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Interpretation of the Ages of Cod from an Exchange of Cod Otoliths
taken on the Flemish Cap

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INTRODUCTION

The degree of variability in the interpretation of ages of cod from otoliths has received considerable attention within ICNAF during the last few years.

An exchange of cod otoliths from Division 3M was therefore undertaken in 1977 on a bilateral basis between the laboratories at St. John's, Canada and Murmansk, USSR. Consistency between interpretations of different laboratories in the ageing of cod from Division 3M was considered to be of particular concern in view of the need in the Flemish Cap Project to investigate age composition of the cod stock and the rates of change of various biological parameters.

MATERIALS AND METHODS

Samples of 50 and 63 otoliths were taken from the collections of the February, 1977 cruise of A.T. Cameron and the April 1977 cruise of Persey III. These samples were exchanged during 1977. The lengths of the specimens from which the otoliths were extracted were known to the readers at the time of reading. Interpretations of the otoliths were made by the authors.

For the otolith samples from A.T. Cameron, photographs of the otolith sections were prepared, all at the same level of magnification. A complete set of 50 photographs containing the interpretations of both readers is available at the St. John's laboratory.

RESULTS

The age interpretations are given in Tables 1 and 2. Table 3 shows that, of the 113 otoliths examined, there were 96 agreements and that 16 of the 17 disagreements showed the same bias between the two readers. There was almost complete agreement for ages 1-3.

Table 4 shows the age-length key composed only of the 96 agreed interpretations from both samples. Over the range of lengths considered, the number of specimens of age 6 and older is small.

Some representative photographs of otolith sections are shown as an appendix. One photograph is included of each of a 2-year-old, 3-year-old, and 5-year-old specimen. Three photographs of 4-year-olds, the important 1973 year-class, are included.

It was noted that cod of year-classes 1973, 1974, 1975 and 1976 have distinct annuli whereas, in general, earlier year-classes displayed less contrasted annuli and a poorly developed first annulus.

CONCLUSIONS

The percentage agreement between the St. John's and Murmansk laboratories in the ageing of two cod otolith samples collected in 1977 was good (85%). The disagreements showed a clear bias rather than a random variation in interpretation of cod of age 4 and older. The agreement for cod of ages 1-3 was excellent.

Otoliths of cod of the 1973-1976 year-classes generally had annuli which were distinct and fairly easy to interpret. The annuli of older cod tended to be less distinct and harder to interpret.

The stock in 1977 was composed mainly of cod younger than 6 years.

Table 1. Age interpretations of cod otoliths collected on Flemish Cap by A. T. Cameron in February 1977.

Specimen no.	Length (cm)	Age interpretation (yr)	
		Postolaky	Wells
583	17	2	2
591	19	2	2
597	22	3	3
601	23	3	3
385	24	3	3
386	25	3	3
494	25	3	3
496	26	3	3
498	26	3	3
500	27	3	3
502	29	3	3
514	27	3	3
515	28	3	3
503	30	3	3
680	34	4	4
681	37	4	4
771	37	4	4
391	39	4	4
392	40	4	4
394	41	4	4
481	39	4	4
396	43	4	4
402	43	4	4
413	43	4	4
540	44	4	4
571	44	4	4
650	42	4	4
354	45	4	4
355	46	4	4
373	46	4	4
397	45	4	4
398	46	4	4
509	47	4	4
404	49	4	4
412	48	4	4
522	48	4	4
523	49	5	4
524	50	5	4
549	53	4	4
550	53	6	5
638	53	5	5
648	51	5	4
665	54	4	4
667	55	4	4
672	58	7	4
686	59	5	5
689	62	5	5
693	65	6	5
694	66	6	5
803	70	6	5

Table 2. Age interpretation of cod otoliths collected on Flemish Cap by *Persey III* in April 1977.

Specimen no.	Length (cm)	Age interpretation (yr)	
		Postolaky	Wells
92-6	12	1	1
93-6	12	1	1
91-6	18	2	2
94-6	18	2	2
97-6	19	2	2
98-6	20	2	2
96-6	20	2	2
44-6	25	2	2
4-6	24	3	3
54-6	24	3	3
59-6	24	3	3
61-6	24	3	3
13-6	25	3	3
22-6	25	3	3
11-6	26	3	3
23-6	28	3	3
5-6	27	3	3
18-6	27	3	3
10-6	29	3	3
7-6	30	3	3
9-6	30	3	4
29-6	30	3	3
26-6	31	3	3
34-6	30	4	4
35-6	30	4	4
34-11	32	4	4
33-6	33	4	4
6-11	34	4	4
8-6	34	4	4
26-11	37	4	4
1-6	38	4	4
3-11	38	4	4
2-6	39	4	4
4-11	39	4	4
1-11	40	4	4
2-11	40	4	4
83-5	42	4	4
82-5	44	4	4
11-5	45	4	4
13-5	48	4	4
98-5	41	5	4
5-5	45	5	4
76-5	46	5	4
81-5	46	5	4
87-5	47	5	5
289-5	47	5	5
15-5	48	5	5
79-5	48	5	4
17-5	50	5	4
105-5	50	5	5
7-5	51	5	5
6-5	52	5	5
78-5	57	5	5
102-5	58	5	5
208-5	66	6	6
107-5	67	6	6
144-5	68	6	5
86-5	77	6	6
1-5	97	9	9
10-5	95	9	9
37-5	76	7	7
19-5	70	7	5
21-5	78	7	7

Table 3. Comparison of age readings of Flemish Cap cod from Tables 1 and 2.

Age	Reader Postolaky									Total
	1	2	3	4	5	6	7	8	9	
1	2									2
2		8								8
3			26							26
4			1	42	9		1			53
5					11	5	1			17
6						3				3
7							2			2
8										
9									2	2
Total	2	8	27	42	20	8	4	-	2	113

Table 4. Age length key of cod in Division 3M in February and April 1977. Agreed ages only from Tables 1 and 2 are shown.

LENGTH	Age									TOTAL
	1	2	3	4	5	6	7	8	9	
13	2									2
16		1								1
19		6								6
22			2							2
25		1	12							13
28			8							8
31			4	3						7
34				4						4
37				5						5
40				7						7
43				8						8
46				8	2					10
49				4	2					6
52				1	3					4
55				2						2
58					3					3
61					1					1
64										
67						2				2
70										
73										
76						1	1			2
79							1			1
82										
85										
88										
91										
94									1	1
97									1	1
TOTAL	2	8	26	42	11	3	2		2	96

Photographs of Representative Otolith Sections





