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The Icelandic Shrimp fishery (*Pandalus borealis*) in the Denmark Strait in 1991 and early 1992.

by

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Catch Trends

In 1991 the fishery was carried out from May onwards. The total catch of the year was 465 tonnes and the mean CPUE for the whole year was 198 kg per trawling hour (table 1) as compared to 76 kg of 1990. What is so unusual about the catch rate through the year is that there were good catches in May or 252 kg per trawling hour, but for the remainder of the year the shrimp was hardly available. The size of the trawl has changed from the average of about 2400 meshes (circumference) on an average in the years 1987 -1990 to 2583 meshes average in 1991. But this change is not so big as to cause any substantial increase in the CPUE. The catch per stratum (fig. 2) is given in table 2. In 1992 there were also rumours of very high catches in April and May on the eastern side.

Commercial Samples

The samples obtained in 1991 were all gathered in May and all came from the same stratum 677 where indeed the bulk of the catch came from. Of the females without spines 79 % were still carrying their eggs suggesting that no hatching had taken place. This is not different from the percentage of females with external eggs against all females without spines in May 1989 (Skuladottir 1991) nor indeed the former findings of Smedstad (1989) of the percentage not spawning in the ovigerous period 1988/89 in the strata no. 628 and 677 of 17.7% and 20.2% respectively, nor the 22.2 % not spawning in the ovigerous period of 1989/90 in stratum -628 (Smedstad 1990). Both last mentioned observations were made in September when spawning was presumably complete. The February sample of 1990 of stratum 627 indicates a proportion of 35.3% not spawning, but that was a very small sample (Skuladottir 1991).

The percentage of males in the catch in May 1991 is 66% (table 3), in 1992 the proportion is 61% in April stratum 676 (table 4) and 35-72% in strata 627,676 and 677 (tables 5-7), or 52 % on the average. This high proportion of males appears to be similar to that of 1990 (Skuladottir 1991) and a much higher occurrence than generally observed in the period 1987-1989 (Hallgrimson and Skuladottir 1988). A small proportion of males appears to have changed sex one year earlier than observed before 1990 and although not so pronounced as in September 1990 where 21.5% of mature females were less than 27 mm carapace length there are still some signs of this early change of sex in samples of both May 1991 and April-May 1992. The percentage of females without spines less than 27 mm being 10.8% in 1991 and 11.1 in 1992 as compared to the 0-1.5% in 1987-1989. The small mode of mature females of 25- 27 mm is visible in the May samples of 1991 and most of the samples of 1992. It should be noted that here are only two ovigerous periods involved.

References

HALLGRIMSSON, I. AND SKULADOTTIR, U. 1988. The Icelandic shrimp (*Pandalus borealis*) fishery in the Denmark Strait in 1987. NAFO SCR Doc. No. 64, Serial No. N1506, 10 p.

SKULADOTTIR, U. 1991. The Icelandic shrimp fishery (*Pandalus borealis*) in the Denmark Strait in 1989 and 1990. NAFO SCR Doc. No. 72, Serial No. N1956, 16 p.

SMEDSTAD, O. 1989. Preliminary report of the cruise with M/T "Hakoy-II" to East Greenland waters in September 1988. NAFO SCR Doc. No. 19, Serial No. N1595, 11 p.

1990. Preliminary report of a cruise with M/T "Hakoy-II" to East Greenland waters in September 1989. NAFO SCR Doc. No. 12, Serial No. N1724, 13 p.

Table I. The catch, effort and CPUE as reported by Icelandic logbooks, in the Denmark Strait in 1991. It is considered that the catch was reported 100 %.

YEAR	FROM LOGBOOKS CPUE kg/hr	EFFORT Tr. hours	CATCH Tonnes
1991			
May	252	1536	387.7
June	85	394	33.4
Σ May-June	218	1930	421.1
August	24	9	0.2
September	68	64	4.4
October	112	350	39.2
Σ Jul-Nov	104	423	43.8
Total 1991	198	2353	464.9

Table 2. Nominal catch (tonnes) per stratum and month in 1991.

	Stratum number						
Month	626	627	628	676	677	678	728
May		51.52		2.62	333.51		
June	0.87	7.46		0.70	24.39		
July							
August			0.04		0.18		
September			4.07			0.30	
October		0.37	37.41		0.32	0.16	0.89
Total	0.87	59.35	41.52	3.32	358.40	0.46	0.89

The legend for the different sex categories of P. borealis in the Denmark Strait, see tables 3-7:

m a	Males.
m i	Transitionals.
m g	Females with sternal spines, no headroes.
g m	Females with sternal spines, with headroes.
a g	Females without sternal spines, no headroes, not berried but at times with egghairs.
g a	Females without sternal spines, with headroes, not berried.
e a	Females with green eggs, no eyespots.
e m	Females with eggs with eyespots.
e g	Females with eggs with eyespots and also with headroes.
w i	Primaparous females, mi+mg+gm.
w o	Multiparous females, ag+ga+ea+em+eg.

Table 3. The length distribution by 3 major categories, males, transitionals and immature females combined and females with no sternal spines. At the bottom there are sums by 9 sexual categories as explained above.

May 1991 Stratum 677				
CL mm	♂	♂ ♀	♀ no spines	Σ
12.5	1			1
13	1			1
13.5				
14	1			1
14.5	2			2
15	3			3
15.5	10			10
16	10			10
16.5	10			10
17	13			13
17.5	14			14
18	25			25
18.5	25			25
19	22			22
19.5	29			29
20	50			50
20.5	63			63
21	84			84
21.5	94		1	95
22	112			112
22.5	104		1	105
23	118	1	1	120
23.5	69	3		72
24	72	4	3	79
24.5	52	2	4	58
25	40	10	4	54
25.5	27	6	7	40
26	25	14	11	50
26.5	10	9	11	30
27	11	16	4	31
27.5	11	15	16	42
28	9	27	11	47
28.5	3	19	22	44
29	6	16	24	46
29.5	1	19	41	61
30		14	59	73
30.5		12	46	58
31		2	38	40
31.5		3	35	38
32		1	22	23
32.5		2	13	15
33		1	13	14
33.5			3	3
34			4	4
34.5			2	2
Σ	1127	196	396	1719
	ma	mi	mg	gm
Σ	1127	1	0.	195
mean CL	221.00	285.00	0.00	279.00
%	65.56	0.06	0.00	11.34
	ag	ga	ea	em
Σ	9	66	0.	288
mean CL	275.56	291.89	0.00	299.98
%	0.52	mar.84	0.00	16.75
	eg			
Σ	33			
mean CL	297.58			
%	1.92			

Table 4. The same legend as in table 3.

May 1992 Stratum 676				
CL mm	♂	♂ ♀	♀ no spines	Σ
14				
14.5				
15				
15.5				
16				
16.5				
17				
17.5				
18	1			1
18.5	1			1
19				
19.5				
20				
20.5	1			1
21				
21.5				
22	2			2
22.5				
23	2			2
23.5	1			1
24	8	1		9
24.5	6		1	7
25	3	1	1	5
25.5				
26	2		1	3
26.5			1	1
27			2	2
27.5			2	2
28	1		1	2
28.5			5	5
29			3	3
29.5		1	3	4
30			7	7
30.5			1	1
31			5	5
31.5			3	3
32			4	4
32.5			3	3
33			3	3
33.5			2	2
34				
34.5				
35				
35.5				
Σ	28	3	48	79
	ma	mi	mg	gm
Σ	28	1	0.	2
mean CL	23.73	25.00	0.00	26.75
%	35.44	1.27	0.00	2.53
	ag	ga	ea	em
Σ	0.	11	0.	33
mean CL	0.00	31.36	0.00	29.86
%	0.00	13.92	0.00	41.77
	eg			
Σ	4			
mean CL	27.00			
%	5.06			

Table 5. The same legend as in table 3.

May 1992 Stratum 677				
CL mm	♂	♂ ♀	♀ no spines	Σ
14				
14.5				
15				
15.5				
16				
16.5				
17	1			1
17.5	1			1
18				
18.5				
19	1			1
19.5	1			1
20	5			5
20.5	3			3
21	4			4
21.5	5			5
22	8			8
22.5	10			10
23	6			6
23.5	5			5
24	7			7
24.5	7		1	8
25	9	1		10
25.5	6			6
26	5			5
26.5	4	2	1	7
27	2	1	1	4
27.5	2	1	1	4
28		3		3
28.5			2	2
29			1	1
29.5				
30			2	2
30.5			1	1
31			3	3
31.5			2	2
32			2	2
32.5			3	3
33			3	3
33.5			1	1
34			1	1
34.5				
35				
35.5			1	1
Σ	92	8	27	127
	ma	mi	mg	gm
Σ	92	1	0.	7
mean CL	23.32	25.00	0.00	27.36
%	72.44	0.79	0.00	5.51
	ag	ga	ea	em
Σ	0.	15	0.	12
mean CL	0.00	30.87	0.00	31.08
%	0.00	11.81	0.00	9.45
	eg			
Σ	0.			
mean CL	0.00			
%	0.00			

Table 6. The same legend as in table 3.

April 1992 Stratum 676				
CL mm	♂	♂ ♀	♀ no spines	Σ
14	1			1
14.5				
15				
15.5				
16	1			1
16.5				
17	2			2
17.5	2			2
18	5			5
18.5	3			3
19	6			6
19.5	4			4
20	19			19
20.5	20			20
21	34	1		35
21.5	22			22
22	21		2	23
22.5	25			25
23	24	1		25
23.5	41	3	1	45
24	40		2	42
24.5	30	1	3	34
25	34	1	4	39
25.5	24	4	5	33
26	26	6	7	39
26.5	18	4	5	27
27	10	4	5	19
27.5	7	3	9	19
28	4	5	16	25
28.5	2	10	14	26
29		6	20	26
29.5		5	22	27
30		3	20	23
30.5		2	14	16
31		1	17	18
31.5			16	16
32			6	6
32.5			6	6
33			8	8
33.5			1	1
34			4	4
34.5				
35				
35.5			4	4
Σ	425	60	211	696
	ma	mi	mg	gm
Σ	425	10	2	48
mean CL	23.28	25.00	2.00	28.13
%	61.06	1.43	0.29	6.90
	ag	ga	ea	em
Σ	3	59	0.	145
mean CL	24.50	30.44	0.00	29.23
%	0.43	8.48	0.00	20.83
	eg			
Σ	4			
mean CL	25.38			
%	0.57			

Table 7. The same legend as in table 3.

May 1992 Stratum 627				
CL mm	♂	♂ ♀	♀ no spines	Σ
14				
14.5				
15				
15.5				
16	1			1
16.5	1			1
17				
17.5				
18	1			1
18.5	2			2
19	4			4
19.5				
20	4			4
20.5	4			4
21	9			9
21.5	5			5
22	9	1		10
22.5	3			3
23	8			8
23.5	7		1	8
24	13			13
24.5	8			8
25	12		1	13
25.5	8	2	2	12
26	4	2	2	8
26.5	5	1	4	10
27	5	1	3	9
27.5	3		4	7
28		2	3	5
28.5		1	7	8
29		1	7	8
29.5			9	9
30		3	17	20
30.5			13	13
31			16	16
31.5			11	11
32			7	7
32.5			3	3
33			4	4
33.5			1	1
34			2	2
34.5			2	
35				
35.5				
Σ	116	14	119	249
	ma	mi	mg	gm
Σ	116	1	2	11
mean CL	23.29	22.00	26.00	28.00
%	46.59	0.40	0.80	4.42
	ag	ga	ea	em
Σ	0.	12	0.	98
mean CL	0.00	29.83	0.00	30.01
%	0.00	4.82	0.00	39.36
	eg			
Σ	9			
mean CL	30.05			
%	3.61			

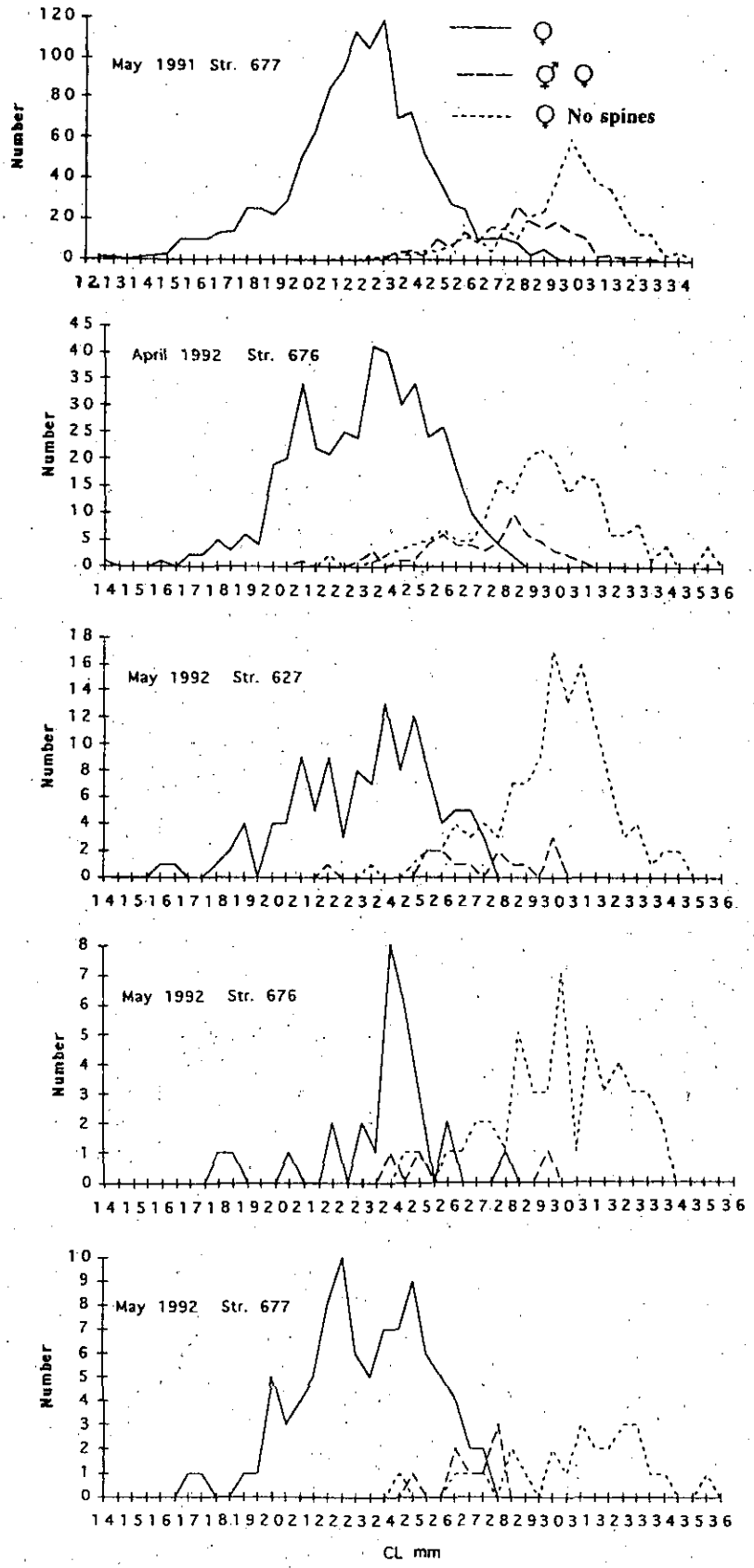

Fig. 1. The samples obtained in 1991 and 1992 compiled by month and stratum, see tables 3-7.

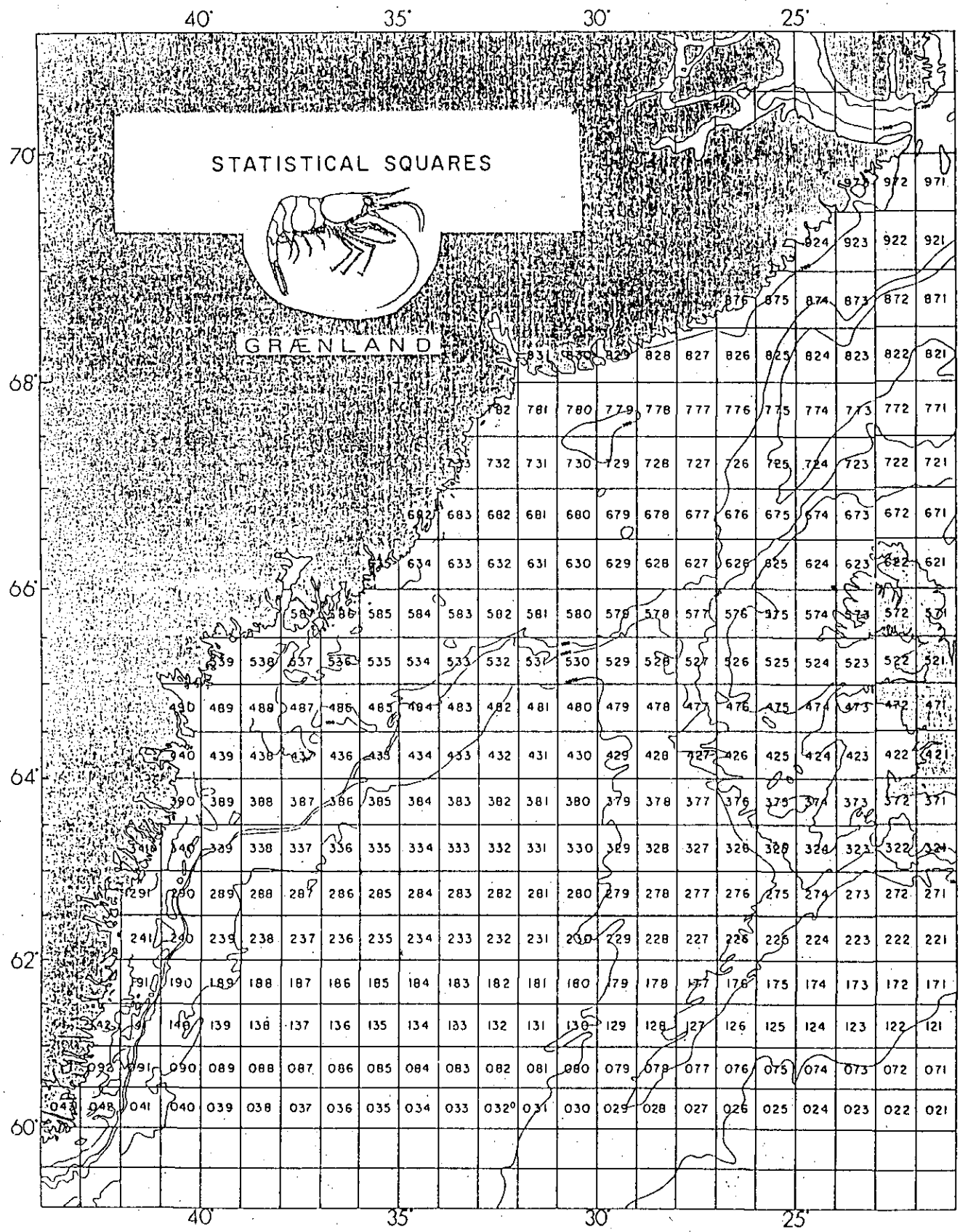

Fig. 2. The strata numbers in the Denmark Strait area.