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Results of the Canada-Spain cod otolith exchange

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Introduction

During 1974 an otolith exchange was carried out between the Instituto de Investigaciones Pesqueras (Vigo, Spain), the St. Andrews Biological Station (N.B., Canada), and the St. John's Biological Station (Nfld, Canada). The otoliths, collected from commercial samples taken on Spanish pair trawlers, were aged by Spanish readers prior to their being sent to participating laboratories. A total of 338 otoliths from Subdiv. 4Vs were sent to St. Andrews and 850 otoliths from Div. 3LNO and 3Ps were sent to St. John's.

In the Spanish laboratory, otoliths are aged by three readers independently and it is necessary to have an agreement of two for an age to be accepted as valid. In both of the Canadian laboratories, the otoliths are usually aged by only one reader. In the present exchange the otoliths from 4Vs were aged by one reader at St. Andrews and those from 3LNO and 3Ps were aged by two persons at St. John's.

Results

The agreement between the two St. John's readers (not illustrated) was 61% for the Subarea 3 sample, and between the two Spanish readers was 55% for the Subdiv. 4Vs sample. These percentages of agreement can probably be considered as normal although the Spanish value seems to be somewhat low.

Otolith reading comparisons between Spain and St. Andrews, Spain and St. John's (I), and Spain and St. John's (II) are shown in Tables 1, 2 and 3. The agreement between Spanish and St. Andrews readings was 61% which may be considered as normal, but the agreement between Spanish and both of the St. John's readings was really low - 42 and 34%. The differences in mean size at age are not particularly large (Fig. 1 and 2), but they are greater in the Spain-St. John's comparison than between Spain and St. Andrews.

In all three of the comparisons (Tables 1 to 3), Spanish readings tend to be lower than the Canadian ones. In the case of Subdiv. 4Vs, the differences in age composition are not very great and both Spain and St. Andrews show age-group 5 as being the most important in the sample (Table 4). In the case of the Subarea 3 sample, however, there are serious differences; both of the Canadian readings show age 5 as being the most important in the samples whereas Spanish readings indicate ages 4 and 5 as being equally dominant.

These differences are large enough to affect the assessments which depend on age compositions of catches derived from age-length keys, and an ageing workshop is justified to help in resolving the differences. An objective of at least 80% agreement is desirable.

Table 1. Age-reading comparison between Spain and Canada (St. Andrews).

		SPAIN															
Age		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
ST ANDREWS	3	8	1														
	4	15	29														
	5	1	31	91	9												
	6	1	2	12	13	2											
	7			1	11	25	3										
	8				1	16	13	3									
	9					1	4	6	1								
	10						3										
	11							3									
	12																
	13																
	14																
	15																
	16														1		
	17															1	
			OTOLITHS READ 305 AGES AGREED 186 % AGREEMENT 61														

Table 2. Age-reading comparison between Spain and Canada I (St. John's).

		SPAIN											
Age		2	3	4	5	6	7	8	9	10	11	12	13
ST. JOHN'S (I)	2												
	3	2	2	1									
	4	1	20	55	12								
	5		3	151	127	34	3						
	6			3	36	49	13	1					
	7				5	44	41	16	2	1			
	8				2	5	29	13	1	2			
	9						6	7	5	1			
	10							1	2				
	11									1	1		
	12										1	1	
	13												1
			OTOLITHS READ 702 AGES AGREED 294 % AGREEMENT 42										

Table 3. Age-reading comparison between Spain and Canada II (St. John's).

		SPAIN											
Age		2	3	4	5	6	7	8	9	10	11	12	13
ST. JOHN'S (II)	2												
	3	3	3										
	4		18	31	4	1							
	5		4	165	113	21	1						
	6			4	48	42	13				1		
	7				15	37	23	5			1		
	8				1	14	33	18	2				
	9					13	14	8	4	2			
	10					2	5	5	3				
	11					1	2		1	1			
	12					1	1				1	1	
	13												1
			OTOLITHS READ 687 AGES AGREED 235 % AGREEMENT 34										

Table 4. Percentage age frequencies based on comparative age-readings of Subdiv. 4Vs and Subarea 3 samples.

AGE	Subdiv. 4Vs sample		Subarea 3 samples		
	SPAIN	ST. ANDREWS	SPAIN	ST. JOHN'S I	ST. JOHN'S II
2			0.4		
3	8.1	3.0	3.3	0.7	0.7
4	20.4	13.8	26.9	10.6	8.1
5	34.7	43.3	26.7	39.7	37.2
6	11.0	10.2	19.7	16.4	17.1
7	14.3	13.4	14.3	16.9	12.9
8	7.5	10.6	6.1	10.7	11.3
9	2.9	3.6	1.6	3.0	7.5
10	0.3	1.0	0.7	0.9	3.1
11		1.0	0.1	0.6	0.8
12			0.1	0.4	0.7
13			0.1	0.1	0.6

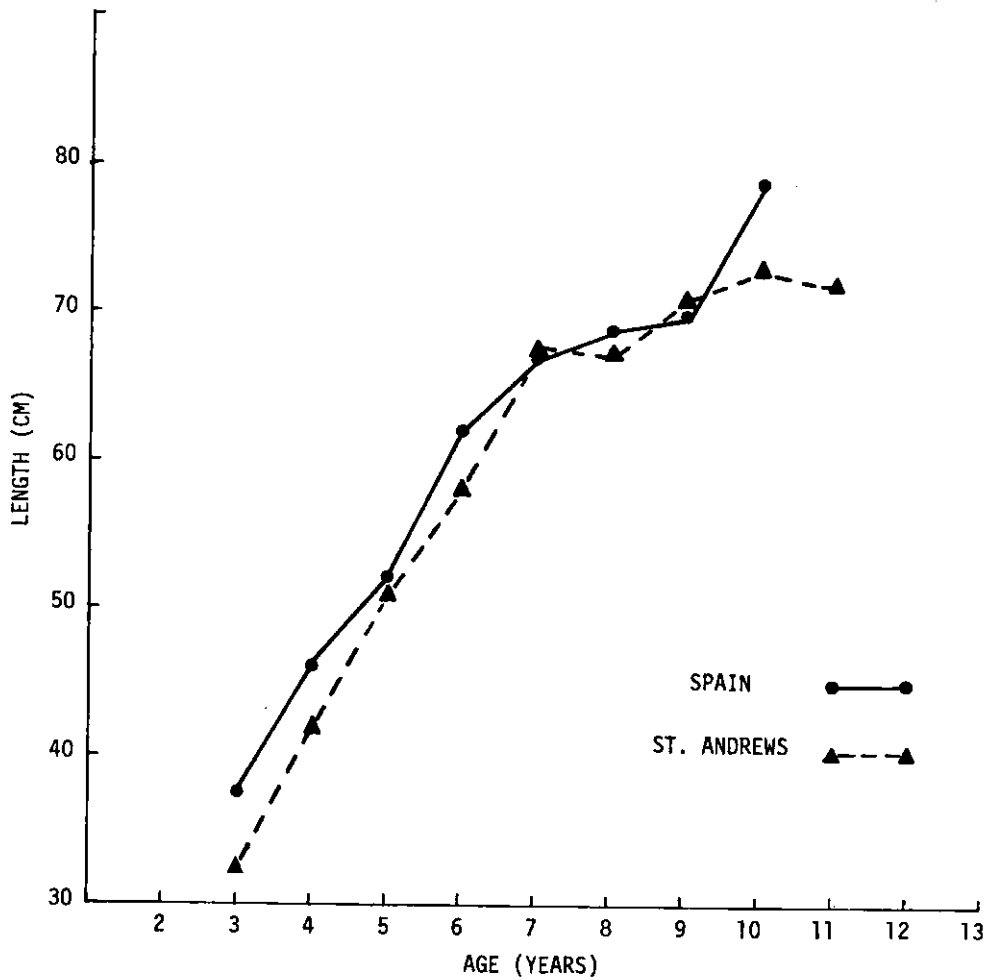


Fig. 1. Mean length at age for Subdiv. 4Vs cod sample aged by Spain and St. Andrews.

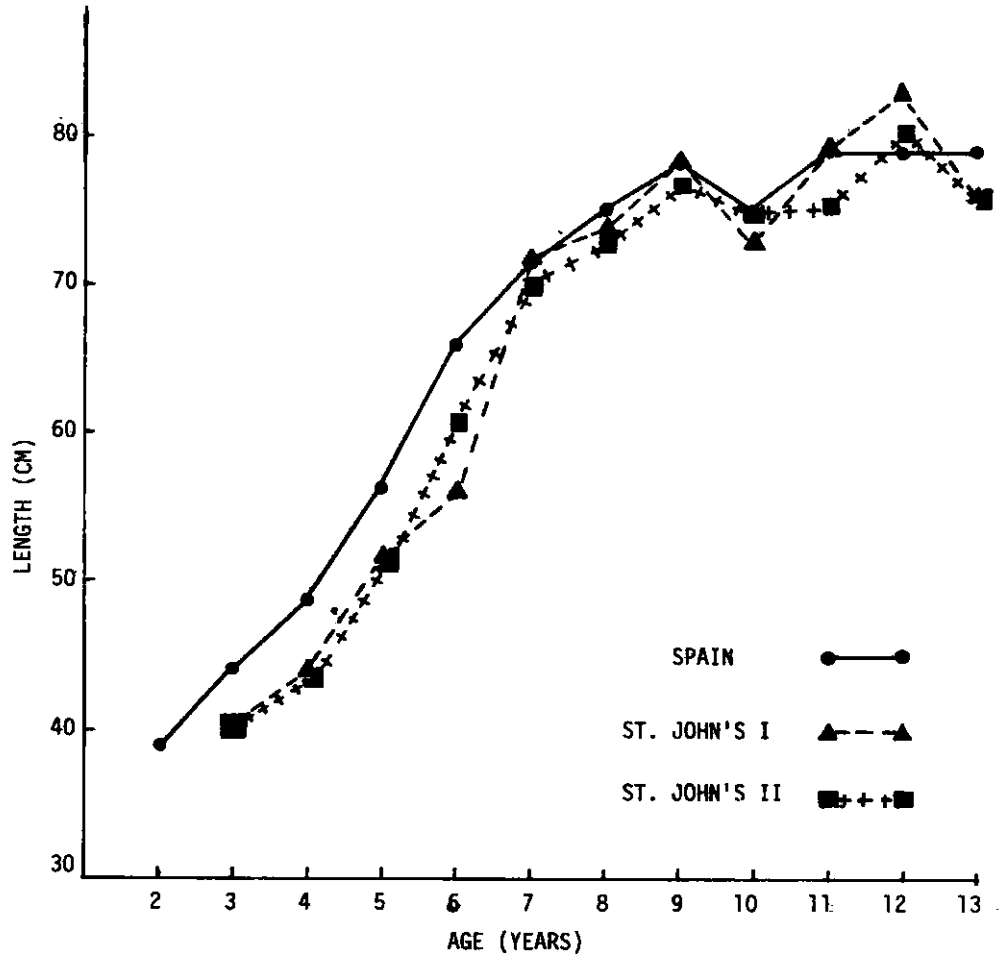


Fig. 2. Mean length at age for Subarea 3 samples aged by Spain and St. John's.