

THESIS ABSTRACT

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TITLE: Reproduction In Two Populations of the Red Abalone, Haliotis rufescens,
Near Mendocino, California

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The reproductive cycles of two subtidal populations of the red abalone, Haliotis rufescens, were studied at Point Cabrillo Lighthouse Station and Van Damme State Park near Mendocino, California. From June, 1972, through March, 1974, gametogenesis was monitored histologically. Both populations spawned during the spring and early summer, but not all members of either population spawned during a season. Three different spawning patterns are described for members of the populations. No correlation was detected between spawning and water temperature, but a possible correlation with food supply is discussed. Necrotic oocytes as noted by Young and DeMartini (1970) were common. Previously undescribed cells and a granular substance appeared in the digestive gland and gonad wall and lumen. Larger numbers of each were associated with large numbers of necrotic oocytes; these cells may have a resorptive function. The hypothesis that the sex ration was 1:1 was tested for each study population. It was rejected for the Point Cabrillo population and accepted for the Van Damme population. The minimum size at sexual maturity was investigated. The smallest male was 84.5 mm and the smallest female was 39.5 mm. Females matured at a smaller size than males.

The hypothesis that a number of oocytes in each of three regions of a given ovary were the same was tested using analysis of variance. The hypothesis was accepted. Fecundity was estimated for females ranging in shell lengths 134.0 - 198.5 mm. The lowest and highest estimates were 619,000 and 12,575,000 ripe oocytes per ovary. My calculations underestimate the number of large oocytes present immediately prior to spawning, since specimens were collected before maximum ripeness was attained. Quantities of necrotic oocytes, which could not be accurately determined, reduce the true fecundity of the population.

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