

The Effect of nanoflagellate grazing and viral lysis on the diel variations of *Synechococcus* spp. abundance: an experimental test in the East China Sea

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Diel variations in the nanoflagellate grazing and viral-mediated mortality of *Synechococcus* spp. were simultaneously estimated using a dilution and size-fractionation approach in the inner (I-1 and I-2) and outer regions (O-1, O2 and O-3) of the Changjiang River plume in the East China Sea during summer 2014. *Synechococcus* spp. abundance generally tended to increase during the dark period, followed by a plateau until midnight for all sampling stations. Overall, gross growth rate of *Synechococcus* spp. ranged from 0.069 h^{-1} to 0.122 h^{-1} during the growth phase, and microzooplankton, nanoflagellate grazing, and viral lysis had no effect on the *Synechococcus* spp. abundance during this phase. Moreover, nanoflagellate grazing was a largest cause of *Synechococcus* spp. mortality during the loss phase at nighttime. In comparison to the predators, viruses had only a minor impact on mortality at St. I-1, where we detected some effect of this community on *Synechococcus* spp. This study is the first to provide information on the impact of nanoflagellates and viruses on the removal of *Synechococcus* spp. in the East China Sea and suggests that knowledge about the relative importance of nanoflagellates and viruses may provide a better understanding of trophic structures and the energy flow within the microbial loop.