ISSN : 2393-8358

UGC Approved, Journal No. 48416 (IJCR)
Impact Factor : 2.314

Interdisciplinary Journal of Contemporary Research

An International Peer Reviewed Refereed Research Journal

Vol. 5, No. 5 March, 2018

Analysis of Bio-Chemical Oxygen Demand (BOD) in Gomati River Water in Sultanpur District (U.P.)

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Abstract

The BOD monitoring of Gomati river water of Sultanpur District was carried out at an interval of one month in duration Jun. 2003 to May. 2004. The Eight sampling sites, i.e. Ruthighat (S_1), Dhanraghat (S_2), Khudwarghat (S_3), Golaghat (S_4), Paparghat (S_5), Sothimalaghat (S_6), Dipnaraghat (S_7) and Dhopapghat (S_8) were selected for study of BOD parameter on the basis of their importance. The results of BOD are expressed on the basis of monthly intervals.

The different sampling sites have been selected in Sultanpur District and it was observed that due to surface run-off land and the effluents transported to the river from Paper and Sugar Mills on its bank and the other sewages the Gomati river water was found severely polluted. The water resources are used to meet the day to day requirements of human settlement for production of [illegible] water and most important of all for industrial and agricultural needs. The Gomati river water also invites the town people situated on its bank. The human land around the river stations Utilize its water for drinking purposes.

Introduction

Gomati river has been under existence since very long period and many millions people have been benefited by this river. It originates from a lake in Pilibhit District and conglomerates to the great river Ganga at Sarnath in Varanasi. The Gomati river also conglomerates in to Sai river at Jalalpur, Jaunpur. Gomati river during its whole stretch in Sultanpur District is chiefly polluted at Golaghat.

Any disturbance in the natural cycle creates ecological imbalance, which is the main cause of environmental pollution. Pollution of the environment is increasing at a dreadful rate particularly during post-industrial period and has created a serious environmental crisis, threatening the very survival of mankind. In addition of pollutants through drainages of mills, municipal lands to the river is responsible for diseases, unwilling odour, deep colour formation and poisoning the aquatic lives. Yet it has been ignored by governments and investigators in context of river water pollution control.

Experimental

The samples of Gomati river water for the determination of Bio-chemical oxygen demand (BOD) was collected in BOD bottles by siphoning to avoid aeration. BOD bottles are 1 litre pyrex or stoppering bottles. The special devices such as displacement sampler etc. or Kemmerer type sampler can be used for collecting samples for BOD bottles should be filled without entrapment of any air and should not be disturbed during collection. The effluents can be siphoned through a rubber in to the sample bottle. An important point is that tip of the tube should be noted immediately. The BOD is determined by calculating dissolved oxygen before and after 5 days at 20°C. The BOD can also be calculated and hence there is no need to collect the samples for BOD separately. When samples does not contains any oxygen then it is supplied with oxygen and depletion is calculated as BOD.

The sampling from each site was performed in three steps. The first step includes the collection of sample from surface at a depth of 10 cm, secondly it was performed from middle layer and the sampling was also made from the bottom layer. Each sampling was performed periodically at an interval of 10 days and average of readings was obtained. Separately for surface, middle and bottom layers, and the average denotes the results for the concerned month. The procedure was repeated in every month in the duration Jun. 2003 to May. 2004. The BOD of each sample was measured in the table-1.

Table-1

The BOD values of Gomati river water at different sites in the duration of Jun, 2003 to May 2004.

Duration	Sampling sites							
	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8
Jun	4.1	4.0	4.1	4.0	4.3	4.0	3.6	4.0
Jul	2.7	3.0	3.2	3.6	3.6	3.5	3.5	3.5
Aug	2.3	2.7	3.0	3.1	3.0	3.0	3.1	3.1
Sep	2.6	3.1	3.1	3.2	3.1	3.0	2.7	2.4
Oct	3.0	3.0	2.7	2.6	2.6	2.6	2.6	2.3
Nov	3.1	3.1	3.0	3.0	2.4	2.5	2.8	2.7
Dec	3.2	2.5	3.3	2.7	2.7	3.1	2.9	2.8
Jan	3.1	2.3	3.2	3.0	2.9	3.0	3.1	3.1
Feb	3.6	3.2	3.5	3.1	3.0	3.1	3.0	3.0
Mar	4.1	3.7	3.6	3.4	3.3	3.4	3.2	3.4
Apr	4.0	4.0	4.1	3.7	3.4	3.6	3.8	3.5
May	4.2	4.1	4.2	4.1	4.0	3.9	3.9	4.0

Result and Discussion

The data recorded through the studies of samples of Gomati river water applying standard methods have been presented in table-1.

On the study of Gomati river water it indicated the presence of BOD at all the sites. A narrow range was obtained with a significant monthly variation. However at site S_1 in Aug, 2003, S_2 in Jan 2004 and S_8 in Oct 2003, the BOD was least with a value of 2.3. It reached to its peak point of 4.2 in May, 2004 at site S_3. The BOD content was found largest in the bottom layers and lowest of BOD was observed in the surface layers. Since long time man is regarding the rivers as main route cause of culture and civilization. The importance of rivers in maintaining a healthy as well as prosperous nation in appropriate environment amply understood from the very existence of the civilization on this globe. River water is primarily used to satisfy the daily need of the living world in and around them. The curves of the same nature are also observed at S_3, S_4, S_5, S_6 and S_7, which indicates that variation in contents of BOD at all the Eight sites depend on weathers and seasons of the year. The BOD of Gomati river water is greater in rainy season that in summer in the duration of Jun. 2003 to May. 2004.

After all the above observation, it was found that higher value of BOD at Bhaddaurghat and the least value occured at Richhghat, Thauraghat, Dhopapghat & Golaghat in Sultanpur. The tanneries stablished on the bank of Gomati are responsible for pollution of the river water. This type of pollution can be dominant in the hills, which are in the vicinity of the tanneries.

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