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Biomass estimates of squid, *Illex illecebrosus*, in Subdiv. 3Ps

by

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Introduction.

Data discussed in this paper were collected during a cruise carried out aboard R/V CRYOS, from October 29 to November 16 1977 on Saint-Pierre Bank.

The trawling sites were selected randomly in the stratified design currently adopted for Groundfish Surveys in this area.

46 stations, each consisting of a standard 30 minutes trawling tow with a Lofoten trawl, were occupied in strata 310 to 323, 705-706 and 716.

Methods.

The biomass and stock size estimates were calculated from the catches in weight and number in each individual stratum by areal method.

The total area swept by the trawl is calculated on the basis of an horizontal opening of 13.5 m at the wings, in the 3.5-4 knots speed range. The mean area swept per tow, b , is estimated at 0.015 square nautical miles.

The minimum biomass B is given by :

$$B = \bar{y}_h \frac{A_h}{b}$$

where \bar{y}_h = mean yield in the stratum h

A_h = surface of the stratum h .

The variance of this estimate is given by :

$$s_B^2 = \frac{A_h^2 s_h^2}{b n_h}$$

where s_h^2 = variance of yields in the stratum h

n_h = number of tows in the stratum h .

Results.

Detailed data are included in Table I. The biomass and stock size are estimated at 48,480 metric tons and 186037963 individuals in the surveyed area. The standard error of these estimates is important : 31 p.cent of the value.

As underlined by MESNIL (1977) the important variances observed in the most of the strata may be due to the fact that Illex is not a strictly benthic species and the catchability with our shallow opening trawls is therefore irregular.

Moreover the species was actively migrating back the deep waters ; the main catches were obtained in the southern and southwestern edges of the Bank (strata 317-706-319-316-318).

The catches consist of large squids commonly found in this season.

Males range 19 to 25 cm with mean length at 22.7 cm ; they are mature or maturing.

Females sampled have mantle length 20 to 30 cm with a mean of 24.9 cm ; females are all immature.

Summary.

Biomass and stock size estimates of squid Illex in Subdivision 3 Ps were calculated by areal expansion method.

The species was mainly fished on the southern edges of Saint-Pierre Bank as its offshore migration was developing.

Reference

MESNIL (B.), 1977.- Biological characteristics and biomass estimates of squid Loligo pealei and Illex illecebrosus on mid-Atlantic and Southern New England shelves.- Int. Comm. Northw. Atlant. Fish. Res. Doc. 77/VI/4.

Table 1. Squid *Illex illecebrosus*: mean yields in number and weight (kg/half hour) and minimum trawlable biomass estimated (number and metric tons) for each stratum group of strata and for the whole area surveyed during the R/V *Cryos* groundfish survey (1-16 November 1977 Subdiv. 3Ps).

\bar{x}_h, s_h = mean yield in number and standard deviation in the stratum h

\bar{x}, s_x = mean yield in number and its standard error in a group of strata

\bar{y}_h, s_h = mean yield in weight and standard deviation in the stratum h

\bar{y}, s_y = mean yield in weight (kg/half hour) and its standard error in a group of strata

B, s_B = minimum trawlable biomass estimated and its standard error

Depth fath.	30	30-50	50-100	100-150	150												
Stratum number	314	320	312	315	321	311	317	319	322	323	310	313	316	318	705	706	716
\bar{x}_h	3.00	207.33	1.33	103.67	1.00	38.00	4658.00	536.00	0.00	57.50	10.00	61.50	527.67	445.0	55.00	1605	13.33
s_h	2.75	346.13	2.31	69.55	1.91	60.62	4034.04	471.33	0.00	46.62	10.00	85.56	424.12	572.76	72.12	1873.83	8.39
\bar{x}	105.17	39.63	503.88										262.60			480.00	
s_x	81.96	22.90	358.61										117.61			410.06	
B	18.439840	5.819057	90.565.600										11.087475			52.125991	
Number B = 186037963 individuals $s_B = 57636613$																	
\bar{y}_h	0.33	56.67	0.33	27.33	"0"	9.67	1190.33	138.33	"0"	15.00	3.00	16.00	134.33	111.00	14.00	426.00	4.33
s_h	0.58	93.92	0.58	18.18	"0"	15.89	1025.74	123.93	"0"	12.65	3.00	22.63	105.94	142.84	18.38	489.32	3.21
\bar{y}	32.75	9.92	100.16										66.60			171.77	
s_y	31.20	3.79	35.75										29.50			136.13	
B	5.008388	1.512778	25.290386										2.812758			13.855991	
Weight B = 48.480302 kg $s_B = 15.007$ metric tons 48.480 tons																	

