MP240 *EROD activity in wild and laboratory birds with embryonic exposure to environmentally relevant PCB mixtures as an assessment of biomarkers of exposure*

Biomarkers of exposure to environmentally persistent organic compounds provide critical data for use in assessing potential risk to wild populations. Ethoxyresorufin-O-deethylase (EROD) activity has been used largely as a biomarker of dioxin exposure, but has also been used for assessing exposure of wildlife to dioxin-like compounds such as polychlorinated biphenyls (PCBs). PCBs can vary in their ability to induce EROD, which is an important consideration in establishing EROD as a valuable biomarker for PCB exposure. We studied EROD activity in two experiments: one in wild birds (*Tachycineta bicolor* and *Sialia sialis*) and one in a laboratory avian model (*Coturnix japonica*) which our studies indicate has a similar sensitivity to that seen in some wild birds. Four compounds were administered to Japanese quail during embryonic development: two environmentally relevant PCB mixtures found at the upper Hudson River and two single congeners, PCB 126 and PCB 77. The wild bird study revealed a congener related difference in response. Embryonic exposure to PCB 77 resulted in a relatively flat response in tree swallows, while the two PCB mixtures and PCB 126 yielded clear increasing trends in response profiles. The laboratory model study showed similar responses. These data provide evidence that PCB 77 may not have strong dioxin-like biological activity in some avian species, which is in agreement with a previous WHO report that has proposed a recalculation of the PCB 77 TEF from 0.0005 to 0.0001. As such, indices of toxicity such as TEQs and TEFs should be utilized to estimate potential effects, with the recognition that these calculations may not be fully informative for all mechanisms of toxicity, including endocrine disruption and other non-aryl hydrocarbon receptor mediated actions. These data also contribute to our understanding of EROD response to complex PCB 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.
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