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# Limnological study of water from Khanapur Dam Ajara Dist:-Kolhapur, MS, India

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**ABSTRACT**

The Physico-chemical parameters from Khanapur dam Ajara shows variability in different seasons. In present investigation Water temperature varied from $17^0$ C to $35^0$ C being highest in the month of May and lowest during the month of October. The pH was found to be varying from 7.0 to 8.1 which were slightly alkaline. The pH was minimum in winter and maximum in summer season. The Transparency values ranged between 75 cm to 140 cm. The TDS fluctuated between 50 to 165 mg/lit. In the month of May it was 50 mg / lit and in the month of June it was 165 mg/Lit. During May least DO was recorded 6.5 mg/lit and maximum DO was seen during rainy season June i.e.10.5 mg/l. While free carbon dioxide was ranging between 2.0 to 4.6 mg/l. It was high in month of May and low in month of June. Total hardness ranged between 20 mg/l and 114 mg/l. Other parameters are also given in detail. The diversity of phytoplankton also observed in the Khanapur dam. The investigation of physico-chemical parameters is done during June 2016 to May 2017.

**Keywords: -** Khanapur dam, Physico-Chemical parameters.

## INTRODUCTION

Khanapur dam is constructed at Khanapur which is about 4 km west from Ajara city. Ecological studies, generally involves analysis of physico-chemical parameters and reflects on status of the environment in connection with both the biotic and abiotic factors (Munawar (1974). This is helpful in utilizing the resources in right manner in order to cure the pollution, to boost the productivity and to conserve the prosperity of biodiversity. Since, there is constant interaction and exchange of mass and energy in an ecosystem, the quality of water becomes an important and dynamic entity. That is exactly why the ecological studies have done on water from Khanapur Dam during period June 2016 to May 2017. Similar studies were done in India by Hosmani *et al.* (1999),Dwivedi and Pandey(2002), Kaur et.al(2000) and in Maharashtra by (Lohar and Korekar, (2012),Shashtri and Pendase (2001) .Ever since the spread of environmental awareness all over the world, monitoring of water resources through regular analysis has become crucially important feature.

**Table 1: Salient Features of Khanapur Dam Ajara**

| | Attribute | Value |
|---|---|---|
| 1 | Name of Dam | Khanapur (Kolhapur) Dam |
| 2 | River | Local Nallah |
| 3 | Nearest City | Ajra Mahal |
| 4 | District | Kolhapur |
| 5 | State | Maharashtra |
| 6 | Basin | Krishna |
| 7 | Status | Completed |
| 8 | Purpose of Dam | Irrigation |
| 10 | Year of Completion (YYYY) | 1988 |
| 11 | Operating & Maintainance Agency | WRD,GOM |
| 12 | Dam as per Parliamentary Constituency | Kolhapur |
| 13 | Seismic Zone | Seismic Zone-III |
| 14 | Type of Dam | Earthen |
| 15 | Length of Dam (m) | 240 |
| 16 | Max Height above Foundation (m) | 21.35 |
| 17 | Total Volume Content of Dam (TCM) | 95 |
| 18 | Spillway Capacity (cumec) | 36 |

Water is important abiotic component of environment. The quantity and quality of water at given time and given space is very significant in relation to the algal life at that location. Many limnological studies were carried out on the reservoirs in Maharashtra. However, no such work was carried out on Khanapur Dam in Kolhapur Dist. of Maharashtra. Water from this reservoir is being used by peoples of Khanapur for drinking and irrigation purposes that's why it is necessary to check the quality of water from this Dam.

**Study Area**

The dam selected for the study is a small earthen dam which is about 4 km away from the Ajara city.The salient features of which are given in Table 1.

## MATERIALS AND METHODS:

To analyze the water, one sampling stations was selected. Water is collected once in a month on 1st day at 10.00 A.M. The temperature is measured by digital thermometer on the spot.

Other parameters like PH, DO, Total dissolved solids, Transparency, Free carbon dioxide, Total alkalinity, hardness and Chlorides etc. were analyzed in the laboratory according to the methods suggested by APHA and AWWA (1985). The water samples (at a depth of one meter) were collected with the help of sampler in one liter plastic containers and brought to the laboratory.

All parameters were studied monthly for period of one year. PH, temperature and color of water studied on the spot. Selected tank was visited frequently every month during June 2016 to May 2017. At each sampling site, temperature, pH and conductivity were measured with Luftman P300 and C400 combined electronic meters, Filterable reactive phosphate was determined. The pH was measured on the spot using pH paper and later confirmed in the laboratory using digital pH meter. The water samples were brought to the laboratory for physico-chemical analysis in separate plastic cans. Samples were collected for analysis in laboratory to find remaining parameters. Analysis of parameters was carried out according to the standard methods suggested by APHA and AWWA (1985) and Trivadi and Gogl (1986).

The dissolved oxygen (DO) content of water was determined and primary productivity was measured. The DO was determined on the field itself. The seasonal variations in terms of primary productivity of the selected sites of Khanapur dam in Kolhapur District were determined. The values are expressed as mg/Lit. for DO, and cm for Transparency.

## RESULTS AND DISCUSSIONS:

Monthly variations in values of different parameters of water from Khanapur Dam were noted and analyzed in the tabular form.(Table-2).

In Khanapur dam it is clear that with increase in water temperature, DO and primary productivity decreases. Similarly it indicates that higher water temperature decreases primary productivity. Because of the shallowness of the lake, the temperature of water varies, as slightly lower or higher than those restricting maximum photosynthetic activity of phytoplankton. The records show variation in temperature, light intensity, DO and primary productivity during the day time in the month of June 2016. The Transparency values ranged between 75 cm to 140 cm. The TDS fluctuated between 50 to 165 mg/lit. In the month of May it was and 50 mg / lit and in the month of June it was 165 mg/Lit.

The analysis of water samples were done between 10.00 am to 04.00 pm. Temperature and light intensity remained changing during the experimental period. After 1.00 pm the light intensity and temperature decreased due to cloudy atmosphere, but DO level increased in the evening. However, the primary productivity remains high in the morning hours and low afterwards perhaps due to low light intensity. The variation in temperature and light intensity shows variation in primary productivity. Though roughly the change in primary productivity parallels the change in temperature, there is no significant correlation between the two. The maximum water temperature was noted ($35^0$C) in May and minimum ($17^0$C) in October. The present study indicates that temperature and Light intensity both vary during the experimental period. There are records of variations in dissolved oxygen and primary productivity (mg/l/h) for selected sites.

There are five sites from the Khanapur dam in Kolhapur District (Maharashtra). The DO values ranged from 6.5 mg/l to 10.5 mg/l during all seasons. The highest value of 10.5 mg/l is recorded in monsoon and lowest 6.5 mg/l in summer. In general DO is lower during summer. The lower level of DO during summer may be due to higher temperature. The utilization of oxygen by micro-organisms found high levels of dissolved oxygen during monsoon. The present results indicate that seasonality in dissolved oxygen and primary productivity is site specific and there is no common trend for the sites studied. The three sites in dam show highest primary productivity during summer season whereas others have more productivity in rainy season. The pH recorded at that time goes to 8.1 which is obvious (Shown in Tables 2.)

The present study was done on the ecological features of the tank special reference to algal population. The physico-chemical parameters of the reservoir are well under the prescribed limits for inland surface waters and can be used for aquaculture and for irrigation purpose.

**Table - 02: Monthly variation in Physico-chemical parameters of Khanapur dam in Kolhapur District from June 2016 to May 2017.**

| Months | Water temp. | PH | DO | Dissolved solids | Transparency | Alkalinity | Chlorides | Hard ness | Free carbon dioxide |
|---|---|---|---|---|---|---|---|---|---|
| **June 16** | 21 | 7.1 | **10.5** | **165** | **75** | **20** | **4.0** | **20** | **2.0** |
| **July 16** | 20 | **7.0** | 10.5 | 150 | 80 | 30 | 5.5 | 25 | 2.5 |
| **Aug. 16** | 20 | 7.2 | 9.5 | 100 | 85 | 30 | 8.5 | 34 | 2.2 |
| **Sept. 16** | 22 | 7.9 | 9.6 | 120 | 87 | 45 | 6.0 | 38 | 3.0 |
| **Oct. 16** | **17** | 7.5 | 9.7 | 90 | 75 | 50 | 12 | 39 | 3.4 |
| **Nov. 16** | **18** | 7.6 | 10.1 | 80 | 90 | 60 | 18 | 33 | 2.9 |
| **Dec. 16** | 20 | 7.3 | 8.5 | 85 | 100 | 75 | 22 | 40 | 3.0 |
| **Jan. 13** | 25 | 7.4 | 7.8 | 75 | 99 | 79 | 33 | 60 | 3.7 |
| **Feb. 17** | 28 | 7.5 | 7.7 | 70 | 110 | 80 | 30 | 64 | 3.9 |
| **March 17** | 32 | 7.5 | 7.8 | 60 | 88 | 99 | 38 | 80 | 4.0 |
| **April 17** | 32 | 8.0 | 6.5 | 55 | 89 | 110 | 40 | 99 | 4.2 |
| **May 17** | **35** | **8.1** | **6.5** | **50** | **140** | **120** | **46** | **114** | **4.6** |

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**REFERENCES:**

APHA, AWWA (1985) Standard. Methods For The Examination Of Water & Waste Water. Washington Dc18th Edition.

Dwivedi BK and Pandey GC (2002) Physico-Chemical Factors And Algal Diversity Of Two Ponds In Faizabad, India *Poll.Res.*21(3):361-370.

Hosmani SP, Vasanthakumar L and Partha S (1999) Ecological Significance Of Biochemical Parameters In Certain Fresh Water Lakes Of Mysore. *Journal Of Environmental Biology* 20 (2):121-124.

Kaur H, Bath KS, Mander G and Jerath N (2000) Physico-Chemical Status Of Kanjli Wetland (Punjab) India. *J.Envi.And Poll.* 7(1):39 . 42.

Lohar DN and Korekar SL (2012) Hydrobiological Study Of Vibhutwadi Tank, Tal- Atpadi,Dist. Sangli (M.S.) India 415301 *Jsi, Vol.* 2 (2):212-222

Munawar M (1974)Limnological Studies On Fresh Water Ponds Of Hyderabad, *India. Biocenase Ibid*, 45:1-32.

Shastri Yougesh and Pendse DC (2001) Hydrobiological Study Of Dahikhuta Reservoir *Environ.Biol. 17(2)17-22.*

Trivedy RK and Goel PK (1986) Chemical And Biological Methods For Water Pollution Studies.