Development and application of microsatellite markers for spatiotemporal population genetic analysis of *Riftia pachyptila*

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Ecological processes at deep-sea hydrothermal vents on fast-spreading mid-ocean ridges are punctuated by frequent physical disturbance, often accompanied by population turnover. Despite local extinction events, sessile invertebrate species persist in these geologically and chemically dynamic habitats via larval dispersal and temporal connectivity among vent sites. Regional population extension and rapid habitat recolonization by the siboglinid tubeworm *Riftia pachyptila* have been well documented along the East Pacific Rise and the Galápagos Rift. *Riftia pachyptila* has also exhibited high rates of inferred migration in allozyme and single gene studies—discordant with larval physiology and modeled oceanographic current predictions. Given the potential of high-resolution genetic tools to detect finer scale spatiotemporal structure, we characterized twelve polymorphic microsatellite markers from *R. pachyptila*. All of these microsatellite loci are highly polymorphic and conform to Hardy-Weinberg expectations without linkage (mean H_E = 0.9405, mean N_A = 20.25). Eight microsatellites are currently employed in the investigation of spatial and temporal population genetic structure among nine sites in the eastern Pacific Ocean; samples encompass recent colonists and resident adults collected over a period of seven years spanning a volcanic eruption. Preliminary results suggest population genetic stability through time and small but significant genetic structure, largely consistent with major geologic features. Correlation of these genetic patterns with ecological processes—including rates of habitat turnover—will reveal insights into the maintenance of population connectivity across disjunct and ephemeral habitats on ecologically relevant time scales.

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