Structure and development of free neuromasts in barramundi, Lates calcarifer (block)

Abstract

This study was conducted to clarify the development of free neuromasts with growth of the barramundi, Lates calcarifer. A pair of free neuromasts was observed behind the unpigmented eyes in newly hatched eleutheroembryos with a mean total length of 1.93 mm, and two-hour-old eleutheroembryos could respond to an approaching pipette. At 2 days after hatching, the egg yolk sac was mostly consumed, the eyes were pigmented, and the larvae commenced feeding on rotifers. Free neuromasts increased in number with growth and commenced developing into canal neuromasts in barramundi 15 days old with a mean total length of 8.07 mm. The average length of the major axis of the trunk free neuromasts attained approximately 12.9-15.5 μm, and the number of sensory cells was 15.4-17.5 at 15-20 days old. Developed cupulae of free neuromasts were observed in 1-day-old eleutheroembryos. The direction of maximum sensitivity of free neuromasts, determined from the polarity of the sensory cells, coincided with the minor axis of the lozenge-shaped outline of the apical surface of the free neuromasts. The polarity of trunk neuromasts was usually oriented along the antero-posterior axis of the fish body, but a few had a dorso-ventral direction. On the head, free neuromasts were oriented on lines tangential to concentric circles around the eye.