

## WEST INDIES LABORATORY

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P.O. ANNEX BOX 4010, CHRISTIANSTADT, ST. JOHN, U.S. VIRGIN ISLANDS  
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EEL LARVAE, *LEPTOCEPHALUS TUBERCULATUS* Castle, 1965, (MORINGUIDAE)  
IN SOUTH ATLANTIC WATERS

INTRODUCTION This leaflet describes five new specimens of a rare eel larva, distinctive in having the intestine swollen and looped dorsally at one point just anterior to the vent. These specimens (35.0-42.0 mm TL, 100-103 myomeres) were collected in the South Atlantic Ocean between Brazil and St. Peters and St. Pauls Rocks by the USCGC *Evergreen* during February 1966.

A similar larva, with the same intestinal structure, has been described only once before: *Leptocephalus tuberculatus* Castle (1965a), based on two specimens (32.7-33.5 mm TL, 100-101 myomeres) found beachcast at Sydney, Australia, in 1907. Castle was unable to assign his larvae to a known genus, but did refer *L. tuberculatus* to the family Moringuidae because of the similarity of these larvae to a group of early and metamorphic leptocephali of *Moringua* (Castle, 1965a).

Castle's type and paratype of *L. tuberculatus* and these South Atlantic specimens agree closely in measurements and meristic values but contain major differences in pigmentation. Although these widely separated larvae might belong to two distinct species or subspecies, they are of the same genus and should tentatively retain the same name, *L. tuberculatus*, until further moringuid studies reveal their specific identities.

ACKNOWLEDGMENTS I am indebted to Mr. J. W. McGary, Director of Oceanography, and Mr. R. B. Elder, Chief of Special Projects, of the United States Coast Guard Oceanographic Unit, Washington, D. C., who donated to the Laboratory 33 South Atlantic plankton samples from which these larvae were derived.

I wish to thank Dr. John C. Briggs, University of South Florida, for critically reviewing the manuscript. My thanks are also extended to Miss Robin Ingle, Scientific Illustrator, Florida Board of Conservation Marine Laboratory, for her drawings of *L. tuberculatus*.

MATERIAL EXAMINED (Florida Board of Conservation Marine Laboratory Collection) (5 specimens): 35.0 mm, 37.5 mm, 38.0 mm TL (FBC 4130L), Station EG12-1, Lat. 00°41'N, Long. 31°35'W, 4 February 1966 (0327 hrs),

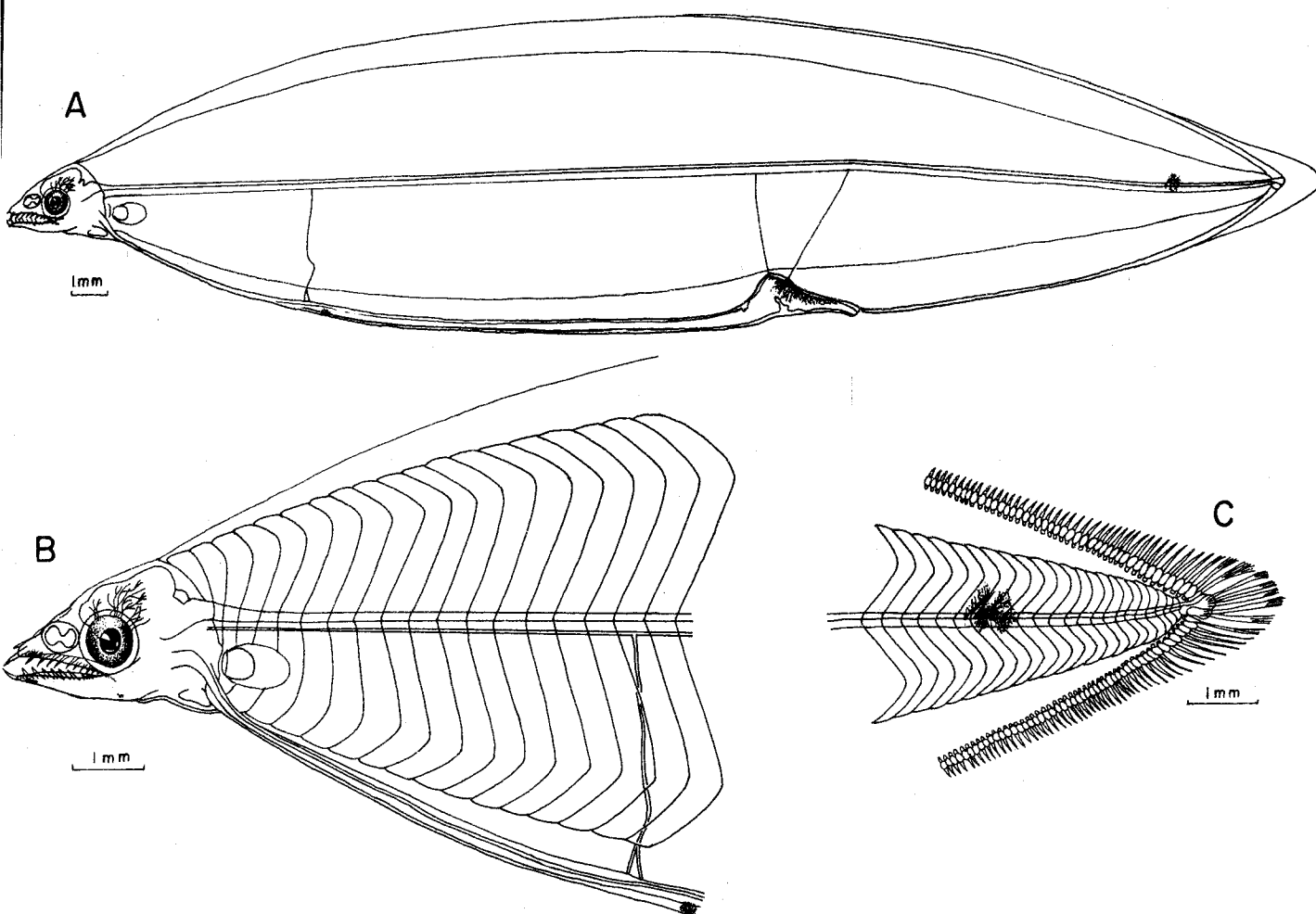


Figure 1. *Leptocephalus tuberculatus* (37.5 mm TL, FBC 4130L).  
 A - lateral view of body. B - lateral view of head.  
 C - lateral view of caudal area.

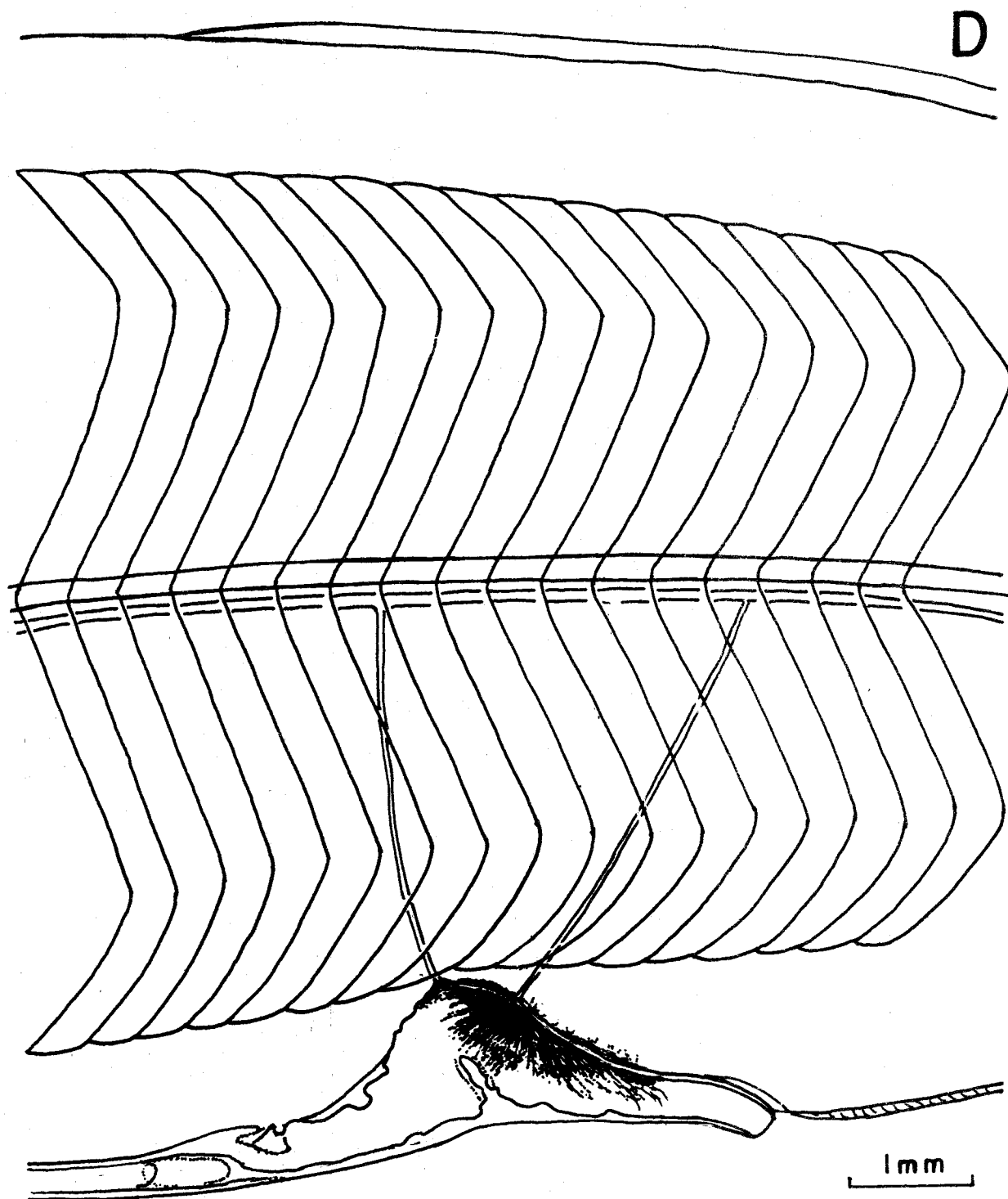


Figure 1 (cont'd). D - lateral view showing structure and pigmentation of intestinal loop.

30 min. surface tow; 41.2 mm, 42.0 mm TL (FBC 4131L), Station EG5-2, Lat. 01°41'S, Long. 35°54'W, 9 February 1966 (0123 hrs), 30 min. surface tow. Specimens were collected with a one-meter nylon plankton net of #30 grit gauze (cod end #56 grit gauze).

**METHODS** Methods of measurements and counts follow those of Eldred (1966). Larvae, preserved in three to five per cent buffered formalin, were examined (left side of specimen) under a Zeiss low-power, polarizing microscope. Measurements were made with a pair of fine-point dividers, marked off on a millimeter scale, and estimated to the nearest 0.1 mm.

**DESCRIPTION** (5 specimens). Measurements (ranges) in mm: total length 35.0-42.0, preanal length 23.0-27.3, postanal length 12.0-15.6, head length 2.6-3.0, snout length 0.9-1.0, eye diameter (vertical) 0.6-0.9, postcranial depth 1.8-2.0, depth at base of pectoral 2.2-3.0, maximum depth 8.5-9.9. Total myomere number 100-103, preanal myomeres 53-58, postanal myomeres 45-50, anterior margin of liver at level of myomeres 18-20 and posterior margin at myomeres 42-46, anterior margin of gall bladder at myomeres 40-44. Dorsal fin origin at level of myomeres 41-44 (a-d=+11-+15), first major vertical artery at level of myomeres 18-20, renal artery at myomeres 45-49, renal-portal vein at myomeres 52-56. Caudal rays 3+2, 4+3, 4+4, branchiostegal rays ?12-13 in two specimens (41.2-42.0 mm). Teeth  $\frac{1+V-VI+7-13}{1+VI-VII+3-7}$ .

Body elongate-oval, much compressed, deep with maximum depth (at dorsal fin origin) about 24% of total length, gradually tapering to head and caudal region (Figure 1A). Intestine straight and narrow except close to vent where it becomes swollen and looped dorsally (Figure 1A and D). Liver long and narrow but thickened just in front of intestinal loop, kidney terminating over vent. Head small (Figure 1B), jaws pointed and equal, teeth numerous. Eye slightly oval with narrow fleshy margin, large nasal capsule placed between dorsal edge of snout and eye margin. Dorsal fin origin about 11 to 15 myomeres in advance of anus, dorsal and anal fins well developed with short rays, caudal fin with well developed hypurals and rays (Figure 1C) pectoral fin elongate-oval and equal to length of snout.

Pigmentation of the head consists of a widely scattered dendritic pattern of chromatophores extending dorsally from the eye to the dorsal portion of the brain (Figure 1B), a small diffused chromatophore on the dorsal surface of the snout above the nasal capsule, small chromatophores on the upper jaw between the bases of the 1st, 2nd, and 3rd large teeth, an elongate chromatophore on the lower jaw between the bases of the 1st and 3rd large teeth, and one small elongate chromatophore near the posterior ventral surface of the lower jaw. Pigmentation of the body consists of one large diffused chromatophore over the ventral and lateral surface of the intestine at level of myomere 23, a very large distinctive dendritic pattern of chromatophores covering the dorsal, lateral, and posterior surfaces of the looped intestine just before the vent between level of myomeres 46-50 (Figure 1D), a large surface and subsurface, dendritic chromatophore extending over myomeres 85 to 88 at and above the midline (Figure 1C).

REMARKS The measurements and meristic values of these South Atlantic specimens correspond closely with the larvae of *L. tuberculatus* Castle from Australia. In Castle's larvae, however, the dendritic pigmentation above the eye is absent, the large diffused chromatophore on the intestine at level of myomere 23 is not present, the chromatophore pattern on the intestinal loop is not nearly so pronounced as in the present larvae, and the midlateral chromatophore is smaller and not so near to the caudal fin. Despite these major differences in pigmentation, I believe that, at least for the present, the South Atlantic specimens should be referred to *L. tuberculatus*.

*L. tuberculatus* differs from *Moringua* larvae (Castle, 1965a; Eldred, in manuscript) in the number of myomeres and pigmentation (*Moringua* larvae contain an alternate series of seven or more large midlateral chromatophores, while *L. tuberculatus* has only one midlateral chromatophore). Although Castle (1965a) was unable to place this new eel species in a distinct genus, he assigned it to Moringuidae, since the structure of the intestine (swollen and looped only in front of the vent) and the pigmentation are so similar to that found in larvae of the genus *Moringua*. Castle (1965a) also pointed out that *L. tuberculatus* might belong elsewhere in the various eel families. However, additional work by Castle (1965b and 1965c) and my present studies of larval eels have shown that the structure and size of the intestine and liver are important and reliable larval characters, especially in the broad sorting of leptocephali, which should lead to familial distinctions.

Much taxonomic confusion exists within the family Moringuidae (Parr, 1930; Trewavas, 1932; Gordon, 1954; Gosline and Strasburg, 1956) and the validity of genera distinct from *Moringua* has not to my knowledge been definitely established. Although Castle's larvae of *L. tuberculatus* and these South Atlantic specimens may be the young of separate species or subspecies, they are both of the same unknown genus and must await final identification in future moringuid studies.

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