平成２８年度　環境科学院　修士論文内容の要旨

Study on material cycling in the coastal waters and the role of the Kiritappu Wetland, in Hamanaka Town, Hokkaido: An analysis using surf clam (*Pseudocardium sachalinense*) as an environmental indicator

（北海道浜中町沿岸域における物質循環と霧多布湿原の役割に関する研究：環境指標としてホッキガイ（*Pseudocardium sachalinense*）を用いた解析）

北海道大学　大学院環境科学院
環境起学専攻　国際環境保全コース
巴　鑫

Suspension-feeding benthos surf clam *Pseudocardium sachalinense*, living on phytoplankton, benthic microalgae and detritus in the coastal waters, is one of the most important marine products in Hamanaka Town, Hokkaido Prefecture, Japan. It was used as an environmental indicator in this study to investigate coastal material cycling as well as the possible connection between the Kiritappu Wetland and the coastal waters, for the purpose of providing a guideline for enhancing people's awareness of environmental conservation and reasonable management in the region.

Four points in the coastal area of Hamanaka Town were chosen as study areas, where samplings were carried out in April through September, 2015. Measurements of stable carbon and nitrogen isotope ratios ($\delta^{13}C$ and $\delta^{15}N$) and carbon:nitrogen (C/N) ratios of adductor muscle and stomach contents in surf clams, oceanic particulate organic matters (POM), oceanic sediments, riverine POM and soil as well as physical and chemical parameters such as temperature and salinity, chlorophyll-a and nutrients were conducted to clarify spatial and seasonal variations of environmental conditions, surf clams and their food sources in the four study areas. Tasting and free amino acid analysis of surf clams were also carried out to investigate differences in taste of surf clams in different fishing areas.

The results show that $\delta^{13}C$, $\delta^{15}N$ and C/N ratios in surf clams and oceanic organic matters were significantly different from those in riverine organic matters, which means terrestrial organic matters might not contribute to the bottom of the coastal environment and might not become food sources of surf clams in the study areas. Besides, there were no significant spatial and seasonal variations in $\delta^{13}C$ and $\delta^{15}N$ of surf clams, indicating similar food sources of surf clams in all of the four study areas and in all the sampling periods. Also, benthic microalgae and epiphytes are considered to be the major food sources of surf clams since the $\delta^{13}C$, $\delta^{15}N$ and C/N ratios are similar to those of surf clams. Moreover, the taste of surf clams is different among the three fishing areas, although difference in the free amino acid concentrations is not significant.

The overall results imply that little contribution of terrestrial organic matters to the coastal environment in the study areas might be beneficial to the growth of surf clams because terrestrial organic matters have low nutritional values which are not preferable food sources for surf clams. As the wetland could function as a barrier to prevent excessive terrestrial organic matter flows to the ocean, it is suggested that the Kiritappu Wetland plays an important role for coastal resources environment. Therefore, environmental conservation and reasonable management related to the wetland should be firmly implemented.