

A Leptocephalus Larva of *Elops hawaiiensis* (Elopiformes: Elopidae) from Jeju Island, Korea

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Three specimens of leptocephalus larvae (33.4~35.2 mm in SL) were collected from the southern coast of Jeju Island, Korea, by an aquatic lamp on August 14, 2004. These larvae were identified as *Elops hawaiiensis* because of their having a forked caudal fin, a smaller anal fin than dorsal fin, and anal-fin position posterior to dorsal fin.

Key words : Leptocephalus larva, *Elops hawaiiensis*, Jeju Island, description

Introduction

Larval stages of elopiform fishes have attracted great interest among ichthyologists due to their unusual leptocephalus development, a ribbon-shaped translucent larval stage found in no other fish group but the Anguilliformes and Notacanthiformes (Richards, 1969, 1984). Elopiform leptocephali are readily differentiated by their conspicuous forked caudal fins from other leptocephali, which have reduced or no caudal fins at all (Richards, 1984).

Recently we collected three leptocephalus larvae belonging to the family Elopidae (Elopiformes) from the southern coast of Jeju Island, Korea. In Korea, three species of *Elops*, i.e., *E. saurus* Linnaeus 1766, *E. machnata* Forsskål 1775, and *E. hawaiiensis* Regan 1909, were reported from the southern coast of Korea by date (Mori, 1952; Chyung, 1977; Youn, 2002).

However, larvae of *Elops hawaiiensis* have never been known from Korea, although the larvae of *E. machnata* has been reported from the south-

ern coast of Korea (Kim, 1983), and the larval occurrence and their morphology of *Elops* from Korea have not been well studied yet. In the present study, we describe the external morphology of the larva of *E. hawaiiensis* on the basis of three specimens from Jeju Island and provide an identification guide of the larval fishes of the genus *Elops* from Korea.

Materials and Methods

Specimens examined were collected from the southern coast of Jeju Island, Korea using an aquatic lamp (200W) on August, 2004. They were fixed in 4% formalin solution made with seawater, and preserved in 70% ethyl alcohol solution. They were observed under a stereomicroscope (Olympus SZH10, Japan), and illustrated using a camera lucida. Measurements were made to the nearest 0.1 mm using a profile projector (Mitutoyo PJ-3000, Japan).

Description

Specimens examined. MRIC-L (Larval Fish

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collection of Marine and Environmental Research Institute, Cheju National University, Korea) 001~003. Three specimens, 33.4~35.2 mm in standard length (SL), collected from Wimi fishing port, Namwon-eup, Namjeju-gun, Jeju-do, Korea by an aquatic lamp (200W) on 14 August, 2004 (20 : 35 ~ 21 : 35). Water temperature on surface 26.0°C.

Measurements and segmental characters were shown in Table 1.

Body elongate and compressed, deepest on kidney, its depth 12.8~13.5% of SL. Head depressed and relatively short, 8.0~8.5% of SL, dorsal profile nearly straight. Snout rather round, lower

jaw slightly longer than upper jaw, gape slightly oblique, reaching below the pupil; nasal capsule formed. Eye oval, its diameter 17.9~20.3% of head length. Teeth niddle-like, sprouting irregularly. Dorsal fin situated between 54th~59th myomeres, occupying 5~6 myomeres and with 21 unossified fin rays. Anal fin situated between 61st~64th myomeres, occupying 4 myomeres, and 12~13 unossified fin rays. Dorsal and anal finfolds disconnected with caudal fin. No rays in pectoral fin. Pelvic fin not appearing. Gas bladder situated between 31st~32nd myomeres. Caudal fin large and forked, fixed in number, 19 (10+9). Caudal skeleton differentiated. Gut straight, without swellings.

Table 1. Measurements and myomere counts of three leptocephalus larvae of *Elops hawaiiensis* from Jeju Island, Korea

	MRIC-L001	MRIC-L002	MRIC-L003
Standard length (mm)	33.4	34.1	35.2
Head length	2.8	2.9	2.8
Eye diameter	0.5	0.6	0.5
Body depth	4.5	4.5	4.5
Snout to origin of dorsal fin	28.2	28.6	29.8
Snout to origin of anal fin	31.1	31.7	32.7
Length of caudal fin	2.7	2.6	2.7
Total myomeres	66	66	66
Predorsal myomeres	55	54	54
Preanal myomeres	61	61	61
Preairbladder myomeres	32	32	32
Last blood vessel myomeres	46	47	46

Pigmentation on specimen preserved in alcohol. The melanopores on choroid, and a large melanophores on upper surface of eye (Fig. 1C); one roughly triangular spot beneath base of pectoral fin; a low of minute melanophores numbering 35 along dorsal surface of gut; a row of small black spot along lateral midline in 33.4 mm SL (Fig. 1A). Three to six short stricks on septum of myomeres of lower portion of caudal peduncle region; several melanophores on base of caudal fin and fin rays, especially those on lower lobes thicker.

Distribution. The adult of *Elops hawaiiensis*, widely distributed in the Western Central Pacific Ocean, is known from the southern coast of Korea (Busan, Jinhae) (Youn, 2002), and the larvae are

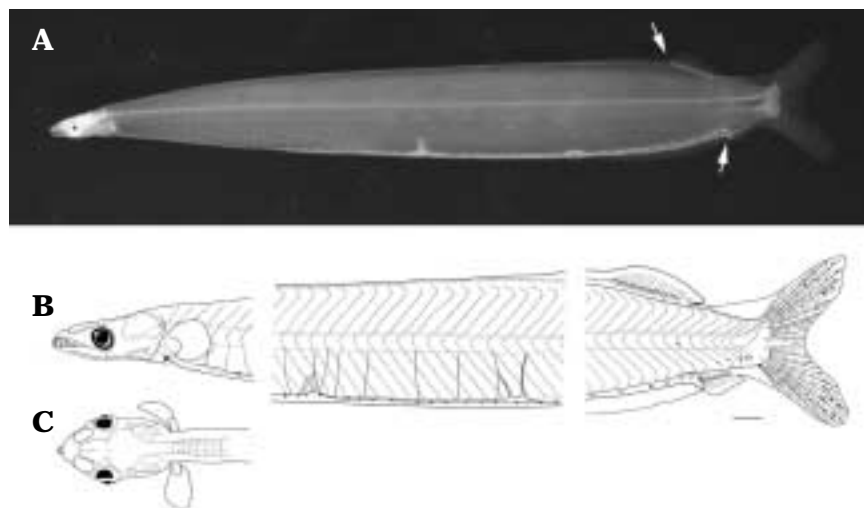


Fig. 1. Leptocephalus larva of *Elops hawaiiensis* collected from the southern coast of Jeju Island, Korea. A. MRIC-L001, 33.4 mm SL; B. MRIC-L002, 34.1 mm SL, lateral views of head, trunk, and caudal regions; C. MRIC-L002, dorsal view of head region of B. Arrows indicate origin of dorsal and anal fins, respectively. Scale indicates 1 mm.

reported from southern coast of Jeju Island in Korea (present study).

Remarks. The tenpounders (family Elopidae), comprising about six species in one genus *Elops* Bonaparte, 1831 (Whitehead, 1962), are distributed in tropical and subtropical oceans of the world (Nelson, 1994). From Korea, three species of them have been reported: *E. saurus* (Mori, 1952), *E. machnata* (Chyung, 1977; Kim, 1983) and *E. hawaiiensis* (Youn, 2002). Occurrence of a larva of *Elops* is only by Kim (1983) from the southern coast of Korea.

According to the recent revision of *Elops* by Whitehead (1962), *E. saurus* is an Atlantic species and would not occur in Korea. It means that the report of *E. saurus* from Busan and Jinhae, Korea by Mori (1952) is a misidentification of some other species of *Elops*. Chyung (1977) described *Elops machnata* from the southern coast of Korea and also presented a figure of a leptocephalus larva of the species collected at the river mouth of Nakdong River. However, he did not give any description of the larva. According to Mochioka (1988), the larvae of the family Elopidae is discriminated from those of the closest family Albulidae by the origin of anal fin, i.e., in the former, the origin of anal fin situated below or slightly posterior to the end of dorsal fin, whereas in the latter, the origin of anal fin situated quite posterior to the end of dorsal fin. Judging from the figure (Pl. 21, fig. 3) of a leptocephalus larva given by Chyung (1977), it is not a fish of Elopidae but a fish belonging to Albulidae because origin of anal fin is quite posterior to the end of the dorsal fin. In addition, it is similar to those of *Albus vulpes* by Mochioka (1988) in the characteristics of the shape of head, short anal fin base, and presence of pelvic fin. While, the figure (Pl. 22, fig. 3) identified as a leptocephalus of *Megalops cyprinoides* by Chyung (1977) is not a member of *Megalops* but *Elops*, because that figure is similar to the description of *Elops hawaiiensis* by Sato and Yasuda (1980), and by Mochioka (1988) in overall body shape and a relative position of dorsal and anal fins.

Three leptocephalus larvae examined in the present study were identified as *E. hawaiiensis* because morphological characteristics (myomeres and pattern of melanophores of body) of the specimens agreed well to those by Sato and Yasuda (1980) and Mochioka (1988).

Although Kim (1983) reported occurrence of larvae of *Elops machnata* from the Changseon

Strait on southern coast of Korea, the taxonomy of the species of *Elops* from Korea is still confusing, because the description by Chyung (1977) is not only incorrect and insufficient, but also any of his specimens, including larvae and adults, have not been maintained.

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제주도 남부연안에서 출현한 당멸치 *Elops hawaiiensis* (당멸치목: 당멸치과)의 엽상자어

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2004년 8월 제주도 남부연안에서 집어등에 의한 연안 자치어 조사과정 중에 당멸치과(당멸치목)에 속하는 엽상자어 3개체(표준체장 33.4~35.2 mm)를 채집하였다. 이들 엽상자어는 꼬리지느러미가 이차하고, 뒷지느러미가 작으며, 그 기점이 등지느러미 후단부 하방에 위치하는 점에서 '당멸치 *Elops hawaiiensis*'로 동정되었다.