AGE AND GROWTH STUDIES OF COD COLLECTED IN SUMMER
OF 1961

By John M. Hoberman
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Activities Report for 12 July through 30 August 1961

by

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The major part of my work this summer was devoted to the age and growth project of the Cod Research Program. In addition, minor projects I worked on included the age and growth of the tomcod and the fecundity of the spiny dogfish.

I impressed, read for age, and measured for back-calculation the scales from about 100 cod collected on Delaware Cruise 61-9. A length frequency tabulation and graph of the total sample was prepared. A regression analysis of the Ipswich Bay sample (81 fish) suggested a straight-line relationship between fish length and scale length.

I participated in Delaware Cruise 61-12 as a member of the scientific party, and in addition to routine duties, personally collected scale and otolith samples from about 200 cod and 8 pollock. A length frequency was prepared for the total number of cod captured, with the exception of 28 young-of-the-year; however, these 28 fish (preserved at sea) were included in the regression analysis of the Ipswich Bay cod. Scales and otoliths from these fish were taken later at the Woods Hole Laboratory.
The cod scales were impressed, read for age, and measured for back-calculation. A regression line, age-length curve, and coefficient of correlation were computed for 216 Ipswich Bay cod. A plot of the points suggests there is a straight-line relationship between fish length and scale length up to about 60 cm. Beyond this length a fitted line would curve upward, due, I believe, to erosion of many scales from the larger fish. I also believe that measurements of these eroded scales included in the regression are responsible for the physiologically impossible Y-intercept of the regression equation (109.9). It is my opinion that a regression line fitted to the data from fish up to a (fork) length of about 60 cm. would give a reasonable and probably accurate length-at-scale-formation.

During the cruise, with the assistance of Dr. Edwards, I collected embryological data from 234 female spiny dogfish. I later analyzed this data extensively for a review of the life history of the spiny dogfish being prepared by Mr. Albert C. Jensen. I collected about 30 rear spines from the smaller spiny dogfish captured, as well, for future age and growth studies.

I impressed, read for age, and measured for back-calculation the scales from about 100 tomcod. I computed for 58 of these tomcod (the first group of samples prepared) a regression line, an age-length curve, and a Walford transformation. The regression
showed a straight-line relationship between fish length and scale length. I also computed a correlation coefficient to test the significance of "checks" occurring before the first annual ring in the scales of these 58 fish. The "R" value proved very highly significant, indicating that the formation of a "check" may be proportional with the growth of the scale. I participated in two seining trips to Great Pond, Falmouth, for the collection of young-of-the-year tomcod.

I observed the recently developed serological procedures, and assisted to a small extent in the Laboratory and in blood collection on Delaware Cruise 61-12.

I participated, also, in an aborted one-day trip on a Chatham line trawler for the collection of cod and haddock blood. Fog prevented us from proceeding beyond the harbor entrance and we lay at anchor there for 5 hours before we could return to the dock.

Finally, in conjunction with Mr. J. A. Posgay, the Laboratory Editor, and Mr. Jensen, I completed the manuscript The Age and Growth of the New England Pollock, a project done mainly during last summer. The manuscript has been submitted to Washington for review.

I learned a great deal this summer about many phases of fishery biology and I hope that I was of some help to the Laboratory and the Cod Research Program.
Attachments:

1. Plot of fish length-scale length for Ipswich Bay cod collected on Delaware Cruise 61-9.
2. Plot of fish length-scale length for Ipswich Bay cod collected on Delaware Cruise 61-12.
3. Length frequency graph for all cod collected on Delaware Cruise 61-12.
4. Average length at age for Ipswich Bay cod collected on Delaware Cruise 61-12.

5 Sept 1961
$Y = 6.3x + 8.5$
$y = 10.1x - 108.9$

216 Fish
Length - Frequencies Delaworfe Cruise 61-12

- Ipswich Bay
- Stebluden Bank
- Nauset

Fish Length IN Cms. (3 cm. groups)
Age

Age Length
1 117
2 251
3 351
4 551
5 871
6 851
7 819

No. of Complete Annuli

- COD -

AGE-LENGTH CURVE

NF 2/3

- Average length derived from 4.5 or more fish

- Average length derived from 12 or fewer fish

DELWARE CRUISE

61 x 12

IPSWICH BAY