GROWTH AND REPRODUCTION OF THE BAT RAY, *MYLIOBATIS CALIFORNICA* GILL, IN CALIFORNIA

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By

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ABSTRACT

The growth and reproduction in 191 bat rays, Myliobatis californica Gill, from Elkhorn Slough and Monterey Bay, California was studied. Vertebral centra were removed, morphometric measurements made, and sexual condition assessed in all specimens. Among several ageing technqiues tested, x-radiography and oil clearing were used most successfully to elucidate circuli (rings and bands) in the centra of the bat ray. The annual nature of band deposition was verified by comparison of modal disc widths (DW) from size frequency analysis to mean back-calculated disc widths, mineralization patterns seen in x-rays and tetracycline marking, and by correlating changes in the appearance of circuli with season and age.

Evaluation of each ageing technique based on consistency of band counts indicated that the oil clearing technique is slightly more reliable. Comparison of calculated DW_∞ to published observed maximum disc widths indicated that for males the x-radiography technique produced the most realistic growth curve, while for females the oil clearing technique was best. The Brody-Bertalanffy growth curves derived from these techniques indicated that female bat rays reach a greater size (DW_∞ = 1587 mm) and have a lower growth rate (K = 0.0995) than males (DW_∞ = 1004 mm, K = 0.229).

Reproduction in bat rays from Elkhorn Slough appears to follow a well-defined annual cycle in which mature individuals enter the slough in May to give birth and mate, and depart by late September. It is suggested that, similar to other rays (Strushaker, 1969; Smith, 1980), the bat ray's gestation period is 9 to 12 months long.

In male bat rays, three indicators of sexual maturity (presence of mature spermatozoa, clasper-DW relationship, and internal morphology) showed that onset of sexual maturity occurs at 2 to 3 years of age, at a disc width of about 622 mm. In females, presence of mature ova indicated that 50% maturity occurs at approximately 5 years of age, at a disc width of about 881 mm.