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Norwegian Investigations on Shrimp, *Pandalus borealis*,
in East Greenland Waters in 1981

by

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INTRODUCTION

Norwegian landings of shrimp in East Greenland waters in 1980 were 2461 tons compared to the quota of 2500 tons. The Norwegian quota in 1981 was 3000 tons. 19 vessels have taken part in the fishery and preliminary reported landings are 1918 tons. One reason why the quota was not taken, may have been the bad ice conditions in the fishing area. A working document giving the preliminary commercial fishery data for the year 1980, was presented by Jakobsen (1980). Norwegian field investigations on shrimp in East Greenland waters were carried out for the first time in 1981 and the results of the investigations together with analyses of preliminary catch and effort data are presented in this paper.

MATERIALS AND METHODS

From 20 April to 7 May 1981 one of the authors was observer on board the stern trawler "Lyshaug". The catches examined were taken in a small area close to the ice-border (Fig. 1).

The shrimps were sorted into "landings" and "discards" categories after they had been separated from the fish in the catch. Details of the trawl hauls that were examined by the observer are given in Table 1.

Random samples of shrimp catches were taken for length measurements (carapace length to the nearest mm) (Fig. 2). In addition, some length compositions were obtained for by-catches of Greenland halibut (Fig. 3) and redfish (Fig. 4).

Monthly catch and effort data for 1980 and 1981 are compiled from logbooks of the vessels participating in the fishery. For 1981, preliminary data were available from 14 vessels, accounting for 77 per cent of the landings.

SIZE COMPOSITION OF SHRIMP

Length compositions of shrimp in samples of the catch collected by the observer on board "Lyshaug" are listed in Table 2. The weighted mean length composition (with catch as the weighting factor) is shown in Fig. 2. Large shrimp with a modal group around 29 mm were dominating.

The quantity of discarded shrimp was 15.7% of the total shrimp catches. Because of some trouble with the sorting machine at the beginning of the fishery, the percentage of the first eight trawl hauls was on the average somewhat higher than for the later hauls (Table 1).

After adjusting the machine, i.e. excluding hauls nos. 1-8, the discarded shrimp on the average made up 14.9%. Three hauls (nos. 16, 17 and 18) were taken in the northern part of the fished area where shrimp of smaller size were abundant at that time. However, because of the high percentage (42-63%) of discarded shrimp, most of the Norwegian boats returned to the southern part of the fishing area. If these three hauls are also excluded, the average discarding is 11.5%.

BY-CATCHES IN THE SHRIMP FISHERY

By-catches of fish in the trawl hauls of "Lyshaug" examined by the observer are listed in Table 1.

None of the fish were kept except those consumed on board during the trip.

The dominating groups of by-catches were small Greenland halibut and redfish (Fig. 3 and Fig. 4).

The mean number of fish relative to the mean shrimp catch (retained) per tow in 1981 is given in the table below.

Species	Mean number per haul
Cod	1
Greenland halibut	86
Redfish	166
Others	77
Total	330
No. of hauls observed	39
Mean shrimp catch (kg)	504
No. of fish per kg shrimp	0.65

The category others consisted of small skates, plaice and capelin, with the latter as the most numerous.

CATCH AND CATCH PER UNIT OF EFFORT

Table 3 shows catch and catch per hour trawling (CPUE) by month and division for the Norwegian fishery off East Greenland in 1980-1981. (CPUE is calculated as total catch/ total effort.) For 1981, landings are reported only from Div. 14B.

Fig. 5 shows the trend in CPUE in Div. 14B by quarters in 1980 and 1981. There is a decline after the 1st. quarter in both years, but the CPUE levels in 1981 are only about 1/4 to 1/2 of the corresponding 1980 levels. The fact that the average CPUES for the whole year in 1980 and 1981 are very similar, is explained by difference in the seasonal distribution of the effort.

REFERENCE

Jakobsen, T. 1980. The Norwegian trial fishery for shrimp, Pandalus borealis, at East Greenland in 1980. NAFO SC Working Paper 80/XI/52.

Table 1. Catches of shrimp and by-catches of fish in trawl hauls by M/M "Lyshaug" off East Greenland in April-May 1981.

No	Date	Time (hr)	Position		Direction towed	Towing time (hr)	Shrimp catches				By-catches (Nos)			
			N	W			Landings kg	Discards		Total kg	Cod	Gre. hal.	Red- fish	Other
								kg	%					
1	20 April	1300	66°02'	30°10'	360°	3.00	660	200	23	860	1	2	40	9
2	20 April	1945	66°09'	30°09'	190°	3.00	445	80	15	525	2	-	50	10
3	20 April	2400	66°05'	30°08'	355°	2.25	x)							
4	21 April	0330	66°12'	30°06'	190°	3.00	970	-	-	970	1	-	300	46
5	21 April	1615	66°03'	30°06'	195°	2.25	345	55	14	400	2	3	200	22
6	22 April	1215	66°19'	30°08'	360°	2.75	480	190	28	670	-	40	300	28
7	22 April	1620	66°26'	30°11'	180°	3.00	295	122	29	417	-	40	150	30
8	22 April	2120	66°18'	30°10'	15°	3.00	700	200	22	900	-	112	102	48
9	23 April	0420	66°19'	30°09'	360°	2.90	410	45	10	455	-	50	600	57
10	23 April	0840	66°27'	30°10'	150°	2.90	410	-	-	-	3	108	800	16
11	23 April	1515	66°23'	30°11'	190°	2.75	295	38	11	333	-	60	90	32
12	23 April	2020	66°17'	30°11'	170°	3.00	630	52	8	682	1	32	150	12
13	24 April	1100	66°14'	30°10'	360°	3.00	505	30	6	535	1	111	200	20
14	24 April	1500	66°20'	30°11'	180°	3.00	510	30	6	540	3	97	200	20
15	24 April	1900	66°16'	30°09'	350°	3.00	495	21	4	516	-	56	90	3
16	25 April	1425	66°36'	30°17'	345°	2.60	240	100	29	340	-	32	41	-
17	25 April	1850	66°42'	30°16'	180°	2.75	450	270	38	720	2	1055	98	3
18	25 April	2230	66°38'	30°17'	360°	2.50	615	385	39	1000	-	142	200	3
19	26 April	0840	66°19'	30°15'	180°	3.00	365	30	8	395	1	38	140	-
20	26 April	1300	66°14'	30°13'	180°	3.00	185	15	8	200	1	11	80	-
21	26 April	1700	66°09'	30°15'	360°	2.20	260	22	8	282	-	12	38	6
22	27 April	1035	66°19'	30°15'	185°	3.00	275	19	6	294	-	32	106	-
23	27 April	1450	66°13'	30°22'	350°	3.00	600	80	12	680	1	120	112	103
24	27 April	1910	66°21'	30°26'	20°	3.00	340	172	34	512	1	98	80	-
25	28 April	1040	66°20'	30°21'	175°	3.70	310	68	18	378	1	200	200	-
26	29 April	1000	66°29'	30°22'	175°	3.50	665	220	25	885	-	130	170	-
27	29 April	2230	66°23'	30°19'	200°	3.00	465	50	10	515	7	82	800	-
28	30 April	0550	66°22'	30°19'	350°	3.00	880	305	26	1185	2	240	200	-
29	1 May	0130	66°17'	30°32'	360°	0.80	200	13	6	213	4	33	160	-
30	1 May	0950	66°09'	30°08'	360°	2.00	360	20	5	380	-	42	166	-
31	1 May	1355	66°04'	30°08'	180°	2.00	785	40	5	825	2	56	70	1200
32	1 May	1700	66°07'	30°06'	185°	2.00	760	43	5	803	1	40	54	-
33	2 May	1535	66°05'	30°04'	360°	2.00	585	21	3	606	-	46	60	-
34	3 May	1000	66°19'	30°07'	180°	2.00	245	23	9	268	-	41	26	300
35	3 May	1640	66°13'	29°55'	360°	2.00	165	17	9	182	-	5	3	500
36	4 May	1445	66°17'	30°09'	185°	2.00	345	26	7	371	1	40	60	-
37	6 May	1520	66°23'	30°04'	180°	2.50	220	26	11	246	1	65	200	21
38	6 May	1520	66°05'	30°05'	360°	2.00	255	12	4	267	-	22	40	8
39	6 May	2105	66°12'	30°09'	10°	2.50	100	16	14	116	-	31	72	-
40	7 May	0905	66°23'	29°42'	180°	1.80	155	20	11	175	-	17	10	500

x) trawl torn

Table 2. Length composition of random samples from shrimp catches by M/V "Lyshaug" off East Greenland in April - May 1981. (Numbers in heading refer to tow numbers in the first column of Table 1).

Carapace- length (mm)	1	6	10	13	14	17	23	29	33	35	40	Total
15	-	-	1	1	-	-	-	-	-	-	-	2
16	-	-	-	1	-	-	-	-	-	-	-	1
17	-	-	-	-	1	2	-	-	-	-	-	3
18	-	3	1	3	1	-	-	1	-	-	1	10
19	1	7	-	1	2	8	-	2	-	-	2	23
20	-	2	5	4	3	12	1	2	-	1	4	34
21	2	6	5	6	5	15	1	-	-	6	7	53
22	6	17	6	8	6	25	-	-	1	9	13	91
23	5	12	9	4	4	21	-	1	-	9	6	71
24	2	10	5	4	4	23	1	-	3	8	5	65
25	7	7	9	3	3	23	-	1	2	9	6	70
26	1	11	5	1	4	19	4	2	4	12	6	69
27	11	24	14	7	11	27	3	11	10	11	16	145
28	31	37	49	23	34	36	21	14	37	37	27	346
29	53	48	70	42	41	39	23	14	56	54	34	474
30	49	48	66	32	39	19	21	24	60	36	35	429
31	49	20	26	14	22	14	9	18	54	37	21	284
32	26	11	14	17	13	6	8	5	38	25	13	176
33	18	4	5	-	5	9	4	2	18	6	2	73
34	8	3	7	1	2	2	4	3	12	2	1	45
35	-	-	1	1	-	0	-	-	5	1	1	9
36	-	-	2	-	-	0	-	-	-	-	-	2
Total	269	270	300	173	200	300	100	100	300	263	200	2475

Table 3. Catch (metric tons) and catch per hour trawling
(CPUE) by month and division in 1980-1981.
(CPUE is calculated as total catch/total effort)

Year	Month	05 A		14 A		14 B		Total catch
		catch	CPUE	catch	CPUE	catch	CPUE	
1980	Jan							
	Feb							
	Mar					360	0.904	360
	Apr	62	0.713			558	0.704	620
	May					405	0.378	405
	Jun					70	0.098	70
	Jul							
	Aug					83	0.095	83
	Sep					418	0.145	418
	Oct	1	0.071			304	0.099	305
	Nov			11	0.112	189	0.160	200
	Dec							
	Total	63	0.623	11	0.112	2387	0.217	2461
1981	Mar					38	0.322	38
	Apr					937	0.291	937
	May					427	0.146	427
	Jun					83	0.113	83
	Jul							
	Aug					2	0.039	2
	Sep					1	0.042	1
	Total					1488	0.210	1488

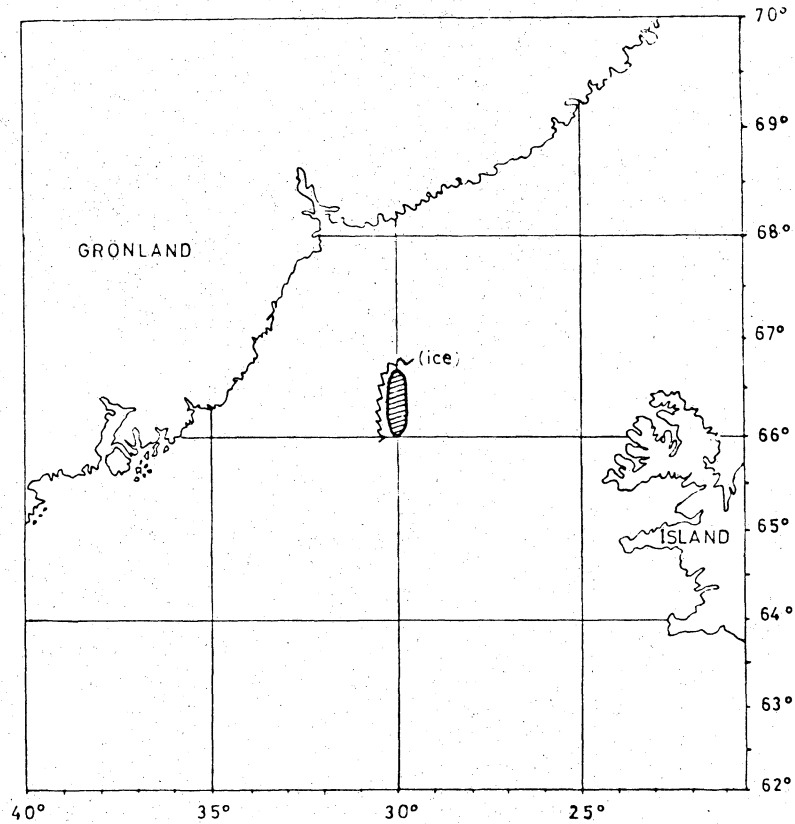


Fig. 1. Hatched area: Area fished by M/V "Lyshaug" during the stay of the observer in April - May 1981.

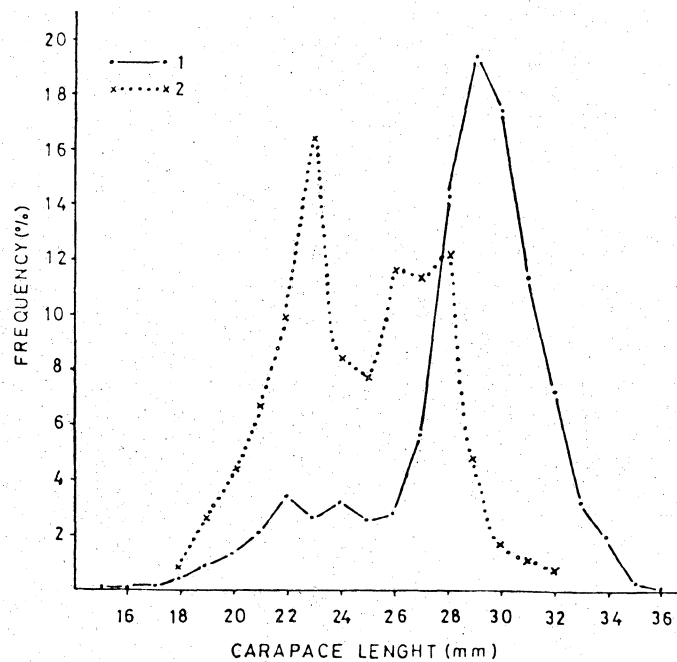


Fig. 2. Weighted mean length composition of shrimp from samples taken off East Greenland in April - May 1981. 1) Landed shrimp 2) Discarded shrimp.

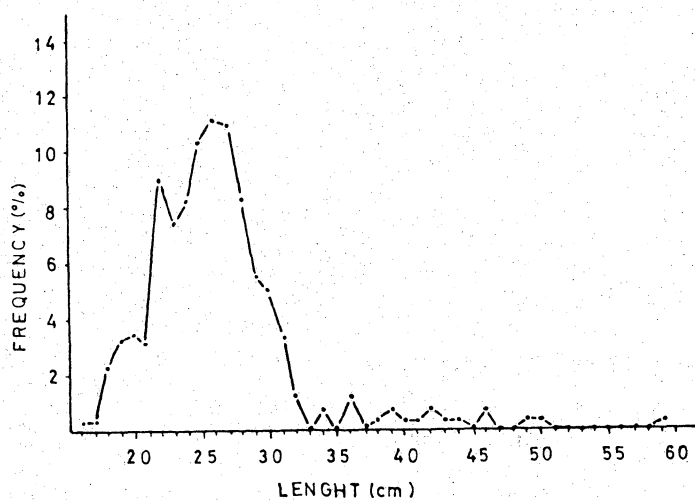


Fig. 3. Length composition of Greenland halibut taken as by-catch with shrimp off East-Greenland in April - May 1981.

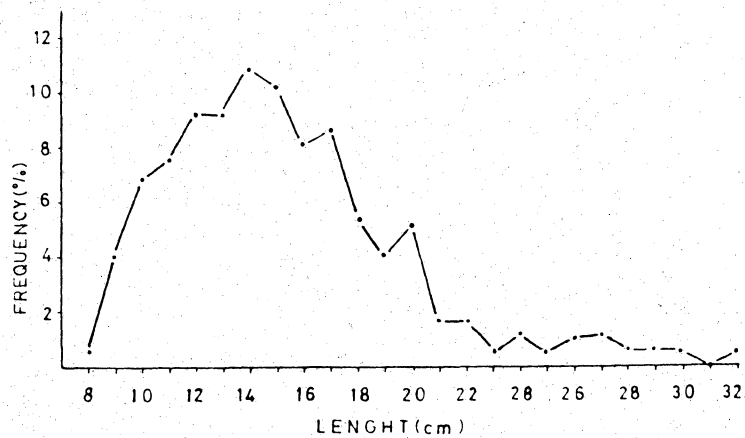


Fig. 4. Length composition of redfish taken as by-catch with shrimp off East Greenland in April - May 1981.

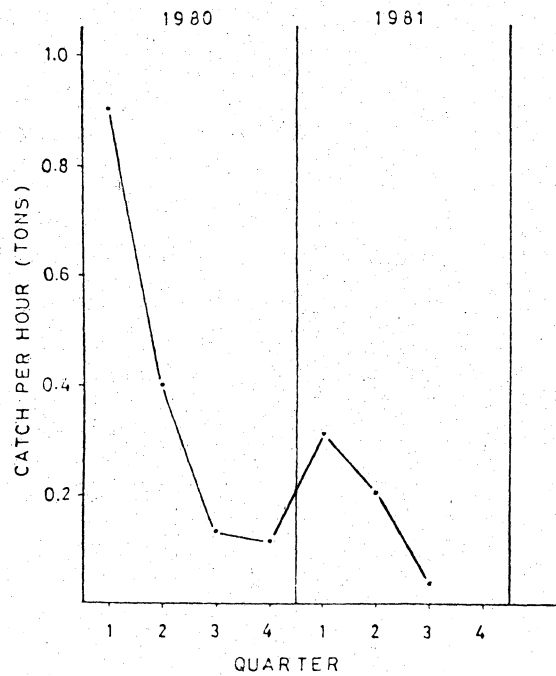


Fig.5. Quarterly mean shrimp catch per hour trawling by Norwegian vessels in Div. 14 B 1980-1981.

