

Infaunal burrows are enrichment zones for *Vibrio parahaemolyticus*

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Vibrio parahaemolyticus, a known human pathogen linked to shellfish gastroenteritis, and other *Vibrionaceae* are common, naturally occurring bacteria in coastal environments. Understanding the ecology and transport of these organisms within estuarine systems is fundamental to management initiatives aimed at limiting *Vibrionaceae* infections and to prediction of outbreaks of pathogenic strains. In addition to porewater advection during tidal exchanges, infaunal burrows serve as conduits for increased transport of tidal waters and *V. parahaemolyticus* by providing large open channels from the sediment to salt marsh tidal creeks. An extensive seasonal study was conducted at the North Inlet Estuary in Georgetown, SC to quantify *Vibrionaceae* and specifically *V. parahaemolyticus* in tidal water, fiddler crab (*Uca pugilator*, *Uca pugnax*) burrow water, and interstitial porewater. Concentrations of *V. parahaemolyticus* were significantly higher within burrow waters (4875 CFU mL⁻¹), relative to creek water (193 CFU mL⁻¹) and interstitial porewater (128 CFU mL⁻¹), demonstrating that infaunal burrows are sites of *V. parahaemolyticus* enrichment. A strong seasonal trend of increased abundances of *Vibrionaceae* and *V. parahaemolyticus* during the warmer months of May through September was observed. Multi-locus sequence typing (MLST) analysis of presumptive *V. parahaemolyticus* isolates from creek water, porewater and burrow water identified substantial strain level genetic variability of *V. parahaemolyticus*. Analysis of substrate utilization capabilities of the presumptive *V. parahaemolyticus* also indicated physiological diversity within this clade. These burrows are “hot spots” of *Vibrionaceae* and *V. parahaemolyticus* numbers and strain diversity and represent a novel microhabitat.