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DETERMINATION OF THE MATURITY STAGES OF MARINE FISHES

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(A) Aim: To determine the maturity stages of marine fishes based on eye examination.

(B) Materials: (1) Unpreserved specimens of the species in various length ranges.

(2) Scissors, needles, scales, balance, note book and pencil.

(C) Methods:

(1) Cut open the abdominal cavity and spread out the skin sufficiently to permit a full view of the gonads.

(2) Note down the approximate proportion of the gonad in relation to the volume of the body cavity excluding the other visceral organs, in percentages such as 15%, 20%, 40%, 70% etc. or 1/3rd, 1/2, 3/4th etc.

(3) Record the unpreserved colour of the gonad.

(4) Determine whether based on the eye examination you can decide the fish is a male or a female; if so, record the sex.

(5) If it is not possible to determine the sex, you may record the fact as 'indeterminate'.

(6) Record the texture of the gonad such as "flat", "blade like", "leaf like", "tubular" etc.

(7) If it is possible to determine the sex, then repeat the above procedures with specimens of different size groups and group them according to approximate 'stages' based on eye estimation and in consultation with literature (vide infra).

(8) Usually, the maturity stages of female marine fishes are grouped into seven Stages:- (In total spawners - isochronal seven to eight stages and in partial spawners heterochronal, five stages).

(a) Stage I - Indeterminate, occupying about 5 to 10% of the body cavity.

(b) Stage II- Pinkish in colour, tubular and granular in appearance, occupying about 10 to 20% of the body cavity (early maturing).

(c) Stage III-Pale yellowish in colour, developing eggs fairly visible, the whole gonad occupying about 20 to 50% of the body cavity(maturing).

(d) Stage IV -Light pinkish in colour, the eggs increasingly much more visible and the gonad occupying about 40 to 70% of the body cavity, blood vessels prominent (late maturing).

(e) Stage V - Whitish in colour, eggs very well visible, not oozing out under gentle pressure and the gonad occupying 50 to 80% of the body cavity (mature).

(f) Stage VI - Eggs transparent, resembling boiled sago, oozing out under gentle pressure and the gonad occupying 70 to 100% of the body cavity (ripe).

(g) Stage VII- Ovary reduced in volume to about 20 to 30% of the body cavity, flacid, blood shot in appearance (spent).

(9) In the case of males, the testes are usually pale whitish in colour and thin in appearance through early maturing, maturing and late maturing stages (II through IV). In the mature (stage V) condition, the gonad occupies upto about 80% of the body cavity and is creamy white in colour, with milt not oozing out under pressure. In the ripe condition for males (stage VI), the milt oozes out under gentle pressure of the gonad which occupies about 70 to 100% of the body cavity. And under spent condition for males (stage VII) the gonad has become flacid and small in size about 20 to 30% of the body cavity, pale whitish in appearance and small amounts of milt still oozing out under gentle pressure (spent).

(10) Based on the above seven basic stages, the maturity stages of a few species may be determined and recorded. In some species the stages II to V may not be clearly recognisable and divisible. In such cases only the stages indeterminate, maturing, mature ripe and spent stages can be recognised on eye estimation, thus reducing the stages to only 5, instead of 7.

Note: After the above determination, the gonad may be gently removed from within the body cavity, wiped of the blood and body fluids with cotton and weighed before preservation. This is for the purpose of determining the ratio of the weight of the gonad in relation to the total weight of the fish and the maturing stages.

References

CMFRI, 1970. The Indian Mackerel. Bull. Cent. Mar. Fish. Res. Inst., No.24.

Nair, R.V. 1960. Notes on the spawning habits and early life history of the oil sardine, Sardinella longiceps. Cuv. & Val. Indian J. Fish. 6: 342-359.

Prabhu, M.S. 1956. Maturation of intraovarian eggs and spawning periodicities in some fishes. Ibid., 3 (1): 59-90.

Pradhan, L.B. and V.C. Palekar. 1956. Key to the stages of sexual maturity of Rastrelliger canagurta (C). Appendix I to the paper by Pradhan, L.B. on the 'Mackerel Fishery of Karwar'. Ibid., 3(1): 183-185.

Raja, B.T. Antony. 1966. On the maturity stages of Indian oil-sardine, Sardinella longiceps Val., with notes on incidence of atretic follicles in advanced ovaries. Ibid., 13 (1 & 2): 27-47.