

Uniformly ^{14}C -Ring-Labeled 2,4-Dichlorophenoxyacetic Acid: A Metabolism Study in Bluegill Sunfish, *Lepomis macrochirus*[†]

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The fate of 2,4-dichlorophenoxyacetic acid (2,4-D), a mixture of [*phenyl*(U)- ^{14}C]-2,4-D and unlabeled 2,4-D, in bluegill sunfish was investigated after exposure to ~11 ppm under static conditions for 4 days. Total radioactive residues (TRR) in whole fish increased from 0.41 ppm on day 1 to 0.60 ppm on day 3. TRR levels in fillet (edible) and viscera (nonedible) of treated fish on day 4 were 0.41 and 1.9 ppm, respectively. Most residues in both matrices were acetonitrile soluble; small amounts were hexane soluble or unextractable with solvents. Acid and base hydrolyses with ethyl acetate partitioning were used to release the fillet unextractable residues. The identification of 2,4-D and 2,4-dichlorophenol (2,4-DCP) in the fillet was conclusively confirmed by GC-MS analysis. On the basis of the experimental data from this study, a metabolic pathway for 2,4-D in bluegill sunfish in which the 2,4-D is metabolized to 2,4-DCP and conjugates of 2,4-D and 2,4-DCP is proposed.

Keywords: 2,4-Dichlorophenoxyacetic acid; 2,4-D; bluegill sunfish; herbicide; metabolism
