

AN INTERPRETATION OF THE DATA FROM "THE EFFECT OF MESH SIZE ON THE FISHING EFFICIENCY OF SARDINE GILL NETS"

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The paper, "The Effect of Mesh Size on the Fishing Efficiency of Sardine Gill Nets" [K. M. Joseph and A. V. Sebastian, Fish. Tech; 1(2), 180-182 (1964)] marks an important step in the progress of Fisheries Technology and Biology in India. The impact of this significant experimental study, particularly if it is followed by extensive and intensive investigations on similar lines, should be far-reaching and of import not only for commercial fishing (for determining optimum mesh sizes), but also in studies pertaining to populations of the pelagic fishes of India. This study pinpoints the fact that studies on length frequency distribution and growth of pelagic fishes would have validity only if the samples are based on catches of gill nets of varying mesh sizes.

The data in the paper (p. 181, Tables I&II) invite an interpretation incorporated in the following observations and comments:

1. Tropical pelagic fishes like *Sardinella longiceps* (Val.), on which the study was carried out, *Rastrelliger kanagurta* (Cuv.) etc. have a shorter life and more rapid growth than comparable species of temperate and cold waters; thus schools of tropical pelagic fishes are likely to be composed of individuals of different length (age) groups, in contrast to comparable temperate species, in many of which individuals of different age (length) groups tend to form discrete schools. As a consequence a drift net of a particular mesh size would enmesh

individuals of only a limited length range within the wide spectrum of length groups represented in the school.

2. In a given stock or population, the representation of the various length (age) groups is *not* equal; the percentage representation of the larger length groups (= older fish) becomes progressively less (making allowances for successful or poor year classes), until the point of maximum length (age) attained by the particular species is reached. This is because of the cumulative effect, on the older fish, of predation and mortality due to natural causes as well as fishing.

3. While it is true that the larger catch of net B (and to a lesser extent, nets A and C) has significance from the point of view of output and commercial application, one cannot take the "poor" catch of net D (Joseph and Sebastian, p. 185) *ipso facto* to mean that net D is less "efficient" than net B. It is probable that the smaller catch of net D is due to the fact that there are less numbers of the larger individuals (modal length 181-190 mm.) in the stock.

4. When drift nets of different mesh sizes are employed in juxtaposition, and the catches are repeated, one can expect the percentage representation of the different length groups in the total catch to reflect the representation of the different groups in the stock or population.

5. Catches of two (or more) gill nets or sections of nets of different *meshes*, albeit of the same material, are not comparable for efficiency because the two (or more) sets of length groups which the nets are capable of enmeshing may not be present *in the same proportion* (vide 2 above) in the school. A more appropriate comparison would be between nets of the same type and mesh size, but braided of different *material/s*.

6. The value of such studies will be enhanced if the following points are taken into consideration :

- a. that drift nets placed in juxtaposition do operate uniformly.
- b. that the catch of the experimen-

tal nets is not influenced by their position in a fleet of nets; and

- c. that the effect of wind and currents on disposition of meshes is estimated.

Further and repeated experiments, and the use of drift nets with mesh size below that of net A (14.0 mm. bar) and above that of net D (20.9 mm. bar) should give valuable data that would be applicable not only to the determination of optimum mesh size for drift nets during the different parts of the sardine fishing season, but also to studies on populations of sardines. It is to be hoped that intensive studies on these lines will be extended to other pelagic fisheries of India.