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HALF-LIFE OF POLYCHLORINATED BIPHENYL (AROCLOR 1254) IN FISH FROM AN ALABAMA RESERVOIR AND STREAM

Chong-i Paul Lo, Mary W. Vitter, Robert S. Reimers,
Gerald E. Gunning, Ann C. Anderson

Tulane University School of Public Health
and Tropical Medicine
New Orleans, LA 70112

Data from an eight year (1969-1976) field study for PCB's (Aroclor 1254) in fish along the Choccoloco Creek and Logan Martin Reservoir in Alabama were analyzed. Two additional years of collecting field data completed the study. Four fish collecting stations were established. Station #1 was a control station miles above the mouth of Snow Creek (which is known as the discharging point by the PCB's plant of Monsanto Chemical Co.). Station #2 and #3 were downstream along Choccoloco Creek and Station #4 was at the Logan Martin Reservoir.

Concentrations of PCB's (Aroclor 1254) in fish tissue were analyzed to determine accumulation patterns over time and to calculate the half life of the compound for the various fish species.

A decreasing concentration of PCB's (Aroclor 1254) in fish was observed from samples taken in Choccoloco Creek. The half lives among several fish species are given in Table 1. The half lives for individual species range from 18.0 to 27.8 months with good statistical correlation within individual species. The average half life for PCB (Aroclor 1254) for all species was 21.2 months.

Table 1

Fish Species	Half Life in Months	P-Value
Stone Roller (Compostoma anomalum)	18.5	$0.01<p<0.05$
Bluegill (Lepomis macrochirus)	27.8	$0.01<p<0.05$
Longear Sunfish (Lepomis megalotis)	18.0	$0.01<p<0.05$
Bass (Micropterus spp.)	21.2	$0.10<p<0.25$
Blacktail Shiner (Notropus venustus)	20.9	$0.01<p<0.05$
Average	21.2	

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In contrast, the fish sampled in the Logan Martin Reservoir (Bass and Longear Sunfish) showed increasing PCB concentrations over time. Based on uptake data, the projected time for doubling the PCB concentration is 46 months for the Longear Sunfish and 61 months for the Bass (see Table 2). This increasing trend may be due to the availability of PCB's because of transport of suspended and colloidal material downstream from Choccoloco Creek.

Table 2

Fish	Doubling Time in Months	P-Value
Longear Sunfish (Lepomis megalotis)	46	$0.1 < p < 0.25$
Bass (Micropterus spp.)	61	$0.1 < p < 0.25$

The different uptake patterns in fish taken from stream and reservoir will be elucidated, taking into account water quality, flow, and sediment composting.