赤潮期間に沿岸生態システムの巨大ウイルスと藻類と細菌との相互関係分析

Analysis of interaction among giant viruses, algae and bacteria in the costal ecosystem during bloom period

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研究成果概要

This research used the super computer system in Institute for Chemical Research of Kyoto University and was cooperated with Graduate School of Agriculture of Kyoto University.

Uranouhci Bay is an enclosed, eutrophic bay in the south-west Japan, only with a narrow inlet to Tosa Bay. Temporal change from 1985 to 2014 showed that from early spring to late summer the water temperature was usually increasing and was decreasing from late summer to winter. There were harmful algae blooms happened from spring to the early autumn almost every year. Blooms usually happened from inner bay to inlet. The major harmful algae were belonging to Chattonella and Karenia, which cost large fishery damage in this area.

This research is to figure out that (1) what is the relationship among algae, bacteria and giant viruses in gulf ecosystem; (2) is there any succession between hosts and viruses in different stages of algae bloom; (3) what is the role playing by giant viruses during algae bloom period; (4) can giant virus species be applied to algae bloom monitoring, even forecasting. The sample collection will be performed by membranes with different pore sizes. And then in the laboratory, DNA extraction, amplification with different primers and MiSeq sequencing will be done. After getting the sequence data, (1) survey of seasonal variation among giant viruses, algae and bacteria; (2) community dynamics analysis; (3) network analysis based on quantitative relationship will be finished. The most important part is the network analysis, it will indicate which group is the center position, which connection among algae, bacteria, giant virus, and if there are any community successions in different periods of the bloom. With all the analysis done by the super computer, it shows a big diagram of interaction of coastal ecosystem in microbial scale.

発表論文（謝辞あり）

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