

**AN INSTANCE OF HERMAPHRODITISM IN THE INDIAN  
OIL SARDINE, *SARDINELLA LONGICEPS* (CUV. & VAL.)**

Hermaphroditism, as an occasional abnormality, has been observed in some of the marine food fishes but as there is no record of such a condition in the oil sardine, *Sardinella longiceps*, the present finding will be of interest.

While recording routine biological observations on a sample of fish taken from the commercial *Pattenkolli* (Boat seine) returns at Vellayil (Kozhikode) fish landing place on 23-8-1960, hermaphroditism was noticed in a specimen measuring 175 mm. in total length. Externally it was distinguished as a female but anatomically it was seen that the two gonads were differing in size, shape and nature and having separate ducts not uniting distally but opening independently on the genital papilla which was muscular and not membranous as is expected in a female (George, 1959). This may be considered as a peculiarity accompanying abnormal development of the gonads. The right gonad measuring 53 mm. was in the form of an ovo-testis. For the major portion it was testis, pod shaped, globular and fleshy unlike the dorsoventrally flattened nature of a normal testis. The posterior end was not continued as vas deferens but instead the outlet was in the form of an outgrowth of 27 mm. in length, narrower at the start forming pouch-like distally and opening on the papilla by a small transparent duct. However, this outgrowth contained maturing and immature oocytes and appeared to arise from the dorsal side at the posterior one-fourth of the gonad, having a distinct wall of its own and giving an impression that a portion of ovary was superimposed on a testis (fig. 1a). On the ventral side (fig. 1b) it was seen that a thin layer of ova was spread out

from the anterior one-fourth of the gonad to the posterior one-fourth. Majority ova of this layer as well as the outgrowth measured 0.504 to 0.554 mm. in diameter. The counterpart on the left side was a partially spent ovary, 59 mm. in length, long, narrow, a bit flaccid, dark reddish in colour and showing one set of maturing ova ranging in size from 0.504 to 0.588 mm. closely followed by another group of 0.420 to 0.504 mm. size range. However, both the sets can be treated as a single batch which would have been shed under normal circumstances in the same spawning season. It is, thus, clear from the partly spent nature that the ovary had been functioning in this fish but it cannot be said with any such precision whether the testis also would have started functioning later although it was in an advanced state of maturity with sperm-filled lobules and the genital papilla was muscular as in a normal male.

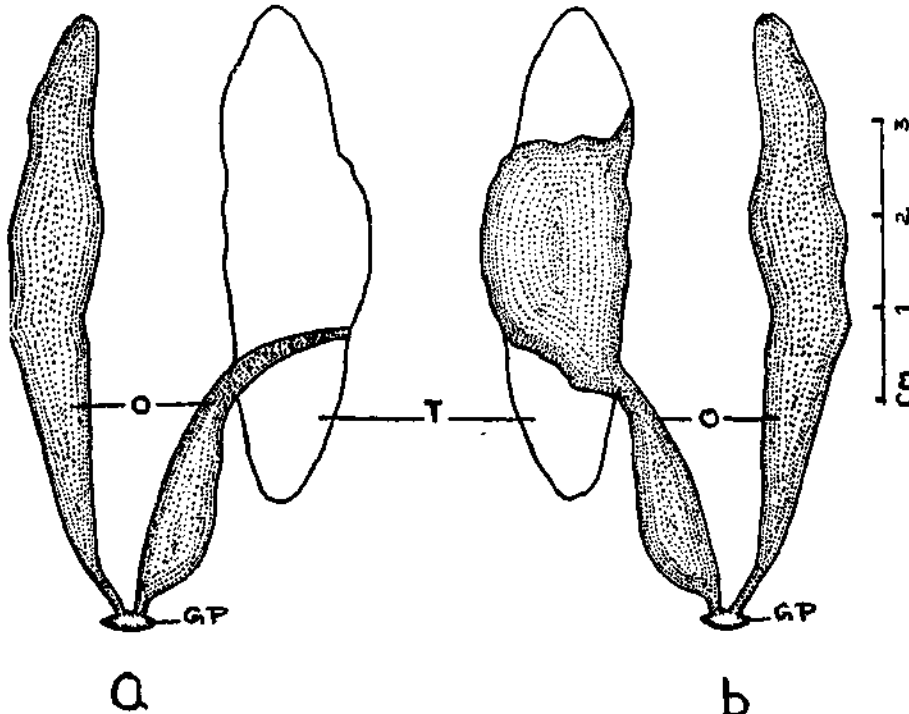


FIG. 1-a. (Dorsal view) and 1-b. (Ventral view) showing the gonads. O=Ovary; T=Testis; GP=Genital Papilla.

In abnormal hermaphroditism, the arrangement or the disposition of the component parts of the gonads is widely variable. Thus, in *Huro salmoides*, it is seen that the gonad, in the form of an ovo-testis, is almost equally divided into half ovary and half testis (James, 1946). In *Hilsa ilisha*, the anterior one-third of the gonad is testicular and the remainder ovarian (Chacko and Krishnamurthy, 1949). In *Cirrhina reba*, the ovary occupying a small portion of the posterior half of the gonad ensheaths the base of the anterior testicular portion. (Sathyanesan and Ranga Rajan, 1953). In *Rastrelliger canagurta*, it is reported that the left gonad is a complete ovary and the right, a complete testis (Prabhu and Antony Raja, 1959). In *Polynemus heptadactylus*, where hermaphroditism is of common occurrence, the arrangement is such that the testicular portions of either side face each

other while the ovarian portions lie away (Nayak, 1960). In *Katsuwonus pelamis*, while the left gonad consists of an anterior ovarian and a posterior testicular region, on the right side, the testis extends forwards over the ovarian portion into a tapering structure (Raju, 1960) and in the present report, it is found that in *Sardinella longiceps* only the right gonad has developed into an ovo-testis while the left has remained as an ovary. Recently, it has come to the author's notice that another hermaphrodite specimen of *Rastrelliger canagurta* has been recorded (Rao, 1962) wherein the gonads have developed into an ovo-testis on the right side and ovary on the left, exactly similar in disposition to the one described in the present case but different in other details.

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