

## **The mechanism of the large diatom *Coscinodiscus wailesii* bloom which is harmful species for *Nori* (*Porphyra*) culture**

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The large diatom *Coscinodiscus wailesii* is often observed and it becomes dominant during low temperature period. *C. wailesii* is also one of the harmful species that causes serious damage to *Nori* (*Porphyra*) culture in the Seto Inland Sea, Japan. Therefore, the aim of present study was estimated the impact of *C. wailesii* during low temperature period on the bio-philic element cycle in coastal water.

*C. wailesii* was cultured in the laboratory and the growth rate was measured. The growth rate was varied from 0.50 to 1.81 day<sup>-1</sup> under 5 to 25 °C. The chemical composition of *C. wailesii* was determined for *C. wailesii* cells which collected during its bloom by vertical tow of plankton- net in February. C:N:P:Si mol ratio of *C. wailesii* was 103:15:1:52. It indicated that Si contents of *C. wailesii* was about three times higher than the average mol ratio of diatoms.

A monthly observation was conducted from November 2002 to December 2003 to determine the seasonal variation of *C. wailesii* density and nutrient concentration. Cell flux of *C. wailesii* was also measured by duplicates sediment traps. Deployment trap experiment was continually conducted for two weeks during low temperature period. The flux of *C. wailesii* varied from  $1.1 \times 10^4$  to  $1.6 \times 10^5$  cells/m<sup>2</sup>/day and large flux was observed under low nutrient concentration.

It was estimated that the uptake and sinking by *C. wailesii* account for 50% of nitrate decrease and 79% of silicate decrease of surface seawater during low temperature period. These results suggested that *C. wailesii* consumed the most of the nutrient in low temperature period and has a great role on the bio-philic element cycling of coastal water. *C. wailesii* has also high silicon contents. Si/N ratio in the surface water decreased due to the large silicate consumption of *C. wailesii*. As a result, it may cause the harmful dinoflagellate bloom in next spring.