

RESEARCH ARTICLE

Assessment of physico-chemical parameters of Karadkhed dam, District Nanded, Maharashtra, India

Pawar SK

Department of Zoology, Gramin Mahavidyalaya, Vasantnagar, (kotgyal), Tq. Mukhed Dist. Nanded, (M.S.) India

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ABSTRACT

The present study was conducted to assess the Physico-chemical Parameters of Karadkhed dam water of Deglur Taluka in Nanded district Maharashtra, India, during the year June 2016 to May 2017. Analysis was performed on 08 different parameters. The monthly Variation in the physical and chemical parameters such as water temperature p^H Total Hardness, Calcium Magnesium, Chloride, Phosphate and Nitrate. Were investigated. All the parameter was beyond on the permissible limits. Aquatic ecosystem monitoring has been carried out in India based on either chemical or biological analysis. The result revealed that there were significant seasonal variations in some physico-chemical parameters and most of the parameters were in the normal range and indicated better quality of dam water.

Keywords: Karadkhed dam, Total Hardness, p^H , Calcium, Magnesium, Chloride, Phosphate

INTRODUCTION

India has vast fresh water resources in the form of both lentic and lotic ecosystem. The lentic ecosystems have long attracted attention of ecologists, both for their importance as a source of drinking water and the development of fishers. Therefore, the attention is given on the physico-chemical factors which affect the aquatic inhabitants [1, 2, 3]. All living organisms on the earth need water for their survival and growth. Water is one of the most important and abundant compounds of the ecosystem. An essential resource for human life, freshwater has no substitutes. Freshwater is also essential for many natural systems that support human wellbeing [2, 3, 4, 5]. Expanding human activity has extensively altered the planets freshwaters, with modifications impacting the physical, chemical and biological features of aquatic system [6, 7, 8, 9]. This review emphasizes large-scale physical, chemical and biological changes in fresh waters and their associated arrivers, including human factors that affect freshwaters, but does not address

institutional aspects of water management oxygen. Aquatic ecosystems undergo constant change and adaptation and can withstand stress based on their unique physical, chemical and biological properties [10,11,12]. Each species of animal and plant has an optimal range for physical and chemical requirements [12]. Aquatic organisms and the physical and chemical components of their environment are inseparably interrelated and interact with other. Many researchers have done studies on Physico-Chemical and biological characters of river and dam water Killen *et al.*[1], Bauer and Wacheter [2], Kuzbali *et al.*[3], Basavaraja *et al.*[5], Pawar [5-11], Alaka [12-13], Beckerman [14], Ramula and Benarjee [15], Pandey *et al.*[16], Lubal *et al.*[17], Kashyap [18], Meme *et al.*[19], Daka and Moslen [20].

The present study was to assess the ecosystem of Karadkhed dam Taluka Deglur in Nanded District Maharashtra by estimating the various physico-chemical parameters like water temperature p^H total Hardness, Calcium, Magnesium, Chloride Phosphate and Nitrate.

METHODOLOGY

The water samples were collected for physico-chemical analysis from dam. At the regular intervals of one month a period of one year from June 2016 to May 2017. The samples are well mixed and stored in two litre plastic cans. Sample collection was usually completed during morning hours between 6:00 a.m. to 9:00 a.m. every for further analysis. The water temperature and p^H were estimated on the spot at the time of sampling while other

parameters were estimated in the laboratory. Standard methods as prescribed APHA [21], Saxena [22] were followed for examination of various Physical and Chemical Parameters of Water.

RESULTS

The seasonal variation in physico-chemical parameters are given table respectively.

Water Temperature

During the study period water temperature varied from 22.1 to 31.2 °C. The minimum temperature was observed during the month of October and maximum temperature was observed in the month of May. The fresh water environment best demonstrate the unique thermal properties of water. It is a factor of prime important in the physical environment of organisms. The significant correlation between ambient temperature and water temperature was observed by Ganpati [23] and Verma [24]. Pointed out the seasonal changes were mainly dependent on water temperature in Gidigich Reservoir.

Hydrogen ion concentration (p^H)

In the present study the p^H range was record 7.2 to 7.9. The high p^H range was recorded in summer and low range in winter. p^H of water is important for the biotic compound because most of the plant and animal species can survive a narrow range of p^H from slightly acidic to slightly alkaline condition. Shubhaschandra *et al.* [25], Recorded the p^H range between 7.2 to 7.8 in Purna River Parbhani District Maharashtra.

Table 1: Assessment of Physico-Chemical Parameters of Karadkhed Dam during the year 2016-2017.

Period	Water Temp. °C	p^H	Total Hardness mg/l	Calcium mg/l	Magnesium mg/l	Chloride mg/l	Phosphate mg/l	Nitrate mg/l
June	27.6	7.3	138	72	20.3	44.6	0.80	18.9
July	27.4	7.4	145	75	20.7	43.3	0.60	18.6
August	26.8	7.7	152	81	21.9	42.5	0.40	17.2
September	26.3	7.5	160	87	23.6	41.4	0.30	16.5
October	22.1	7.2	172	99	24.27	40.2	0.25	15.3
November	25.2	7.6	168	85	23.9	48.2	0.32	18.5
December	26.6	7.8	160	80	22.7	55.3	0.39	21.2
January	27.4	7.4	150	78	21.3	62.1	0.48	28.4
February	28.6	7.5	148	74	20.8	68.5	0.57	30.5
March	29.1	7.7	140	70	20.3	70.1	0.69	34.2
April	30.9	7.8	132	68	19.29	71.2	0.78	38.6
May	31.2	7.9	129	65	19.31	74.1	0.86	41.7

Total Hardness, Calcium and Magnesium

The total hardness ranged from 129 to 172 mg/l. The calcium level varied from 65 to 99 mg/l. The magnesium level varied from 19.31 to 24.27 mg/l. The maximum values were during summer while minimum values were during winter. The total hardness is due to the presence of polyvalent metal ion e.g. calcium and magnesium arising from dissolution of minerals. The total hardness was in the range from similar result were observed by Hiware and Jadhav [26] found the values of total hardness were 48.75 during summer and 34.5 mg/l. during rainy season. Kulkarni *et al.* [27], observed the calcium level varied from 56.9 to 101.7 mg/l. N. Shubhashchandra *et al.* [25], observed the total hardness range from 102 to 104 mg/l. in Purna River, Parbhani District Maharashtra.

Chloride

The chloride value ranged from 40.2 to 74.1 mg/l. The maximum values were during summer while minimum values were during winter. The aquatic bodies in due to rainfall and substances carried from catchment. Mohammad *et al.* [28], by the analysis of water of paler reservoir at Khammam District of Telangana reported that the chloride concentration was ranged between 100 mg/l. to 180 mg/l.

Phosphate

The phosphate value ranged from 0.25 to 0.86 mg/l. The maximum values were during summer while minimum values were during winter. In water bodies phosphate occurs both in its inorganic and organic forms as organic phosphorous and orthophosphate, phosphate plays a dynamic role by acting as the limiting nutrient presence of phosphate in water and waste water analysis has a great significance. High concentrations of phosphates can indicate the presence of pollution and are largely responsible for entropic conditions, WHO [29].

Nitrate

The Nitrate value range from 15.3 to 41.7 mg/l. The maximum values were during summer while minimum values were during winter. Nitrogen is less soluble in water than oxygen. Nitrogen is important as it is a necessary element in the structure of protein there is an entry of detergents in the water body and less water quantity and during summer season the relatively low level of phosphate have been reported which may be attributed to abundance of phytoplankton. Rana *et al.*

[30], recommended that it should not exceed 0.2 mg L⁻¹ in fresh water and 0.125 mg L⁻¹ in sea water.

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