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693 *Comparing Effects of Complex Mixtures versus Single PCBs: Functional Outcomes of Exposure in Field and Lab Studies*

Environmental exposure to endocrine disrupting chemicals (EDCs) often involves complex mixtures. Most studies have focused on acute effects, with little attention to non-lethal effects. We have been investigating biological effects of a range of EDCs in laboratory studies on Japanese quail; embryonic exposure to a range of EDCs affected neural systems, immune response, thyroid and reproductive axes, and impaired male reproductive behavior. Recent studies have focused on polychlorinated biphenyls (PCBs) in Japanese quail and tree swallows; treatments included single congeners (PCB 126, PCB 77) and complex PCB mixtures. Eggs were injected with concentrations that bracketed those found in eggs in contaminated regions. Results showed dose dependent lethality for PCB 126 and the complex PCB mixtures. All impacted organ indices and physiological systems. However, PCB 77 did not impact lethality. This suggests that the predictive value of the Toxic Equivalency (TEQ), based on activation of the aryl hydrocarbon receptor (AhR) may not be sufficient for some compounds, such as endocrine disrupting compounds (EDCs). Other approaches have been developed to address inconsistencies in effects and to incorporate diverse data into the potency estimates. Perhaps it is time to develop a more inclusive estimation method for endocrine and neuroendocrine effects. An Endocrine Disruption Index (EDI) would complement other indices, and focus on endocrine disruption with consideration of effects beyond those mediated solely by the AhR for a comparative assessment of non-lethal EDC effects. Initial approaches in developing this index will be discussed. In summary, testing our laboratory findings in field birds has required considerations in methodologies and measurements, including field injections with continued parental incubation, consideration of environmental conditions, and assay of physiological markers of health and fitness. As such, there are some issues that must be considered when interpreting findings from laboratory and field studies, especially relative to biological actions of complex mixtures. The conclusions and opinions presented here are those of the authors, they do not represent the official position of any of the funding agencies, the Hudson River Trustees, or the United States.

Mary Ann Ottinger, Tiffany Carro, Meredith Barton, Leah Baltos, Karen Dean