

Growth and Mortality Rates in Sibling and Unrelated Oyster Populations

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Abstract

GROWTH CHARACTERISTICS of three different populations of oysters grown near Pensacola, Florida, present some unusual features. The populations described were of the same age and exposed to similar hydrographic conditions for a period of thirteen months. These populations may be described as follows:

Wild oysters resulting from natural set on shell cultch during a 12-hour period; had unlimited supply of water; oysters were crowded; remained on shell cultch throughout the year; kept free from predators but not otherwise handled or cultured.

Cultivated oysters resulting from natural set on flat artificial cultch during a 12-hour period; oysters cleaned regularly and separated from sub-stratum within first two months so that they grew as "singles"; unlimited water supply as above group.

Sibling oysters growing on flat artificial cultch throughout the year; had a restricted but not necessarily inadequate water supply; oysters derived from a single fertilization; kept free from predators, but not otherwise cleaned; oysters were not crowded.

Analysis of total mortalities in the three groups gave the following data: Wild—67 per cent; Cultivated—33 per cent; Sibling—22 per cent. The seasonal occurrence of mortality was, however, essentially similar in the three groups. Approximately 70 per cent of total mortality in each group occurred during first four months in the summer. This is correlated with high temperature and salinities and not with age of oysters as shown by fact that similar distribution of seasonal mortality occurs in older oysters in same environment. A somewhat higher mortality during first months of growth of the wild oysters is attributed to crowding.

Analysis of seasonal and total increments in average linear growth of the three groups showed the populations were remarkably similar. Data were as follows for final average length at age of 13 months: Wild—52.6 mm., Cultivated—59.3 mm. and Sibling—63.7 mm. However, the range of sizes in the three groups was quite different. Wild oysters varied most and showed the greatest length—from 34 to 95 mm., Cultivated—32 to 70 mm. and Sibling—48 to 86 mm.

Graphs illustrating curves of distribution of population sizes show a striking difference in the populations. These may be summarized as follows:

Sibling oysters showed reasonably normal distribution curve, although tails of the curve were cut short and there was a concentration of the population at the average size. Wild oysters showed a curve with marked shift to the smaller sizes although total length attained was greater than in the other two groups. Cultivated oysters showed peculiar frequency distribution in which majority of oysters attained maximum size length. These differences can be explained only on the basis of a combination of both hereditary and environmental factors which influence growth patterns.