DIEL CHANGES IN THE VERTICAL DISTRIBUTIONS OF SOME COMMON FISH LARVAE IN SOUTHERN KANEOHE BAY, OAHU, HAWAII

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ABSTRACT

Nine series of vertically-stratified zooplankton tows were made with a closing net at a single station in southern Kaneohe Bay, Oahu, Hawaii, between 31 August 1973 and 11 April 1974. Sampling periods occupied from 12 to 26 hours, with tows usually taken at about 3 m intervals between the surface and a maximum depth of 10 m.

A total of 21,254 fish larvae of 49 kinds was collected. Six species were abundant: Foa brachygrammus, Omobranchus elongatus, Callionymus decoratus, Caranx mate, Stolephorus purpureus, and Abudefduf abdominalis. Blennius sp. and Gnathanodon speciosus were commonly taken in small numbers.

These common larvae displayed five distribution patterns:

1. F. brachygrammus and the smallest S. purpureus were most abundant near the surface at night and at depths below 4 m during the day;
2. C. mate and G. speciosus were dispersed throughout the water column at night and usually most abundant between 5 m and 6 m depth during the day;
3. Blennius sp., O. elongatus, and A. abdominalis were dispersed throughout the water column at night and concentrated near the surface during the day;
4. the larger S. purpureus maintained a level of maximum abundance below 6 m day and night;
5. C. decoratus was taken at all depths at all times.

Patterns 1, 2, and 3 are shown to be light-related. Pattern 4 is shown to be partially attributable to avoidance of the towed net by S. purpureus larvae larger than about 6 mm, and a feeding-related migration is proposed to account for pattern 5.

The observed patterns are analogous to those shown for fish larvae in the open ocean on scales of from 50 m to 200 m. It is proposed that Kaneohe Bay represents a vertically compressed ocean with respect to the vertical distribution of fish larvae.