SCCWRP #0179

Xenobiotic Organic and Biological Effects in Scorpionfish Caged Near a Major Southern Municipal Outfall

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ABSTRACT

The objective of this research was to determine the rate at which parent compounds and oxygenated metabolites are accumulated in fish residing near a major municipal outfall. Scorpionfish were captured by otter trawl from Dana Point, a relatively clean control site, and transferred to cages placed on the bottom near a large municipal wastewater outfall at Palos Verdes. 10 fish were sampled at each of 0, 12, 27 and 45 days after transfer. Concentrations of the parent compound DDT, its primary derivatives DDE and DDD, and their oxygenated metabolite DDA. Did not increase in livers during the exposure period. Liver concentrations (mean +- SD) of DDT + DDE + DDD was 6.77 +- 3.33 mg/kg (wet) at a day 0 (n = 10) and 6.90 +- 4.20 mg/kg (wet) at day 45 (n = 10) relative to 35.0 +- 21*2 mg/kg (wet) (n=10) in scorpionfish collected from the exposure site at Palos Verdes. The concentration of the oxygenated metabolite DDA was 4.11 +- 5.22 mg/kg (wet) at day 0 (n=10) and 4.17 +- 2.50 mg/kg (wer) at day 45 (n=10).

Composites of 10 liver cytosols from each sampling period were separated according to molecular weiht using Sephadex G-75 gel chromatography. At day 0, 94% of the cystolic oxygenated metabolites DDA + DDOH were found in the low molecular weiht (<3000 daltons) glutathione-containing (GSH) pool and 6% in the medium molecular weight (3000-20,000 daltons) metallotionein-containing (MT) pool. At day 45.96% of this total was found in the GSH pool, and 4% in the MT pool. None of these oxygenated metabolites were detectable in the high molecular weight (> 20,000 daltons) enzyme-containing (ENZ) pool.