

# Comparison of Particle Association of Different Bacteria in the Hudson River Estuary

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The Hudson River Estuary is an ecosystem that provides a habitat for a complex aquatic community, including a natural bacterial community. Unfortunately, it is intermittently contaminated with pathogens from sewage. Previous research has shown that approximately 50% of the commonly-used, fecal-indicator bacteria, *Enterococcus*, are particle associated in the Hudson River. Particle association can impact microbial growth rates, mortality, transport, and other aspects of microbial ecology within aquatic ecosystems. However, the effects of particle association have not been studied for other species of bacteria in the Hudson River Estuary. In this study, we determined the proportion of particle association of 8 groups of bacteria, including five potentially sewage-associated pathogens and three naturally-occurring bacteria. Particle-associated and free-living fractions were separated using 3-micron filters and then cultured on petri plates according to standard culture methods, using selective media. In addition, correlation analysis was used to determine which bacterial groups were co-occurring. *Salmonella*, *Shigella*, antibiotic-resistant heterotrophs (free-living only) and lactose-fermenters were found to be correlated with *Enterococcus*, indicating that these bacteria are likely coming from a common sewage source. Results also demonstrated that the particle-associated rates did not differ significantly between sewage-related and naturally-occurring bacteria.