INTRODUCTION

Species of the genus Macrobrachium are widely distributed in fresh and brackish waters mainly in subtropical and tropical parts of the world. In the past fifteen years interest in these shrimps, many of which reach large size, has increased greatly, largely due to the possibility of the commercial culture of some of them. Among the studies that have been carried out in this period have been a number dealing with the larval and early postlarval development of various species. Thus Ling & Merican (1961), Ling (1969), and Uno & Kwon (1969) studied Macrobrachium rosenbergii (De Man, 1879) Lewis & Ward (1965) and Choudhury (1971) worked on M. carcinus (L., 1758), Kwon & Uno (1969) investigated M. nipponense (De Haan, 1849), Fielder (1970) M. australiense Holthuis, 1950, and Choudhury (1970) and Dobkin (1971) M. acanthurus (Wiegmann, 1836). Other works dealing with the larval development of species of this genus in a somewhat less complete fashion were those of Henderson & Matthai (1910) and Rajyalakshmi (1961) on M. lamarrei (H. Milne Edwards, 1837), Sollaud (1923) on M. borellii (Nobili, 1896), M. potiuna (Müller, 1880) M. iheringi (Ortmann, 1897), and M. pilimanus (De Man, 1879), and Boschi (1961) on M. borellii (Nobili, 1896).

Species of Macrobrachium thus far discovered in Florida are M. acanthurus (Wiegmann), M. carcinus (L.), M. faustum (De Saussure, 1857), M. heterochirus (Wiegmann, 1836), M. obione (Smith, 1874), and M. olfertii (Wiegmann). The latter species, the object of this study, shows a rather peculiar distribution. Holthuis (1952) reported it from Central and South America from Mexico to southern Brazil, with a single record of its occurrence in northern Florida at St. Augustine. Holthuis & Provenzano (1970) found the species just south of Miami and state that "the Florida finds of M. olfertii are so eccentric that it has been suggested that the species was introduced into Florida waters with water plants or fishes from South America." The authors have collected M. olfertii in southern Palm Beach County, some 50 to 60 miles north of the Holthuis & Provenzano finds.

1) Present Address: Ralston Purina Corp., Crystal River, Fla.
Investigations concerning the larval development of the Florida species of *Macrobrachium* have been conducted in the laboratory of the junior author over the past several years. This study, dealing mainly with the description of the first eight larval stages of *M. olfersii* was carried out in 1970.

**METHODS**

Six adult *Macrobrachium olfersii* were collected by dip net in Lake Worth Drainage District Lateral Canal No. 42 about 75 meters west of where it joins Equalizing Canal No. 4 (El Rio Canal) in Boca Raton, Palm Beach County, Florida. The catch was made up of three males and three females. Two of the females were ovigerous, and each of these was placed in a large jar along with two or three gallons of fresh unfiltered canal water. The water in which the females were held was aerated, and a cover was placed on each jar to prevent the shrimp from jumping out. The jars were placed in an environmental chamber programmed to maintain a temperature of 30° C and a light-dark regime simulating a twelve-hour day. The salinity of the water in the jars was gradually increased over a two-week period until it reached a level of about 60 per cent sea water (approximately 21 parts per thousand).

Seventeen days following capture, one of the females hatched between 150 and 200 larvae. Seventy-two of these were placed in four plastic compartmented boxes, one larva in each compartment. Two of these boxes contained water of approximately 21/00 salinity, while in the other two boxes the water was approximately 35/00. The female was removed from the jar in which the larvae were hatched, and the remaining larvae were reared in mass culture. All of the larvae were raised in the environmental chamber under the conditions described above.

The compartmented boxes were examined daily for exuviae and the water was changed each day or every second day. The exchange of water was followed by the addition of the newly-hatched-nauplii of the brine shrimp, *Artemia salina* (L.) as food. Each day several specimens were taken from the mass culture jar, anaesthetized with urethane, and preserved in 10% formalin buffered with borax. Exuviae were also preserved in buffered formalin.

Illustrations of the entire larva were made with the aid of a drawing tube mounted on a Wild M-20 compound microscope. The specimens used for these illustrations were generally alive, anaesthetized by means of urethane. Some preserved specimens were also used. Illustrations of the appendages were made by means of the same instrument. The larger appendages were dissected directly in the preservative, but the mouth parts were dissected in 85% lactic acid.

The written descriptions were composed from both the completed drawings and notes made while the specimens and dissected appendages were being observed under the microscope. Most illustrations are based on dissection and comparison of several specimens. Setules have been omitted from the setae of the appendages in the dorsal and lateral views of the various stages in order to more clearly show gross appearance. These setules are also more numerous and somewhat longer.