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Metamorphosis of Marine Invertebrate Larvae: Effects of Sediment Treatments and No. 6 Fuel Oil

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METAMORPHOSIS OF MARINE INVERTEBRATE LARVAE: EFFECTS OF SEDIMENT TREATMENTS AND NO. 6 FUEL OIL

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Research was completed at the Woods Hole Oceanographic Institution
under the direction of Dr. Rudolf Scheltema

Many species of marine invertebrate larvae have the ability to detect particular environmental cues which are believed to stimulate larval metamorphosis into the adult form. Metamorphosis in response to bottom sediment was measured in two species of marine planktonic larvae, *Ilyanassa obsoleta*, a common mud-snail, and *Capitella*, sp. I, a polychaete worm. The control consisted of organic-rich sediment collected from Barnstable Harbor, Massachusetts. One sediment treatment, termed muffled sediment, consisted of the sediment control heated at a high temperature in a muffle oven to remove all organic matter. A sharp decrease in percent metamorphosis was observed in larvae exposed to the muffled sediment condition compared to the sediment control. Results confirmed that settlement involves more than physical contact with the sediment and suggest that the metamorphosis-stimulating factor is probably a water soluble substance.

The June 10, 1990, spill of 7,500 gallons of No. 6 fuel oil into Buzzard's Bay, Massachusetts, provided oil contaminated samples of salt marsh sediment. Both the sediment control and the muffled sediment were contaminated with the oil. The influence of oiled conditions on percent larval metamorphosis varied between species. *I. obsoleta* showed no significant change (ANOVA $\alpha = 0.01$) in the percent metamorphosis between the oiled and unoiled conditions. In *Capitella* sp. I, larval settlement rates of oiled sediment conditions were significantly lower than the control sediment. This trend in *Capitella* Sp. I could suggest a masking of the metamorphosis cue. However, the variability in results of both species support the need for further studies investigating the specific mechanisms of metamorphosis as well as the impacts of No. 6 fuel oil on the development of marine invertebrate larvae.