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Water pollution in Bhopal and Quality parameters of drinking water

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ABSTRACT

The quality of water is of vital concern for mankind since it is directly linked with human welfare. All the organisms use water for their metabolic processes and all the biochemical reactions in the body of the organisms takes place in the water medium. The present work incorporates the study on water pollution in Bhopal and quality parameters of drinking water of Upper lake. The study is of considerable interest involving BOD, COD and heavy metals in water. Analysis of physicochemical factors in lake water is of fundamental importance to assign the water quality in general and it's nutrient status in particular.

Key words: Parameters, Analysis, Pollution, Heavy metals.

Environment is the representative of physical components of the earth where man is the important factor influencing its environment. Water is the internal medium for all organisms and principal external medium for several organisms. A large proportion of about 70% of the body weight of most organisms including man is constituted of water[3]. Ideally drinking water should not contain any micro-organism known to be pathogenic and should also be free from bacteria[4,5]. Water pollution can be classified in mainly four categories, physical pollution of water, chemical pollution of water, biological pollution of water and physiological pollution of water. The chief sources of surface water pollution are atmospheric gases, surface run off, industrial and municipal waste, agricultural waste, decomposed plants and animal matter and radioactive material[2]. Ground and surface waters have appreciably different characteristics. Many substances either dissolve in surface water or get suspended in it on it's path to the ocean. Surface water collected in lakes having mineral nutrients essential for algae growth may support a heavy growth of algae. Surface water having a high level of biodegradable organic material normally contains a high population of bacteria.

Sampling for physicochemical study was done monthly. Water samples were taken with the help of clean narrow mouthed polythene bottles. The water sample so collected were brought to lab. and were placed at low temperature.

Table-1(2012)

S. No.	Physico-chemical parameters	Units	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1.	Colour		Dusky	LG	LG	LG	LG	Dusky	Dusky	Dusky	LG	DG	DG	DG
2.	Fluoride	Mg/l	0.41	0.4	0.39	0.42	0.43	0.38	0.36	0.36	0.37	0.39	0.38	0.40
3.	Nitrate	Mg/l	2.1	2.2	2.3	2.6	2.5	2.6	2.8	2.4	2.2	1.8	1.6	2.0
4.	Phosphate	Mg/l	0.02	0.02	0.02	0.02	0.03	0.03	0.028	0.02	0.02	0.03	0.06	0.03
5.	DO	-	7.0	7.1	5.0	5.1	5.0	6.1	6.4	6.4	6.8	6.8	6.6	6.4
6.	Ph	-	7.0	7.1	7.1	7.2	7.3	7.2	8.2	8.1	8.0	7.8	7.2	7.2

Analysis of water was done by the method of APHA[1].

Dissolved oxygen :

Winkler's method

$$\frac{\text{ml Sodium thiosulphate X normality X } 0.008 \text{ X } 10^6}{\text{Volume of sample(ml)}} = \text{ppm DO}$$

Biochemical Oxygen Demand :

$BOD_5(mg/L)=(DO-D_5)$ X Dilution factor

The maximum water level of upper lake was observed in July and August while minimum in May and June. The fluoride level was in desirable limit. The nitrate contents were high. Dissolved oxygen play an important role for metabolism of aquatic organisms, presence of DO in water is due to direct diffusion from air and photosynthetic activity of autotrophs. The DO value of the lake was suitable for potability and aquaculture. The recommended maximum lead concentration in drinking water is 0.10 ppm. The lead concentration in upper lake of Bhopal city is found to be 0.086ppm. The study indicates increase in the DO of water bodies, whereas, the BOD and COD decrease significantly.

Thus, in the light of the above mentioned observation and discussion we lead to the conclusion that the morphometry and hydr-biological condition of upper lake water is favourable for drinking and irrigation purpose.

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