

Water Chemistry of Masoli Reservoir, Parbhani, Maharashtra State, India**S. M. Yeole**M. S. P. Mandal's, Shri Shivaji College,
Parbhani**Abstract**

Since time immemorial, fresh water has always been of vital importance to man and it is interesting to note that his early habitations were within easy reach of lakes and rivers. Man's primary concern with water was thought to be for drinking, food and as a means of cleaning, but with the passing of time man realized the inherent mysteries of aquatic phenomenon and water as the basis for all life activities. Fresh water habitats are highly diversified and marked by a wide range of physico-chemical conditions, which greatly influences the aquatic biota. Masoli reservoir is a rural aquatic habitat and hence an attempt has been made to assess its water chemistry in order to utility of selected aquatic habitat. Present work has been carried out for the period of one year i.e., from February 2018 to January 2019. During the studies various physico-chemical parameters were analysed viz., pH, dissolved oxygen, total hardness, chlorides, nutrients etc. Study revealed that the water body is useful for pisciculture and agricultural practices.

Key words:- Water chemistry, Utility, Masoli reservoir, Parbhani.

Introduction

Water, the elixir of life, is becoming more and more unfit and dearer to mankind due to unwise use, neglect and mismanagement. It possesses a number of physico-chemical properties that help the molecule to act as best suited medium for life activities. The movement of water from earth surface to atmosphere through hydrological cycle appears to be a close system. Water occurs in all its very familiar forms i.e., ice, liquid and vapour. In spite of multifarious uses, unfortunately the water bodies are being used as receptacles for sewage and industrial wastes. Even from narrower point of view a body of fresh water which provides a variety of human needs is full of value, only when it is not abused and polluted. In aquatic ecosystem nutrients like nitrates, phosphates and sulphates from sewage, fertilizers, animal wastes and detergents enter lakes and affects aquatic life in various ways. Nutrient enrichment seriously degrades aquatic ecosystems and impairs the use of water for drinking, industry, agriculture and recreation (Carpenter *et al.*, 1998). Physico-chemical characteristics not only reflect the quality of an aquatic ecosystem but also its biological diversity (Tas and Gonnol, 2007). In fact such abiotic features deliberate on the health status and productivity of an ecological system (Parray *et al.*, 2010). In order to make any concrete decision

regarding its usefulness water chemistry of Masoli reservoir has been assessed.

Materials and Methods

Water chemistry of Masoli reservoir, Parbhani, Maharashtra, India, was conducted for the period of one year i.e., from February 2018 to January 2019. Water samples from selected aquatic habitat were collected on monthly basis for assessment of various physico-chemical parameters. All the physico-chemical parameters viz., pH, dissolved oxygen, total hardness, chlorides, sulphates, phosphates and nitrates were estimated by using standard methods given by APHA (1989).

Result and Discussion

Table 1:- Seasonal Variations in Various Physico-chemical Parameters of Masoli Reservoir, Parbhani

Sr. No.	Parameters	Winter	Summer	Monsoon
1	Air Temperature (°C)	20.40 ± 0.14	27.27 ± 0.18	25.74 ± 0.17
2	Water Temperature (°C)	19.27 ± 0.11	25.11 ± 0.15	23.63 ± 0.17
3	Total Solids (mg/L)	422.37 ± 0.41	502.46 ± 0.42	321.77 ± 0.32
4	pH	7.93 ± 0.10	8.34 ± 0.11	7.57 ± 0.12
5	Dissolved Oxygen (mg/L)	8.16 ± 0.11	6.52 ± 0.10	7.12 ± 0.12
6	Chlorides (mg/L)	32.88 ± 0.11	41.14 ± 0.14	30.88 ± 0.21
7	Total Hardness (mg/L)	70.20 ± 0.31	84.75 ± 0.40	67.00 ± 0.42

8	Sulphates (mg/L)	0.16 ± 0.010	0.24 ± 0.012	0.14 ± 0.011
9	Total Phosphorous (mg/L)	0.25 ± 0.009	0.34 ± 0.011	0.21 ± 0.008
10	Nitrates (mg/L)	0.31 ± 0.009	0.54 ± 0.010	0.30 ± 0.008

Water chemistry of Masoli reservoir, Parbhani was assessed during February 2018 to January 2019. Results are shown in Table 1. Temperature is a vital parameter for growth of organism and plays an important role in the physico-chemical and physiological behavior of aquatic ecosystem (Manimegalai *et.al.*, 2010). In the present investigation water temperature followed similar seasonal trend as that of air temperature and recorded minimum as compared to air temperature. Both these variables were recorded maximum in summer whereas minimum in winter. Fluctuations experienced in air and water temperature may be due to the influence of season, location and difference in the time of collection (Angadi *et.al.*, 2005).

Total solids refer to matter suspended and dissolved in water. Solids may affect water or effluent quality adversely in a number of ways. Waters with high dissolved solids generally are of inferior palatability and may induce an unfavourable physiological reaction in the transient consumer (APHA, 1989). In the present investigation total solids of the selected aquatic habitat were estimated which recorded as maximum in summer and minimum in monsoon. pH is an important parameter in water body since most of the aquatic organisms are adopted to an average. The higher photosynthetic activity increases production of phytoplankton, which support an increase in pH (Das and Srivastava, 1956). The higher pH is also attributed to anthropogenic activities like washing of cloths with detergents and mixing of sewage (Dhanasekaran *et. al.*, 2017).

Dissolved oxygen is a very important parameter for the survival of fishes and other aquatic organisms. Oxygen is also needed for many chemical reactions that are important to lake functioning oxidation of metals, decomposition of dead & decaying matter, etc. (Ramachandra & Solanki, 2007). During the study period maximum dissolved

oxygen was recorded in winter. Low dissolved oxygen in summer may be due to the low solubility of atmospheric oxygen and high degradation of organic substances (Rajgopal *et.al.*, 2010).

Chloride anion is generally present in natural waters. In the present investigation seasonal variations in chlorides was estimated and all have shown the maxima in summer and minima in monsoon. Decrease in the water levels of these waterbodies during summer may be the reason for increase of chloride concentration. Similar findings were also made by Karne & Kulkarni (2009).

Total hardness of water is the measure of the capacity of water to react with soap. In the present investigation maxima of seasonal total hardness was recorded in summer. High range of total hardness in summer obviously was due to high loading organic substances, detergents, chlorides and other pollutants (Yewale and Patil, 2011).

Various nutrients viz., sulphates, phosphates and nitrates were also estimated during the study period. All the estimated nutrients were showed peak in summer whereas low count in monsoon. Lower values in monsoon may be due to inflow of water (Kedar & Patil 2002, Jha & Barat, 2003, Angadi *et.al.*, 2005 and Ramachandra *et.al.*, 2006).

Conclusion

All the selected parameters were found within the permissible limit as per the guidelines given by WHO (1984), hence, it can be concluded that the water of Masoli reservoir is good for pisciculture and agricultural practices.

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