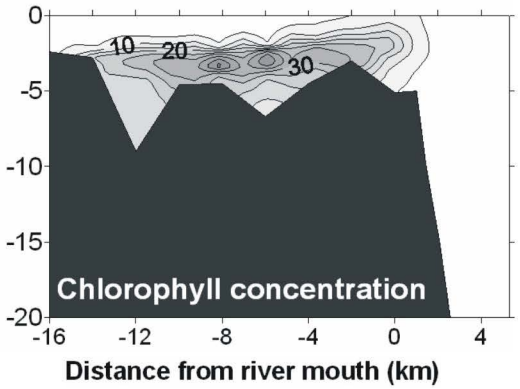

Fig. Longitudinal distributions of salinity and chlorophyll concentration (μg/l) in the Yura Estuary on 22 September 2006.

Monitoring of POPs with bivalves as a bioindicator in the Pearl River Delta

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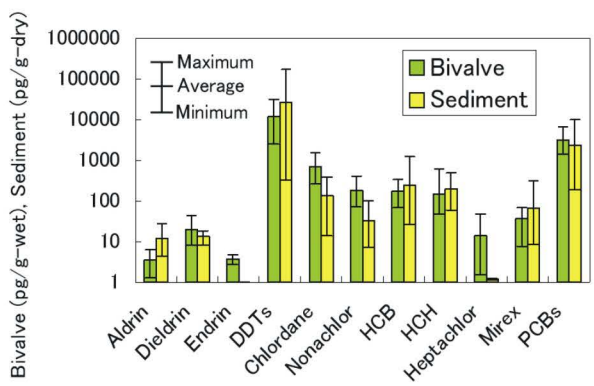
In recent years, influence of POPs to humans and the ecosystem has been concerned and international monitoring and control has been more needed than ever. Because POPs concentration is commonly very low in the environment, it is difficult to measure the concentration directly. In contrast, biomonitoring is efficient because the concentration can be increased due to bioaccumulation.



In this study, distribution of POPs concentration was monitored with bivalves as a bioindicator in the Pearl River Delta. Accumulation characteristics of POPs and the availability of the POPs monitoring in the Pearl River Delta were discussed. Field surveys were conducted, and bivalves, water, and sediment samples were collected from 11 points in the Pearl River Delta. 10 kinds of chemical group and their isomers recognized POPs were targeted, and their concentrations in the bivalves, water samples (both dissolved condition and contained condition in the suspended solids in the water), and sediment samples were determined using high-resolution GC-MS. As a result, range of POPs concentration in each media was $1\sim10^4$(pg/g-wet), $1\sim10^5$(pg/g-dry), $1\sim10^4$(pg/L) and $1\sim10^4$(pg/L) respectively. DDTs concentration was the highest among POPs in bivalves, sediment and SS, whereas HCHs concentration was the highest in DM. In regard to DDTs, an indicator (DDE+DDD)/DDT that shows a possibility of new DDT discharge was below 10 in all samples[1)]. And also the indicator exhibited below 1.0 in 7 of 38 samples, therefore the possibility of new DDT discharge was suggested. Concerning homologue of PCBs, total ratio of PCBs from M1CB to T4CB was 70% in water, however, that of PCBs from P5CB to D10CB was 60% in bivalves. Therefore it was found that high chlorinated PCBs can be more accumulated than low chlorinated PCBs from water to bivalves. In respect to accumulation characteristic of POPs, it was shown that there is a strong correlations (R^2=0.86) among the BCF of POPs, octanol-water partition coefficient (Kow), and fat content (%) in bivalves. Using the monitoring result, primary risk assessment due to shell consumption was

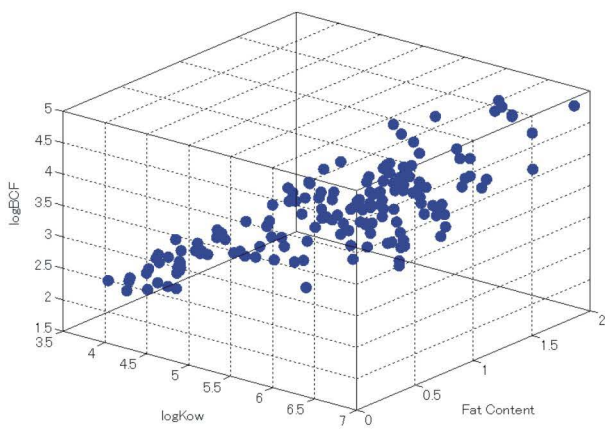


Fig.2 Multiple correlation among logBCF, logKow, and fat content

conducted, and potential cancer risk by PCBs and DDT was suggested. Based on the results, it was verified that POPs monitoring method with bivalves as a bioindicator is efficient and monitoring of PCBs and DDTs is significant in the Pearl River Delta.

Reference

Guo Jianyang, Eddy Y. Zeng1, Wu Fengchang, et al (2007). Organochlorine Pesticides In Seafood Products From Southern China And Health Risk Assessment. Env.Tox.Chemi., 26: 1109-1115

Effect of the condensed tannin from the dead leaves of deciduous trees on the photosynthesis reaction inhibition to *Microcystis aeruginosa*

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Hepatotoxin like microcystin from *Microcystis aeruginosa* (*M.a.*) is extremely toxic to human and is an important water issue in terms of water resources and water quality preservations. The countermeasures to the water-bloom occurrence due to the excessive growth of toxic cyanobacteria are not necessarily available at present. The authors have revealed that the condensed tannin (CT) in the water-soluble extract from the dead leaves of deciduous trees is very effective to the growth control of *M.a.* Furthermore, the growth control was clearly affected by the condensed tannin loading intensity (CTLI). The mechanism of the *M.a.* growth control is unknown yet. Photosynthesis light reaction has been divided into NADP reduction reaction (PS I) and oxygen generation reaction (PS II). The addition of the extract results in the growth control and in fact decreases in the oxygen generation simultaneously, which imply the extract from the dead leaves functions like PS II inhibition. Accordingly, the effect of the photosynthesis reaction inhibition was examined on the basis of the direct measurement of the DO concentration trend in the *M.a.* culture solution to evaluate the oxygen generation rate (OGR).Data were plotted in Fig. 1 to show the photosynthesis inhibition effect on *M.a.* obtained from National Institute for Environmental Studies, Japan, (NIES) as NIES 102 when the CT was

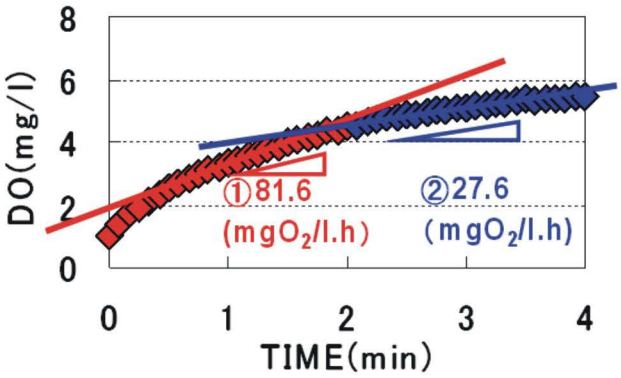

Fig. 1 OGRs before(①) and after the extract addition(②)

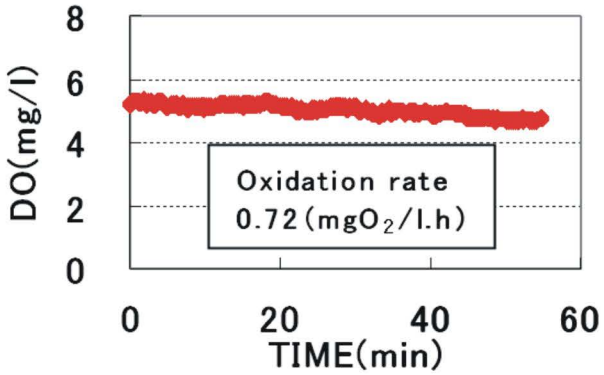

Fig. 2 DO consuption by condensed tannin

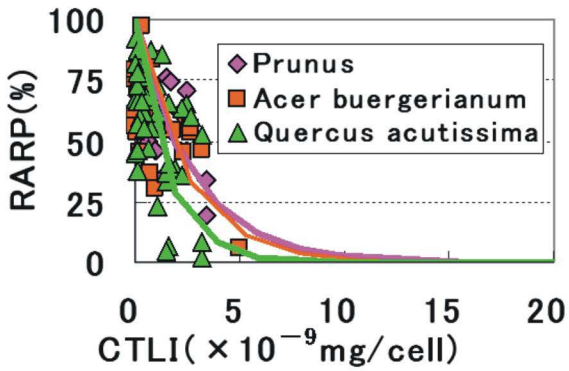

Fig. 3 Effects of condensed tannin on RARP

added into the *M.a.* culture solution at about 2 mg/L CT concentration and at about 1.47×10^{-9} mg/cell CTLI. The *M.a.* culture solution containing about 0.9 million cells per ml was lighted so that the initial OGR for control was about 81.6 mg-O_2/L·h. The OGR in 2 minutes after the addition of the extract decreased immediately down to 27.6 mg-O_2/L·h. The extract itself was consuming the DO at about 0.72 mg-O_2/L·h, being very small and neglected when compared with the