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Catch, Effort and Biological Characteristics of Squid (Illex illecebrosus)
in the French Fishery in Subareas 3 and 4, 1980

by

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St. Pierre et Miquelon

I - Introduction.

In 1980, the French fishery on squid (Illex illecebrosus) was conducted by small inshore boats around St. Pierre and Miquelon Islands (Subdiv. 3 Ps) and by 3 large freezer trawlers off the Nova Scotia Shelf (Div. 4VWX) and on St. Pierre Bank (Subdiv. 3 Ps). A program was set up in the St. Pierre Laboratory to study the squid stock around the French Islands. A survey was carried out by the R/V La Perle in September 1980 (DUPOUY, 1981) to estimate the biomass of this species and bring new biological data. Furthermore, an effort was made to collect a maximum of data on the commercial fishing operations : fishing areas and periods, catches and efforts, by-catches, biological sampling to know the composition of catches (length distributions by sex and maturity stages).

II - The inshore fishery.

1. Catch and effort.

The inshore fishery took place around the French islands of St. Pierre and Miquelon, inside the 12 miles limits in Subdiv. 3 Ps. The fishery was conducted by 50 dories : 45 based in St. Pierre and 5 based in Miquelon. The fishing season started on 20 July, as soon as the squid concentrations began to appear in the inshore waters. The provisional figures give a total catch of 1,885 metric tons. The best concentrations were located around the St. Pierre islands.

The mean CPUE for the 1980 squid season was estimated to 37.7 t/dory against 36.9 t/dory in 1979 (MINET and DUPOUY, 1980). But this slight increase of catch rate don't reflect the abundance observed from year to year (Table 1). So, first concentrations were observed in 1980 one month

later than in 1979. Moreover, squid landings were not limited in 1980, except during one week in August when catches were too important for the fish plant. The peak in abundance was observed in September and fishing activity lasted till mid-october.

2. Hydrographic observations.

Observations on water temperature (Fig.1) were made at standard station in entrance of St. Pierre harbour (10 m depth) where most of squid are usually caught by dories. It was noted, as in 1979, that first squid arrivals took place when water temperature rose higher than 7° C. But this minimum level was delayed from one month in 1980 compared to previous year, probably due to poor meteorological conditions observed in spring. Best concentrations coincided with maxima in temperatures (about 13° C in first decade of August and beginning of September).

3. Biological characteristics of catches.

Eleven samples of squid, from catches landed in St. Pierre between July 21 and October 15, were examined after determination of sex and maturity stages according to the procedure established by AMARATUNGA and DURWARD (1979). During this period, the mean size (mantle length) increase was about 3.6 cm for males and 4.7 cm for females, corresponding to an average growth of 1.2 cm and 1.6 cm by month respectively.

Comparison with previous year (MINET and DUPOUY, 1980) indicates very close growth rate but mean length by month was higher in 1979 season.

Most of length distribution frequencies (Fig.2) are unimodal and sex-ratio indicates that males are dominant in the catch till mid-September. Then, proportions are inversed, as males progressively leave inshore waters for reproductive migration. In 1979, this migration begun in mid-August.

In conclusion, the 1980 squid inshore season presented some differences with previous years characterized by a general shift in arrivals, growth and departures of squid from about one month, probably related to the slower increase of water temperature during June and July.

III - The offshore fishery.

Three french freezer trawlers participated to the offshore fishery : Commandant Gué, Joseph Roty and Victor Pleven. On a total allocation of about 2,000 m.tons for NAFO Areas 3 + 4, only 609 m.tons were fished (provisionnal catches). Total catches by month on NAFO Divisions are given in the following table :

Month	3 Ps	4 W X	Total 3 + 4
August	9	2	11
September	34	362	396
October	202	0	202
Total	245	364	609

These figures are very low, if we compare to previous year (2,736 m.tons by 4 trawlers). Most of squid catches were made on Scotian shelf during the first two weeks of September, principally in NAFO Division 4 W (Fig.3).

Analysis of catch data from log-book of trawler Commandant Gué (Table 3) indicates a mean CPUE of 5.5 t by day fished for the period from August 18 to October 12 with maximum of 15.1 t/day in 4 W (September 8-14) and 6.0 t/day in 3 Ps (Sept. 29-Oct. 5). Squid represented 78 % of the total catches for the whole trip. By-catches were composed, in order of importance, of cod (principally on 3 Ps), hake (exclusively in 4 W), skate, halibut and haddock.

References

- AMARATUNGA, T. and R.D. DURWARD, 1979.- Standardization of Data collection for the short-Finned Squid, Illex illecebrosus. ICNAF Sel. Papers, No. 5 : 37-41.
- DUPOUY, H., 1981.- Biological Characteristics and Biomass estimate of the squid, Illex illecebrosus, on Scotian shelf (Div. 4VWX) in late summer of 1980. NAFO SCR.DOC. 81/VI/38.
- MINET, J.P. and H. DUPOUY, 1980.- Catch, Effort and Biological Characteristics of squid (Illex illecebrosus) in the French Fishery in Subarea 3 and 4, 1980. NAFO SCR.DOC. 80/II/12.

Month	1979	1980
June	32	0
July	283	86
August	918	225
September	612	1,317
October		257
Total	1,845 m.t.	1,885 m.t.
CPUE (t/dory)	36.9	37.7

Table 1 - Provisional catch (m. tons) and CPUE data from French (SP) squid inshore fishery in 1979 and 1980.

Date	Number measured	Males		Females		Sex-ratio
		\bar{ML} (cm)	S.d.	\bar{ML} (cm)	S.d.	
July 21	211	18.35	1.10	18.72	1.26	47
July 28	185	18.66	1.02	19.18	1.15	63
August 6	200	19.16	0.83	19.79	1.05	63
August 11	199	19.66	0.92	20.38	1.23	55
August 18	195	19.90	0.95	21.02	1.33	58
September 1	198	20.47	0.97	21.63	1.36	51
September 18	199	21.59	0.85	22.95	1.55	40
September 23	200	21.62	0.86	23.09	1.43	36
September 30	197	21.49	1.02	23.10	1.80	44
October 8	139	21.68	0.94	22.63	1.32	49
October 15	168	21.91	0.88	23.44	1.28	44

Table 2 - Characteristics of samples collected from squid inshore french fishery around Saint-Pierre and Miquelon islands (July-October 1980).

Date	3 Ps			4 W			Total		
	Catch	Days	CPUE	Catch	Days	CPUE	Catch	Days	CPUE
Aug. 18-24	1,494	4	373				1,494	4	373
Aug. 25-31	8,657	3	2,886	940	2	470	9,597	5	1,919
Sept. 1-7				78,842	7	11,263	78,842	7	11,263
Sept. 8-14				105,545	7	15,078	105,545	7	15,078
Sept. 15-21	8,578	6	1,430	770	1	770	9,348	7	1,335
Sept. 22-28	24,377	6	4,063				24,377	6	4,063
Sept. 29-Oct. 5	42,021	7	6,003				42,021	7	6,003
Oct. 6-12	4,292	7	1,860				4,292	7	1,860
Total	89,419	33	2,710	186,097	17	10,947	275,516	50	5,510

Table 3 - Provisional catch (kg) and effort (days fished) from French (M) offshore trawler Commandant Gué on squid Illex during the period from August 18 to October 12 1980.

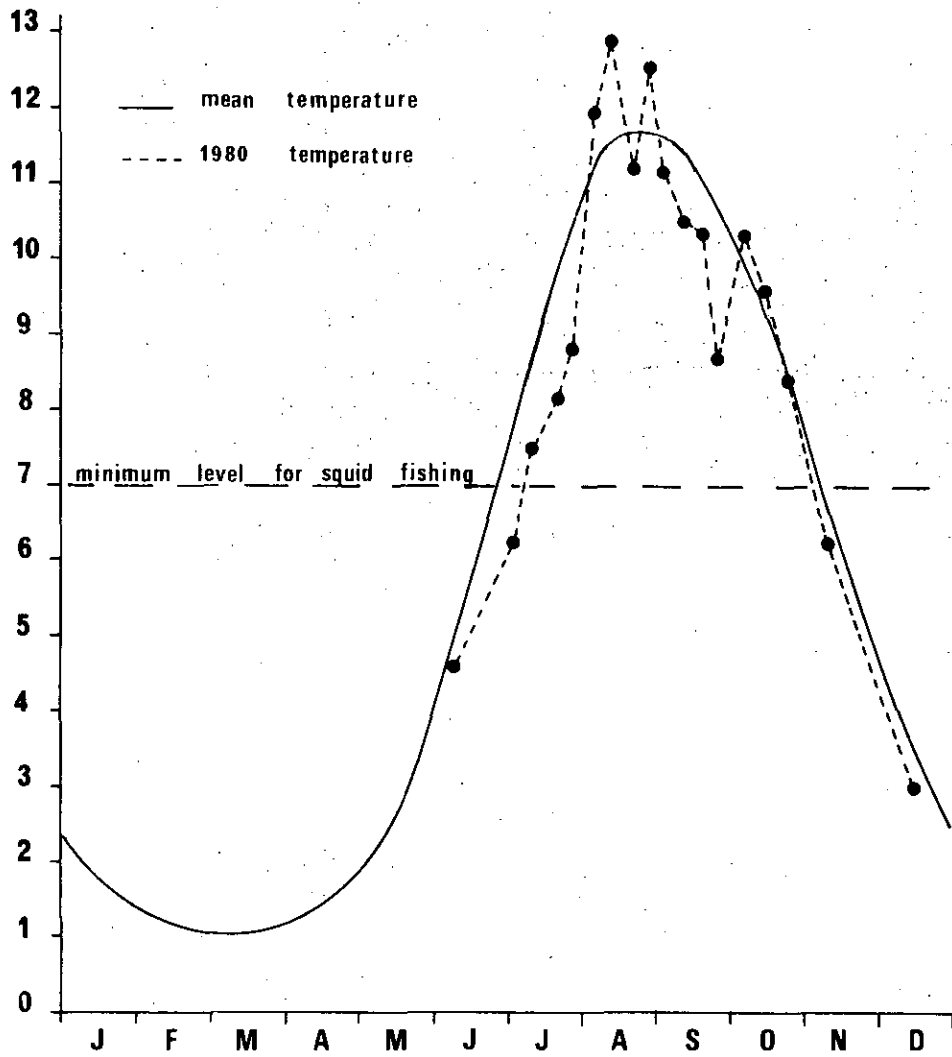


Fig.1 - Evolution of water temperatures in St. Pierre entrance (10 m depth).

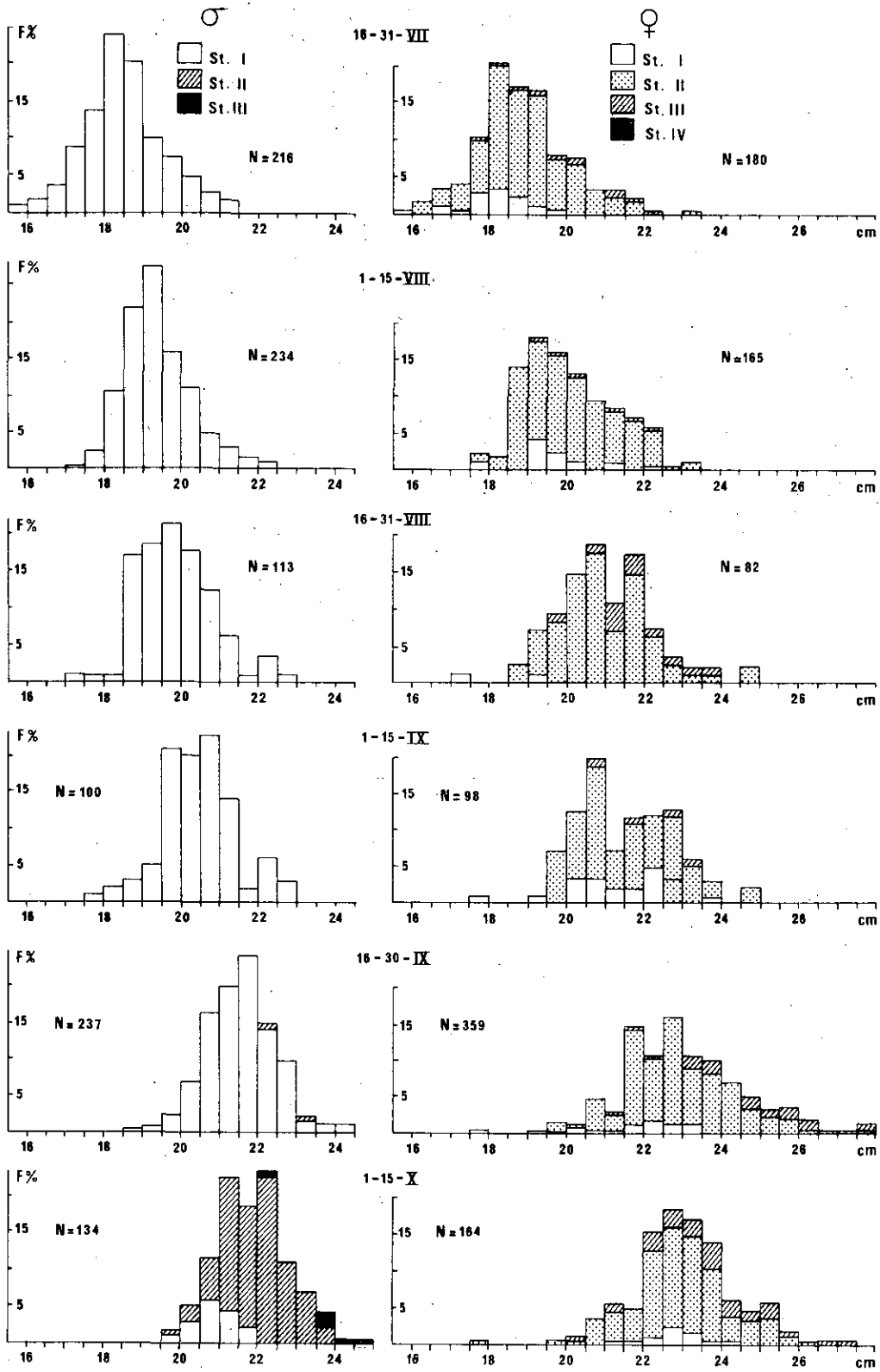


Fig.2 - Length distribution of squid, *Illex*, in the French (SP) inshore fishery (Subdiv. 3 Ps) according to sex and maturity stages.

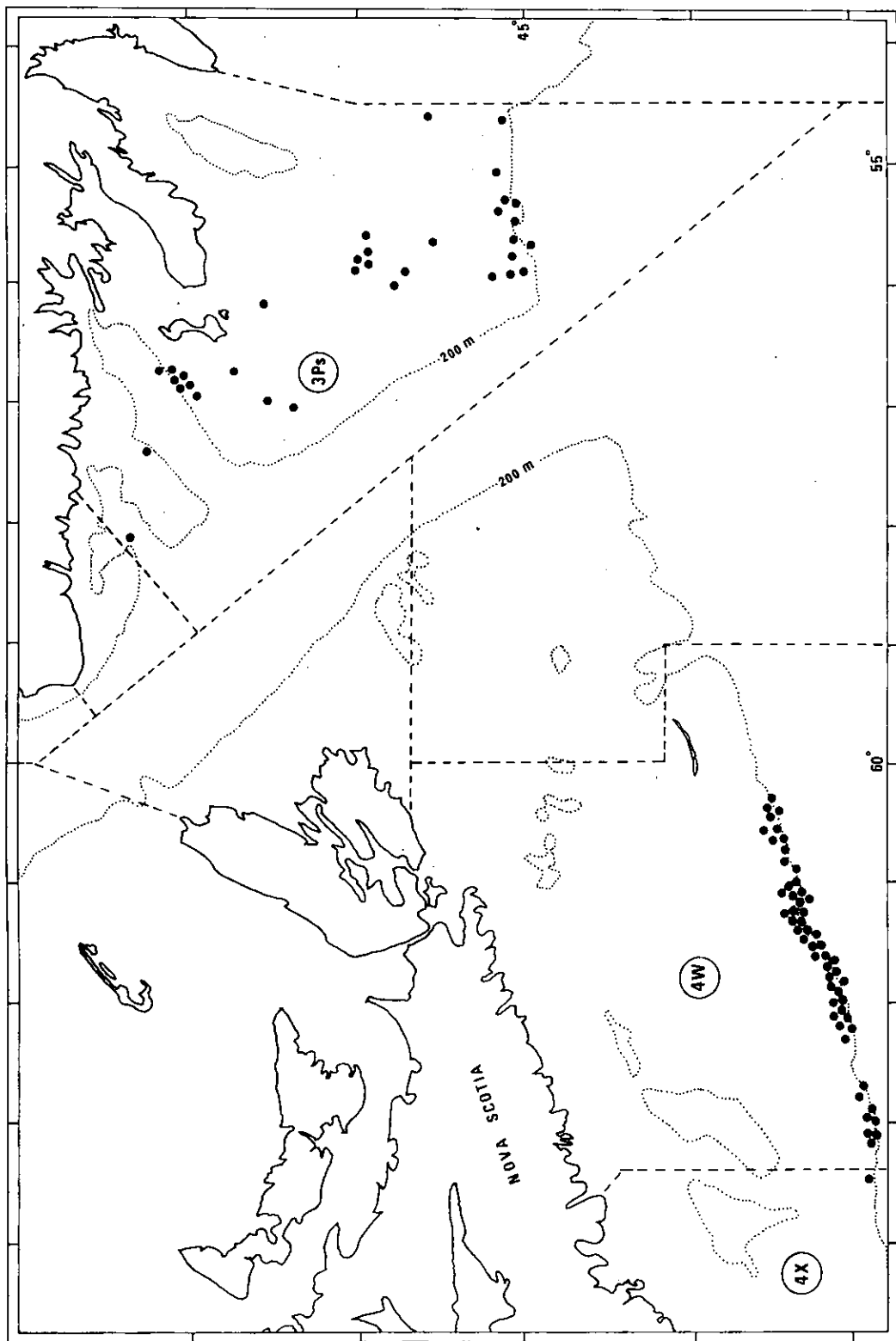


Fig.3 - Position of tows made by French (M) offshore trawler Commandant Gué during Squid trip in NAFO areas 3 and 4 from August 18 to October 12, 1980.

