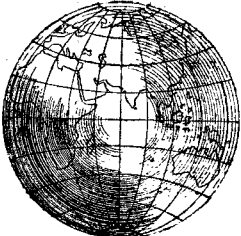


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AGE-DETERMINATION OF THE
INDIAN OIL-SARDINE, *SARDINELLA*
LONGICEPS VAL. BY MEANS OF
SCALES*

DIVERGENT opinions have been expressed in the past regarding the age of the Indian oil-sardine.¹⁻⁵ Recent work on some Indian fishes has shown that the scales can be used for age-determination. A detailed study of the scales of the oil-sardine was, therefore, undertaken to see the extent to which they could be utilized for determining the age of the fish.

The material for the work was collected at Calicut from January 1957 to August 1958. A careful examination of the scales of the different regions of the body of the fish was made on the same lines as was done by Phillips⁶ on *Sardinops caerulea*. It was observed that the scales from the region just above the tip of the pectoral fin were the most reliable for this work and accordingly six scales from each of 1,370 specimens were studied in detail.

The disposition of circuli in the scales was more or less horizontal. The centre or the focus of the scale was not quite distinct. A ring, when present, was seen as a semicircular mark concentric with the scale-margin and breaking the continuity of the circuli; occasionally, a ring might be broken into segments. While generally well-defined, the rings were not quite clear in a few cases. Besides the true rings, certain false rings, similar to those described by Walford and Mosher⁷ in *Sardinops caerulea*, were noticed in a few scales.

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TABLE I
Table Showing Distribution of Rings

	Size-groups (in cm.)*													
	7.0 to 7.9	8.0 to 8.9	9.0 to 9.9	10.0 to 10.9	11.0 to 11.9	12.0 to 12.9	13.0 to 13.9	14.0 to 14.9	15.0 to 15.9	16.0 to 16.9	17.0 to 17.9	18.0 to 18.9	19.0 to 19.9	20.0 to 21.0
No. of fish examined	4	10	7	..	..	110	349	301	103	144	163	114	41	24
No. of rings 0	4	10	3	..	..	33	142	120	18	5	1	1	..	..
1	..	..	4	..	..	74	206	177	67	71	49	24	6	3
2	..	..	..	..	..	3	1	4	17	67	93	75	30	15
3	..	..	..	..	..	..	..	..	1	1	20	14	5	6
Average No. of rings	0	0	0.57	..	..	0.73	0.60	0.61	1.01	1.44	1.80	1.90	1.98	2.13

* Total length from tip of snout to tip of dorsal caudal fluke.

It is obvious from Table I that the scales from the sardine below 8.9 cm. do not have any ring and that above that size the average value of the rings increases in general with the increasing size of the fish. Scales with one, two and three rings make their appearance at the sizes of 9.9-9, 12-12.9 and 15-15.9 cm. respectively. The one-ring class predominates up to 16-16.9 cm. group and the two-ring class thereafter, the fish with three rings in their scales being small in number. It has been observed that the period of ring formation is May-July and it appears that only one ring is formed every year. The presence of three rings in the large-sized fish suggests that they may be in the fourth year of their life.

The percentage length-frequency distribution studied separately indicates three distinct modes at 12.0, 16.0, and 18.0 cm. for the year 1955-56 and at 12.0, 17.0 and 19.0 cm. for 1956-57. For 1957-58 there are two modes at 13.0 and 16.0 cm., the third mode being not clear owing to the absence of adequate number of large fish in the catches.

It is evident from the above that the results obtained by length-frequency analyses and study of scale-rings of the fish are in agreement to some extent. It may, therefore, be reasonable to assume that these rings may prove useful in the determination of the age of the sardine. The work is in progress and details will be published in due course.

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