

# Contribution of viral lysis and nanoflagellate grazing to bacterial mortality in the inner and outer regions of the Changjiang River plume during summer

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## ABSTRACT

This study tested the validity of the modified dilution approach in partitioning bacterial mortality into nanoflagellate grazer versus virus-induced fractions. Growth and removal rates for bacteria in the inner and outer regions of the Changjiang River plume, were characterized by a series of dilution experiments at four sites, two inner sites (I-1 and I-2) and two outer sites (O-1 and O-2) in the summers of 2011 and 2012. Bacterial growth rates varied between 0.058 and 0.157 h<sup>-1</sup>, with higher growth rates detected in the inner plume. Grazing mortality rates ranged from 0.042 to 0.126 h<sup>-1</sup>, with highest grazing rates detected in the inner plume. Meanwhile, viral activity could not be detected during this period (St. I-1). These findings suggest that grazing nanoflagellates may play a key role in controlling bacterial biomass, and the impact of the nanoflagellates might exceed that of viral lysis during the summer period in the inner region of the Changjiang River plume. It is speculated that the weakening correlation between viruses and bacteria in the inner plume, as well as the increasing the virus to bacteria ratio (VBR) from offshore oligotrophic waters to estuarine waters, may be a consequence of the increasing relative abundance of non-bacteriophage viruses with increasing environmental productivity.