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Polybrominated Diphenyl Ethers And Polychlorinated Biphenyls In A Marine Foodweb Of Coastal Florida

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Nine species of marine fish, including teleost fishes, sharks, and stingrays, and dolphins collected from Florida coastal waters were analyzed for polybrominated diphenyl ethers (PBDEs) and polychlorinated biphenyls (PCBs) to evaluate biomagnification factors of these contaminants. In addition, bottlenose dolphins and bull sharks collected during the 1990s and the 2000s were evaluated for temporal trends. Mean concentrations of PBDEs in muscle tissues of teleost fishes ranged from 8.0 ng/g, lipid wt, to 88 ng/g, lipid wt with an overall mean concentration of 43 ± 30 ng/g, lipid wt. Mean concentrations of PBDEs in muscle of sharks ranged from 37.8 ng/g, lipid wt, in spiny dogfish to 1630 ng/g, lipid wt, in bull sharks. Mean concentrations of PBDEs in the blubber of bottlenose dolphins and striped dolphins were 1190 ± 1580 and 660 ng/g, lipid wt, respectively. Tetra-BDE 47 was the major congener detected in teleost fishes and dolphin samples, followed by BDE-99, BDE-153, BDE-100, and BDE-154. In contrast, BDE-209 was the most abundant congener in sharks. Concentrations of PBDEs and PCBs in dolphins and sharks were 1-2 orders of magnitude greater than those in lower trophic-level fish species, indicating biomagnification of both of these contaminants in the marine foodweb. Sharks and dolphins collected over a 10-year period, an exponential increase in the concentrations of PBDEs and PCBs has occurred in these marine predators. The doubling time of PBDE and PCB concentrations was estimated to be 2-3 years for bull sharks and 3-4 years for bottlenose dolphin.