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Size distribution of the edible crab (Cancer pagurus) and catch/
effort in the crab fishery at one locality in Norway during
1972-1974

by

Sverre Torheim^{x)}

INTRODUCTION

The main crabfisheries in Norway today take place on the coast from Møre to Trøndelag mainly in Sept. - Nov.

The fishery has been going on since about 1935, but investigations from this area are very scarce or missing.

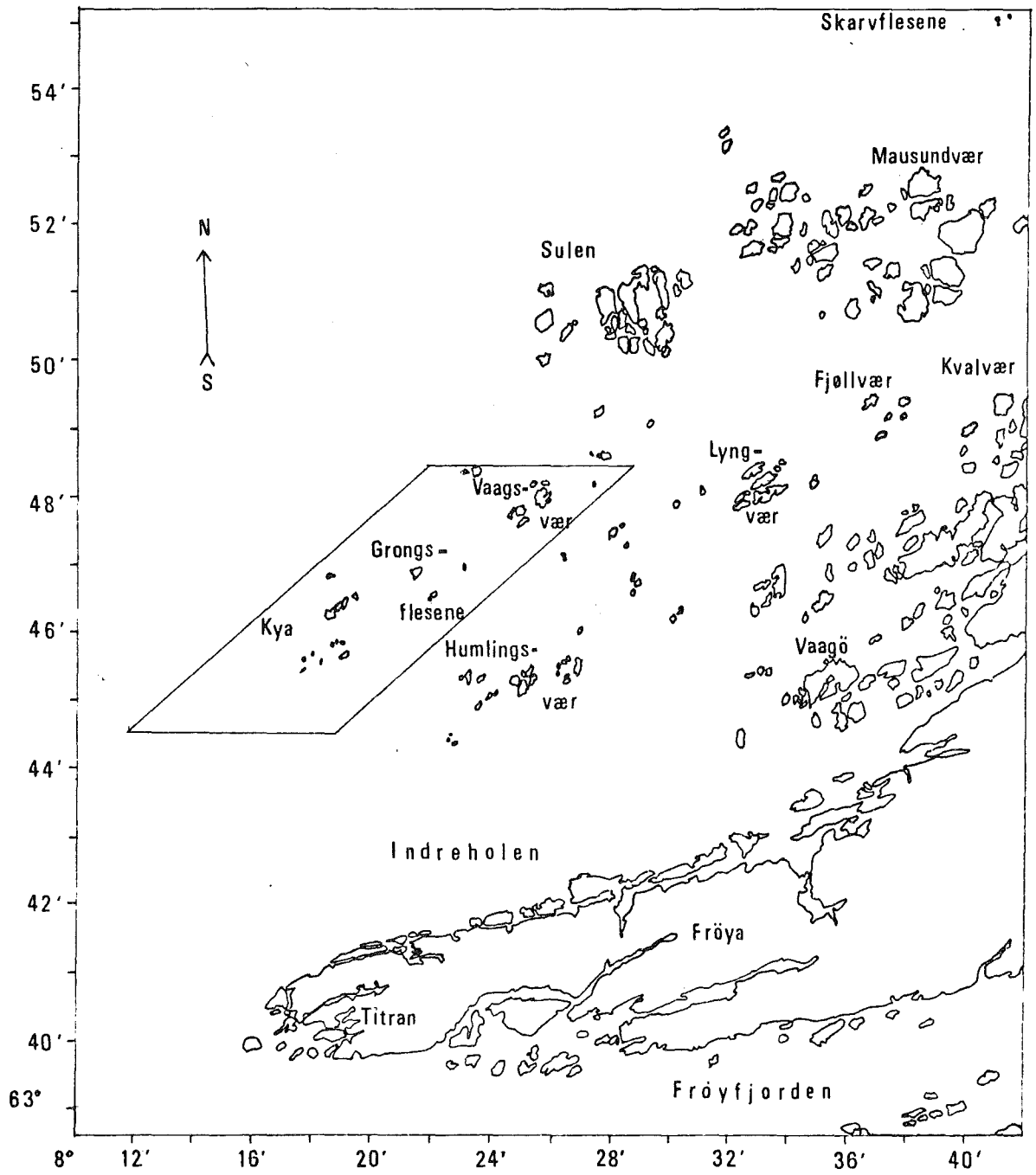
In 1972 it was decided to make a cruise to an area off Kya, a group of islands west of the Trondheimsfjord (Chart I). A fishingboat (31'), which usually is engaged in crabfishing here, was chartered for this purpose.


The main aim of the research program was to investigate the state of the crab stock, size composition, tagging experiments, migration, moulting time and distribute log books to the fishermen.

Only the two first phases of the program will be discussed in this paper.

x) Institute of Marine Research
Bergen, Norway

Chart I



 The crabfishing area.

THE FISHING GROUNDS AT KYA (TOPOGRAPHY)

The fishing grounds are situated in shallow water, 10-20 fathoms, along the shore and islands on the eastern side of Kya (Chart I). Between rocks and stones covered with seaweed there is sandy bottom, and the crabs are often numerous early in the season (i.e. Sept.). On fishing grounds in deeper water (20-50 fathoms) the bottom is sandy with isolated rocks.

Farther offshore, west, south and east of the Kya islands, the water is relatively deep (50-100 fathoms). Fishing for crabs deeper than 50-60 fathoms is rather seldom.

DESCRIPTION OF THE FISHERY

The fishing fleet in this area usually consists of six boats (23-42') using mechanical haulers, each operating 150-400 traps the last year. The traps used are square cases made of wood (0,30 x 0,30 x 0,85) m with a synthetic net entrance in each end of the trap.

The amount of bait is 4-5 fresh saithes (Gadus virens) of 20-30 cm length, i.e. the traps are seldomly underbaited. They are lifted and rebaited once a day.

Traps are fished in strings of 12-20 traps with 10-12 fathoms of line between each, and the end trap is often heavily weighted in order to anchor the line.

OBSERVATIONS

Because of difficulties with cartering a fishing boat before the crabfishery started, it was impossible to get random sampling.

The samples discussed here are taken from two different stations of 10-15 and 30 fathoms respectively, starting from the beginning of each season. As far as possible the observations used are taken from the same places from year to year, and the samples must be assumed to be representative for the commercial catches at the beginning of the crabfishing season.

SIZE AND SEX

The measurements taken during 1972, -73 and -74 are presented below.

Number, sex and percentage of crabs in various size-groups off Kya at the beginning of the crab fishery, Sept. -72

Table 1.

Size mm	80- 89	90- 99	100- 109	110- 119	120- 129	130- 139	140- 149	150- 159	160- 169	170- 179	180- 189	190- 199	200- 209	Tot
Female	1	2	18	30	53	61	51	36	21	8	11	1	1	294
Male	3	9	28	45	59	47	47	19	12	3	12	1	1	286
Total	4	11	46	75	112	108	98	55	33	11	23	2	2	580
%	0,7	1,9	7,9	12,9	19,3	18,6	16,9	9,5	5,7	1,9	4,0	0,3	0,3	100

Number, sex and percentage of crabs in various size-groups off Kya at the beginning of the crab fishery, Aug. -73

Table 2.

Size	80- 89	90- 99	100- 109	110- 119	120- 129	130- 139	140- 149	150- 159	160- 169	170- 179	180- 189-	190- 199-	200- 209	Tot.
Female	0	0	4	20	36	43	58	42	20	7	2	0	1	233
Male	2	7	20	37	61	94	65	47	19	8	5	1	0	366
Total	2	7	24	57	97	137	123	89	39	15	7	1	1	599
%	0,3	1,2	4,0	9,5	16,2	22,9	20,5	14,9	6,5	2,5	1,2	0,2	0,2	100

Number, sex and percentage of crabs in various size-groups off Kya at the beginning of the crab fishery, Sept. -74.

Table 3.

Size mm	80- 89	90- 99	100- 109	110- 119	120- 129	130- 139	140- 149	150- 159	160- 169	170- 179	180- 189	190- 199	200- 209	Tot.
Female	0	2	6	20	55	67	56	55	18	12	0	0	0	291
Male	0	4	46	80	77	50	37	8	6	2	0	1	2	313
Total	0	6	52	100	312	117	93	63	24	14	0	1	2	604
%	0	1,0	8,6	16,6	21,9	19,4	15,4	10,4	4,0	2,3	0	0,2	0,3	100

EDWARDS (1967) found that the average increase in shell width during a single moult is one fifth of the previous size.

Of the crabs examined in 1972, 57 per cent were of commercial size (shell width larger than 130 mm), and 32 per cent had a shell width in the range 110-130 mm (Table 1, Fig. 1.) Part of the crabs in the range 110-129 mm would moult and reach commercial size (i.e. above 130 mm) the following year, 1973.

The data for 1973 (Table 2, Fig. 2) show that 69 per cent of the crabs were of commercial size, but that year only 25 per cent of the crabs were between 109 and 130 mm. This indicates a smaller recruitment from undersized crabs to the stock of commercial crabs in 1974.

Table 3 and Fig. 3. from 1974, show that only 52 per cent of the crabs were of commercial size. This year, however, 38 per cent of the crabs examined were between 109 and 130 mm, and this indicates good recruitment to the stocks of commercial crabs for the crab-fishery in 1975.

Proportion of crabs at various sizes at the beginning of the crabfishery off Kya during three years

Fig. 1.

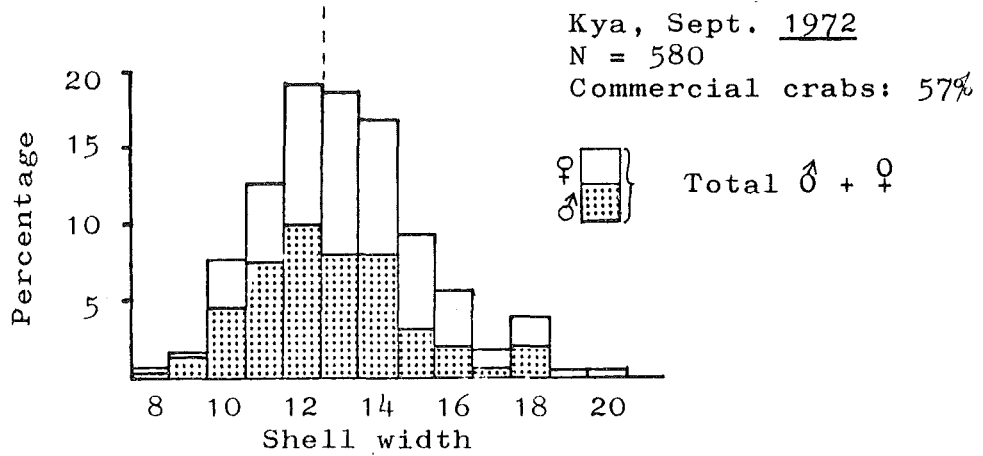


Fig. 2.

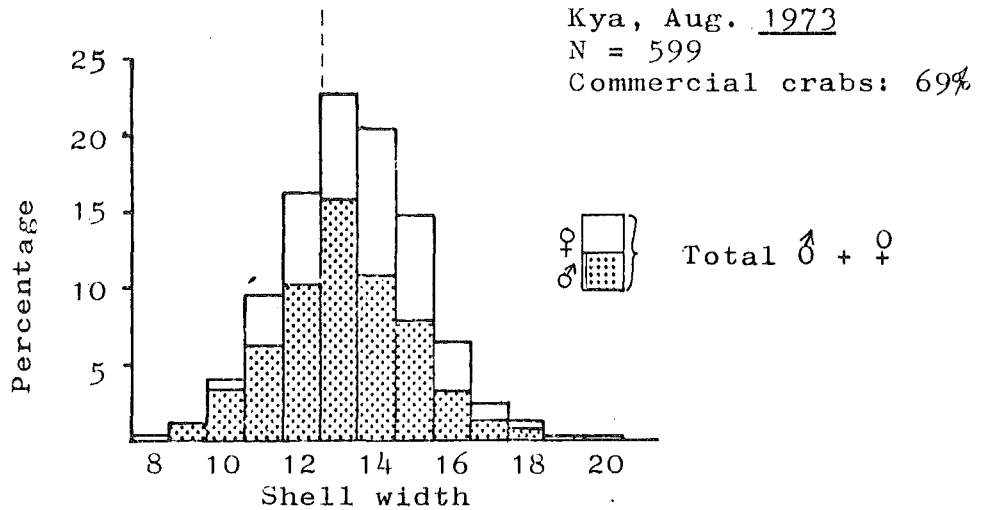
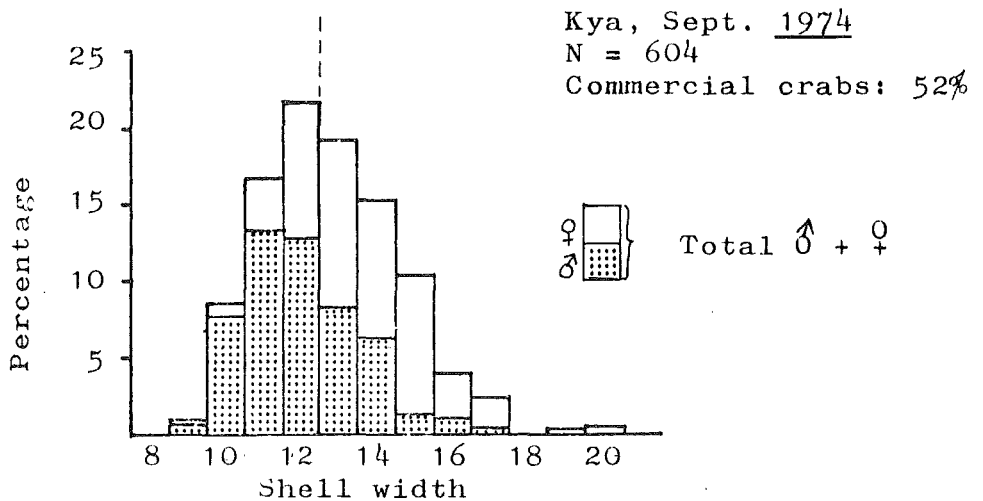


Fig. 3.



Shell width: 8: 80-89 mm, 9: 90-99 mm etc...

N = number of crabs

The broken line represents the size limit of commercial crabs.

Percentage and size distribution of commercial crabs at the beginning of the crab fishery off Kya during three years

Table 4.

Year	% of crabs of commercial size								No. measured
	130 mm	140 mm	150 mm	160 mm	170 mm	180 mm	190 mm	200 mm	
1972	33	28	17	10	3	7	1	1	332
1973	33	30	22	9	4	2	0	0	412
1974	37	30	20	8	4	0	0	1	314

130 mm: 130-139 mm, 140 mm: 140-149 mm etc.....

Average width of carapace and standard deviations for the three years (commercial crabs only):

	Mean	St. dev.
1972:	150,2 mm	16,2 mm
1973	147,7 mm	12,3 mm
1974	146,7 mm	12,6 mm

The data show that the difference between the three years in carapace width is without significance.

CATCH AND EFFORT

Unfortunately only three of the six fishing boats had filled the log books completely. The data are summarized under the following headings:

Fishing effort : Total traphauls per season.
 Catch per effort : Catch of crabs (kg) per 100 traphauls.
 Lifting days : Days of lifting all or a lot of the traps operating.

* = days out of fishing, i.e. stormy weather, engine breakdown etc.

Catch of crabs off Kya from the fishermen's log books
data, 11.9-13.11 1972

Table 5.

Fishing boat	Average traps lifted per day	Fishing effort	Weight in kg.	Catch per effort	Lifting days	*
I 26'	131,3	5645	8500	150,6	43	11
II 23'	95,7	4019	5856	145,7	42	13
III 26'	131,2	5380	6865	127,6	41	9
Average	119,4	5014,7	7073,7	141,3	42	11

Catch of crabs off Kya from the fishermen's log books
data, 3.9-16.11 1973

Table 6.

Fishing boat	Average traps lifted per day	Fishing effort	Weight in kg.	Catch per effort	Lifting days	*
I 26'	126,6	6456	10898	168,8	51	16
II 23'	105,8	5397	7553	139,9	51	14
III 26'	126,1	5170	7422	143,6	41	9
Average	119,5	5674,3	8624,3	150,8	47,7	13

Catch of crabs off Kya from the fishermen's log books data,
2.9-29.10 1974

Table 7.

Fishing boat	Average traps lifted per day	Fishing effort	Weight in kg.	Catch per effort (kg)	Lifting days	*
I 26'	135,8	5430	8244	151,8	40	8
II 23'	126,0	5290	5990	113,2	42	6
III 26'	138,9	6250	7616	121,9	45	4
Average	133,5	5656,7	7283,3	129,0	42,3	6

Average catch of crabs off Kya from log books data during three
years

Table 8.

Fishing boats	Year	Average traps lifted per day	Average fishing effort	Average weight in kg.	Catch per effort
I, II and III	1972	119,4	5015	7074	141,3
I, II and III	1973	119,5	5674	8264	150,8
I, II and III	1974	133,5	5625	7283	129,0

Table 8 shows that average number of traps lifted per day are approximately the same in 1972 and 1973, but the catch per unit effort is higher in 1973. This agrees with the observations in 1972 (Table 1, Fig. 1) which indicated good recruitment for the season 1973.

In 1974 the average number of traps lifted is higher, but there is a fall in catch per unit effort. This agrees with the data from 1973 (Table 2, Fig. 2) which indicated lower recruitment to stock of crabs above legal size (i.e. 130 mm) for the season 1974.

Recruitment to the stock of crabs above legal size may also be influenced by migration.

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