

## Observations on Living Juvenile Specimens of the Slender Mola, *Ranzania laevis* (Pisces, Molidae)<sup>1</sup>

BRUCE H. ROBISON<sup>2</sup>

*Ranzania laevis* (Pennant) is an epipelagic species that spawns in the central North Pacific and ranges throughout the tropical region; although occasional captures have been reported from temperate waters (Parin 1968). The captures reported herein are the second and easternmost Pacific record of juvenile stages; the first was of a 108-mm specimen obtained in a Honolulu market (Jordan and Evermann 1903, Snyder 1913). To my knowledge this is the first report of observations on living juveniles.

Thirteen specimens, ranging from 99 to 109 mm in total length, were captured by a mid-water trawl during two oblique nighttime hauls that sampled between the surface and a maximum depth of 200 m. Two individuals were collected at 27° 06.3' N, 137° 57.9' W and 11 living specimens were taken at 29° 12.4' N, 130° 15.3' W. The excellent condition of the live specimens suggests that they were captured near the surface by the ascending net. The collections were made in July of 1971 at localities within transitional water between the California Current and Eastern North Pacific Central Water. Surface water temperatures at the two stations were 21.4° and 20.0° C respectively.

I thank Nancy Burnett for the motion picture footage and Marsh Youngbluth for identification of the zooplankton remains.

### OBSERVATIONS

#### *Living Specimens*

The living specimens were placed in a large aquarium supplied with running seawater where they survived for several hours. Juvenile

*R. laevis* exhibited the diving escape response common to many small pelagic fishes and, during the meter-long dashes allowed by their container, achieved speeds estimated at 90 to 100 cm/sec. A reduction in illumination coincided with a decrease in their darting activity between the walls of the aquarium. At rest they were negatively buoyant, sinking slowly, head-first.

At no time was the cowlike lip structure seen to close. Fitch (1969) found the mouth inflexible on preserved specimens and this was also the case for living individuals. Fraser-Brunner's (1951) speculation that the orifice closes vertically thus seems refuted.

The color of the living specimens was silver on the lateral and ventral surfaces. The dorsal surface was dark brown with blue-green highlights as were the leading edges of the paired fins and the mouth. The lateral bands which are found on the adults were not present (Figure 1). Nor was there any evidence of the eye-sized dark spots described by Snyder (1913) on a similarly-sized specimen.

#### *Motion Pictures*

High-speed photography permitted several aspects of the slender mola's swimming behavior to be observed. The dorsal and anal fins appear to be the sole source of motive power. The pectoral fins were observed to act only as diving planes for attitude control. All observed turns were a result of the fishes' bouncing off the aquarium walls. Thus, the potential roles of the pectoral fins and clavus in controlling lateral turns remains unresolved.

At rest, the dorsal and anal fins assumed a vertical orientation with respect to the body. Most often the two fins functioned in unison, both being directed to one side and then the other. Movement of the dorsal fin occasionally preceded vigorous action by the two fins. During rapid swimming motions the fins were

<sup>1</sup> Ship support was provided under National Science Foundation grant GB 24816 for the R.V. *Alpha Helix*. Manuscript received 1 December 1973.

<sup>2</sup> Hopkins Marine Station, Pacific Grove, California 93950. Present address: Woods Hole Oceanographic Institution, Woods Hole, Massachusetts 02543.

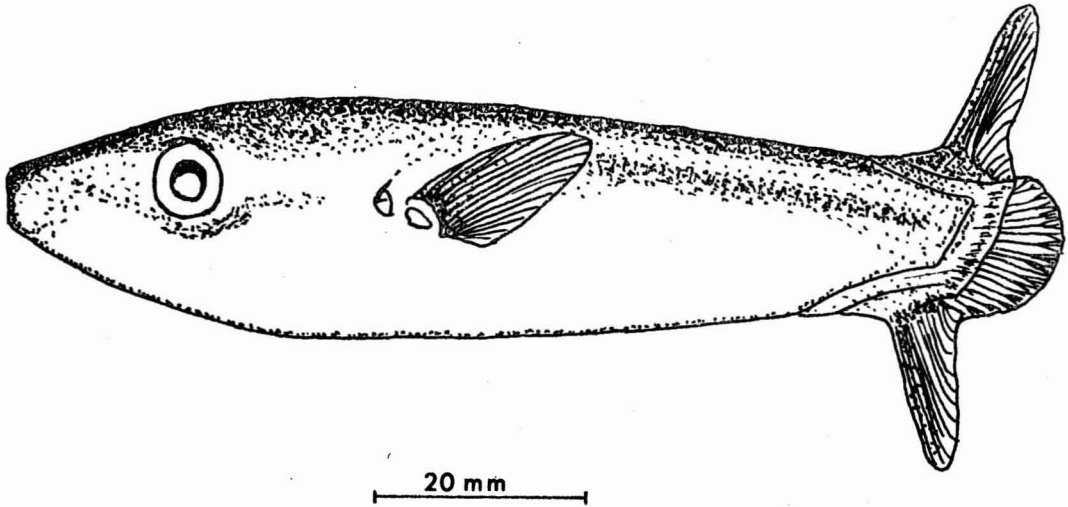


FIGURE 1. *Ranzania laevis* (Pennant), a 100 mm juvenile specimen from the eastern North Pacific.

directed through a sweep of  $160^{\circ}$  to  $190^{\circ}$ . The most rapid beating rate measured was 8 to 12 beats/sec.

#### Dissected Specimens

Raven (1939) figured the musculature of an adult *R. laevis* from Australia, showing the anal lateralis muscle to be larger than the dorsal. In the juvenile, however, the two are of about equal size. As a consequence, the adult body form is much deeper than the juvenile. When contraction was simulated by pulling the left dorsal lateralis muscle, its attached tendons, which lie at right angles to the main muscle body, caused the dorsal fin to flip to the left. No muscle structures were apparent that could cause closing of the oval lip structure.

The stomach contents of seven individuals were examined and found to contain, in addition to a quantity of partially digested material, the exoskeletons of calanoid copepods (*Pleuromamma gracilis*, *Candacia* sp.), cyclopoid copepods (*Oncacea* sp., *Corina* sp.), ostracods, and fragments of amphipods.

#### DISCUSSION

Small crustaceans apparently constitute a significant portion of the diet of the adult (Barnard 1935, Fitch 1969). The stomach con-

tents of these specimens suggest that this may also be the case for juveniles. Feeding probably occurs when zooplankters are encountered during straight-line swimming and perhaps when pursued by quick turns controlled by the pectoral fins. The inflexibility of the carapace rules out twisting turns for prey capture. The presence of *Pleuromamma gracilis*, a vertically migrating species of copepod, indicates that the juvenile stages, at least, feed nocturnally.

These captures indicate that while the adults are most often solitary, the juveniles may associate. The vast numbers of larvae reported by Sherman (1961) in the spawning region and the now apparent speed with which the juveniles could avoid predators and slow-moving trawl nets leads to the speculation that the abundance of *R. laevis* may be far greater than has been previously supposed.

#### LITERATURE CITED

- BARNARD, K. H. 1935. Notes on South African marine fishes. *Ann. S. Afr. Mus.* 30 (5): 645-658.
- FITCH, J. E. 1969. A second record of the slender mola, *Ranzania laevis* (Pennant), from California. *Bull. S. Calif. Acad. Sci.* 68 (2): 115-118.

- FRASER-BRUNNER, A. 1951. The ocean sunfishes (family Molidae). Bull. Brit. Mus. (nat. Hist.) 1: 87-121.
- JORDAN, D. S., and B. W. EVERMANN. 1903. The aquatic resources of the Hawaiian Islands. Bull. U.S. Fish Comm. 23 (1): 1-574.
- PARIN, N. V. 1968. Ichthyofauna of the epipelagic zone. Israel Program for Scientific Translations, Jerusalem. 206 pp. U.S. Dept. of Commerce, TT69-59020.
- RAVEN, H. C. 1939. Notes on the anatomy of *Ranzania truncata*. Amer. Mus. Novit. 1038: 1-7.
- SHERMAN, K. 1961. Occurrence of early developmental stages of the oblong ocean sunfish *Ranzania laevis* (Pennant) in the central North Pacific. Copeia 1961 (4): 467-470.
- SNYDER, J. O. 1913. Notes on *Ranzania makua* Jenkins and other fishes of rare occurrence on the California coast. Proc. U.S. nat. Mus. 44: 455-460.