

ANNUAL MEETING - JUNE 1968Comparative selectivity of trawl nets made of Kapron and Manila

by

A.T.Treschev and G.N.Stepanov
VNIRO, Moscow

Due to the fact that in the Soviet trawl fishery conducted in the Northern Atlantic polyamide twine, i.e. kapron, is a main material used for manufacture of trawl webbing, a great number of experiments have been carried out during recent years with the aim of determining the selectivity of kapron trawl nets against those made of manila.

All the experiments were performed according to the same method worked out by ICES as a result of the Joint Experiment of 1959.

The comparative selectivity of trawl nets was studied in respect to cod and redfish separately. Systematization and treatment of experimental material were carried out in accordance with the recommendations of ICNAF and ICES.

Summarized results of experiments on determination of the comparative selectivity of kapron and manila trawl nets are shown in Tables 1-3.

For the sake of comparison, apart from data collected on board the Soviet vessels from 1959 to the present time, the above Tables contain also some data gathered by ICNAF from 1962 to 1966 (Res.Doc. 67/75; Redbook 1967, part III) as well as by ICES (Cooperative Research Report 2, 1964; Cooperative Research Report 3, 1965).

Since in trawl fishery for ground species single-braided materials practically are not used now, the Tables show only those data which are pertinent to trawl nets made of double webbing.

The given Tables lead to a conclusion that the mean value of the selection factor for double kapron trawl nets is 4.1 for

cod, 3.6 for haddock and 3.1 for redfish. For double manila nets the factor is 3.5, 3.1 and 2.6 respectively.

If the mean values of that factor for double manila trawl nets is taken as 1, then with the same mesh size the mean values of the selection factor for kapron nets will be 1.171 for cod, 1.161 for haddock, and 1.192 for redfish, and at an average it will be 1.176 higher than that for respective manila trawl nets.

Consequently, mesh sizes of kapron trawl nets equivalent to manila nets by selectivity will be determined by division of a mesh size of manila net by the conversion factor 1.176. Thus, the Convention mesh sizes will be:

a) for areas in the North-West Atlantic, where at present 114 mm. manila mesh size is adopted, for kapron - $114:1.176=97$ mm.;

b) for the North-East Atlantic, where 120 mm. inner manila mesh size is adopted, for kapron - 120 mm.; $1.176 = 102$ mm. and so on.

As repeatedly been noted by many authors, fishing nets made of polyamide twines of which kapron and nylon are typical representatives, possess maximum extensibility, which accordingly influences the selectivity of fishing gear made of them.

All other materials, including synthetic, exert lesser influence on the selectivity, but nevertheless this influence is considerable and cannot be ignored. For this reason in accordance with the principle of the equivalent selectivity (established by the resolutions of ICNAF Annual Meetings) it is expedient to determine differentiated factors for conversion of mesh sizes equivalent by selectivity for all material used in fishing.

Application of the above method allows to determine mesh sizes for various materials on a scientific basis and would help to get a more precise idea on size composition of fish taken from stocks. Keeping in mind the present state of stocks of ground fish in the Northern Atlantic the latter is of a great practical importance.

Table 1.

Summarized results
of experiments on determination of comparative selectivity of
trawl nets made of kapron and manila (for cod)

Experiment	Double manila			Double polyamide			Difference of factors (in %)	Notes
	Number of hauls	mesh size (mm)	selection factor	number of hauls	mesh size (mm)	selection factor		
1	2	3	4	5	6	7	8	9
"Tunets" 1959 (Joint Experiment)	10	105	3.4	10	108	4.2	23	Cooperative re- search report, 2 1964, table 21,26.
"-"	10	128	3.4					
"Treska", 1959	-	-	-	10	98	4.4		32, 33,34
"-"	-	-	-	10	110	4.4		
"-"	-	-	-	20	90	4.3		
"-"	-	-	-	10	90	4.1		
"Lot", 1959	-	-	-	10	108	4.3		
"-"	-	-	-	10	108	3.8		
"Tresca", 1960	10	125	3.8	10	103	4.2	10	

Table 1 (continued)

1	2	3	4	5	6	7	8	9
"Tresca", 1960	-	-	-	10	104	4.0		
"Melitopol", 1960	10	106	3.7	10	93	4.0	8	
"Lot", 1960	-	-	-	10	106	4.4		
"Goncharov" 1962	5	141	3.4	10	108	4.1	21	Cooperative re- search report, 3 1965, table ICNAF Redbook 1967, p. 135
"Komet", 1963	-	-	-	5	105	4.0		
"Vaigatch", 1964	-	-	-	26	95	4.1		
"Lot", 1964	-	-	-	33	94	3.8		Redbook, 1966, p.135, 138-141
"Severnoe Sijanije", 1965	-	-	-	5	107	3.9		
"_"	-	-	-	5	102	4.0		
Mean value by ICES data	178	105+144	3.5	185	90+140	4.1	17.2	Cooperative re- search report, 2 1964, p.1
Mean value by ICNAF data perlon, kapron, stylon	97	98 - 130	3.5	23	60-125,4	3.7	5.7*)	ICNAF, Redbook 1967 part III, p.103-104
Mean value by data from all the Countries			cp. 3.5			cp. 4,1	17.2	

*) Hauls by nets with chafer are included

Table 2.

Summarized results
of experiments on determination of comparative selectivity of trawl
nets made of kapron and manila (for haddock)

Experiment	Double manila			Double polyamide			Difference of factors (in %)	Notes
	number mesh of size haults (mm)	selection factor	number of haults	mesh size (mm)	selection factor			
"Tunets", 1959	5	106,0	3.2	103	3.8	18.8		
"Tresca", 1960	-	-	2.9	102	3.7	27.6		
"Goncharov", 1963	-	-	3.0	98	3.6	20.0		
Mean values by ICES data								
a/ Arctic	95	109+144	3.2	104+140	3.3	3.1	Cooperative	
b/ Faroes	39	82+106	2.9	-	-	-	research report, 2	
c/ Iceland	51	67-178	3.2	-	-	-	1964	
Mean values by data from								
Joint Experiment	112	98+141	3.3	89-126	3.5	6.1	Cooperative rese- arch report, 3, 1965	
Mean values by ICNAF data	179	67+118	3.2	113.4-127.3	3.5	9.4	Redbook 1967, part III, ICNAF	
Mean value by data from								
all the countries	-	-	3.1	-	3.6	16.1		

Table 3.

Summarized results
of experiments on determination of comparative selectivity of
trawl nets made of kapron and manila (for redfish)

Experiment	Double manila		Double polyamide			Difference of factors (in %)	Notes	
	number mesh of hauls (mm)	selection of size factor	number mesh of size factor	selection of hauls (mm)	Difference of factors (in %)			
1	2	3	4	5	6	7	8	9
<u>USSR</u>								
"Sulin" 1961	8	116.0	2.7	-	-	-	-	-
"-"	8	116.0	2.7	-	-	-	-	-
"-"	6	119.8	2.9	-	-	-	-	-
"-"	6	119.8	3.0	-	-	-	-	-
"-"	6	130.3	2.9	-	-	-	-	-
"-"	6	130.3	2.9	-	-	-	-	-
"Ogon" 1961	-	-	-	3	150.0	2.9	-	-
"Goncharov" 1962	5	92.0	2.5	5	116.0	3.3	32.0	-
"Kometta" 1963	-	-	-	8	103.0	2.7	-	-
<u>Canada</u>								
1954-56 "Marinus"	6	106.7	2.7	-	-	-	-	TEMPELMAN-W, Selection
"-"	4	99.1	2.7	-	-	-	-	of redfish, Joint Sc.
"-"	10	66.4	2.1	-	-	-	-	Meeting S. 21, Lisbon, 19

Table 3 (continued)

1	2	3	4	5	6	7	8	9
1954-56 "Marinus"	17	111.8	2.6	-	-	-	-	
"-"	39	111.8	2.5	-	-	-	-	
Small size trawler	10	114	2.2	-	-	-	-	Mc. CVACKEN F.D. Se- lection by large mesh codends of flat fish and redfish
"-"	10	114	2.4	-	-	-	-	
<u>USA</u>								
"Prisaila - 5"	8	115	2.5	-	-	-	-	
"-"	3	99	2.4	-	-	-	-	CLARK J.K. Escapement of redfish through codends Summary of United States experi- ment, J.Sc.Meeting s.29 Lisbon, 1957
"-"	4	69	2.3	-	-	-	-	
"Albatros - 3"	2	132	2.4	-	-	-	-	
"-"	8	109	2.2	-	-	-	-	
"-"	4	80	2.2	-	-	-	-	
"-"	3	82	2.6	-	-	-	-	
<u>Norway</u>								
"Georg Sars" 1956-57	1	144	2.6	-	-	-	-	ICNAF, Spec. Publ.5
"-"	1	144	3.1	-	-	-	-	
"-"	1	144	2.8	-	-	-	-	
"Johan Jort" 1960	1	132	3.0	-	-	-	-	C.M. 1960, N 89
"-"	1	132	2.9	-	-	-	-	

Table 3 (continued)

	1	2	3	4	5	6	7	8	9
<u>FRG</u>									
"Anton Dorn" 1957-60	-	-	-	-	12	129	3.5		
"-"	-	-	-	-	11	129	3.3		
"-"	5		129	2.4	7	132	3.1	29.2	
<u>Joint Experiment</u>									
<u>1962</u>									
"Anton Dorn"	11		139	2.9	17	132	2.9		
"-"	10		149	3.1	7	142	3.1		
"Explorer"	8		127	2.2	3	89	2.7	22.7	
"-"	3		132	2.8	-	-	-		
"Goncharov"	-		-	-	3	118	3.2		
Mean value by data from all the countries				2.6			3.1	19.2	

Cooperative
Research report,
3, 1965.