

Leptocephalae of the Eel *Anguilla obscura* found in the Stomachs of Skipjack Tuna *Katsuwonus pelamis* caught near New Guinea*

By

Isao MATSUI, Toru TAKAI and Akiyoshi KATAOKA

Introduction

On October 4, 1959, the training ship "Cyoho-maru" of Yamaguchi Fisheries High School caught many skipjack tuna (*Katsuwonus pelamis*) on hooks at a station near the north east coast of New Guinea, position 5°11'S, 153°48.5'E. In the stomach of two fishes many leptocephalae of measuring 41-48mm in total length were found. So far as the authors are aware, no anguillid leptocephalae have previously been found in the stomachs of fishes, though PETERSEN (1905) reported some young eels in the stomach of *Gadus callarias* and *Gadus virens* at one of the "Thor's" trawling stations in Skagerak, North Atlantic. This paper describes the morphological characters of the anguillid leptocephalae and determines this identify.

Material and Methods

The present specimens were taken from the stomach of two skipjack tuna which were hooked at the station shown by the double circle in Fig. 1. Specimens were preserved in 5% formalin solution. The counts and measurements of various parts of body were made by the same methods as those used by JESPERSEN (1942). We identified the leptocephalae using the data of EGE (1939), JESPERSEN (1942) and CASTLE (1963).

Description

Measurements in mm: total length 45.7 (41.0-48.4), head 3.5 (3.5-4.1), snout 1.1 (1.1-1.5), eye 1.1 (1.1-1.4) maxillary 2.1 (1.9-2.4), pectoral 1.4 (0.8-1.4), preanal 33.2

* Contribution from the Shimonoseki University of Fisheries, No. 609.
Received Oct. 26, 1970.

(30.8-35.1), predorsal 31.3 (29.9-34.0), great depth 7.5 (6.5-7.5). Myomeres 75+33=108 (103-109), a-d=5 (3-5), 1st vertical blood vessel at 16 (16), 2nd at 37 (34-38), 3rd at 44 (43-44), anterior margin of gall-bladder at level at 29 (26-29) myomere. Measurements and counts of body in specimens were shown in Table 1.

Body moderately elongate, compressed, deep, with the great depth contained about six times in total length. Head short, about one-thirteenth of total length; snout short, about one-third of head length; anterior and posterior nostrils well separated; eye equal to length of snout, oval; cleft of mouth oblique, extending almost to level of posterior margin of eye. Pectoral fin about 1.2 times diameter of eye, rounded. Median fin well developed with fin rays.

Colour in preservative translucent with black pigment restricted to the chorioid of the eye.

Table 1. Measurements (mm) and counts of five specimens of *Anguilla obscura*. BL, Body length; AL, anal length; SD, snout-dorsal distance; ADL, ano-dorsal distance; HL, head length; HH, head height; SL, snout length; ML, maxillary length; ED, eye diameter; BD, body depth; PL, pectoral fin length; AFL, anal fin base length; DFL, dorsal fin base length; TM, total myomere; POM, postanal myomere; DPM, predorsal myomere; LBV, position of last vertical blood vessel at level of myomere; GBS, position of gall-bladder at level of myomere; ADM, ano-dorsal myomere.

Specimen	M 3 1 0 0 1	M 3 1 0 0 2	M 3 1 0 0 3	M 3 1 0 0 4	M 3 1 0 0 6
BL	45.7	41.0	48.4	44.0	47.7
AL	33.2	30.8	35.1	32.8	35.0
SD	31.3	29.9	34.0	30.8	33.4
ADL	1.9	1.5	1.1	2.0	1.6
HL	3.5	3.5	3.5	4.1	3.8
HH	2.0	2.1	2.0	1.9	2.3
SL	1.1	1.3	1.3	1.5	1.2
ML	2.1	2.4	2.1	2.0	1.9
ED	1.1	1.4	1.1	1.3	1.2
BD	7.5	6.7	6.5	7.1	7.0
PL	1.4		0.8	2.1	1.1
AFL	11.5	10.4	13.2	11.1	12.7
DFL	14.4	11.3	14.3	9.0	11.1
TM	108	103	109	108	108
PAM	75	68	72	73	70
POM	33	35	37	35	38
DPM	70	64	69	68	65
LBV	44	44	43	44	43
GBS	29	27	26	29	27
ADM	5	4	3	5	5

Discussion

According to EGE (1939), the species of anguillid eels of short finned type which inhabit in the Indo-Pacific are : *Anguilla australis*, *A. bicolor* and *A. obscura*. The position of the renal portal vein is situated in the 45th to 46th myomeres in *A. australis* and in the 48th myomere in *A. australis schmidti* (CASTLE, 1963). The 43th to 44th myomeres of the present specimens undoubtedly differ from those of *A. australis*. EGE (1939) reported that *A. bicolor* occurs in the waters near the sampling station of the present leptocephalae. But *A. bicolor* is clearly different from the present leptocephalae in having a very narrow space on the ano-dorsal distance, as mentioned by JESPERSEN (1942).

As to the remaining species, *A. obscura*, the leptocephalus has the following morphological characters : preanal myomeres 67-68 in number, total myomeres 102-108 in number, anterior margin of gall-bladder at level of 27th myomere, a-d=5-6, and major vertical blood vessels at 15th to 17th, 35th to 37th and 42th to 47th myomeres respectively, as shown by JESPERSEN (1942) and CASTLE (1963). In these characteristic features, the present leptocephalae agree well with the leptocephalus of *A. obscura*. In addition to such evidence, the sampling station of the present leptocephalae falls on the distributional range of the leptocephalus of this species, as reported by JESPERSEN (1942) (Fig. 1.), and also the sampling month of the present leptocephalae agree well with that of leptocephalus of *A. obscura* reported by JESPERSEN (1942).

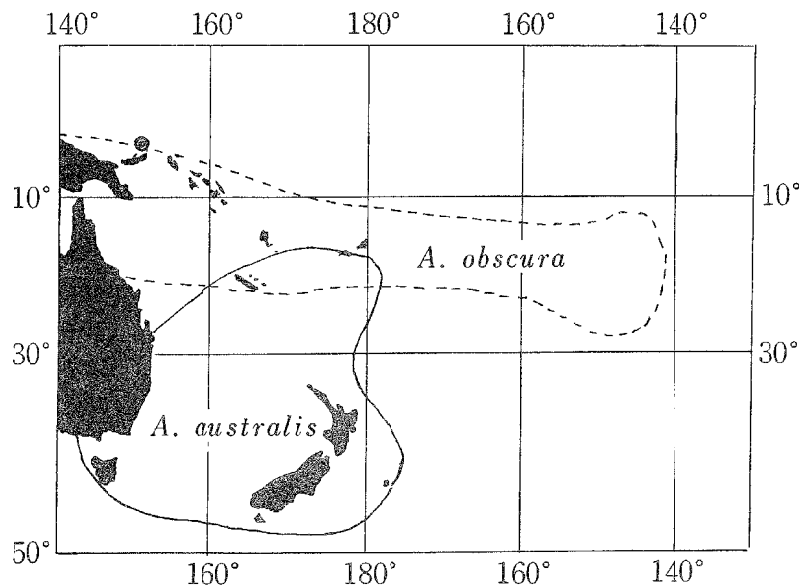


Fig. 1. Showing sampling station (⊙) of the present specimens. And distribution shown by curves of short-finned species of *Anguilla* in the South Pacific (after JESPERSEN, 1942).

We therefore conclude that the present leptocephalae are *Anguilla obscura*.
The skipjack tuna must be a predator of leptocephalae.

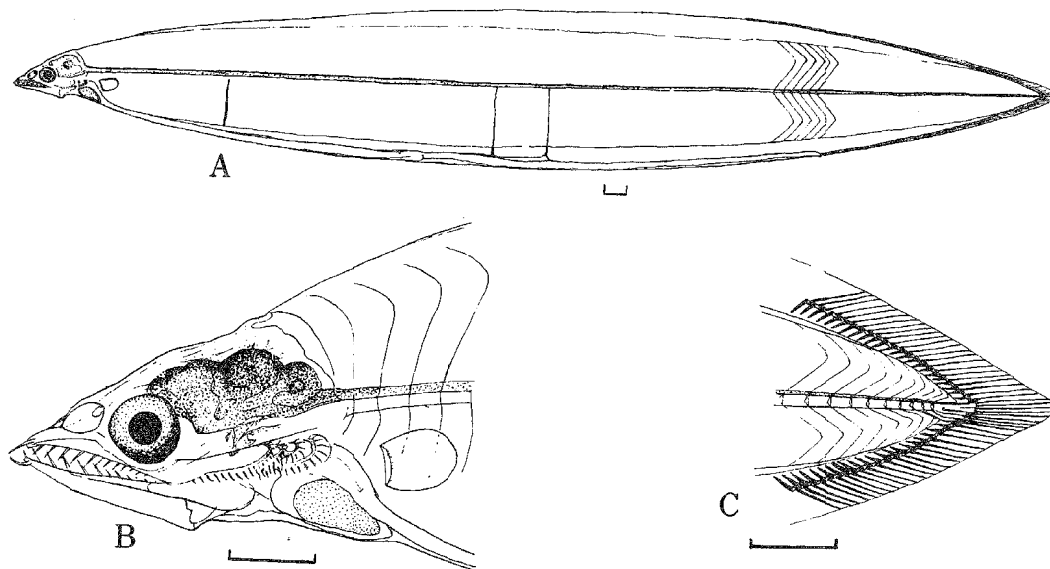


Fig. 2. *Anguilla obscura*, 45.7mm total length. A, Lateral view, to show distribution of major vertical blood-vessel, intestine and myomere at level of vent. B, Lateral view of head. C, Lateral view of caudal region. Scales represent 1mm.

References

1. CASTLE, P.H.J., 1963: Anguillid leptocephali in the Southwest Pacific. *Zool. Publ. Victoria Univ.*, 33, pp.1-14.
2. EGE, V., 1939: A revision of the genus *Anguilla* Show. A systematic, phylogenetic and geographical study. *Dana Rep.*, 16, pp.1-256, 6pls.
3. JESPERSEN, P., 1942: Indo-Pacific leptocephalid of the genus *Anguilla*. Systematic and biological study. *Dana Rep.*, 22, pp.1-127, 4pls.
4. PETERSEN, C.G.J., 1905: Larval eels (*Leptocephalus brevirostris*) of the Atlantic coasts of Europe. *Medd. Komm. Fisk.*, 1-5, pp.1-9.