Effect of Environmental Factors on Fish Growth in Bani Begum Lake Tq. Khultabad Dist. Aurangabad

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***Abstract*: Primary fish production in ponds is influenced by the influence of environmental factors and management practices. Seasonal variations in environmental factors must be accompanied by effective management practices for optimal fish production. This requires the collection of data on seasonal changes in environmental factors such as temperature, pH, dissolved oxygen levels, and nutrient levels. In the present study, we collected data on these factors from local ponds and tried to correlate them with fish productivity. This study will help increase the productivity of rural area of Khultabad, dist.Aurangabad fisheries.**

***Keywords*: fresh water fish, fish growth, fisheries, lake, environmental factors.**

Introduction:

Khultabad is situated on 20.05N and 75.18E.It's a hilly area with elevation of 857m. The lake in Khultabad Dist. Aurangabad, Maharashtra known as "Lake Bani Begum" is one of the main sources of fishing in Khultabad. Their fish is regularly sold at Khultabad's weekly fish market. Natural and man-made ponds are an important source of fish farming. Due to the tropical location, there is considerable variation in environmental factors such as temperature, rainfall, photoperiod duration, etc., which also physically affect water bodies. The primary production of freshwater bodies is influenced by physical factors such as temperature, pH, transparency and chemical factors such as dissolved oxygen and carbon dioxide levels and inorganic nutrient levels (Ruttner, 1963). For optimal fish production, it is necessary to know the variations of environmental factors in local conditions, which can be combined with management practices to maximize fish production. To this end, we collected data on the seasonal variation in water temperature, pH, dissolved oxygen levels, etc. from a local pond and we also studied the seasonal variation in common carp growth in this Lake.

Material and method:

Site of study: Bani Begum Lake in Khultabad was selected for present study. This pond is approximately 3-4 acres in size. and it feeds on the local runoff from agricultural fields and seasonal rains. It has been used for a long time for the production of fish. The exact date is not yet known, but it is said to have existed since the time of Aurangazeb, a Mughal emperor.

Sample Collection: Pond water was collected along with fish samples each month for a period of 12 months from July to June and physicochemical parameters were recorded. Fish samples were taken to measure the monthly growth rate during this period to assess the influence of environmental factors on fish growth.

Temperature measurement: The temperature of the water sample was measured in situ with the aid of a mercury thermometer.

pH Measurement: The pH of the water sample was measured in situ with the help of a portable digital pH meter.

Dissolved Oxygen Level:To calculate dissolved oxygen levels, water samples were collected in BOD bottles and transported to the laboratory. OD values were calculated using the modified Winkler method.

Transparency of water: the transparency of water was measured with the Sacchi disk method.

Fish Growth Measurement: Fish growth was studied in terms of weight gain (GBW%) calculated as follows: GWB = ((W2 - W1) / (txW1)) X100 Where W2 is the mean weight of the fish (in grams) in the given time period, W1 is the average weight of the fish (in grams) in the previous time period, and t is the time period (in days) between the two measurements.

Result and discussion:

Fish Growth: The annual change in monthly growth from July to June was monitored. It was clearly observed that the growth rate showed steady increase and maximum growth was observed in June.

Monthly Temperature Change: The water temperature was calculated by averaging the monthly surface and lowest temperatures of the pond. The water temperature ranged from 21^0 degrees Celsius in December to 31^0 degrees Celsius in June.

Month	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Ape	May	June
Temperatures in Degree Centigrade	26^0	27^0	28^0	25^0	23^0	19^0	18^0	20^0	24^0	31^0	29^0	30^0

Table 1: The monthly water temperatures

Change in pH of water: The pH of the water was calculated by measuring the pH of the surface and the bottom and averaging these values. The pH of the water has approached the alkaline range, with a maximum pH in July and a minimum in February.

Month	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
pH	8.4	8.3	8.3	8.2	8.1	8	8.1	7.8	7.9	7.9	8.1	8.4

Table 2: The monthly variation in water pH values

Dissolved oxygen concentration: Dissolved Oxygen (DO) levels showed seasonal variations. Maximum dissolved oxygen levels were recorded in March and April.

Month	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
DO Level in Mg/L	4.5	5	5.5	6.5	6	6	5.5	6.5	7.1	7.1	6	6.1

Table 3: on variation of DO in water

Water transparency: the transparency of water showed a maximum during the months of December and January, and then decreased.

Month	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
Transparency in cm	24	29	34	35	37	39	38	37	35	33	27	25

Table 4: The water transparency levels

This study attempts to correlate the common carp's monthly growth rate with existing physical and chemical conditions such as water temperature, pH, dissolved oxygen and pond water transparency. Atmospheric temperature showed considerable variations during the annual seasonal cycle. In the present study, the average water temperature ranged from 200C in December to 310C in June, and a notable increase in the monthly growth rate was observed from December to June. Dwivedi et al. (1986) also reported that rising water temperatures lead to increased fish production. The pH is an indicator of the general chemical composition of the water and, therefore, of the quality of the water. In this study, the pH varied considerably from 7.8 in February to 8.4 in June. Dissolved oxygen (DO) is an extremely important factor in aquatic life because organisms such as fish depend solely on dissolved oxygen for respiration. Dissolved oxygen levels showed variations in the range from 4.5 mg / L in July to 7.25 mg / L in April. The fish growth rate also shows a parallel increase from July to April. in the 3-8 ppm range, indicating that higher DO levels favor greater fish growth.

Light is an important factor in regulating aquatic life. It affects the photosynthesis rate of aquatic plants, which indirectly affects the fish fauna in the water body. The depth of light penetration is influenced by seasonal factors and the transparency of the water. In the present study, transparency ranged from 24 to 40 cm in depth. The variation in transparency can be influenced both by the availability, which is reduced in cloudy conditions in the rainy season, and by the increase in turbidity due to evaporation during the summer months. However, from the present study, it appears that the level of transparency may directly affect the maximum growth rate of fish growth during the months of May and June, when water transparency was towards the lower range.

Conclusion:

In the present study we have seen a clear influence of physicochemical parameters on fish growth rate, however, future studies on the influence of physiological and biotic factors on fish growth will be required.

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