

NOTES ON EGGS, LARVAE AND JUVENILES OF FISHES FROM INDIAN WATERS

XIV. Further Notes on *Xiphias gladius* Linnaeus

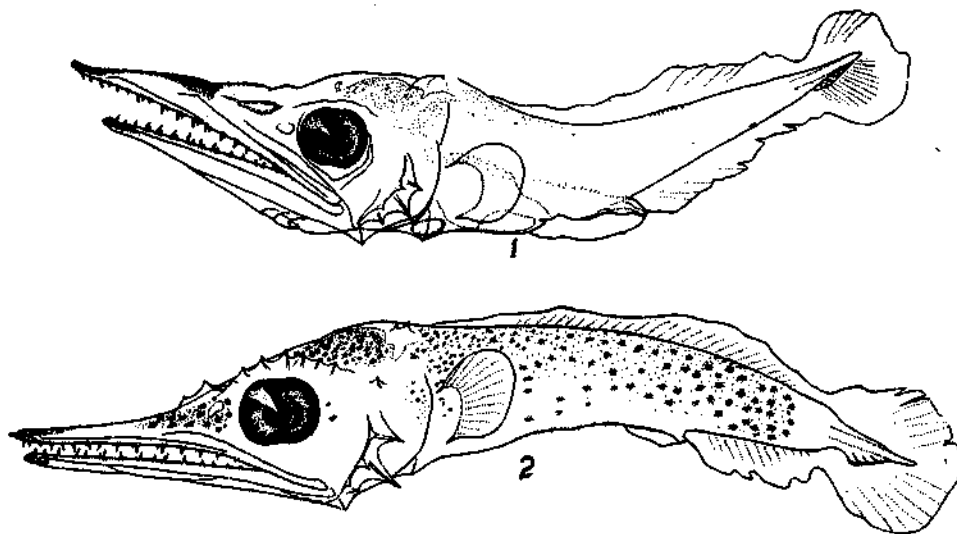
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INTRODUCTION

IN the first number of this series (Jones, 1958) a postlarval specimen of *Xiphias gladius* of 16.27 mm. in length collected from R.V. "Kalava" Station 218 (Lat. 10° 03' N., Long. 74° 10' E.) in the Laccadive Sea was described and the previous records of the larval stages of this species were briefly discussed. Subsequently during the 3rd cruise of R.V. "Kalava" in the Laccadive Sea a very interesting scombroid type of larva with a conspicuously long snout was obtained which though resembles superficially larval swordfish does not appear to belong to that species.

The larva referred to above is shown in Fig. 1, and the body measurements are given in Table I. Unlike in the *Xiphias* larva of about this stage,



FIGS. 1-2. Fig. 1. Unidentified swordfish-like larva, 6.32 mm. Fig. 2. *Xiphias gladius* larva, 6.80 mm.

the postanal portion is longer, the body is almost devoid of chromatophores, the snout is proportionately longer with the upper jaw projecting conspicuously beyond the lower jaw, the supraorbital ridge is less prominent and the body is laterally compressed. In swordfish larva the postanal portion is very short, the head and the preanal portion of the body are heavily pigmented, both the jaws are of about the same length, the snout is not proportionately so long in relation to the body length, the supraorbital crests are more prominent with 7 or 8 spines and the body is stout and laterally rounded. The above characters are fairly constant in the larvae of swordfish described by Sanzo (1930), Arata (1954), Tåning (1955), and Yabe *et al.* (1959).

TABLE I
Measurements of swordfish-like larva in mm.

Station	Date	Total L.	Standard L.	Head L.	Snout L.	Eye diam.	Upper jaw	Lower jaw	Snout to dorsal	Snout to vent.	Post-anal
"Kalava" 441 11° 19' N. 73° 10' E.	25-4-1959	6.32	6.06	2.82	1.78	0.47	2.25	1.93	3.08	4.34	1.98

L = Length.

The only distinct chromatophores present on the body of the unidentified swordfish-like larva consist of a row of about seven tiny black spots on either side of the base of the middle of the dorsal finfold and a fairly large chromatophore towards the posterior aspect of the base of the anal finfold. The tip of the snout and the dorsal aspect of the head and abdomen have a slight brownish colouration but distinct chromatophores cannot be made out.

The question is, if this is not the larva of *Xiphias gladius*, of what it could be? In general appearance it resembles a scombroid larva but in the absence of a connected series its correct identity could only be a matter of speculation. It has not been possible to count the myotomes accurately but it is definite that there are more than fifty. The only scombroid with more than 50 vertebrae is *Acanthocybium solandri* which has 54-66 vertebrae. In case the above larva is of a scombroid the only possibility is that it could be of the above species. Nothing, however, is known about the developmental stages of *Acanthocybium*. If the shape of the snout is any index;

the snout of the larva under discussion appears to be rather too long in comparison to that of the adult of *A. solandri* and the upper jaw projects beyond the lower jaw in the larva under discussion while in the adult of the above species the lower jaw projects slightly beyond the upper jaw.

In view of our very imperfect knowledge of the developmental stages of fishes occurring in this region proper identification of the larva at this stage is out of the question. The object of describing the same is to bring this interesting specimen to the notice of the workers who might have occasion to see older stages of this which would help to facilitate its identity. Extensive collections have been made from this region during the recent years by the participants of the International Indian Ocean Expedition and it would be interesting if similar specimens when found could either be described or sent to me for study.

The specimens of larval swordfish collected by the "Dana" Expedition have been sorted out and worked by Täning (1955). He refers to the collection of 7 specimens ranging in length from 4.9 to 17.1 mm. from five different localities in the Indo-Pacific of which the only area in the Indian Ocean is off the west coast of Sumatra. No further details are given. However, in a collection of sailfish larvae sent to me by the Carlsberg Foundation a stray specimen of swordfish larva was found which is figured and described here. This larva was collected from "Dana" Station No. 3857 I (Lat. 4° 31.8' S., Long. 99° 13' E.) off the west coast of Sumatra in the Eastern Indian Ocean.

The specimen is 6.80 mm. in total length and has the unmistakable characters of larval *Xiphias gladius*. It is shown in Fig. 2 and the body proportions are given in Table II. Stages between 6 and 7 mm. have already

TABLE II
Measurements of Xiphias gladius larva in mm.

Station	Date	Total L.	Standard L.	Head L.	Snout L.	Eye diam.	Upper jaw	Lower jaw	Snout to dorsal	Snout to ventr.	Post-anal
"Dana" 3857 I 4° 31.8' S. 99° 13' E.	18-10-1929	6.80	6.51	2.98	1.62	0.58	2.30	2.19	3.08	4.71	2.69

L = Length.

been described by Sanzo (1930), Arata (1954) and Yabe *et al.* (1959) and this specimen agrees with those in all essential features. This is probably the youngest larva described so far from the Indian Ocean. Even at this stage the rudiments of the scales are indicated by the presence of minute projections on some parts of the body.

In my earlier note on the larva of *Xiphias gladius* I had pointed out the rather abrupt difference in body proportions and general appearance between the very early larvae hatched out of eggs considered as belonging to swordfish collected from the Mediterranean by Sella (1911) and Sanzo (1922) and the postlarvae described by Sanzo (1930) and Arata (1954). Since then Yabe *et al.* have described a larval swordfish 5.1 mm in total length from the Pacific. In spite of the fact that there is no marked elongation of the snout it has the unmistakable features of the swordfish larva. On the other hand, the larvae described by Sella (*op. cit.*) and Sanzo (*op. cit.*) have yet to attain these characteristic features in spite of the fact that the oldest larva described by the latter is 5.56 mm., *i.e.*, longer than the smallest described by Yabe *et al.* (*op. cit.*). The body proportions of all swordfish larvae up to 6.80 mm. so far described are given in Table III for comparison. As

TABLE III
Measurements of Xiphias gladius larvae in mm

Characters	Authors							
	Sella (1911)	Sanzo (1922)	Yabe <i>et al.</i> (1959)	Sanzo (1922)	Arata (1954)	Sanzo (1930)	Yabe <i>et al.</i> (1959)	Jones (in this paper)
Total length	4.50	4.96	5.1	5.56	6.3	6.40	6.4	6.80
Head length	0.76	1.24	1.8	1.32	3.1	2.75	3.0	2.98
Snout length	0.13	0.22	0.5	0.25	1.5	1.34	1.3	1.62
Eye diameter	0.29	0.41	0.5	0.37	0.7	0.66	0.6	0.58
Preanal length	2.64	2.92	3.6	3.31	4.3	4.56	4.8	4.71
Preanal body length (without head)	1.88	1.68	1.8	1.99	1.2	1.81	1.8	1.73
Postanal length	1.86	2.04	1.5	2.25	2.0	1.84	1.6	2.09

already stated the abrupt differences in feature between the early larvae described from the Mediterranean and the postlarvae described from there and elsewhere require an explanation. It is hoped that this will receive the attention of workers who will have the opportunity to examine *Xiphias* larvae.

ACKNOWLEDGEMENT

My thanks are due to Mr. M. Kumaran for the very able laboratory assistance given and for the preparation of the diagrams.

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