Uptake and retention of artificial radionuclides from seawater in the oyster *Crassostrea Gigas*

GI HOON HONG*, SUK HYUN KIM, HYUN MI LEE, YOUNG IL KIM, SUNG YONG OH

Institute of Ocean Science and Technology 787 Hean-ro, Sangrok-gu, Ansan 426-744, South Korea
*ghhong@kiost.ac

The uptake and loss of radionuclides in the oyster (Crassostrea Gigas) commonly cultivated in Korean waters were studied under the laboratory conditions using radiotracer techniques to develop countermeasures against radiological emergencies, e.g. intrusion of elevated artificial radionuclides laden seawater from the offshore or atmosphere into the oyster rearing waters from the accidents occurred in the adjacent nuclear installations, such as Fukushima nuclear reactor accidents in 2011. 241Am, 109Cd, 57Co, 60Co, 123mTe, 51Cr, 113Sn, 85Sr, 137Cs and 88Y radionuclides were selected and their concentration were arbitrary chosen to yield 137Cs to be about 10.0 Bq kg-1 sufficiently high to resulting a fish meat exceeding Korean regulatory limit if we assume concentration factor for fish is 100. Three oysters were placed in each seawater tank at 12±1°C. Uptake rates in oyster's tissue were determined at the fixed time intervals to 8 days and excretion rates were also determined at the fixed time intervals up to 12 days by placing radiolabeled oysters in the radionuclides free seawater tanks. Three uptake patterns were emerged: (1) initial exponential uptake and reached asymptotic concentration for 137Cs and 85Sr within several days, (2) continued linear uptake for 109Cd and 99Y, (3) initial rapid uptake with subsequent decrease in other radionculdies. All radionuclides except 85Sr and 109Cd in oyster's tissue were decreased more than half by within 6 days, and 85Sr was completely removed from the tissue within 3 days, but 109Cd remained slightly decreased more than 10 days. Therefore, if there is an intrusion of radio-cesium and radio-strontium laden seawater from elsewhere, oysters should be harvested within a few hours or place oysters in the those radionuclides free seawater to decontaminate for 3 days would be options to counter radiological emergency occurred in the sea.