e-ISSN: 2455-667X

Annals of Natural Sciences
Vol. 2(3), September 2016: 35-37
Journal's URL: http://www.crsdindia.com/ans.html
Email: crsdindia@gmail.com

Annals of Natural Sciences

ORIGINAL ARTICLE

Biomonitoring of Water Quality in Chambal *River* at Dholpur District

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ABSTRACT

Society's basic interest in pollution is owing to its effect on living organism have the assessment of pollution is basically a biological problem. Yet the assessment of pollution have traditionally been chemically oriented and biological aspects have been either omitted or put subsidiary position. The damage of an aquatic ecosystem is caused by different kind of pollutant, the organism through their presence number and behaviour can integrate the whole effect. In the present study, water quality is standardize on the basis of coliform and faecal coliform measurement.

***Key words**: Coliform, Faecal coliform, Water pollution, Chambal River*

Received: 10th July, 2016, Revised: 25th August. 2016, Accepted: 27th August. 2016

How to cite this article:
Tiwari P.S. and Verma R.K. (2016): Biomonitoring of Water Quality in Chambal *River* at Dholpur District. Annals of Natural Sciences, Vol. 2[3]: September, 2016: 35-37.

INTRODUCTION

Water pollution is a major global problem which requires ongoing evaluation and revision of water resource policy at all levels (international down to individual aquifers and wells). It has been suggested that it is the leading worldwide cause of deaths and diseases and that it accounts for the deaths of more than 14,000 people daily. An estimated 580 people in India die of water pollution related illness every day. Around 90% the water in the cities of China is polluted, and as of 2007, half a billion Chinese had no access to safe drinking water. In addition to the acute problems of water pollution in developing countries, developed countriescontinue to struggle with pollution problems as well. In the most recent national report on water quality in the United States, 45 percent of assessed stream miles, 47% of assessed lake acres, and 32 percent of assessed bays and estuarine square miles were classified as polluted. The head of Chinas national development agency in 2007 said 1/4th the length of China's seven main *River*s were so poisoned the water harmed the skin. Water is typically referred to as polluted when it is impaired by anthropogenic contaminants and either does not support a human use, such as drinking water, or undergoes a marked shift in its ability to support its constituent biotic communities, such as fish. Natural phenomena such as volcanoes, algae blooms, storms, and earthquakes also cause major changes in water quality and the ecological status of water.

MATERIALS AND METHODS

COLIFORM:

For measuring of coliform the multiple tube fermentation process was used for the LMPN count of coliform. The technique involves the several dilution of the sample in a suitable medium after the expiry of the incubation period. The multiple tubes were examined for

production f gas by the coliform bacteria. This process is known as presumptive test. Since this reaction may also be produced by the organism other than the coliform, so the positive tubes from the presumptive test were subjected to a confirmatory test. The density of coliform bacteria was calculated on the basis of positive and negative combination of the tube using MPN table lauryl tryptore broth was used in the presumptive test.

Process: For the estimation of MPN three dilution (0.10, 0.01, 0.001) were selected in water sample. Five experimented test tube with 10 ml with single strength media and 0.1 ml sample, five tubes with 10 ml single strength media and 0.01 sample and five tubes with 10 ml single strength media and 0.001 ml sample were filled. In each test tube the ignition tube was placed. All the test tubes were sterilized at 120^0C for 15 minutes in autoclave. Now all the samples of water shaked immediately before removing sample to aliquots the series of test tube, the sample were added in test tube selected for the test and mixed thoroughly. For each sample dilution separate pipettes were used. Than all test tube put in bacteriological incubator at 35^0C37^0C for 24 hours such test tubes were examined those tubes which showed gas in ignition tube recorded as positive. The tubes showing positive test were subjected to confirmatory test as gas production is not only criteria for a positive test. With estimation of bacterial density index total coliform MPN densities calculated.

FAECAL COLIFORM:

For counting the MPN of faecal coliform, multiple tube fermentation technique was used. The faecal coliform test may be expected to differentiate between coliform of faecal origin (intestine of warm blooded animal) and coliform from other sources.

Process: From the total coliform MPN test transferred all positive presumptive tube to EC medium. By using brilliant green lactose bile both maked this examination confirmatory, used a sterile metal loop with a minimum 3 mm diameter or a sterile wooden applicator to transfer from the positive fermentation tube to EC medium. For such transfer, first gently shake the presumptive tube or mixed by rotating incubate the bacteriological incubator at 45.5 + 0.2^0C for 24+2 hours. Put all EC tube in bacteriological incubator within 30 minutes after inoculation.

The production of gas in a fermentation tube within 24 hours or less is considered a positive reaction indicating faecal origin, failure produce gas constitute a negative reaction indicating a source other than the intestinal tract of warm blooded animal with estimation of bacterial density index, calculated faecal coliform densities.

RESULTS AND DISCUSSION

COLIFORM (MPN/100 ml):

The Coliform water samples from different four stations have been observed. However, the Coliform (MPN) of Chambal water varies significantly after each three months intervals.

Table 1: Average Coliform

Month	Coliform/100 ml			
	Site A	Site B	Site C	Site D
Oct-04	300.00	320.00	321.00	432.00
Jan-05	283.00	350.00	368.00	1200.00
April-05	500.00	500.00	700.00	865.00
July-05	200.00	230.00	358.00	565.00

Site A= High way
Site B= Shamshan Ghat
Site C= Shergarh Fort
Site D= Near railway bridge

FAECAL COLIFORM

The Faecal Coliform of water samples from different four stations has been observed. However, the Faecal Coliform of Chambal water has no significant variation after each three months intervals.

Table 2: Average Faecal Coliform

Month	Average Faecal Coliform			
	Site A	Site B	Site C	Site D
Oct-04	134.78	198.68	210.00	249.00
Jan-05	194.00	243.00	280.00	390.00
April-05	200.00	262.00	400.00	400.00
July-05	193.00	197.00	284.34	374.36

Site A= High way
Site B= Shamshan Ghat
Site C= Shergarh Fort
Site D= Near railway bridge

BIOMONITORING OF WATER QUALITY

It is actually the microscopical examination of water the method include a qualitative analysis of the types of coliform, coliform and planktons and a quantitative estimation of their number. Most popular and simplest method of biomonitoring called "Most probable number". In the present investigation measuring datas that the number of coliform (MPN) as well as faecal coliform continuously increase throughout study period from upstream site (A) to down stream site (D). Depletion in number coliform (MPN) and Faecal coliform is an index of increased organic pollution at down stream site (D) as compared to up stream site (A) increased of coliform and faecal coliform population are due to increase of pollutants. It is clear that the population of coliform and Faecal coliform increased due to domestic waste and sewage and industrial waste in affirmation to Vijay Bhushan, *et. al.* (2005), Jain *et. al.* (2000), Yousuf, *et. al.* (1989).

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