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E. I. du Pont de Nemours and Company
Haskell Laboratory for Toxicology and Industrial Medicine

Haskell Laboratory Report No. 208-71 MR NO. 1420

Materials Tested:

Sample	Species	Location
A	White Perch	Delaware River south from Hope Creek jetty
B	Blueback Herring	Same
C	Roe from A	Same
D	White Perch	Same
E	Minnow	Eddystone - N. J. side down river from Tinicum Island
F	Minnow	New Jersey shore across from Tinicum Island
G	Unidentified	Unidentified
H	White Perch	Delaware River south from Hope Creek jetty
J	White Perch	Same

Materials Submitted by: G. Grulich and R. E. Patterson, Organic Chemicals Department
Chambers Works

ANALYSIS OF FISH FOR METALS

Introduction: All samples were prepared for analysis by atomic absorption at Haskell Laboratory. Results of analysis for lead were obtained at Haskell Laboratory. Results for mercury were submitted by Bruce Julin, Industrial and Biochemicals Department, Experimental Station. Results for copper, chromium and zinc analysis were submitted by Richard E. Patterson, Organic Chemicals Department, Chambers Works.

Procedure: Samples consisted of flesh from the fish unless otherwise indicated. Samples A through G were prepared by digestion with sulfuric acid, potassium permanganate, and nitric acid in a closed system[1)]. Samples H and J were prepared by digestion with sulfuric, nitric and perchloric acids in an open system[2)]. The latter samples could not be used for mercury analysis. Two samples (A and D) were used to determine recovery of metals added as an aqueous solution.

1) F. W. Q. A. Chicago District Method for the Examination of Mercury in Fish by Atomic Absorption.

2) Atomic Absorption Procedure for Lead Analysis (solid samples) Haskell Laboratory Clinical Laboratory Method No. 19.

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Results:

Sample	Wet Weight	No. of Fish	Final Volume	Analysis (µg Metal/g Fish) Pb	Hg	Cr	Cu	Zn
A	7 g	1	200 ml	5.7	1.21	6.9	1.7	4.0
B	5.4 g	3	100 ml	2.8	0.26	6.1	2.8	7.2
C	7 g Roe	1	200 ml	5.7	0.40	6.6	67.	21.
D	6.5 g	1	100 ml	2.2	1.04	6.3	2.5	6.0
E	1.75 g Flesh and guts	1	50 ml	2.9	0.40	6.9	18.	31.
F	6.4 g	2	100 ml	3.1	0.28	5.3	5.2	11.
G	6.73 g	4	100 ml	3.7	0.21	5.8	3.1	11.
H-1	2 g	1	25 ml	1.9				
H-2	3 g	1	25 ml	1.6				
J	2.64 g	1	25 ml	1.2				
A.N.S. Range of Values for Fish*				8-23	0.09-1.7	0.7-2.9	0.8-1.9	20.-47.

Recoveries

Sample Wet Wt./Vol.	µg Metal Added	Pb 200	Hg 40	Cr 40	Cu 40	Zn 200
A 7 g/200 ml	% Recovered	100%	100%	93%	104%	0%
D 5.7 g/100 ml	% Recovered	59%	72%	55%	92%	0% - Loss

* Data obtained by Academy of Natural Sciences of Philadelphia River Survey.

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Summary: The results reported indicate lower concentrations of lead and zinc in fish than the values o
the Academy of Natural Sciences. However, because added zinc was not recovered, the zinc values are qu
The mercury values are in the same range as the A. N. S. values, but the copper and chromium are higher
A. N. S. results.

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Approved by: John A. Zo
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AMP:dhg
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