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題目 : Viral Production and Viral Decay in the Surface and Dark Bottom Water

Environment of the southern East China Sea: a preliminary result#

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Abstract

Viruses are dynamic and play an important role in the regulation of food web dynamics, carbon and nutrient fluxes, and bacterial diversity in aquatic ecosystem. A previous study in a semi-enclosed coastal station in northeastern Taiwan, we found that a clear diel variation in viral production. Another previous study at the same study site showed that negative net viral production patterns were detected in May and July 2021, and suggested that higher viral decay rate, due to high UV light level, resulted in negative net viral production. As for the study in the southern East China Sea, we conduct 24-hours incubation experiment in measuring viral production and viral decay rate to averaging viral activity in daily basis at surface and bottom waters at two stations (St.1 and St.7) in August 2021. In this study, we hypothesis physiochemical changes with depth (e.g., the nutrients, temperature, and UV light level) can have a significant impact on planktonic microorganisms, and these environmental and biological factors (bacterial growth) will then have an effect on the vertical changes in viral abundance and production between surface and dark bottom sea. In this study, viral and bacterial abundance in two stations were decreased with depth, however, it is interesting to note that our results clearly observed that the viral abundance decreased less than the bacteria with depth, and resulted in higher Virus to Bacteria Ratio (VBR) (1~3) in the dark, deep ocean. We observed negative pattern of net viral production at bottom water of St.1 (30 m) with higher VBR, we suggest that viruses attached to particles derived from the surface waters are an important source for deep-water viruses. As we expected, positive net viral production pattern only detected in bottom water, with non-significant viral decay rate and resulted in the higher VBR in the bottom waters of St.7 (100 m). Further work, more stations in southern East China Sea will be added.