INTERACTIONS BETWEEN FISHES AND MOTILE BENTHIC INVERTEBRATES ON REEFS: THE SIGNIFICANCE OF MOTILITY VS. DEFENSIVE ADAPTATIONS

M. L. REAKA

Department of Zoology,
University of Maryland,
College Park, MD 20742

Holes within the reef teem with motile invertebrates that often are characterized by bright coloration, armor, and intense fighting rituals. Competition for space limits many of these populations, but it is often assumed that predation by fishes is the ecological and evolutionary process that restricts these invertebrates to refuges within the substrate. The effects of predation upon this cryptic community, however, have rarely been tested.

Using cage enclosures and artificial reefs that manipulated numbers of fishes and invertebrates, the effects of predation were examined in 10 different reef habitats (10-20 m) in St. Croix, U.S.V.I. Particularly in shallow habitats, few effects of predation upon motile benthic invertebrates were detected even though predatory fishes were present. Two possible hypotheses explained these results: (1) Historically, fish predation favored cryptic habits in benthic reef organisms, but defensive adaptations and the protective substrate renders successful predation on these organisms rare. (2) Spatial limitation allows some individuals to retain territories while others are "floaters"; predation opens sites that are colonized immediately by immigrants, thus predation occurs but it undetected by conventional methods. In a backreef area where predation had been previously undetectable, barriers prevented benthic immigration and emigration from caged and control plots. A predation effect, particularly for the most motile invertebrates (stomatopods), was demonstrated, supporting the second hypothesis. In certain deep habitats, however, the effects of fish predation were measurable even in the absence of barriers to migration.