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OBSERVATIONS ON THE TOXICITY OF "WOODLIFE."

By

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This series of experiments was inaugurated at the Hunt Creek Fisheries Experiment Station to determine what concentration of the product "Woodlife" would kill brook trout. This product appears to have value as a wood preservative and might be used in treating various stream structures if the fish population is not endangered. It is manufactured by the Protection Products Manufacturing Company, Kalamazoo, Michigan.

The tests were carried out in two 10-gallon milk cans. One can carried the mixture being tested. The other was filled with the same amount of water, to serve as a control. We used a 1,000-ml. and a 50-ml. graduated cylinder, a 15-ml. graduated test tube, and a 1-ml. pipette to measure the ingredients. The "Woodlife" solution was agitated with a varnished stick. We observed that part of the "Woodlife" always floated on the water surface. How well the active ingredients were dispersed through the solution was not determined.

After preparation of the test solution and the control, one brook trout was added to each can. Observations were made to determine the time of death of either test fish. No mortalities occurred among the fish placed in the control solutions in any of the test runs. After the first tests it was obvious that aeration of the containers would be necessary, or deaths in either can might be caused by lack of oxygen. Aeration of each test can was by means of a Thiberg aerator operated by electric current, the air current was conveyed by rubber tubes to porous stones suspended in each can.

The results are given in Table 1. The "Woodlife" mixture was observed to be fatal in any concentration greater than 1 to 150,000 (6.667 ppm.) or 0.33 ppm. of active ingredients. (Active ingredients, i.e., the various phenolic compounds, make up only 5 percent of "Woodlife," the balance is composed of petroleum solvents, 85 percent and inert material, 10 percent.) These results appear to be similar to those quoted by Levardsen (1951) from Goodnight's paper (1942) in which he (Goodnight) says "Pentachlorophenol and sodium pentachlorophenate are fatal to the more sensitive species of fish in concentrations above 0.2 ppm. although heartier species will survive at 0.4 or 0.6 ppm."

The results indicate that "Woodlife" is a very toxic mixture. These tests did not show the rate at which the toxic components of this product might leach from treated wood to pollute the surrounding water. To test this a wooden grid with a surface area of 7.67 square feet was treated with "Woodlife" and allowed to dry. The grid was immersed in 7 gallons of water and a brook trout, 6.2 inches in length, was introduced.

Table 1.--"Woodlife" experiments,[1] Hunt Creek, 1951.

Active ingredients: Pentachlorophenol, 3.0 percent; tetrachlorophenol, 1.5 percent; 2-chlororthophenol, 0.5 percent.

Inert ingredients: Petroleum solvents, 85.0 percent; inert, 10 percent.

"Woodlife": cc.	Water: cc.	"Woodlife" concentrations	Concentration, active ingredients: ppm.	Temperature: ° F.	Size of trout: inches	Showed distress: Hours	Showed distress: Minutes	Died: Hours	Died: Minutes
20	5 gal.	1 : 946	52.85	50	6.2	0	35	1	05
20	20,000	1 : 1,000	50.00	50	4.7	1	00	1	45
20	20,000	1 : 1,000	50.00	49	5.8	Immediately		0	30
10	20,000	1 : 2,000	25.00	48	6.4	--	--	1	40
10	20,000	1 : 2,000	25.00	49	6.6	0	15	0	30
1	20,000	1 : 20,000	2.50	50	6.4	1	30	3	27
0.5	20,000	1 : 40,000	1.25	48	6.7	2	45	3	55
0.2	20,000	1 : 100,000	0.50	48	7.0	--	--	22	45
0.2	20,000	1 : 100,000	0.50	47	6.3	16	00	24	50
0.15	20,000	1 : 133,333	0.37	47	6.9	39	10	41	55
0.14	21,000	1 : 150,000	0.33	47	6.4	Still alive after 96 hours.			
0.12	20,000	1 : 166,667	0.30	46	6.1	Still alive after 96 hours.			
0.10	20,000	1 : 200,000	0.25	47	6.6	Still alive after 72 hours.			

[1] During this series of tests, no control trout died.

The fish showed distress in one-half hour and died in less than three hours. A control fish in the same amount of spring water remained alive. Neither the control solution nor the test solution was aerated.

We have treated Wolf traps used in the streams where there is a flow of water through the trap box and lethal concentration did not occur. Indications are that one must be cautious in treating structures that will be used in standing water, but that it may be safely used if there is a reasonable flow through the treated structures.

Literature cited

Levardsen, Norman O.

1951. Review of Literature on Toxicity of some Herbicides to Fish. Report No. 1307, Institute for Fisheries Research (typewritten, unpublished).

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