CHLORINATED BIPHENY (CB) PATTERNS IN ORGANISMS – WILL THEY REVEAL CYTOCHROME ACTIVITY AND ECOTOXIC STRESS?

N. Kannan[1], J.R. Oh[1] and R. Bruhn[2]

[1] Marine Environmental Research Laboratory, South Sea Institute, Korea Ocean Research and Development Institute, Jangmok-myon 391, Geoje-shi 656-834, South Korea

[2]GKSS-Research Centre, Institute for Coastal Research /Physical and Chemical Analysis, Max-Planck-Straße, D-21502 Geesthacht, Germany

A model is described to explain the compositional similarities and differences in chlorobiphenyls (CBs) in members of marine food chains, including water. Four groups of CBs are distinguished based on the presence/absence of vicinal H-atoms in *o,m* and/ or *m,p* vicinal H-atoms, according to structure-activity relations for their biotransformation by cytochrome P-450 1A and 2B isozymes. Contents of CBs (X) in water, diatom, mussel, copepod, worm, shrimp, flounder, herring, and harbor porpoise were transformed into molar X/153 ratios (CB-153 is persistent) and plotted against X/153 ratios in diatom, lacking metabolic efficiency. For each metabolic group, a linear plot results. Their slopes indicate relative metabolic efficiencies of cytochrome P-450 isozymes. Indication of PB-type enzyme activity in harbor porpoise, flounder, and herring that was not observed before biochemically is new. Metabolic slopes of CBs can also be used as environmental stress

indicators by comparison of slopes in a selected organism in areas with different degrees of contamination.

Metabolism of chlorobiphenyls (CBs) was studied in harbour porpoise in a separate study by comparing patterns of CB-X/CB-153 ratios in blood, brain, liver and blubber with the patterns in herring, the main food source. Metabolic slopes revealed activity of PB-type isozymes of the P450 monooxygenase system in contrast to existing literature data, harbour porpoise appears to be able to metabolize congeners with *m,p* vic. Hs, even in the presence of more than 2 *ortho*-Cls. The presence of 3-MC-type (MC-type) isozymes was also detected.