

## 해양환경-P8      Accumulation and Characterization of Polycyclic Aromatic Hydrocarbons in Seafood from the Coastal Areas of Korea

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### 1. Introduction

Polycyclic aromatic hydrocarbons (PAHs) are ubiquitous environmental microcontaminants and derive mainly from anthropogenic activities. Since they are carcinogenic and mutagenic (Lehr and Jerina, 1977), these compounds have been intensively studied in marine environment. Marine organisms may be exposed to PAH by contact with contaminated seawater and sediments, either on the seabed or through suspended sediments, or by ingestion of contaminated prey (Hellou et al., 1996). The different PAH profiles of contaminants have been observed in organisms of different trophic levels (Leonards et al., 1997). These differences were attributed to a partial biotransformation of the contaminants in the organisms of higher trophic levels (Baumard et al., 1998). Therefore, these organisms reflect the pollution extent of PAHs and some species are used as bioindicators at different environmental conditions and foodweb (Hellou and Warren, 1996).

Although PAHs have previously been determined in some locations for sediments and bivalves from Korean coastal environments (Lee et al., 1998; Moon et al., 2001a), there are few reported data on levels of PAHs in seafood including fish from Korean coasts. The main purpose of the current study was to measure the PAH residues in edible tissue of seafood species most often caught from Korean coasts and to investigate bioaccumulation patterns of PAHs in different organism species.

### 2. Materials and methods

Twenty seafood samples were purchased at local markets from nine locations distributed over Korean coastal areas (two from the eastern region, five from the southern region, and two from the western region) during July to August 2001. The samples of sixteen fish species, common squid (*Todarodes pacificus*) from East Sea, crab (*Portunus trituberculatus*), shrimp (*Penaeus orientalis*) from West Sea, topshell (*Batillus cornutus*) from South Sea were collected in this investigation. These seafood species are common edible species and are commercially important food items in

Korea. The analytical methods were similar to published paper by Moon et al (2001b). In order to assess the accuracy of the determinations by experimental procedure and instrument, the certified mussel homogenate (1974a, NIST, USA) was analyzed as Standard Reference Materials (SRMs) in this investigation. The recovery results for two-, three-, four-, five-, and six-ring aromatic groups were in the range of 68%, 77%, 87%, 94% and 107%, respectively.

### 3. Results and discussion

The levels of sixteen PAHs in seafood from Korean coast were 161 to 2,243 pg/g wet weight. The highest concentration was found at saury (*Coloabis saira*) and the lowest level was found at jacobever (*Sebastes schlegeli*). The concentrations of potentially carcinogenic PAHs of six species were in the range of 9 to 123 pg/g wet weight. The residues of PAHs in fish from Korean coasts were slightly low or relatively moderate to other countries. There was no correlation between PAH residues and lipid contents in seafood samples. The predominant contributors in fish samples were lower-molecular-weight two and three ring aromatic PAHs such as naphthalene, acenaphthene, fluorene and phenanthrene. Filter-feeding organisms like shrimp, crab and topshell were dominated by three- and four-ring aromatic PAHs. The PAH profiles in marine sediments, bivalves, fishes, shrimp, crab and topshell according to exposure pathway were compared through factor analysis. The PAH profiles were clearly classified by the difference of species or environmental matrices. This result suggests that most of PAHs within the same samples behave identically in marine environment.

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