



Physico-chemical parameters analysis from different stations of Nagthana dam in Warud Taluka in Amravati district. (M. S.)

Topale PS and Jadhao RG

P.G. Department of zoology, Shri Shivaji Science College, Amravati -444603

Email-prafulltopale@gmail.com

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ABSTRACT

The present study designed to demonstrate the variation in Physico-chemical parameters from Nagthana Dam in during June 2010 to May 2012, from three stations i.e. station-I, station-II and station-III. Water sample were collected monthly and analysed for estimation of water Temperature, pH, Dissolved Oxygen (DO), Alkalinity, Nitrate and Phosphate.

Keywords: crab *Paratelphusa jacquemontii* (Rathbun), density, abundance and frequency

INTRODUCTION

Water is a serious issue for the survival of all living organisms. Some can use salt water but many organisms including the great majority of higher plants and most mammals must have access to fresh water to live. Some terrestrial mammals, particularly desert rodents appear to survive without drinking but they do generate water through the metabolism of cereal seeds and they also have mechanisms to conserve water to the maximum degree. The quality of water is vital concern for mankind because it directly linked with human health. Now a day, the menace of water born diseases and epidemics still looms large on the horizons of developed and developing countries. The polluted water is the culprit in all such cases. Water sources were polluted by domestic wastage in rural areas whereas industrial wastages discharged into natural water sources in urban areas (Sayyed and Bhosle, 2010; Ogbonna *et al.*, 2011). We need water every day for various domestic, irrigation and drinking purposes. Economy of our country is agro based economy. Most of the people who live in villages get their jobs in agriculture field due to irrigation facilities in that sector. When there is no revolution in industry and agriculture, water quality was near about good. But due to industrial and agriculture revolution water which is collected in the various

water resources -highly polluted in various ways (Dhake *et al.*, 2008; Mehta *et al.*, 2008; Lokhande *et al.*, 2009; Moscow *et al.*, 2011). So it was not suitable and safe for domestic, irrigation as well as drinking purposes. Water is basis of all kind of life.

METHODOLOGY

Study area: The study site is located near the Rawala village in Warud Taluka in Amravati district. Nagthana dam is surrounded by open hills of Satpuda ranges. The Nagthana dam is situated on Maharashtra and M.P. border. Nagthana dam is constructed on the river 'Chudamani'. Origin from M.P. Human activities like washing of clothes, fishing, bathing are predominant. This present water body is under the jurisdiction of Irrigation Department Warud.

Physico-chemical parameters of dam water – Water sampling procedure and analysis

The water samples were analysed for various parameters in the laboratory. Various physical and chemical parameters like Temperature, pH, Dissolved Oxygen (DO), Alkalinity, Nitrate and Phosphate have been monitored for the dam water of different locations.

Plastic bottles of 1.5 liter capacity with stopper were used for collecting samples. Each bottle was washed with 2% Nitric acid and then rinsed three times with distilled water. The bottles were then preserved in a clean place. The bottles were filled leaving no air space, and then the bottle was sealed to prevent any leakage. Each container was clearly marked with the name and date of sampling.

SAMPLING POINTS

Samples collected from the sampling point are as follows:

1. Station I 2. Station II 3. Station III

Physical and chemical parameters like Temperature, pH, Dissolved Oxygen (DO), Alkalinity, Nitrate and Phosphate will be carried out according to methods of APHA (2005) monthly for two years.

RESULT AND DISCUSSION

Water temperature:

The minimum and maximum water temperature was recorded in the month of Dec. 2010 and May 2011

respectively. The minimum water temp. is 19.1°C and maximum water temp. 25.8°C. The mean and SE of station-I (22.14±0.47), at station-II (22.15±0.50) and at station-III is (22.17±0.49) respectively during the period of June 2010 to May 2011. The mean and SE of station-I (22.04±0.49), at station-II (22.14±0.476) and at station-III is (22.19±0.479) respectively during the period of June 2011 to May 2012. In present study it showed that higher temperature in summer and relatively lowers in winter. Similar study, Jayabhaye *et al.*, (2008); Salve and Hiware, (2008),

pH (Hydrogen Ion Concentration):

The pH was found maximum (7.66) in the month of May 2011 at station-II and minimum pH (6.48) in the month of Nov. 2010 at station-II. The mean and SE of station-I (7.1±0.061), at station-II (7.2±0.079) and at station-III is (7.2±0.088) respectively during the period of June 2010 to May 2011. The mean and SE of station-I (7.1±0.062), at station-II (7.2±0.086) and at station-III is (7.1±0.065) respectively during the period of June 2011 to May 2012. Similar trend was also reported (Narayana, *et al.*, 2008; Reddy Vasumathi, *et al.*, 2009; Kadam, *et al.*, 2007; Anitha, 2002).

Dissolve Oxygen (DO) (mg/l):

The minimum and maximum values of dissolve oxygen were recorded are (6.18 mg/l) and (7.89 mg/l) in the month of Dec. 2011 and May 2012 respectively.

The highest mean and SE value was recorded at station-II, while the lowest mean and SE value was recorded at station-III (Table 1 and 2). In the present study, the dissolve oxygen of water of Nagthana dam was highest in summer season and lowest in the winter season in both the years. According to Upadhyay and Gupta (2013), the values of DO fluctuate from 6.40 mg/l to 12.6 mg/l. The maximum values (12.6 mg/l) was recorded in the month of May (summer) and minimum values (6.40 mg/l) in the month of November (winter). The high DO in summer is due to increase in temperature and duration of bright sunlight has influence on the % of soluble gases (O₂ and Co₂).

Total Alkalinity:

Total alkalinity of water from Nagthana dam ranged between (161 to 239 mg/l). From the stations of Nagthana dam, the values of total alkalinity were recorded minimum and maximum at station-II and station-III respectively. The highest mean and SE value was recorded at station- III, while the lowest mean and

SE value was recorded at station-I (Table 1 and 2). Minimum fluctuations were observed and recorded during study of investigation from the different station of Nagthana dam. According to APHA (2005) and Ansa-Asare and Asante (2000), alkalinity of water is measure of its capacity to neutralize acids. This is due to the primarily salts of weak acids or strong bases. Bicarbonates represent the measure form of alkalinity. Hujare, (2008), also reported similar results that it was maximum in summer and minimum in winter due to high photosynthetic rate.

Nitrate:

During the course of study nitrate of water from Nagthana dam ranged between (0.59 to 1.2 mg/l). From the stations of Nagthana dam, the values of nitrate were recorded minimum and maximum at station-III in the month of Oct. 2011 and Sept. 2011 respectively. The highest mean and SE value was recorded at station- III, while the lowest mean and SE value was recorded at

station-I Minimum fluctuations were observed and recorded in the month of Oct. 2011 at station-III and Nov. 2011 during study of investigation from the different station of Nagthana dam. Maniky Reddy (1984) have also observed that nitrates are abundant during monsoon season

Phosphate:

During the course of study phosphate of water from Nagthana dam ranged between (1.6 to 14.7 mg/l). From the stations of Nagthana dam, the values of phosphate were recorded minimum and maximum at station-III in the month of Oct. 2010 and Aug. 2010 respectively. At station-III the minimum and maximum value of phosphate is (1.8 to 13.7 mg/l) in the month of Oct. 2011 and Aug. 2011 respectively. The mean and SE value is (5.88±1.10). The highest mean and SE value was recorded at station- III, while the lowest mean and SE value was recorded at station-II (Table 1 and 2).

Table 1: Mean ± SE and of various physico-chemical parameters from different stations of Nagthana dam. (June 2010 to May 2011).

Sr.	PARAMETERS	STATION I	STATION II	STATION III
1	Water Temperature	19.4-25.3 22.14±0.47	19.1-25.8 22.15±0.50	19.3-25.7 22.17±0.49
2	pH	6.54-7.42 7.1±0.061	6.48-7.66 7.2±0.079	6.64-7.58 7.2±0.088
3	Dissolve Oxygen (mg/l)	6.18-7.03 6.55±0.083	6.29-7.05 6.61±0.075	6.23-7.04 6.55±0.075
4	Alkalinity (mg/l)	162-236 202.2±6.20	164-235 206.4±6.21	175-239 207.5±5.19
5	Nitrate (mg/l)	0.61-0.87 0.72±0.025	0.63-1.2 0.76±0.044	0.64-1.0 0.74±0.030
6	Phosphate (mg/l)	1.8-14.6 5.89±1.18	1.8-13.9 5.81±1.13	1.6-14.7 5.9±1.14

(Figures in parenthesis are minimum and maximum ranges)

Table 2: Mean ± SE and of various physico-chemical parameters from different stations of Nagthana dam. (June 2011 to May 2012).

Sr.	PARAMETERS	STATION I	STATION II	STATION III
1	Water Temperature	19.4-25.6 22.04±0.49	19.4-25.6 22.14±0.476	19.2-25.7 22.19±0.479
2	pH	6.57-7.49 7.1±0.062	6.64-7.51 7.2±0.086	6.48-7.39 7.1±0.065
3	Dissolve Oxygen (mg/l)	6.21-7.64 6.65±0.109	6.2-7.89 6.75±0.153	6.19-7.54 6.71±0.118
4	Alkalinity (mg/l)	165-237 203.3±6.52	161-238 207.5±6.57	174-238 209.4±5.73
5	Nitrate (mg/l)	0.64-1.1 0.76±0.037	0.61-0.94 0.73±0.028	0.59-1.2 0.79±0.074
6	Phosphate (mg/l)	1.7-13.3 5.76±1.08	1.7-13.3 5.71±1.06	1.8-13.7 5.88±1.10

(Figures in parenthesis are minimum and maximum ranges)

According to Upadhyay and Gupta (2013), the value of phosphate fluctuates from 0.12mg/l to 12.38 mg/l. the maximum value (12.38mg/l) was recorded in the month of August (monsoon) and minimum value in the month of October (winter). The high values of phosphate in August (monsoon) months are mainly due to rain, surface water runoff, agriculture run off; washer man activity could have also contributed to the inorganic phosphate content. Similar results reported by Arvindkumar (1995)

CONCLUSION

In the present study, the value of physico-chemical parameters such as water temp., pH, DO, total alkalinity, nitrate and phosphate were highest at station-III and lowest at station-I and some fluctuations were observed and suitable and useful for irrigation and fish production, drinking purpose as all the hydrobiological parameter of water were within permissible limits.

In the present study it is clear that the physico-chemical properties of water in the Nagthana dam are on the verge of becoming eutrophic.

REFERENCES

- Anitha G (2002) Hydrography in relation to benthic macro-invertebrates in Mir-Alam Lake Hyderabad Andhra Pradesh, India. Ph.D. Thesis submitted to Osmania University. Hyderabad.
- Ansa-Asare OD And Asante KA (2000) *West Afr. J. Appl. Ecol.*, 1, 23.
- APHA (2005) Standard methods for the examination of water and waste waters, 21st Edn., Washington, DC. USA.
- Arvindkumar (1995) Some Immunological Aspects of the Fresh water Tropical Wetland of Santhal. Pargana (Bihar) India, *J. Envi. Poll.* 2 (3): 137-141.
- Dhake RB, Phalak RP and Waghulde GP (2008) *AJ CER*, 1(1): 54.
- Hujare MS (2008) Seasonal variation of physico-chemical parameters in the perennial tank of Talsande, Maharashtra. *Ecotoxicol. Environ. Monit.* 18(3): 233-242.
- Jayabhaye UM, Pentewar MS and Hiware CJ (2008) A study on physico-chemical parameters of a minor reservoir, Sawana, Hingoli District, Maharashtra. *J. Aqua. Biol.*, 23(2): 56-60.
- Kadam MS, Pampatwar DV and Mali RP (2007) Seasonal variations in different physico-chemical characteristics in Masoli Reservoir of Parbhani district, Maharashtra. *J. Aqua. Biol.*, 22(1): 110-112.
- Lokhande MV, Rathod DS, Shembekar VS and Karadkhele SV (2009) Seasonal variations in turbidity, total solids, and

total dissolved solids, total suspended solids of Dhanegaon reservoir in Maharashtra. *Ecology and Fisheries*, 2 (1): 73.

- Manikya Reddy P (1984) Ph.D. Thesis, Osmania University, Hyderabad.
- Upadhyay Manish and Gupta Vijay Laxmi (2013) Analysis of Water Quality Using Physico-Chemical Parameters of Khudia Dam in Mungeli District, Chhattisgarh, *IOSR Journal of Engineering (IOSRJEN)*, p-ISSN: 2278-8719.
- Mehta KA and Patil CL (2008) *J. Chem tracks*, 10 (1and2), 345.
- Moscow S, Jothivenkatachalam K and Subramani P (2011) *Der Chemica Sinica*, 2 (2): 199.
- Narayana J, Puttaiah ET and Basavaraja D (2008) Water quality characteristics of anjanapura reservoir near Shikaripur, District Shimoga, Karnataka *J. Aqua. Biol.*, 23(1): 59-63.
- Ogbonna O, Jimoh WL, Awagu EF and Bamishaiye EI (2011) *Advances in Applied Science Research*, 2 (2): 62.
- Reddy Vasumathi K, Laxmi Prasad K, Swamy M and Reddy Ravinder (2009) Physico-chemical parameters of Pakhal Lake of Warangal district Andhra Pradesh, *India. J. Aqua. Biol.*, 24(1): 77-80.
- Salve VB and Hiware CJ (2008) Study on water quality of Wanparakalpa reservoir Nagpur, Near Parli Vaijnath, District Beed. Marathwada region, *J. Aqua. Biol.*, 21(2): 113-117.
- Sayyed JA and Bhosle AB (2010) *Der Chemica Sinica*, 1 (2): 104.