

The Bioconcentration of Polychlorinated Dibenzo-*p*-dioxins, Dibenzofurans, Non-*ortho* Polychlorinated Biphenyls, and Mono-*ortho* Polychlorinated Biphenyls in Japanese Flounder, and Relationship with Body Size

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Using high-resolution gas chromatography – mass spectroscopy we measured the concentrations of polychlorinated dibenzo-*p*-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), non-*ortho* polychlorinated biphenyls (non-*ortho* PCBs), and mono-*ortho* polychlorinated biphenyls (mono-*ortho* PCBs) in Japanese flounder (*Paralichthys olivaceus*, body size 11.7–36.6 cm) collected from Sendai Bay, Japan. The bioconcentration in the fish was in the order total PCDFs (0.3–1.5 pg/g dry weight) < total PCDDs (1.6–5.6 pg/g dry weight) < total non-*ortho* PCBs (5.5–25.9 pg/g dry weight) < total mono-*ortho* PCBs (412.3–1809 pg/g dry weight). The total mono-*ortho* PCBs concentrations were hundreds of times greater than those of total PCDFs. On the other hand, the concentrations in seawater and sediment were in the order total non-*ortho* PCBs (2.4 pg/L and 6 pg/g dry weight) < total PCDFs (2.9 pg/L and 28 pg/g dry weight) < total mono-*ortho* PCBs (8.9 pg/L and 79 pg/g dry weight) < total PCDDs (24.4 pg/L and 329 pg/g dry weight). The relative amounts of dioxins and dioxin-like compounds in Japanese flounder did not reflect those in seawater and sediment. The relationship between the body size of the fish as an index of growth and the concentrations of dioxins and dioxin-like compounds varied among compounds. The concentrations of total PCDDs and total PCDFs did not correlate with body size ($R^2 = 0.065$ and 0.022 , respectively), possibly because there is a maximum limit to their bioconcentration in Japanese flounder. The concentrations of total non-*ortho* PCBs and total mono-*ortho* PCBs were significantly correlated ($R^2 = 0.8$ and 0.63 , respectively), which suggests that they are bioaccumulated with the growth of Japanese flounder. The bioaccumulation of dioxins in Japanese flounder was clearly different from that of dioxin-like compounds. The average toxic equivalency quotient of Japanese flounder samples calculated by using toxic equivalency factors was 1.1 pg/g dry weight ($n = 11$), the same as previously reported.