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STUDIES ON PHYSICO-CHEMICAL LIMNOLOGY OF KURNUR DAM, IN AKKALKOT TAHSIL OF MAHARASHTRA

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ABSTRACT

The present communication deals with studies on physic-chemical limnology of Kurnur Dam in Akkalkot Tahsil Maharashtra.The work was carried out during the year June 2014- May 2016.

The present investigation was undertaken to study the physic-chemical characteristics of Kurnur Dam in Akkalkot Tahsil of Maharashtra. In the physical aspects, we evaluate the monthly changes in atmospheric temperature, water temperature, transparency, conductivity and total dissolved solids. In chemical aspects we evaluate the pH, dissolved oxygen, free CO_2, total alkalinity, total hardness, chlorides, nitrates. Present study revealed that the Kurnur Dam water is quite suitable for the drinking purposes after normal filtration processes.

KEYWORDS: *Limnology- Kurnur Dam– Akkalkot.*

INTRODUCTION:

Nature consists of water, air land, flora and fauna. These five aspects are inextricable interlinked with each other. Due continuously interaction there is an Environmental balance achieved. In the nature all five elements are very important for life sustainability. Each and every interaction tends to achieve one complete process of life. The natural environment is one of the most basic and essential element which is an essence of life in the universe which plays an important role in the abiotic component of the water environment which is essential for each biological activity of every life. It is used for various purposes like drinking, domestic, industrial and agricultural in the environment. Water exists in various forms like gaseous, liquid and solid. It acts as a solvent for variety of inorganic as well organic substances so for that it is well known as the universal solvent. However, seriously talking about the chemically pure water does not exist in the nature in any appreciable length of time. In present status of water, it gets polluted due to various life activities upto easily and severely it will reach to us. It does not possible to escape impurity even while falling from rain. They impure by the air pollution in the atmosphere. The rain water reacts with atmospheric gases, dust, iron, as well as various portals which float in the air and it comes on the earth. Now-a-day, the quantity and quality of water at any spaces and time is very significant in relation to the life at that location in particular time. Now this acts as a limiting factor and regulates in turn the diversity of biotic community of environment as well as abundance of energy at various tropic levels of the environment. So, it's impact on the rate of succession.

On the earth, there is 71% water amount is present and out of which 97% is present in the form of oceans, 2% is in the form of icecaps at polar region and just only 1% in the form surface water as well as ground water. This 1% fresh water is available in the form of rivers, lake, Dam, storms, reservoir, etc. Hydrobiology is the study of interrelation of processes and methods whereby matter as well as energy

transferred within the water body. It is also dealing with the scientific view of the interrelationship between organism and fresh water body. Generally hydrobiological study of any water body involves the analysis of physical-chemical as well as biological character and reflects the status of the environment in relation to both biotic and abiotic factors. This is mainly help in utilizing the resources in the right manner in order to curb the pollution, to boost the productivity and the conserve the prosperity of the biodiversity status of water bodies. Thus, it explains the constant interaction and exchange of mass and energy in an ecosystem. In India there is a large amount of water is reserved in various water bodies like oceans, sea, lakes, Reservoir, dam, ponds, river etc. it is approximately 1.4 billion cubic km (km^3). There are many researchers had been worked and explain water quality, plankton diversity and pollution status of water body.

Notable limnological research was carried out on the reservoirs in India and abroad some workers do the investigation in this field in the similar with. The number of workers has been conducted the work on limnology from the different regions of Maharashtra. They are Kamat (1965), Goel (1988), Bhosale (1994), Chavan and Mohekar (1999), Sathe (2001), Hajare and Muley (2005).

No such research was carried out Kurnur Dam, in Akkalkot Tahsil of Maharashtra; therefore present study of the physic-chemical limnology of Kurnur Dam was undertaken.

MATERIALS AND METHODS

Monthly samples were collected from the sampling stations during the June-2014 to May 2016, at a depth of one meter. The samples were collected in a morning session of the day.For the scientific analysis the samples were brought in one liter can and brought it to the laboratory. The parameters like temperature, transparency, pH, D.O, Free CO_2, and alkalinity were analyzed on the spot, where as T.D.S., conductivity, Total hardness, chlorinity and sulphate were analyzed in the laboratory.The analysis was done with the help of standard literature given by APHA (1985), Trivedy and Goel (1984), Koderkar et al (1998),Goel. P.K. and V.B. Chauhan (1991).

Analysis of each parameter was carried out according to standard methods and procedures which was suggested by APHA, IABA (Hyderabad) and Trivedy and Goel (1984, 87) etc. for the water analysis.

RESULT AND DISCUSSION

During the study, the results were morphometric, physical-chemical parameters.

RESULTS-

The Table No. I - Limnological profile of Kurnur Dam.

(June-2014 to May 2016)

Sr.No.	Parameter.	Range.
Physical Aspects of Kurnur Dam-		
1	Air or atmospheric Temperature (ºc)	42.7 to 22.9
2	Water Temperature (ºc)	38.7 to 18.3
3	Transparency (cm)	98 – 35
4	Conductivity(µmho/ cm)	349 - 261
5	Total dissolved solids (mg/lit).	293-205
Chemical Aspects of Kurnur Dam-		
6	pH	8.9 - 6.4
7	Dissolved oxygen (mg/lit).	7.9- 3.0
8	Free co^2 (mg/lit).	5.6- 1.8
9	Total Hardness (mg/lit).	207-107
10	Total alkalinity (mg/lit).	212-101
11	Chloride (mg/lit).	37-19
12	Sulphate (mg/lit)	34-09

DISCUSSION-

1) Physical Aspects of Kurnur Dam-

The overall highest values of **Air Temperature** during the two year study period were 42.7 ^{0}C i.e. in the month of May and lowest value was 22.9 ^{0}C i.e. in the month of December.

The overall highest values of **Water temperature** during the two year study period were 38.7^{0}C i.e. in the month of May and lowest value was 18.3^{0}C i.e. in the month of January.

The overall highest values of **Conductivity** during the two year study period were 349(µmho/ cm) i.e. in the month of May and lowest value was 261 (µmho/ cm) i.e.in the month of February.

The overall highest values of **Water transparency** during the two year study period were 98 cm i.e. in the month of March and lowest value was 35 cm i.e. in the month of July.

The overall highest values of **Total Dissolved Solids** during the two year study period were 293 mg/lit i.e. in the month of June and lowest value was 205 mg/lit i.e. in the month of January.

2) Chemical Aspects of Kurnur Dam-

The overall highest values of **pH** during the two year study period were 8.9 i.e. in the month of July and lowest value was 6.4 i.e. in the month of June.

The overall highest values of **Dissolved Oxygen** during the two year study period were 7.9 mg/lit, i.e. in the month of January and lowest value was 3.0 mg/lit, i.e. in the month of April.

The overall highest values of **Free Carbon Dioxide** during the two year study period were 5.6 mg/lit., i.e. at sampling site- D in the month of May and lowest value was 1.8 mg/lit., i.e. at sampling site- C in the month of July.

The overall highest values of **Total Alkalinity** during the two year study period were 212 mg/lit i.e. in the month of May and lowest value was 101mg/lit i.e. in the month of September.

The overall highest values of **TotalHardness** during the two year study period were 207 mg/lit., i.e. in the month of April and lowest value was 119 mg/lit., i.e. in the month of November.

The overall highest values of **Chlorides** during the two year study period were 37 mg/lit i.e. in the month of June and lowest value was 19 mg/lit i.e. in the month of January.

The overall highest values of **sulphates** during the two year study period were 34 mg/lit., i.e. in the month of October and lowest value was 09 mg/lit., i.e. in the month of May.

CONCLUSION-

After the observing all the physico chemical aspects of kurnur Dam water, Present study revealed that the Kurnur Dam water is quite suitable for the drinking purposes after normal filtration processes. Thus, the above all parameter values of the dam was the sigh of moderately contaminated by various reasons like agricultural practice, domestic uses, rain runoff from surrounding area which is indirectly suggest of the step to beginning of eutrophication in the dam. We can do future study for the development of fish production as well as planktonic diversity conservation of Kurnur Dam from Akkalkot, Maharashtra. This study can be helpful to future fishery development from present status of Dam.

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PLATE – B

View Of Kurnur Dam

Collection of Water Sample for Water analysis