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Continental origin of Atlantic salmon from
West Greenland and the Labrador Sea in 1970

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Abstract

Blood samples of 204 Atlantic salmon taken in the Labrador Sea and at West Greenland in the autumn of 1970 were analysed to determine continental origin of individual fish. 49% were identified as North American in origin; 51% as European. Size and age data of each group tended to support the results of the biochemical analysis.

Introduction

Techniques to identify continental origin of Atlantic salmon taken at sea, using biochemical methods supplemented by data on parasites, size and age, are described by Nyman and Pippy (MS, 1971 - this meeting). The material used was collected from the Labrador Sea and off West Greenland in the autumn of 1969, and from the Labrador Sea in the spring of 1970. Analyses of further drift net collections from the Labrador Sea and West Greenland areas, and shore net collections at Holsteinsborg, West Greenland, all taken in the autumn of 1970, are documented here.

Materials and methods

Sampling stations are shown in Figure 1. Positions, dates, and results of biochemical analyses are listed in Table 1. All drift-net caught fish were taken by the Canadian research vessel A.T. Cameron, being those specimens from each drift net fishing set which were considered unfit for tagging. The shore net sample was collected from specimens landed at the fish plant at Holsteinsborg.

Biochemical identifications were made on the basis of electrophoretic separation of blood serum proteins using techniques of collection and analysis as described by Nyman and Pippy (MS, 1971).

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Results

Of a total of 204 blood samples analyzed, 99 (49%) were classed as North American and 105 (51%) as European in origin (Table 1). Individual samples are too small to allow meaningful comparison of results from widely separated areas; however it appears that fish from both continents are more or less uniformly mixed throughout the area.

Size and smolt age distributions of 1+ sea year specimens, which comprised most of the collection, are given in Tables 2 and 3. As in previous analyses (Nyman and Pippy, MS, 1971) the size and smolt age distributions of the biochemically identified fish tend to support the results of these identifications. Salmon identified as North American in origin are smaller in average size (for all specimens $P < .01$) and have a higher average smolt age (for all specimens $P < .01$) than those identified as European.

Reference

Nyman, O.L. and J.H.C. Pippy. MS, 1971. Techniques to identify continental origin of Atlantic salmon caught at sea. Int. Comm. NW Atl. Fisheries, Res. Doc. 71/ (this meeting).

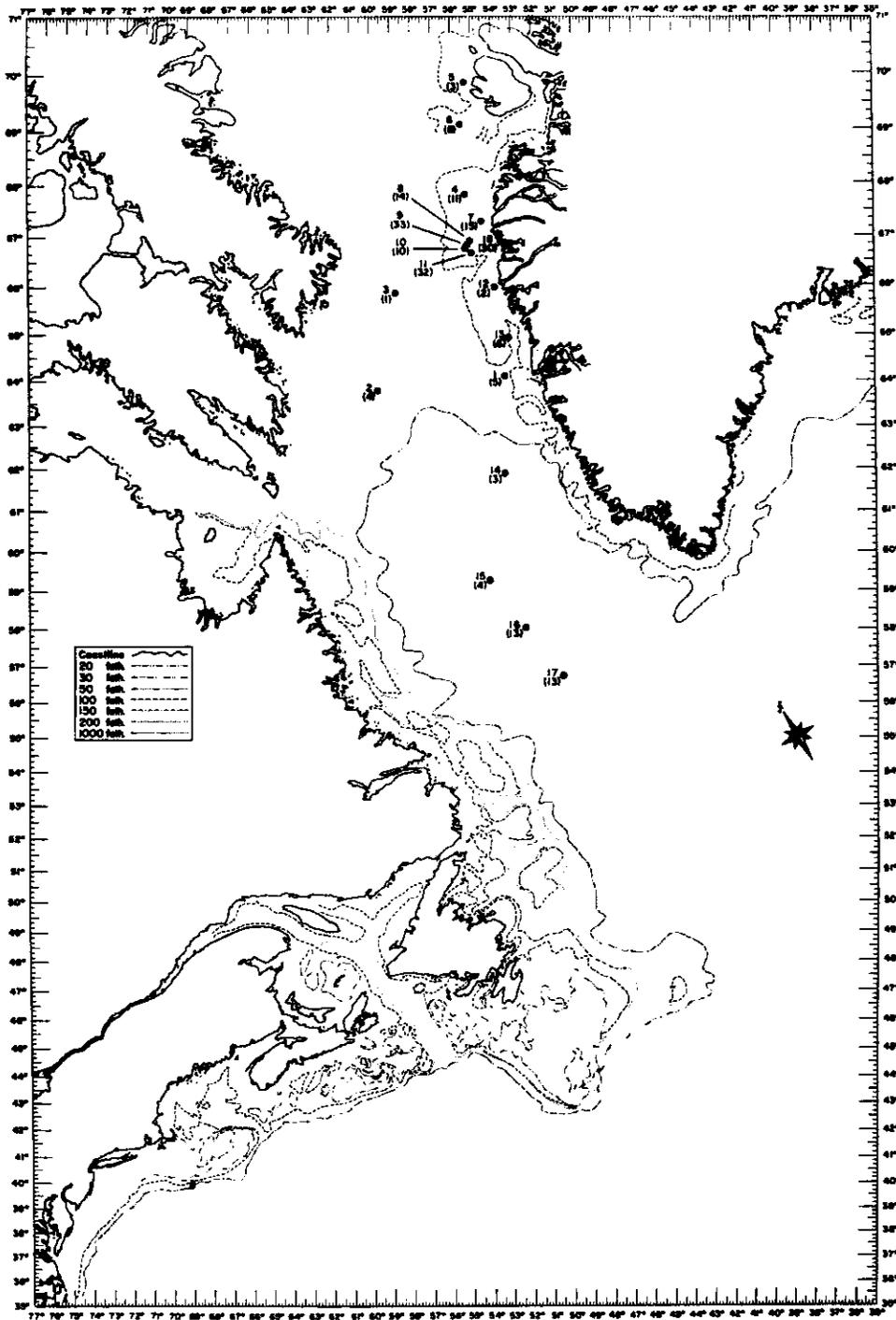


Figure 1. Location of sampling stations. Numbers indicate the number of salmon blood samples collected from individual fish.

Table 1. Continental origin of salmon taken in the Labrador Sea and at West Greenland, autumn, 1970.

Sample No.	Date	Lat N Long W	Number	Continental Origin		% North American
				North America	Europe	
1	Sept 3	64-04 53-18	5	4	1	80
2	Sept 5	63-43 59-40	4	2	2	50
3	Sept 6	65-51 58-42	1	1	0	100
4	Sept 8	67-47 55-20	11	2	9	18
5	Sept 11	69-48 55-17	3	1	2	33
6	Sept 12	69-06 55-30	6	4	2	67
7	Sept 16	67-17 54-31	15	5	10	33
8	Sept 17	66-51 54-59	14	4	10	29
9	Sept 18	66-47 55-12	33	17	16	52
10	Sept 19	66-45 55-14	10	4	6	40
11	Sept 22	66-41 54-53	31	17	14	55
12	Sept 23	65-59 53-51	2	0	2	0
13	Sept 25	64-56 53-08	6	1	5	17
14	Sept 30	61-53 53-26	3	3	0	100
15	Oct 2	59-17 54-10	4	2	2	50
16	Oct 3	58-03 52-26	13	10	3	77
17	Oct 4	56-45 50-32	13	4	9	31
Total			174	81	93	47
18	Sept 7-11	Holsteins- borg	30	18	12	60
Grand Total			204	99	105	49

Table 2. Size distributions of biochemically identified specimens of age 1+ sea years (fork length). NA = North American, E = European.

cm.	<u>Davis Str. & W.G.</u>		<u>Labrador Sea</u>		<u>Holsteinsborg</u>		<u>All specimens</u>	
	NA	E	NA	E	NA	E	NA	E
57			1				1	
8	1				2		3	
9	2		1		3		6	
60	6				1	1	7	1
1	1		2		1		4	
2	3	3			1		4	3
3	6	1			2		8	1
4	3	7		1	1	1	4	9
5	4	3			1	2	5	5
6	7	3	3		3		13	3
7	3	10	1	2		1	4	13
8	10	5	1		2	1	13	6
9	2	10	1	1		1	3	12
70	4	12	1	2			5	14
1	1	4	3	1	1	3	5	8
2	2	8	2	1			4	9
3	2	3	1	2			3	5
4	1	1	1	2		1	2	4
5		3						3
76		1		1				2
77								
78						1		1
Total	58	74	18	13	18	12	94	99
Average Length	65.7	68.7	67.4	70.8	63.1	68.6	65.5	69.0

Table 3. Smolt age distributions of biochemically identified specimens of age 1+ sea years. NA = North American, E = European.

Smolt Age	<u>Davis Str. & W.G.</u>		<u>Labrador Sea</u>		<u>Holsteinsborg</u>		<u>All Specimens</u>	
	NA	E	NA	E	NA	E	NA	E
1	5	4		1	1	1	6	6
2	35	64	11	11	4	5	50	80
3	11	5	5	1	8	4	24	10
4	6				3	1	9	1
5			1		1		2	
6	1				1	1	2	1
Total	58	73	17	13	18	12	93	98
Average Smolt Age	2.4	2.0	2.5	2.0	3.1	2.8	2.5	2.1