INTRODUCTION

*Macrobromium amazonicum* (Heller) is one of 26 American species of shrimp in the genus *Macrobromium*. This species is indigenous to freshwater river basins of South America which empty into the Atlantic Ocean (Holthuis, 1952). *M. amazonicum* is one of the smaller members of its genus (50-110 mm TL) making it a desirable bait and forage organism. They were introduced as forage in several reservoirs in northeast Brazil where they became the major constituent of commercial catches (Boschi, 1974). However, biological information concerning this species is limited. This study was conducted to gather information on the laboratory life history of *M. amazonicum*.

MATERIALS AND METHODS

Broodstock obtained from Lima Campos Hatchery, Ceará, Brazil, were held in indoor 300 l freshwater tanks at Heart of the Hills Fishery Research Station, Kerr County, Texas. Mean total lengths (tip of rostrum to end of telson) and live weights with standard errors of 14 males were 85.6±3.4 mm and 5.3±0.7 g, respectively. The largest male was 100 mm (TL) and weighed 5.64 g. Adults were fed Purina shrimp pellets daily. Excess food and fecal material were periodically siphoned from tanks. Sporadic spawning occurred throughout the study at water temperatures of 24-28° C.

After mating, gravid females were isolated in 40 l brood tanks during embryonic development. After the eggs hatched, females were weighed, measured and moved to a 300 l tank. Larvae were counted and transferred directly to culture tanks (40 l) containing brackish water of 10‰ salinity. They were fed newly hatched brine shrimp daily. When larvae were about 8 days old, their diet was supplemented with finely ground shrimp pellets. Tanks were cleaned weekly.

In determining characteristics of larval stages, observations were made of the telson of 10 larvae held in 100 ml beakers (one larva/beaker). Exuviae were removed from beakers and preserved in 60% alcohol and larvae were transferred daily to beakers containing fresh culture media. Telson illustrations for each molt were made from microscope photographs of exuviae.
After metamorphosis, postlarval shrimp (juveniles) were transferred directly to freshwater tanks (120 l and 340 l) without regard to stocking densities. Periodically shrimp were removed from these tanks for use in other experiments. While in the tanks juveniles were fed shrimp pellets and Daphnia sp. daily. Tanks were cleaned as needed. Samples of 10 juveniles were weighed and measured monthly to study growth. Growth was analyzed using the Von Bertalanffy growth model (Rafail, 1973). This model describes growth by the relationship:

\[ l_t = L_\infty \left( 1 - e^{-K (t-t_0)} \right) \]

where:
- \( l_t \) = length at age \( t \)
- \( L_\infty \) = the maximum (predicted) length for the population
- \( K \) = growth coefficient
- \( t_0 \) = time when length would theoretically be 0.

A length-weight (Everhart et al., 1975) and total length-orbit length (OL) relationship was also calculated.

RESULTS

Reproduction

Mating was observed on several occasions during daylight hours and occurred immediately after the female *M. amazonicum* molted. Eggs were seen attached to pleopods the following day. One day old eggs were slightly elliptical (0.60 X 0.70 mm in diameter) and light green. Fully developed embryos were 0.63 X 0.85 mm and dark grey. Incubation was 12-15 days at 30±1° C and 19-24 days at 24±2° C. Hatching usually occurred at night.

Eight hatches were obtained from female broodstock during the study. An average of 565±238 larvae were produced per hatch (range 195-2200). The largest hatch (2200 larvae) was produced by the largest female.

Larval Development

*M. amazonicum* larvae underwent 8-9 molts (stages) in 23-26 days at 24±0.25° C and 50% survived metamorphosis to postlarvae (fig. 1). Larval development was uniform through stage 6 with molting occurring every 2-3 days. Each molt caused a distinct morphological change in the telson which was used with other abdominal structures to distinguish different stages (fig. 2).

1st Stage. — 1-2 days old. TL = 2.5 mm. The telson was triangular and continuous with the sixth abdominal segment. Its broad posterior edge contained seven pairs of plumose setae and was notched in the middle. Six pairs of setae were terminal and one pair was lateral; disto-terminal and lateral setae were plumose on the inner edge only.

2nd Stage. — 3-4 days old. A naked pair of setae was added medially to the posterior edge of the telson.

3rd Stage. — 5-7 days old. The telson articulated with the sixth abdominal segment and lost one pair of plumose setae. The lateral pair of setae became naked.