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A NOTE ON THE FECUNDITY OF HERRING (CLUPEA HARENGUS HARENGUS
L.) FROM GEORGES BANK, THE GULF OF MAINE AND NOVA SCOTIA

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INTRODUCTION

The fecundity of herring (Clupea harengus harengus L.) has received considerable attention in Europe, but very little information on fecundity is available for the areas of Georges Bank, the Gulf of Maine and Nova Scotia. This report presents egg counts from those 3 areas.

MATERIALS AND METHODS

Pairs of ovaries were collected in 1963 and 1964 from Georges Bank (208), the Gulf of Maine (205), and from Nova Scotia (243). The Gulf of Maine area extends along the coast from Grand Manan Island, New Brunswick, Canada to Cape Ann, Massachusetts; the Nova Scotia herring were collected from LaHave on the southeast coast to St. Mary's Bay on the west. Eggs for counting were prepared by first placing the ovaries in Gilson's fluid for a minimum of one week. The jars containing the ovaries, and fluid, were then placed in a small ultrasonic cleaning tank and subjected to high frequency (25 K.C.) sound waves for 15 or 20 minutes to separate the eggs from the ovarian tissue. The eggs were then washed free of all foreign material and air-dried in a petri dish. After a period of 24 hours, both ovaries were counted.

Counts were made with a "Decca Master count".^{1/} This machine consists of an integral feeder detector, and a master counter. Eggs were placed in a feeder bowl and were moved by vibration, singly, over a sizing groove where they fell through a detector aperture and past the photoelectric cell, which activated the counter. The sizing groove

could be adjusted to allow various sizes of eggs to pass by the photo cell. Ten thousand herring eggs can be counted in 5 minutes with a 95% accuracy.

All ovaries examined were in stage V of gonadal development except a very few late stage IV's from the Gulf of Maine. Stage IV refers to a full herring with the ovary taking up a predominant part of the abdominal cavity. The eggs are 0.5-0.8 mm in diameter. Stage V is a full herring with the whole abdominal cavity occupied by the ovary, and the eggs are from 0.8-1.0 mm or more in diameter.

The material presented here shows fecundity of the herring for Georges Bank, the Gulf of Maine, and Nova Scotia. A more detailed analysis of the fecundity of the herring from these areas will be presented elsewhere.

FECUNDITY OF HERRING FROM GEORGES BANK, THE
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The data chosen for this analysis are given in Table 1. The counts of eggs plotted against length with the regression lines are shown in Figures 1 through 3 for the three areas. Table 2 lists a comparison of egg counts.

Tests for differences were done by analysis of covariance and showed a significant difference in all instances, indicating that the fecundity levels were different and the relationships of fecundity to length were not parallel.

1/ Trade names referred to here do not imply endorsement of the commercial product.

Table 1. Number of pairs of ovaries by year classes examined for count of eggs from Georges Bank, Gulf of Maine and Nova Scotia, 1963-1964.

Year class	Georges Bank		Gulf of Maine		Nova Scotia	
	1963	1964	1963	1964	1963	1964
1960	----	104	----	41	----	9
1959	21	14	62	15	1	4
1958	49	7	50	15	71	19
1957	8	3	9	8	7	41
1956	1	----	3	2	11	11
1955	1	----	----	----	13	----
Earlier than 1955	----	----	----	----	35	21
Totals	80	128	124	81	138	105
	208		205		243	

Table 2. Comparison of egg counts of herring by area (% 1000) based on regression lines.

Total length (cm)	Areas		
	Georges Bank	Gulf of Maine	Nova Scotia
25	28.0	17.5	28.0
26	41.0	33.0	39.5
27	54.5	48.5	51.5
28	67.5	63.5	63.5
29	80.5	79.0	75.5
30	93.5	94.5	87.5
31	106.5	110.0	99.5
32	120.0	125.5	111.5
33	133.0	141.0	123.0

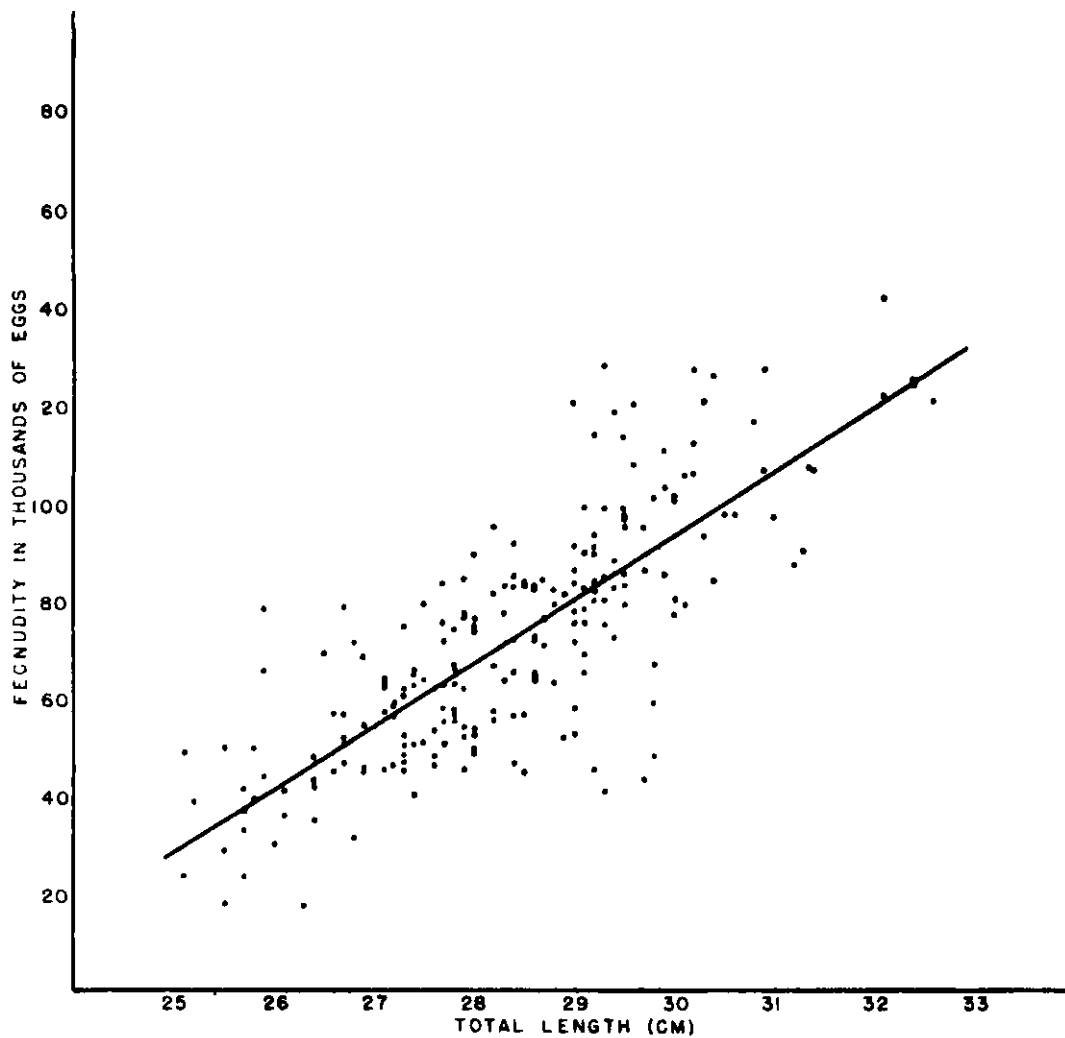


FIG. 1. FECUNDITY VS TOTAL LENGTH (CM) FROM GEORGES BANK

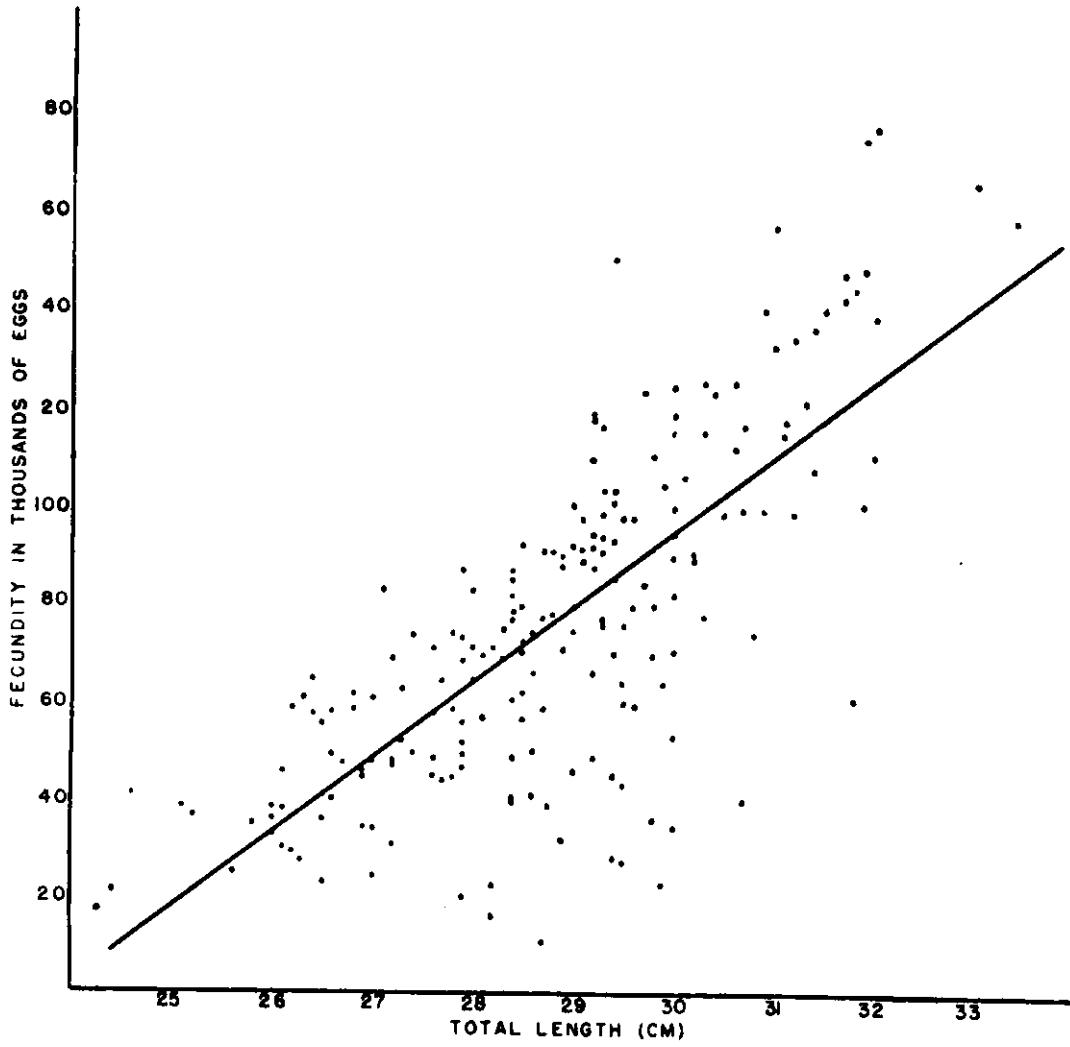


FIG. 2. FECUNDITY VS TOTAL LENGTH (CM) FROM GULF OF MAINE

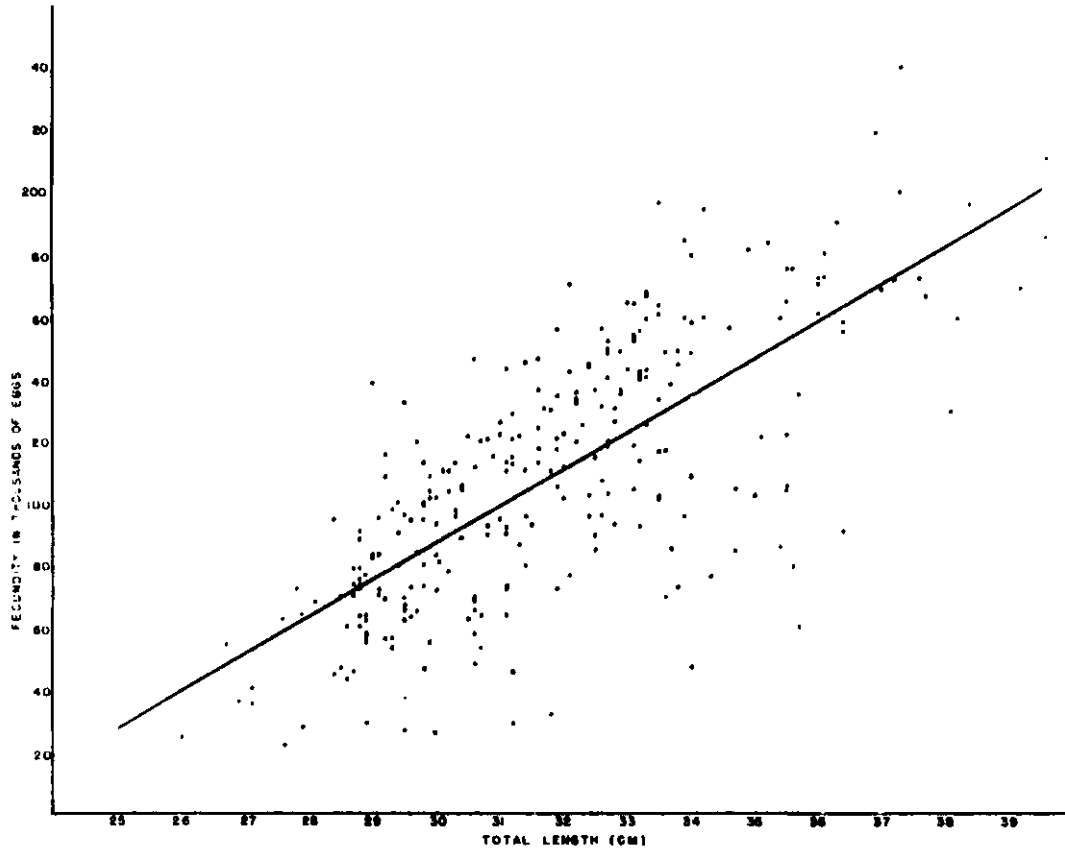


FIG. 3. FECUNDITY VS TOTAL LENGTH (CM) FROM NOVA SCOTIA