

A NOTE ON MASS MORTALITY OF FISH IN SHIVPUR TALAB
(MADHYA PRADESH)

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ABSTRACT

Shivpur Talab is a perennial tank in Hoshangabad district (M.P.) having a maximum water spread of 4 ha. It is rainfed as well as draws water from a close by Tawa canal. On 21st May 1985 heavy mortality of fish was noticed in the tank. Scientific investigation revealed that mass mortality of fish occurred due to reduction in water area of the tank which in turn brought out oxygen depletion. The paper deals with the factors which brought about mass mortality of fish in Shivpur Talab.

The Shivpur Talab situated 70 Kms. south-west of Hoshangabad (Madhya Pradesh) on Shivni-Shivpur road is rainfed, besides water can be drawn from Tawa canal till March/April. From April onwards the water level decreases considerably till the monsoon which brings good quantity of rain water. The water spread area of the talab was 4.0 hectares during peak monsoon period, while during peak summer season it was reduced to 1.5-2.0 hectares with an average depth of 2.5 and 1.0 meters respectively. On the day of fish mortality the water spread area was 1 hectare and average depth was 1 meter. Accumulation of organic matter in the pond was observed due to continuous inflow of dried and semidried sludge for last many years from catchment area due to grazing and usage of water by cattle for drinking and bathing. The talab was stocked with fingerlings consisting of 12,000 *Catla catla*, 25,000 *Cyprinus carpio* and 25,000 *Labeo rohita* approximately one year before the date of mortality.

On the early hours of 21st May, 1985 heavy mortality of fish was recorded. In order to ascertain the reason for fish mortality an investigation was made by a team of scientists. It was reported that the fish mortality occurred during the early hours at 0300-0400 hrs. The samples were collected to determine the mode and possible factors responsible for such a high mortality. The analysis of water was done on the spot and at laboratory as per the standard methods (APHA, 1955)

A total of 3,000 Kgs of dead fish were recovered from the tank. The species composition, total length and weight range was as follows :

Species	Total length range (mm)	Weight range (g.)
<i>Catla catla</i>	450-520	1500-2000
<i>Labeo rohita</i>	450-620	1000-2000
<i>Cyprinus carpio</i>	380-475	11000-1500
<i>Channa punctatus</i>	100-120	20-25

A thorough examination of dead specimen showed that the colour of the body and gills of the fish had turned pinkish - white. The water was giving foul smell due to putrefication of heavy load of organic matter (Table I). The dissolved oxygen depletion was encountered from 2.76 ppm (2300 h. on 22.5.1985) to 0.56 ppm (0400 h. on 23.5.85) and again it started rising to .70 pp. (0600 h. on 23.5.1985). Subsequently the free carbon dioxide increased from 2.0 to 9.0 ppm and decreased to 5.6 ppm during the same period. During the same period the dissolved organic matter ranged from 52.0 to 82.4 ppm. During 0400 - 0500 h. (23.5.1985) the left over fish were seen gulping the air at the water surface for want of dissolved oxygen in water.

Table I : Showing chemical spectrum of Shivpur Talab at different timings.

Parameters	22.5.1985		23.5.985		
	2300 h.	2400 h.	0200 h.	0400 h.	0600 h.
Water temperature (°C)	28.0	26.0	25.0	23.0	21.5
Dissolved oxygen (ppm)	2.8	2.4	1.9	0.6	0.7
Free carbon dioxide (ppm)	2.0	5.0	7.0	9.0	5.6
Total alkalinity (ppm)	90.0	110.0	116.0	114.0	106.0
pH	7.0	7.0	7.0	7.0	7.0
Dissolved organic matter (ppm)	67.6	82.4	62.0	58.6	52.0

It is well known that in stagnant water bodies the mortality of fish occurs due to deficiency of dissolved oxygen. Mortality of fish is attributed to low dissolved oxygen and high free carbon dioxide in water. This phenomenon is also recorded by Laroze (1950). Large quantities of dried and semi-dried sludge especially of unsaturated organic matter brought from the catchment area reduces the dissolved oxygen content which is evident from the high dissolved oxygen consumption value. The increase of biomass of fish per unit area due to decrease in the volume of water is also responsible for the depletion of dissolved oxygen. A similar case of fish mortality due to depletion of oxygen by thick deposit of putrefiable organic matter at the bottom was observed in Chilka lake, (Natarajan *et al.*, 1962) and Byramangala Reservoir. (Raghavan *et al.*, 1977). In the present case, a high carbon dioxide and poor dissolved oxygen concentration could be the chief cause for mass mortality of fish in the tank.

ACKNOWLEDGEMENTS

Authors are indebted to Prof. Y. Sreekrishna, Director and Dr. S. N. Dwivedi Ex-Director, CIFE, Bombay for their keen interest and encouragement during the study. The authors are thankful to Prof. K. K. Ghosh, CIFE, Bombay for critically going through the manuscript.

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