Notice on Plankton Seminar

#15012

13:00-15:00, 13 Oct. (Tus.) 2015 at room #204

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Microcosm experiments to evaluate the growth-inhibition of *Chattonella* using microbial communities at eelgrass bed

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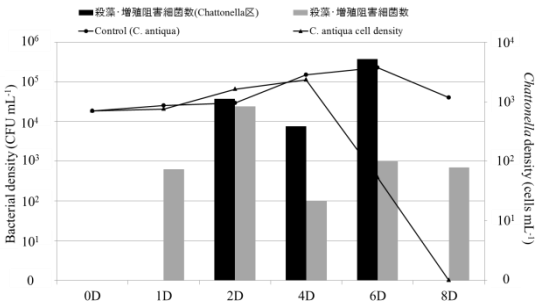
The legislative or policy changes implemented that control of sewage or waste discharges has reduced harmful algal bloom (HAB) occurrences in the Seto Inland Sea. However, numbers of HAB outbreaks in Seto Inland Sea still remain high over hundred, causing adversely affect to fisheries industries. There are five general prevention strategies that are proposed in recent years, including mechanical, biological, chemical, genetic and environmental control. However, considering physical characteristic of ocean as diffusing system, a strategy that is as ecologically friendly as possible is desired for safe and practical use. Biological control of HABs using marine heterotrophic bacteria called algicidal bacteria which are natural living organisms have been showing promising results. In recent years, highly densed population of algicidal bacterial has been detected from biofilm formed on seagrass and macro-algae. In this study, we evaluate the adverse effect of seawater at eelgrass (*Zostera marina*) bed (Genji Bay, Okayama prefecture) against artificial *Chattonella* bloom using microcosm experiments. Surface seawater at *Z. marina* bed at Genji Bay, Okayama prefecture was sampled in July 25, 2014 for the experiments. Whole seawater fraction, seawater filtered through 10 μm (Heterotrophic flagellates + Bacteria) fraction, 1.0 μm (Free-living bacteria) fraction, 0.1μm (Control) fraction and *Z. marina* biofilm fraction were prepared for the each experiment. High densities of *Chattonella* cultured beforehand were added to each fraction to obtain c.a 1000 cells mL^{-1}. Portions from each fraction were taken on 0 day, 1 day, 2 day, 4 day, 6day and 8 day to enumerate algal cell density, viable bacterial density, total bacterial density, algicidal and growth-inhibiting bacterial density in order to clarify how algicidal and growth-inhibiting bacteria fluctuate and bacterial composition changes in relation with *Chattonella* bloom dynamic. Drastic decrease of *Chattonella* cells was observed at free-living bacterial fraction (1.0 μm) of *Z. marina* bed seawater on 4 day (▲). The peak of algicidal and growth-inhibiting bacterial density ($3.7x10^5$ CFU mL^{-1}: Black bar) followed on 6 day. Dominant causative bacteria were *Vibrio* (75%) on 2 day but dominant bacterial genus changed to *Marinomonas* on 4 day (80%) and 6 day (58%). As a result, it was strongly indicated that bacterial community inhabiting at the *Z. marina* bed suppress *Chattonella* bloom. Seagrass populations serve not only as critical habitats for marine and estuarine animals, providing nursery, migratory grounds and food resources but also purifying the water quality comprises removing the nutrients and particle matters. In addition to all, seagrass beds are potentially regulating phytoplankton population through providing a habitat for algicidal and growth-inhibiting bacteria.



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