

Application of oysters as useful concentration indicators to evaluate the fate of xenoestrogenic alkylphenols along the western coastal areas of Taiwan

Wanghsien Ding

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

The oyster is an important aquacultural species in Taiwan. Since oysters naturally inhabit shelves near the coast, samples from particular "oyster cultural sites" can be applied to evaluate the pollution levels of segments of coastal water. Insufficient wastewater treatment has caused untreated wastewaters to flow into rivers, and hence, into oyster cultural areas in estuaries as well as shallow coastal waters. Therefore, the concentration of pollutants in the oysters can be used as concentration indicators to evaluate the fate of the pollutants on the western coastal areas of Taiwan.

In this study, xenoestrogenic alkylphenols were determined in oyster samples by extractive steam distillation prior to their determination by gas chromatography - mass spectrometry. The results show that a group of 4-nonylphenol isomers (4-NPs) were ubiquitous in oysters with concentration levels ranging from 23 to 3370 ng/g (wet weight). The concentrations of 4-NPs varied with different levels of 4-NPs found across unrelated estuaries water samples, and higher level of 4-NPs in water samples caused higher concentration of 4-NPs found in oyster tissue samples. Moreover, at the same oyster sites mentioned previously, the levels of 4-NPs in oysters decreased significantly after the year 2008. This drop in 4-NPs level can be attributed to environmental regulations that banned 4-NPs as additives in household cleaning agents since January 2008 in Taiwan. Due to the mentioned reasons, oysters are concluded to be useful organic pollutant concentration indicators in marine environments.