

Estimates of virus- vs. grazing induced mortality of picoplankton in the brackish waters: a seasonal study in two stations of differing trophy

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Abstract

Viruses and nanoflagellates are known to exert an important control on picoplankton (bacteria and *Synechococcus* spp.). Variability in river discharge, along with salinity and nutrient supply, results in high variability in microbial biomass and productivity in Danshui River estuary. Until now, studies in the Danshui River estuary have mainly focused on the seasonal variations in the abundance of pico- and nanoflagellate. The contribution of viruses and nanoflagellate grazing to picoplankton mortality is still poorly understood. To further estimate grazing and viral mortality of picoplankton and compared their relative contributions of both on picoplankton mortality. We carried out a series of modified dilution experiments in October 2012 and July 2013 at 2 sites—from upriver and at the mouth of Danshui River. At the upriver station, it appeared that seasonal changes in nanoflagellate grazing and viral lysis could account for 35% to 60% and 20% to 50% of the daily removal of bacterial production, and for 15% to 50% and 60% to 80% of the daily removal of *Synechococcus* spp. production, respectively. However, bacterial and *Synechococcus* spp. production was not balanced by nanoflagellate grazing and viral lysis; therefore, other sources of bacterial losses, such as impact of ciliate grazing, may account for the imbalance.