

Observation of a Large Metamorphosing Leptocephalus in a Coral Reef Habitat at Sangeang Island, Indonesia

Michael J. Miller^{1,*}, Jerry Powell², and Katsumi Tsukamoto¹

¹Ocean Research Institute, University of Tokyo, Nakano, Tokyo 164-8639, Japan

²Winterthur Museum and Country Estate, Winterthur, Delaware 19735, USA

(Accepted September 23, 2008)

Leptocephali are rarely seen or photographed in nature, and their ecology is poorly known. A large greenish-colored leptocephalus larva was observed and photographed as it slowly moved along the bottom in a coarse sand and coral clump area (8°09'S, 119°06'E) adjacent to Sangeang I., Indonesia on 26 June 2008. This volcanic island is in the southern Flores Sea just northeast of Sumibawa I. and northwest of Flores Island (Fig. 1). The observation was made at a depth of about 4-5 m, and the leptocephalus was photographed (Nikon D100, Nikon 60-mm f2.8 lens, and dual Ikelite DS-125 strobes) at about midday, at a water temperature of about 27-28°C. The large transparent larva showed no response to the scuba diver taking the photos (JP) or the flash of the camera, and was estimated *in situ* to be larger than 400 mm in length.

Examinations of the photographs indicate that the leptocephalus had a distinctly rounded tail (Fig. 2A), and no apparent gut swellings or distinct pigmentation (Figs. 2, 3), which are all characteristics of leptocephali of the Muraenidae (Smith 1989, Miller and Tsukamoto 2004). It apparently had no teeth (Figs. 3A, B) and had developed externally protruding nostrils (Figs. 3C, E), so was likely undergoing metamorphosis. A remarkable feature of this leptocephalus was its greenish coloration that was most distinct along the dorsal margin of the body and on the head (Figs. 2, 3). The greenish color may represent the initial stages of pigment formation as it transforms into the pigmented elver stage.

Despite many collections of muraenid leptocephali in the Atlantic and Indo-Pacific, no greenish-colored leptocephalus or muraenid larva of this apparent size has been reported (Smith 1989, Miller and Tsukamoto 2004). The larvae of some taxa of moray eels, such as those of *Rhinomuraena*, which have very prominent external nostrils as adults, have never been collected or distinguished among muraenid leptocephali, so this larva may be one of those never before observed leptocephali. If this larva was behaving normally, it suggests the possibility that this species has a different type of behavioral strategy than other taxa of leptocephali,

which may explain why it has never been collected during surveys for leptocephali. <http://zoostud.sinica.edu.tw/Journals/48.1/107.pdf>

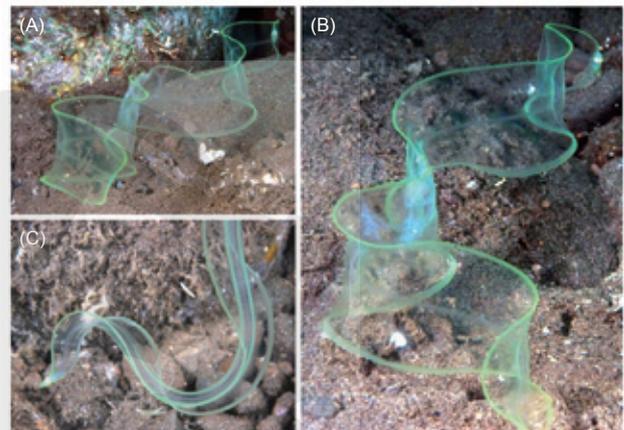


Fig. 2. Photographs showing the transparent body and rounded tail (A, B), and the anterior region of the body (C) of the large leptocephalus that was observed near Sangeang I., Indonesia on 26 June 2008.

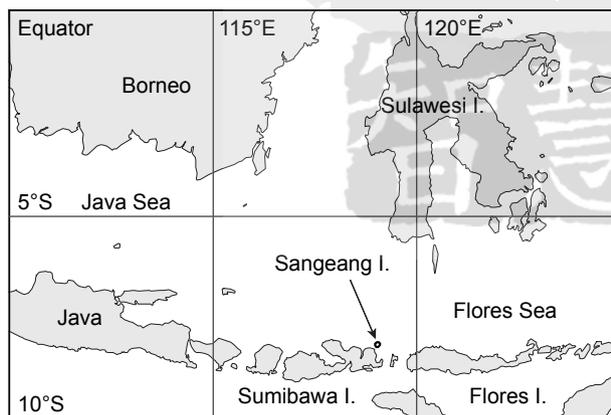


Fig. 1. Map showing the location where a large leptocephalus was observed along the northeastern side of Sangeang I., Indonesia, in the Flores Sea.

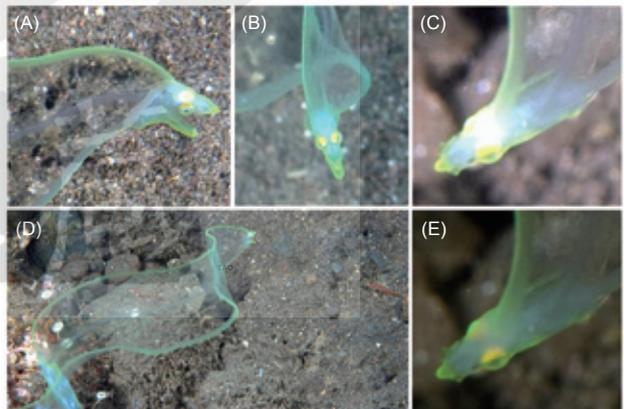


Fig. 3. Photographs showing a lack of teeth and greenish coloration of the head of the leptocephalus (A, B), the external nostrils (C, E), and the size of the larva in relation to 2 small reddish-colored gobies (apparently of the genus *Eviota*) (D). Unprocessed (E) and processed images (C) of an enlargement of the head (from Fig. 2C) show that the greenish color was not an artifact of the lightening of the photographs.

Acknowledgments: We thank David G. Smith of the Smithsonian Institution (Washington DC) and Jeff Leis and Mark McGroutner of the Australian Museum (Sydney, Australia) for discussions about this observation of a large leptocephalus, and Doug Hoese of the Australian Museum for confirming the goby genus.

REFERENCES

Miller MJ, K Tsukamoto. 2004. An introduction to leptocephali: biology and identification. Tokyo: Ocean Research Institute, University of Tokyo, 96 pp.
Smith DG. 1989. Family Muraenidae: leptocephali. In Böhlke EB, ed. Fishes of the western North Atlantic. Mem. Sears. Foundat. Mar. Res. 1: 900-916.

*To whom correspondence and reprint requests should be addressed. E-mail: miller@ori.u-tokyo.ac.jp