

Specific Accumulations of Polychlorinated Naphthalene Congeners in Gull Eggs from Korea and Japan

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All congeners of PCN are planar compounds, structurally similar to highly toxic 2378-TCDD, and can contribute to an Ah-receptor mediated mechanism of toxicity including embryotoxicity, hepatotoxicity, and immunotoxicity. TEFs also have been reported for several PCN congeners. Compared to the researches on contamination sources (halowax, ashes), ambient environment (air, sediment) and fish, concentrations of PCNs in eggs of birds in Korea and Japan have not been investigated. Within the dioxin-like chemicals survey on waterfowls and their eggs from Korea and Japan (1997~1999), levels of the major PCN congeners were determined in gull eggs (*L. crassirostris*). The objectives of the present study are ; 1) to determine concentrations of PCN congeners in black-tailed gull eggs collected in Korea and Japan. 2) to compare the concentrations and congener profiles of PCNs to other planar compounds such as PCDD/Fs and non-*ortho* PCBs, and 3) assess the TEQ concentrations of PCNs, and their contributions to total TEQs.

Eggs of black-tailed gull were collected in Nando, Korea in 1997 (n=10) and in Rishiri Is, Hokkaido in 1998(n=10). Samples were cleaned-up and analyzed according to published methods. Identification and quantification of PCN congeners was performed with HRGC-HRMS (HP5890 II-JEOL SX102A).

Eggs of black-tailed gull from Rishiri-Is. contained significantly higher concentrations of PCNs (2050~6730 pg/g, fat wt) than those of Nando, Korea (425~150 pg/g, fat wt). However, concentrations of PCNs in eggs of cormorants and herring gulls from the Great Lakes were up to 2400 and 1300 pg/g, wet wt, respectively (Kannan et al., 2001), which were greater than those measured in the eggs of black-tailed gull eggs in this study. Among PCN congeners, TrCN accounted for the greatest proportion (47%) of total PCN concentration in the eggs from Japan compare to those in the eggs from Korea, in which TeCN and HxCN were dominated. This may suggest that these gulls might have been exposed to various sources of PCN in the environment. The mean TEQs contributed by PCNs in the eggs from Korea and Japan were 0.9 and 0.4 pg/g, fat wt, respectively. Contribution of PCN to TEQs was 2-4% of the PCDD/F-PCN-TEQs, which is far less than by that of PCDDs and PCDFs. Similarly, PCNs contributed 2-3% to TEQs for PCN-PCB-PCDD/F in eggs of cormorant and herring gulls (Kannan et al., 2001).