Using oysters as anthropogenic indicators to evaluate the occurrence of the wastewater contamination of the estuaries

Wang-Hsien Ding

Department of Chemistry, National Central University,Taiwan (wanghsiending@gmail.com)

The oyster (Crossostrea gigas) is an important aquacultural species in Taiwan. With an area of over 85% of the total inshore aquacultural field, its production, measured by quantity or economic value, ranks above all other aquacultural products in Taiwan. Since oyster's habitat is on shelves near the coast, the samples from a particular "oyster cultural site" can be applied to evaluate the pollution of a segment of the coastal water. Deficient wastewater treatment has caused untreated wastewaters to have flown in rivers into oyster cultural areas in estuaries as well as shallow coastal water. Therefore, the concentration of pollutants in the oysters can be used as anthropogenic indicators to evaluate the occurrence of the for wastewater contamination of the coastal water.

In this study, two groups of anthropogenic organic compounds, chlorinated flame retardant (i.e. Dechlorane Plus) and benzophenone-type UV absorbing substances (i.e. 2-hydroxy-4-methoxybenzophenone), were determined in oyster samples as wastewater contamination pollutants. The method involves the use of matrix solid-phase dispersion prior to their determination by gas chromatography mass spectrometry. The results show that these two groups of compounds are ubiquitous in oysters with the concentrations of chlorinated flame retardant and benzophenone-type UV absorbing substances ranging from 0.3 to 3.6 ng/g and from 120 to 910 ng/g (lipid weight), respectively. Oysters are useful anthropogenic indicators of organic pollutants in Taiwan's marine environment. The ubiquity of these pollutants in Taiwan's coastal environment supports the need for greater awareness of bioaccumulation processes.