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On the Fecundity of Saithe (Pollachius virens L.) in the North Sea

by

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The initial value determining the year class strength as well as the reproductive capacity of a population is the absolute individual fecundity (A.I.F.). Ninety females of the North Sea saithe were examined. The material was collected in the Northern North Sea (off the Shetland Islands) in January-February 1972 and 1973. In 1972 weighed gonad portions were examined for fecundity and the biological analysis of the fish (total length, weight of whole and eviscerated fish, ovary weight, maturity stage and age) was made at sea. The accuracies of weighing 0.3g gonad portions and whole gonads were 0.008g and 5.0g respectively. The data obtained in 1973 were based on examination of frozen fish in the laboratory. The gonad portions were weighed with an accuracy of 0.002g and whole gonads with an accuracy of 1.0g.

A.I.F. was found on the basis of egg counts in weighed gonad portions from the formula $F = n.P/m$ where

F = absolute individual fecundity;

n = number of eggs in the weighed gonad portion;

P = weight of gonad;

m = weight of gonad portion.

The results obtained in 1972 and 1973 appeared to be similar, therefore they were combined for further consideration.

The age of the females examined varied from 4 to 12 years, the total weight from 1 800 to 5 000g and the total length from 56 to 99cm. A.I.F. of the North Sea saithe was found to increase from 677 000 to 8 985 000 eggs with increases in size and weight. The range of variation in A.I.F. appeared to increase with increase in weight, age and length.

A close relationship was observed between A.I.F. and the total weight of females. The correlation coefficient (r) is + 0.84 ($p < 0.001$). The theoretical regression line is expressed as an equation $Y = 1.26x - 1.92$, where Y - A.I.F. and

x - total weight of fish (Figure I).

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Correlation coefficients were calculated for A.I.F., and age ($r = + 0.68$, $p < 0.001$), and for A.I.F. and total length ($r = + 0.77$, $p < 0.001$). The respective regression equations are $Y = 0.89x - 3.32$, where Y is A.I.F. and x is age. $Y = 0.14x - 7.30$ where Y is A.I.F. and x is total length of fish (Figures II and III).

The curvilinearity criterion was calculated for the A.I.F. - length relationship and showed to be a straight-line relationship.

A study was made of the relative individual fecundity (R.I.F.). The relationship between R.I.F. and the length, weight and age of females were found to be curvilinear (Figure IV).

The relative individual fecundity was calculated as the ratio of R.I.F. to the weight of eviscerated fish.

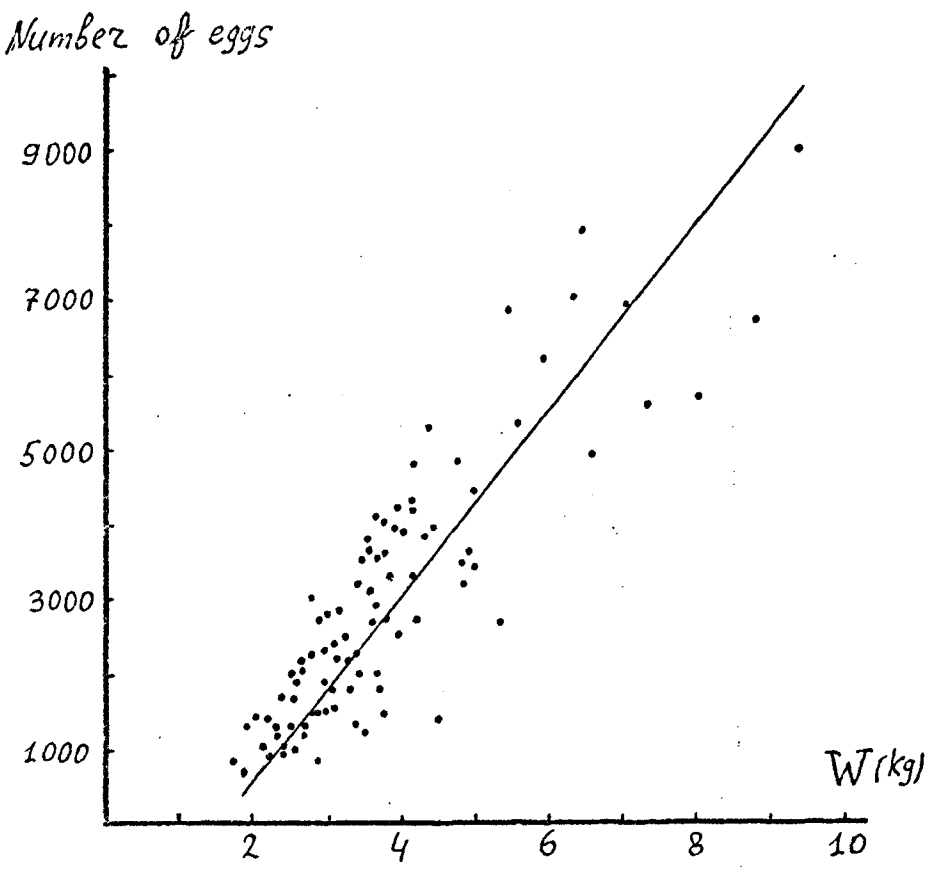

Figure I. Relationship between A.I.F. and the total weight of females.

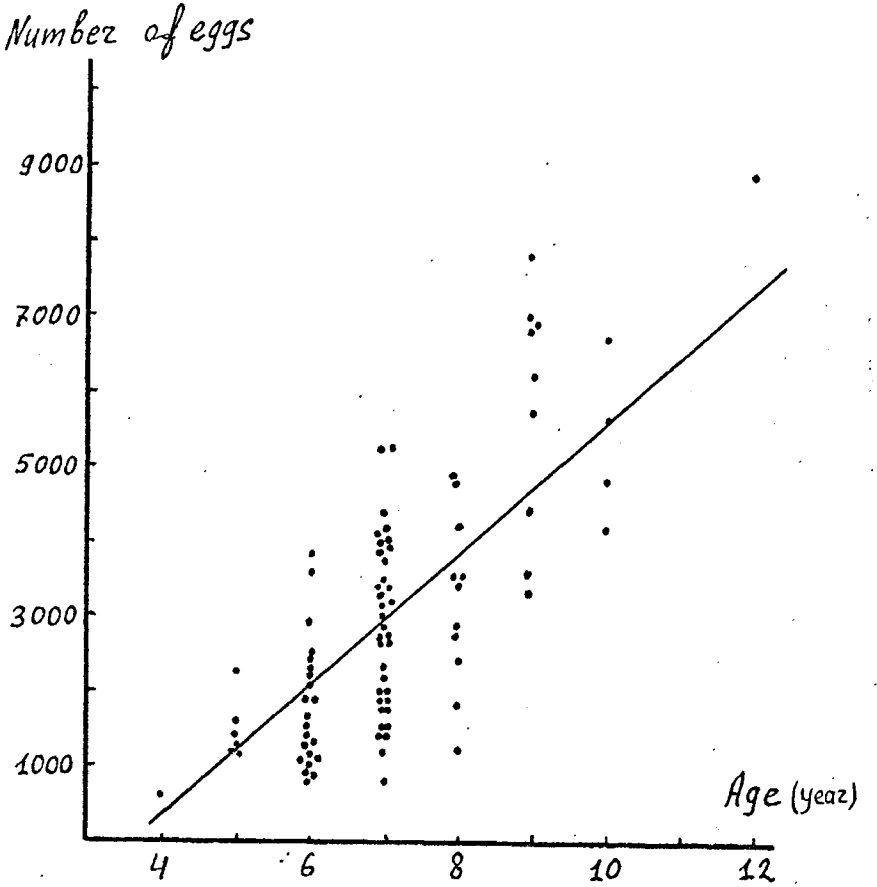

Figure II. Relationship between A.I.F. and the age of females.

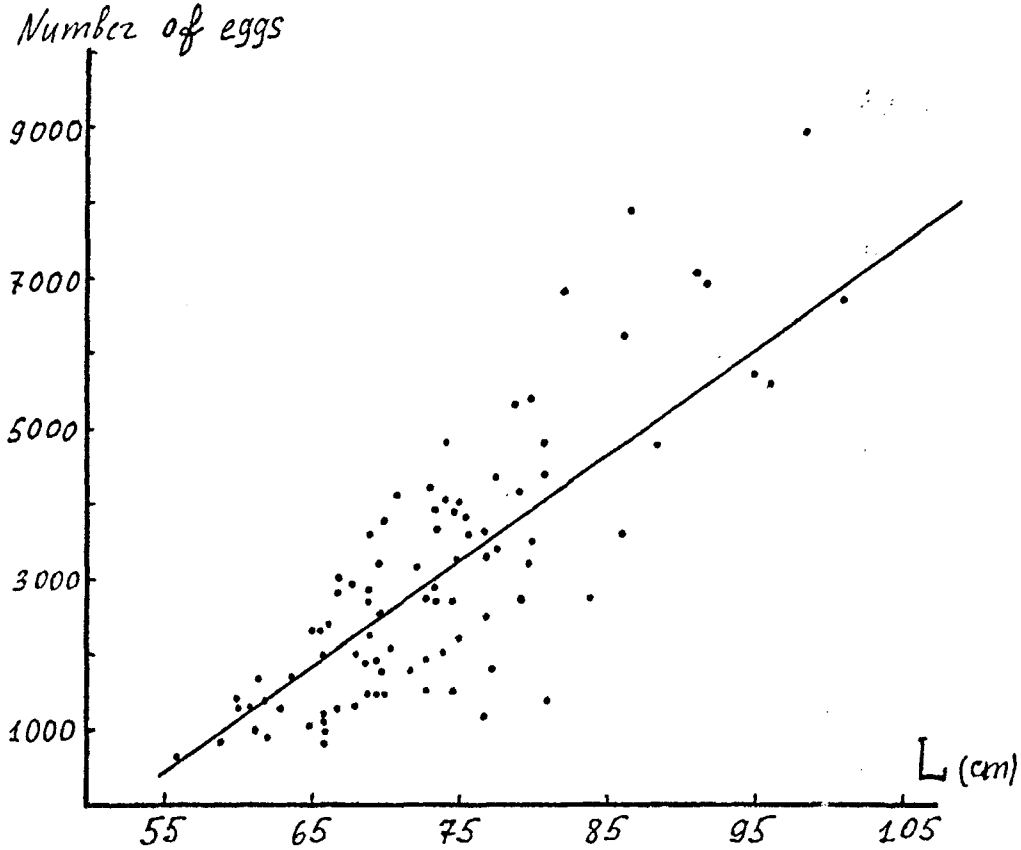

Figure III. Relationship between A.I.F. and the length of females.

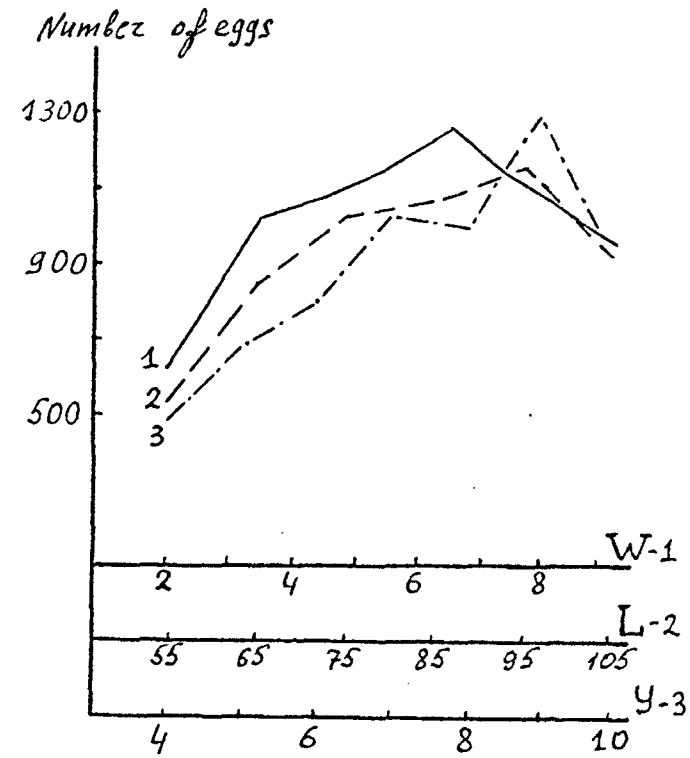

Figure IV. Relationship between R.I.F. and the weight (———), length (----), and age (-·-·-·) of females.