

## The Importance of Predation and Competition in Organizing the Intertidal Epifaunal Communities of Barnegat Inlet, New Jersey\*

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**Summary.** Community organization was studied by experiment and observation from October 1972–October 1974 in the marine epifaunal assemblages at each end of Barnegat Inlet, New Jersey. The rock jetty at the wave-exposed eastern end of the inlet possesses an intertidal community with the following attributes: (1) a high intertidal zone dominated by the barnacle, *Balanus balanoides*, but also occupied by the blue mussel, *Mytilus edulis*, in rock crevices, (2) a mid and low intertidal zone with usually <10% free space and extreme numerical dominance by *Mytilus edulis* (usually >85% cover) during summer and fall, and (3) almost no intertidal predators or herbivores. The predatory seastar, *Asterias forbesi*, is abundant subtidally. Controlled removal experiments indicate that in the mid and low intertidal underlying barnacles perish as a consequence of the establishment of extensive secondary cover by *Mytilus*, probably because *Mytilus* outcompetes *Balanus* through suffocation or starvation. *Mytilus* transplants demonstrate that the mussels do not survive outside of crevices in the high intertidal, which thus may represent for *Balanus* a refuge from competition by *Mytilus*.

The pilings on docks at the protected western end of Barnegat Inlet possess an intertidal epifaunal community with the following characteristics: (1) a high intertidal zone that includes *Balanus balanoides*, a second barnacle, *Balanus eburneus*, and an herbivorous gastropod, *Littorina littorea*, (2) a mid and low intertidal zone with usually >40% free space in the summer and fall and the remaining area covered by several abundant species with no extreme dominant, and (3) abundant predators, chiefly the oyster drill, *Urosalpinx cinerea*, the blue crab, *Callinectes sapidus*, and a mud crab, *Neopanope texana sayi*. *Asterias forbesi*, while abundant subtidally, is also occasionally present on intertidal surfaces. Controlled exclusion of predators by caging several replicate pilings at the western end of the inlet reveals that

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\* This paper is dedicated to the memory of Robert H. MacArthur

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