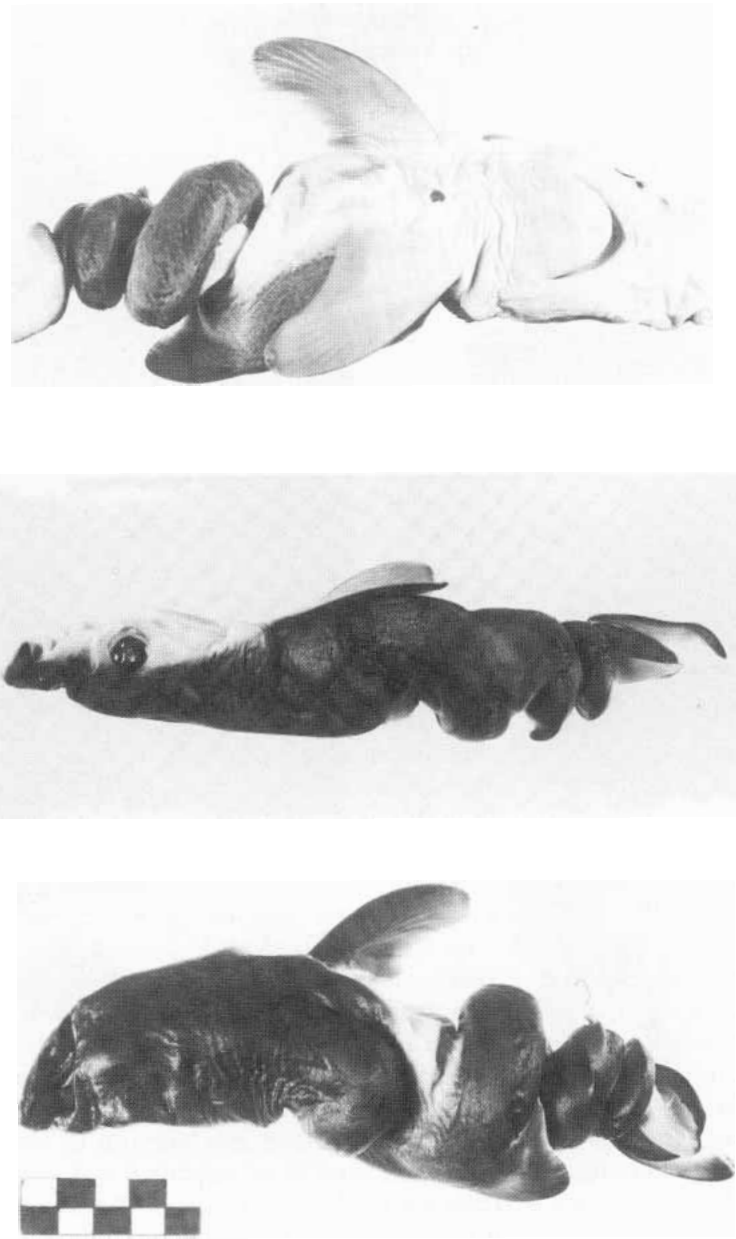

Fig. 2 - *Carcharhinus signatus* foetus in ventral (a), lateral (b) and dorsal (c) views.

Fig. 3 - Xgraphie of the specimen in dorsal (a) and lateral (b) normae.