

THE FECUNDITY-AGE RELATIONSHIP OF THE SARDINE, *SARDINA PILCHARDUS*
(WALB.), IN THE CENTRAL ADRIATIC

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This paper discusses the relation between fecundity and age of sardine from Kaštela Bay at the time they reach the peak of their sexual maturity in November and December 1979 and 1980. This relation is expressed by the formula $F = 7\,237.785 A^{1.015}$

Dans ce travail on analyse le rapport de la fécondité et de l'âge de la sardine capturée dans la Baie de Kaštela lors du maximum de sa maturité sexuelle, en novembre et décembre 1979 et 1980. La relation est exprimée par la formule $F = 7\,237.785 A^{1.015}$.

Fecundity is a very important factor in assessing the stock size population. The data on fecundity of sardine *Sardina pilchardus* (WALB.) are very scarce. Moreover, there is no data at all on the fecundity of sardine in the Adriatic Sea. Because of that and with respect to a considerable interest of Yugoslav commercial fisheries for this species, we have carried out a study of sardine fecundity.

Four samples with total of 150 specimens of sardine from the commercial catches of the Kaštela Bay were analysed. Only female specimens with ovaries showing the maturity stage just prior to spawning were used (stages V and VI). Ovaries were preserved in modified Gilson's fluid (SIMPSON, 1951) and the number of oocytes determined using volumetric method. Alizarine stained otoliths were used for age determination.

For the relation between fecundity and the age of sardine the equation $F = 7\,237.785 A^{1.015}$ was applied where F is absolute fecundity and A is age. The correlation coefficient between fecundity and the age of sardine is highly significant, as well as the

coefficient of determination ($r = 0.991$; $r^2 = 0.982$; $P < 0.001$) which points to a very close connection between fecundity and the age of sardine. Absolute fecundity to age correlation gave a regression coefficient of 1.015 with lower and upper standard error limits of 0.777 and 1.2524, what means that fecundity increases approximately linearly with age.

In studying North Sea herring and shad, HICKLING (1940) and LEHMAN (1953) respectively found an almost linear relation between fecundity and age of these species, too. Linear relation between absolute fecundity and age has also been recorded in Pacific sardine (Mc GREGOR, 1957) as well as in sprat (DE SILVA, 1973). It is possible that fecundity bears a linear relationship to age in a short lived species.

The relation between relative fecundity and age of sardine has also been studied. This relation is given by the formula $F_r = 710.0132 A^{0.1380}$ where F_r is relative fecundity and A is age of sardine. It has been noticed that relative fecundity of the lower age sardine suddenly increases (up to the 4th year) to be significantly reduced in the higher age sardine (from 5 to 9). This points to insignificant increase in the number of oocytes at the time of naturally lower weight increment rate of the higher age fish.

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