The lymph circulating on the top of the skull and the endolymph of the lateral line canals possibly work in consonance and the rostral cartilage might be concerned with it. Feedback systems involving reverberating circuits are likely to be found if electrophysiological studies are undertaken.

This research has been conducted with a grant from the C.S.I.R. in the New College, Madras, assisted by Mrs. K. Jeyachandran, Research Fellow.


B. Bonnell.

2. —, ibid., 1962, 196, 1114.
3. —, ibid., 1964, 203, 206.
4. —, ibid., 1966, 212, 736.
6. —, ibid., 1933, 17, 77, 105.

**ON THE OCCURRENCE OF SMALL-SIZED OIL SARDINE SARDINELLA LONGICEPS VAL.**

The occurrence on a large scale of small-sized oil sardine during the period 1960–66 is of special significance since the fishery, though known for its erratic nature and annual fluctuations, had become steadier during this period yielding an average annual catch of 135,252 tonnes forming 17.89% of the total marine fish landings in India. Not only has such occurrence of juveniles in the inshore waters served as an index of a successful oil sardine fishery, but it has also thrown useful light on certain vital aspects such as the spawning period and the size at which the new recruits and 1-year olds enter the fishery. A perusal of the literature revealed that such consistent occurrence of small-sized oil sardine has not been reported before.

In the course of investigations on the oil sardine fishery in the Mangalore zone, very young ones measuring 35 mm onwards were observed to occur on a large scale in the months of July, August, September and October during the years 1960–66. These were caught exclusively by the non-selective gears, viz., *Koort balu* (small meshed cast net), *Kairampani* (shore-seine) and *Kolli balu* (boat-seine) operated in the inshore waters ranging in depth from 1/2 to 6 metres. The occurrence of such very small-sized oil sardine in the shallow coastal waters suggests that the spawning grounds of this commercially important species, which are yet to be located, may not be far away.

The size frequencies of young ones of oil sardine during the July–October period (Fig. 1) clearly indicate that the juvenile population is constituted by more than one group. However, detailed analyses of the size composition of juveniles based on individual samples showed that there is no intermingling of different broods as evidenced by the unimodal nature of the size frequencies.

Fig. 1
current year’s spawning. However, since past studies have shown that in oil sardine the spawning commences in June and not earlier and extends up to October or even beyond, it can be categorically stated that this group does not belong to the current year’s spawning but comes from the product of the previous year. Similarly, distinct modes representing previous year’s groups are seen at 92, 112 and 122 mm. in August, 102 mm. in September and 122, 117 and 122 mm. in October. In general, modes around 100 mm. seen from July to October during different years can be considered as those representing the products of late spawning of the previous year, which incidentally lends support to the view of a protracted spawning nature of the oil sardine. However, based on the assumption that the spawning period in oil sardine extends from June to November-December subject to slight variations depending upon the hydrological and ecological conditions, the modes at 47, 67, 77 and 82 mm. in August, 52 and 77 mm. in September and 92 mm. in October can be considered as those representing the products of the current year’s spawning. From Fig. 1 it can also be seen that during October 1961 the modes are at 92 and 112 mm. and in August 1965 at 47 and 92 mm. thereby indicating that the fishery is supported by juveniles belonging to more than one “age class”. While the size at which the 1-year olds enter the fishery during the commencement of the season in July is about 100 mm., the modal size of the 0-year class supporting the fishery during the months July to October appears to range from 47 to 92 mm.

Central Marine Fisheries Research Unit, M. H. Dhulkhed.

4. —, Indian J. Fish, 1959, 6 (5), 342.

PROPA GATION OF STERILE MUTANTS AND HYBRIDS IN COTTON

During the course of cytogenetical and mutation work in cotton one comes across some interesting mutants or hybrids which because of sterility or altered photoperiodic requirements fail to reproduce. Such valuable mutants have been lost due to the incomplete success of alternate methods of propagation like grafting or by cuttings. Vegetative propagation of cotton under Indian conditions is not unknown. But these methods, under ideal temperature and humidity conditions, give only 50 to 70% success. When a single plant, which is abnormal, has to be propagated, complete success, even under sub-optimal conditions, is required.

In the summer season of 1966 two interesting plants were isolated in the field and both of them were sterile. One was an induced mutant of the variety H-14 (Gossypium hirsutum) which in addition to many other morphological abnormalities of vegetative parts, had flowers with degenerated anthers even in the bud stage. On the female side also there was some sterility. The other plant was a suspected triploid (G. hirsutum 2n = 52 × G. raimondii 2n = 26). Under field conditions this plant failed to produce flowers because of unfavourable photoperiod (long days of summer). Otherwise, these two plants were vigorous with a well-developed root system and transplanting of such plant into pots was not possible.

With the idea of propagating these two sterile plants, air-layering (pooter) was attempted. Well-developed monopodial branches were selected and the outer bark in the form of a ring was removed at a convenient place. With a fine brush the upper part of the exposed portion was dusted with Seradix B-3 (M and B). Moist Sphagnum moss was used as the rooting medium and this was completely wrapped with alkathene film (of 200 gauge) to prevent loss of moisture. Like this six to seven layers could be prepared in a single plant. This operation was done during September-October when the relative humidity was low and night temperature was also sub-optimal for rooting in cotton. After sixteen days, there was profuse development of roots which was visible through the alkathene film. Rooted branches were separated and carefully planted in pots and all the separated layers survived. The success of rooting was 100% in the case of H-14 and 75% in the triploid. It appears that this is a super method than the ones previously employed.

Division of Genetics, R. Krishnaswami,
Indian Agri. Res. Institute,
Delhi-12, February 14, 1967.