SOME ASPECTS ON BIOLOGY OF *TRACHNOCEPHALUS MYOPS*

ABSTRACT

Size frequency distribution of *Trachinocephalus myops* (Schneider) showed that the species grows 10 mm per month in specimens measuring 70-240 mm. Analysis of stomach contents revealed that teleosts and crustaceans are chief constituents of food, *Leiognathus* sp., *Stolephorus* sp., *Penaeus* sp., *Metapenaeus* sp. and *Solenocera* sp. being the important food items. From the frequency distribution of intra-ovarian eggs, spawning period is taken to be April to June. Generally females dominated over the males in percentage contribution. The ovaries of mature females contained an average of 18,545 eggs.

THE GENUS *Trachinocephalus* belonging to the family Synodidae, is represented by a single species namely *Trachinocephalus myops* (Schneider). Even though the species does not form a fishery of any considerable importance along the coast of Visakhapatnam, it is quite acceptable, both in dry and fresh condition, along with other lizard fishes which comprise 12-13% of total demersal catches. *T. myops* itself contributes 5% of the lizard fishes. A study on of the biology of this species with reference to growth, food and feeding habits, maturity, sex ratio, fecundity was carried out during the period 1986-87 and the results are presented in this paper.

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Material and methods

The material was collected from the catches of private trawlers at the fishing harbour. A total of 2,304 specimens ranging in size from 70 to 240 mm was examined.

Results and discussion

The percentage frequency of various size groups of *T. myops* that contributed to the fishery during the period of April 1986 to August 1987 is given in Fig. 1. It is seen that in April 1986 mode 'a' which is formed at 120 mm could be traced to 170 mm in September thus showing a growth 50 mm during the interval of five months or a growth of 10 mm per month. Further the mode 'b' at 150 mm in May had shifted to 160 mm in June showing the growth of 10 mm in one month. Similarly mode 'c' at 130 mm in August has progressed to 160 mm in November giving the growth of 30 mm during the time interval of three months, thus exhibiting a growth rate of 10 mm per month. In 1987, principally there are two modes, *viz.*, 'a 1' and 'b 1'. The progression of the mode 'a 1' could be followed from 90 mm in January to 110 mm in March. This mode 'a 1' could further be traced at 120, 130, 150 and 160 mm in April, May, July and August respectively thus showing the total growth of 40 mm during the period of four months. Similarly, the mode 'b 1' at 110 mm in February progressed to 130 mm in April and 150 mm in June thus giving a growth of 40 mm in four months or showing a growth rate of 10 mm per month. Thus it could be concluded that in *T. myops*, a growth rate of 10 mm per month could be seen in fishes measuring 70-240 mm.

Qualitative and quantitative analysis of stomach contents of *T. myops* showed that the intensity of feeding was low during June-August and the fish fed mainly on teleost fishes and crustaceans. Among the teleosts *Leiognathus* sp. and *Stolephorus* sp. were dominant and among the crustaceans *Penaeus* sp. *Metapeneus* sp., *Solenocera* sp. and *Squilla* sp. were predominant.

when W = weight, L = length and a and b constants. The relationship for males and females were studied separately and the equations respectively were :

$$\text{Males : } W = 0.01076\ L^{2.9583}$$
$$\text{or log } W = -1.9683 + 2.9583$$
$$\text{Females : } W = 0.00779\ L^{3.0633}$$
$$\text{or log } W = -2.1077 + 3.0633$$

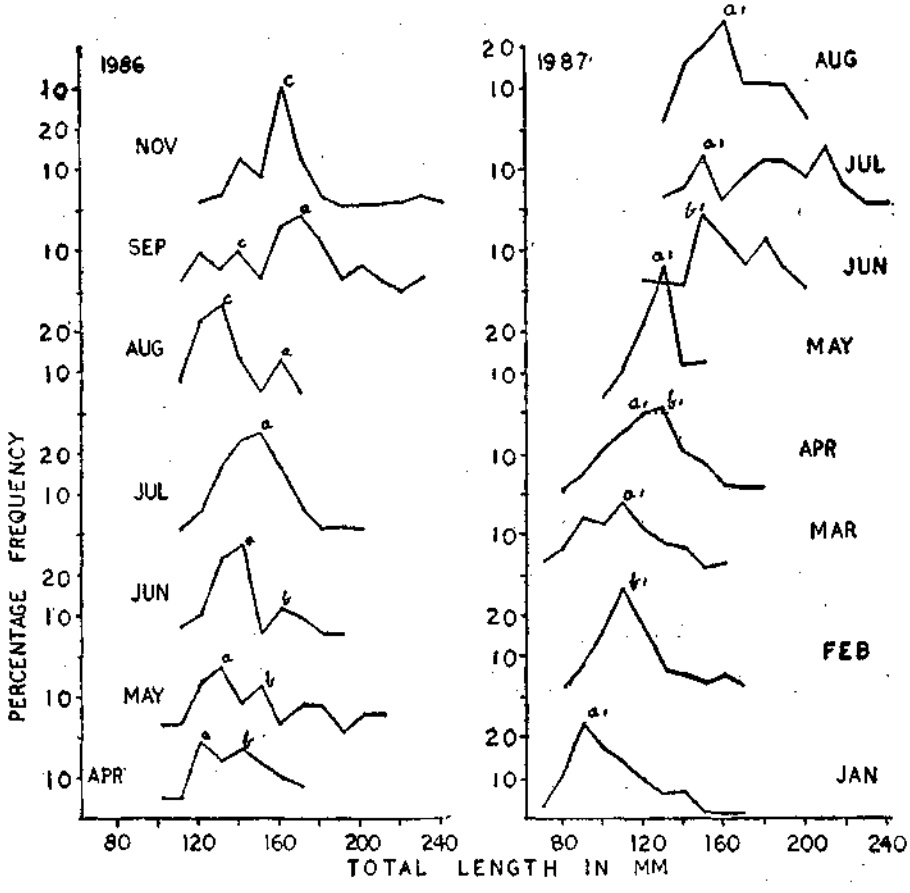

FIG. 1. Size frequency distribution of *T. myops*.

For studying the length weight relationship, 389 specimens of males and females of *T. myops* of length range 100-255 mm were taken for analysis and relationship was estimated by the method of least squares by making use of the formula $W = a\ L^b$ or $\log a + \log L$. Since there is no significant difference between 'b' values for males and females, a single equation to describe the length weight relationship is derived and it is as follows :

$$W = 0.00104\ L^{3.0662}$$
$$\text{or log } W = -2.1195 + 3.0662$$

Among females with maturing and mature gonads, it was observed that 50% of fish were mature at 160 mm and above 190 mm all were mature.

Ovaries of mature and spawning fish whose total length ranged from 165 to 244 mm were examined for ova diameter frequency studies and modal progression of ova shown in Fig. 2.

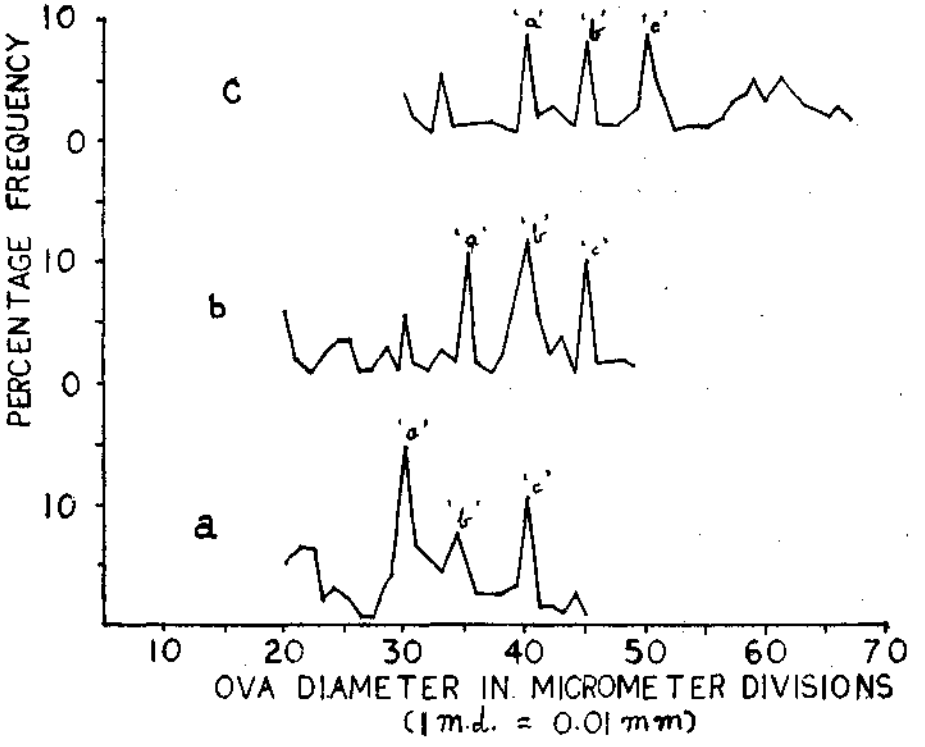

FIG. 2. Frequency polygons of ova diameter in *T. myops*.

The mode 'a' which was formed by maturing ova at 0.3 mm had shifted first to 0.35 and later to 0.4 mm as shown in Fig. 2 b, c, thus showing the growth in size of ova. Similar increase in size of maturing ova is also depicted by the ova falling under 'b' from 0.34 mm to 0.4 mm (Fig. 2 a, b).

In Fig. 2 c is shown the frequency polygon of maturing and fully ripe ova from the ovary of fish of total length 202 mm, which was obtained in May 1986. The mode 'b' formed by the maturing ova at 0.35 and 0.4 mm (Fig. 2 b) had shifted to 0.40 and 0.45 mm and ova falling under mode 'C' at 0.45 mm had also progressed to 0.5 mm. The ova falling under this mode are fully ripe and transparent with distinct oil globules. These are separated from the rest of eggs and are under process of spawning. Since mature and spawning fish are available during the period of April to June and spent fish during July, it could be concluded that the spawning period of *T. myops* is not prolonged and extended from April-June.

Studies on sex ratio showed that during the period April 1986-March 1987 excepting in

May 1986, November 1986, January 1987 and February 1987 females dominated over the males in percentage contribution.

Mature specimens whose total length ranged from 165-244 mm were examined to study the facundity. It was estimated that the mature ovary contained an average of 18,545 eggs.

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EYE OPACITY AND FIN EROSION AMONG FISHES FROM VISAKHAPATNAM HARBOUR WATERS

ABSTRACT

Opacity of eye was confined to *Mugil cephalus* only (23.2%) while fin erosion was observed in several species — *Liza macrolepis* (36.1%), *Rastrelliger kanagurta* (39.1%) and *Sardinella longiceps* (63.4%) including *M. cephalus* (20.3%) from harbour waters of Visakhapatnam. The presence of pollutants in form of heavy metals, and oil and grease at toxic concentrations might be the cause for these abnormalities.

POLLUTION arising from domestic and industrial wastes is known to impair and debilitate the biota in any water system. In fish populations not only debility but physical deformities of different kinds also seem to be manifested with species specific variations. In the case of other organisms which are lowly organised the physical deformities are not likely to be so manifest as in fishes. Thus, the physical deformities in fishes serve as biological indicators of the degree of pollution of a water system. Various substances enter the natural waters at seemingly sublethal levels and the usual *in vivo* toxicity tests may not reveal the harmful effects of pollution at these sublethal levles. Occasional fish kills and disease prevalence are found under conditions of extreme deterioration in addition to the presence of pollutants at sublethal levels. Such observations act as a late eye opener to the degree of deterioration of a water systems. The present report deals with the frequency patterns of deformities in the fishes from the harbour waters of Visakhapatnam.

Visakhapatnam harbour is a receptacle of city's sewage and effluents from several industries (Satyanarayana *et al.*, 1985). Since the growth of the industries has been on the increase for the past two decades, there is ever increasing accumulation of pollutants in Visakhapatnam harbour, which is more or less a closed system except for ineffective tidal flushings. Industrial effluents enter the harbour at station 2 (Satyanarayana *et al.*, 1985) (Northwestern arm of Visakhapatnam harbour), where fish were collected by doing experimental fishing with boat seine. Species specific deformities or abnormalities were often encountered in these fish collections.

Opacity of the iris and adipose covering of the eyes of grey mullet *Mugil cephalus* (Pl. I A) was observed in 13 out of 56 fish (23.2%). This was predominant in fishes of larger size group (>30 cm). This abnormality, which was reported earlier (Steucke *et al.*, 1968; Dukes *et al.*, 1975) in culture fish was attributed to nutritional deficiency. Since there is