



## Spatial and temporal patterns in larval supply at hydrothermal vents on the northeast Pacific Ocean

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Limnol. Oceanogr., 49(6), 2004, 1949-1956 | DOI: 10.4319/lo.2004.49.6.1949

**ABSTRACT:** Larval supply in marine benthic invertebrates influences patterns of settlement and recruitment to adult populations. To successfully colonize newly formed or distant hydrothermal vents, which are discontinuous and ephemeral habitats, larvae of vent invertebrates must possess long-range dispersal abilities. However, a significant proportion of locally produced larvae must remain within the adult habitat to maintain the observed dense assemblages of invertebrates. I compared spatial and temporal patterns in larval availability (flux and abundance) at hydrothermal vents within and between ridge segments in the northeast Pacific ocean at Axial Seamount and Endeavour Segment on the Juan de Fuca Ridge and at Magic Mountain on Explorer Ridge. Near-bottom (within 50 cm) larval supply (individuals  $m^{-2} d^{-1}$ ) at five vents on Axial Seamount, measured with passively collecting traps in 2000 and 2001, varied temporally by an order of magnitude, but not spatially at scales of tens of meters to kilometers. The most abundant larval taxa were gastropods (particularly the limpet *Lepetodrilus fucensis*) and polychaetes. Larval abundance in the water column within the axial valley was measured with net tows by the remotely operated vehicle ROPOS at the three ridge segments: Axial Seamount (2000, 2001); Endeavour Segment (2001, 2002); Magic Mountain (2002). Abundance was greater by an order of magnitude at the Endeavour Segment than at Axial Seamount and Magic Mountain, and it did not differ between on-vent (within tens of meters) and off-vent (up to 5 km from the venting source) locations within the axial valley. The uniformly high abundance of larvae within axial valleys suggests that larval supply within a ridge segment is most likely localized, implying significant larval retention on the scale of vent fields and possibly ridge segments.

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