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Notes on selectivity of hake, horse-mackerel and bib, with trawl gears of polyamyde in the fishery of Galicia

by

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Introduction

In the present notes, preliminary results of selectivity with polyamyde trawl gears for hake (Merluccius merluccius), horse-mackerel (Trachurus trachurus) and bib (Trisopterus luscus), are given. These were calculated from experimental fishing carried out by the fisheries group of the Laboratory of Vigo of the Fisheries Research Institute.

Material and Methods

The gear used was a trawl net called "baca" common in the commercial bottom trawl fishery of Galicia, its cod-end measuring 5 meters long and with a mesh size of 61 mm. The net used for the cod-end was machine weaved with braided polyamyde multifilament. All the experiences were carried out by the covered cod-end method, being the covers of knotless braided polyamyde multifilament, with a mesh size between 27 and 32 mm and a length of 9 meters.

After each trawl, from 40 to 50 meshes were measured, with an ICNAF type calibrator with a 5 kg force.

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The trawls were carried out on board 4 commercial vessels, of the type normally used in the bottom trawl fishery off Galicia. The vessels ranged between 24 and 32 length overall, from 117 to 162 GRT and with a horse power from 270 to 600 H.P. Trawling speed was from 2 to 3 knots and average trawling time one hour and a half.

The trawls were done off Galician coast between Cape Finisterre and Miño River, in depths ranging from 79 to 260 meters, beginning in December of 1970 and finishing in May of 1975. Catch of cod-end and cover were studied separetely, classifying all found species, counting and weighing the total number of each one, and measuring the individuals of commercial species.

The selectivity curves were freehand interpolated by three of the authors, selecting for each case the one showing a 50% selection size between the two others.

Horse-mackerel and bib length was measured to the nearest half centimeter, from the tip of snout, with the mouth closed, to the central point of the line joining the two lobes of the caudal fin (total bilobular lenth) for Horse-mackerel and up to the end of caudal fin (total length) for bib. For hake total length was also used but measured to the nearest centimeter.

Results

In table 1 numeric data referent to the experiences are shown, as well as the selection factors for hake, horse-mackerel and bib respectively, and the selection curves found for these same species are given in figures 1, 2 and 3.

Table 1.- Data of selectivity experiences with Polyamyde nets

	Hake	Horse-mackerel	Bib
Mesh size (mm)	61	61	61
No. of trawls	12	12	12
Total trawling time	20h 40m	20h 40m	20h 40m
Months of experiences (1 to 12)	4-11-12	4-11-12	4-11-12
25-75% length interval (mm)	215-265	237-280	174-202
50% length selection (mm)	242	259	194
Selection factor	3.97	4.25	3.18
No. fishes 25-75% interval	704	2566	1210
Weight of other cod-end animals (kg)	2889	1940	2896
No. of other cod-end animals	16743	7216	8547

Conclusions

Hake

If we compare the selection factor obtained by us with polyamyde nets, with that of other authors (table 2), it is possible to conclude that:

1.- The value found (3.97) is bigger than the one given for polyamyde by MONTEIRO (1964) and LARRAÑETA et al. (1969); it is similar to the values given by DARDIGNAC et al. (1967) and LOZANO-CABO et al. (1968) and smaller than the value given by DARDIGNAC et al. (1968).

2.- The selection factor found for polyamyde is bigger than the one given by VAZQUEZ et al. (1975) for polypropilene and for polyethylene, what means that for the same mesh size, the polyamyde nets allows for a greater escape of young fishes trough meshes.

3.- The 50% selection size found (24.2 cm) is close to the legal size for hake in the Spanish coast (24 cm).

Horse-mackerel

The selection factor for this species (4.25) is bigger than the one given by LARRAÑETA et al. (1969) and VAZQUEZ et al. (1975), what would verify our thinking that with polyamyde is obtained a bigger selection factor than with hemp, polyethylene and polypropylene,at least, for some species.

The 50% selection size of 25.9 cm is even larger than the one given by VAZQUEZ et al. (1975) for polyethylene nets of 67 mm of mesh size.

Bib

In the bibliography revised we have not found any data on selectivity for this species, so that it is not possible to compare our results with other authors. Only we want to indicate that the 50% selection size was 19.4 cm, a size that, without any doubt, allows the young fish to escape trough meshes. The selection factor found was 3.18.

Summary

In the period from December 1970 to May 1975 experimental trawling was carried out in the demersal fishery of Galicia to study the selectivity of polyamyde nets for hake, horse-mackerel, and bib. The selection factors found have been:

Hake.	3.97
Horse-mackerel. .	4.25
Bib	3.18

Comparing with other authors, polyamyde materials seems to produce higher selection factors that other materials.

References

DARDIGNAC, J., F. LOZANO-CABO, M. LIMA DIAZ et P. MERIEL-BUSSY.- 1967. Sélectivité de divers maillages dans la pêche du merlu. Résultats préliminaires d'une campagne dans la région III (Juin-Juillet 1967). CIEM, C.M. 1967/B: 7: 1-5

DARDIGNAC, J., L.HEDE-HAUY et M. PORTIER.- 1968. Sélectivité des chaluts en polyamide dans la pêche du merlu. (Nouvelles expériences (Juin-Juillet 1968). CIEM, C.M. 1968/B: 16: 1-4

LARRAÑETA, M.G., P. SUAU y J.M. SAN FELIU.- 1969. Experiencias de selectividad en la pesquería de arrastre en el Levante español. Inv. Pesq., 33 (1): 15-53

MONTEIRO, R.- 1964. Selectividade de redes de arrastrar. Estudos sobre a pescada, Merluccius merluccius L. na costa de Portugal. Bol. da Pesca, 83: 39-43

LOZANO, F., F. RAMOS, O.CENDRERO y R. ROBLES.- 1968. Estudio de problemas de selectividad de redes de arrastre, de poblaciones de merluza y principales especies acompañantes, en la Región III de la Convención Internacional para las Pesquerías del Atlántico Nordeste (N.E.A.F.C.). Publ.Tec.J.Est.Pesca, 7: 41-56.

VAZQUEZ, A., E.C. LOPEZ VEIGA, E. LABARTA y M.G. LARRAÑETA.- 1975. Selectividad de la merluza y el jurel con artes de arrastre de polietileno y polipropileno en la pesquería de Galicia. Inf.Técn. Inst.Inv.Pesq., 21: 1-24.

Table 2

Hake

Authors	Area	Material	Calibrator force (kg)	Mesh size (mm)	Selection factor	50% Selection size (mm)
MONTEIRO, 1964	Portugal	Manila	4.95	43.8	4.2	184
		Nylon single	4.95	63.4	3.6	228
		Nylon double	4.95	55.3	3.6	198
DARDIGNAC et al, 1967	Bay of Biscay	Nylon	2	62.2-63.4	3.4-3.5	213-219
	Galicia		2	83.4-84.4	3.2-4.2	269-350
	Portugal		2	99.2-102.2	3.6-3.9	359-393
DARDIGNAC et al, 1968	Bay of Biscay	Polyamide	4	62.8	4.6	291
LOZANO CABO et al, 1968	Cantabrian Sea	Polyamide		60	3.7	220
				80	4.0	320
S.LARRAÑETA et al, 1969	Mediterranean	Hemp	1.5	38-52	3.26	126-164
		Polyethylene	1.5	42-52	2.76	112-152
		Poyamide (different types)	1.5	34-52	2.80-3.57	110-167
VAZQUEZ et al, 1975	Galicia	Polyethylene	5	53	2.42	128
				67	2.64	177
				74	3.27	242
		Polypropylene	5	48	3.46	166
ALONSO-ALLENDE et al, 1975	Galicia	Polyamide	5	61	3.97	242

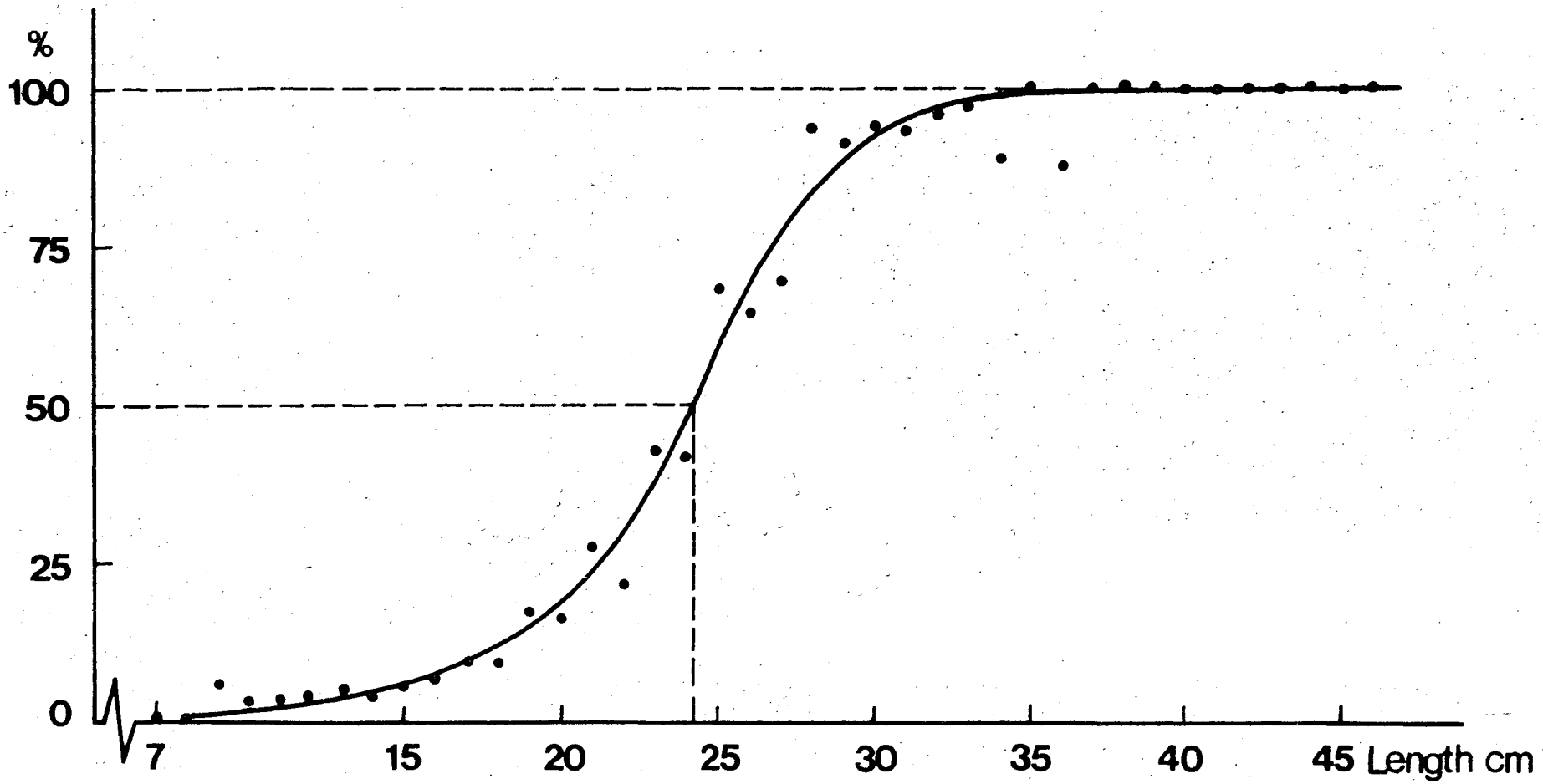

Fig.1 - Selectivity curve for hake with polyamyde nets of 61 mm. mesh size

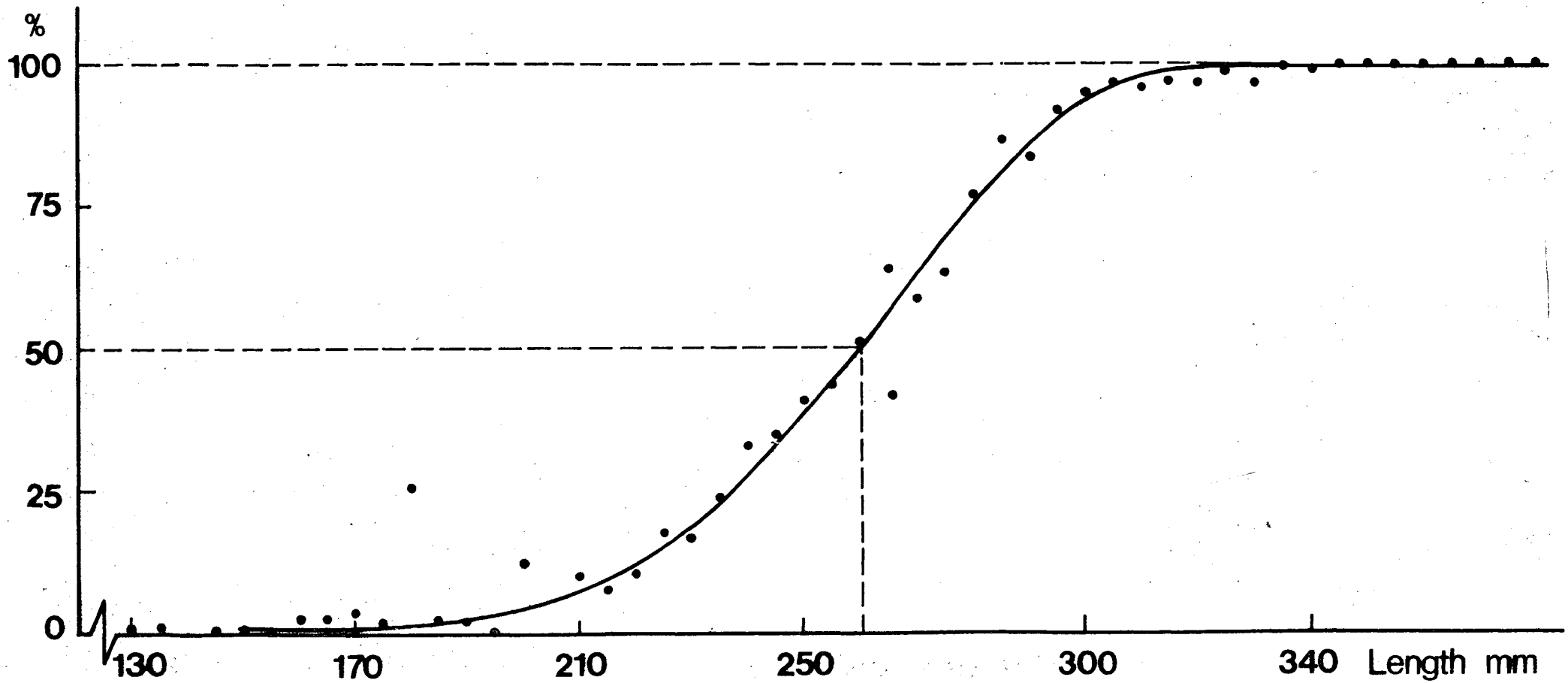

Fig.2- Selectivity curve for horse-mackerel with polyamyde nets of 61 mm. mesh size

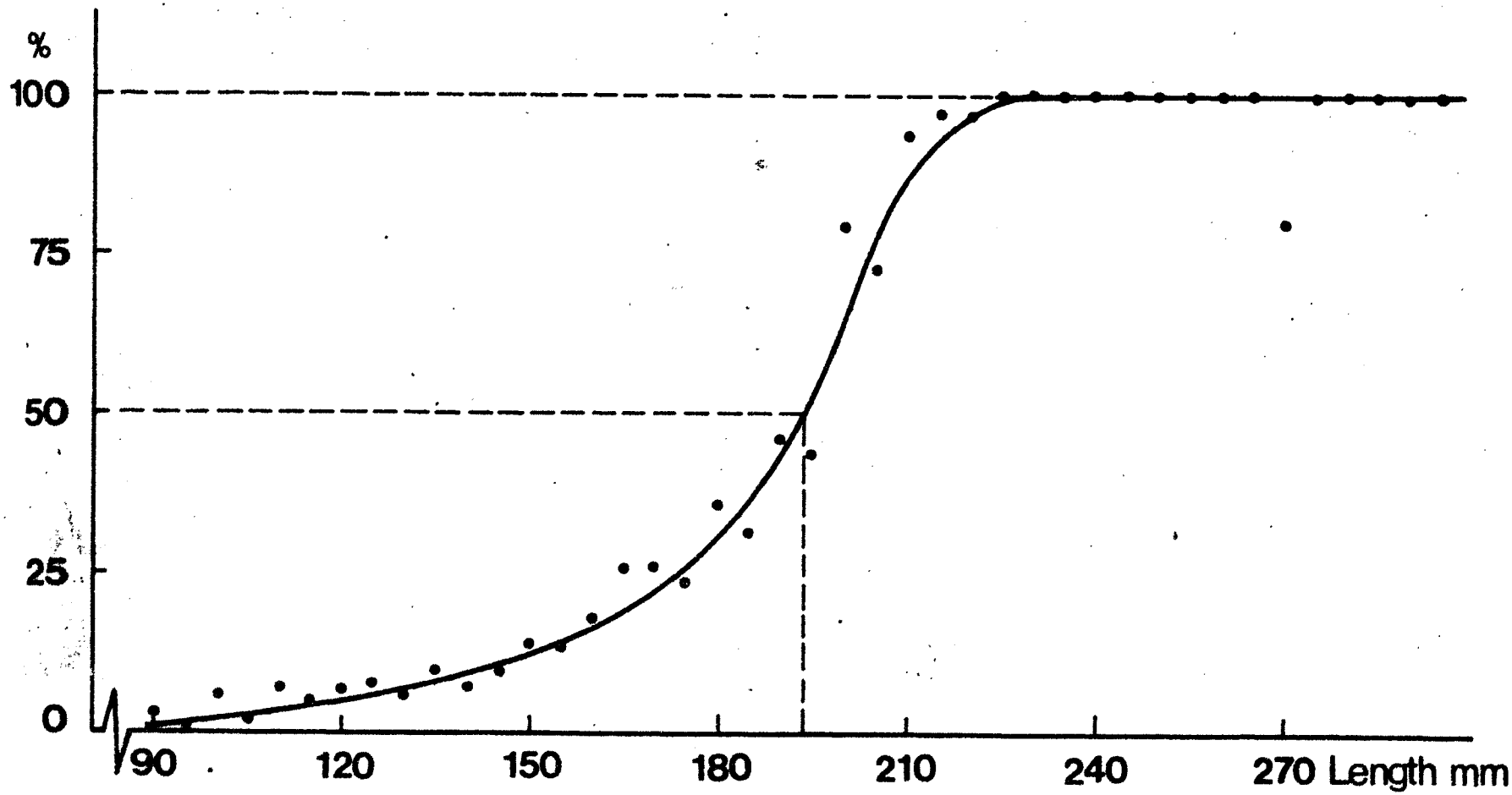

Fig.3- Selectivity curve for bib with polyamyde nets of 61 mm mesh size