Research Journal of Chemical Sciences _____ ISSN 2231-606X
Vol. **5(3),** 6-8, March **(2015)** *Res. J. Chem. Sci.*

Comparative Physico-Chemical Analysis of Narmada River Water at Barwani and Khalghat, MP, India

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Available online at: www.isca.in, www.isca.me
Received 13th January 2015, revised 28th February 2015, accepted 15th March 2015

Abstract

In the present study water sample of Narmada River from two different sites Barwani and Khalghat has been physico-chemically evaluated for its suitability for domestic and irrigation purposes. In Physical and Chemical Parameters Such as Temperature, turbidity, pH, Conductivity, T.D.S., Suspended Solid, Alkalinity, Total hardness, Calcium hardness, Magnesium hardness, Chloride, Fluoride, Nitrate, Dissolve Oxygen, and B.O.D., C.O.D. were analyzed in the laboratory. The Physico-Chemical parameters of water were determined as per standard methods of APHA (2002). The results indicate that the Narmada River water quality is suitable and safe for domestic and irrigation purposes.

Keywords: Narmada River, Barwani, Khalghat, Physico- Chemical parameters, quality of water.

Introduction

Narmada River flows through the three states of Madhya Pradesh (MP), Maharashtra and Gujarat. Nearly 90% of the flow is in MP. Therefore Narmada River is known as "Life Line of Madhya Pradesh". It provides the clean water for domestic and irrigation purposes to Madhya Pradesh[1-3].

Barwani is situated between Latitudes 21°37' to 22°22' North and Longitudes 74°27' to 75°30' East. Khalghat is situated between latitude 21 º06'North and longitude 75 º27'East.

Narmada river water is the main resource for domestic and irrigation purposes in the study area. So it is very important to estimate the superiority of water in the study area. In the present study water sample of narmada river from two different site Barwani and Khalghat has been assessed physico-chemically to evaluate its suitability for domestic and irrigation purposes.

Many researchers have done work on physico-chemical and biological evaluation of water[4-6]. Also many good research papers have published on Narmada River[1,7-10].

Material and Methods

Water samples were collected in March 2012 from the sampling sites viz Rajghat, Barwani (S-I) and Khalghat (S-II). In the evaluation of physico-chemical parameter of water, standard methods approved in available literature were used. Temperature, turbidity, pH, conductivity, t.d.s., suspended solid, alkalinity, total hardness, calcium hardness , magnesium hardness, chloride, fluoride, nitrate , dissolve oxygen, B.O.D. and C.O.D. were determined in the laboratory. The Physico-Chemical parameters of water were determined as per standard methods of APHA (2002).

pH of water sample measured by ph meter using standard solutions; temperature of water sample measured by thermometer; conductivity measured by conductivity meter; turbidity of water sample measured by turbidity meter; TDS (total dissolved solid) measured by tds meter; suspended solid measured by filtration: total alkalinity and bicarbonate determined by acid-base titration method; value of total hardness, calcium hardness and magnesium hardness of water sample determined by EDTA method; chloride measured by titration method; fluoride measured by sodium 2-(parasulphophenylazo)-1,8-dihydroxy-3,6- naphthalene 128 disulphonate (SPADNS) method; nitrate measured by spectrophotometric metod; dissolved oxygen determine by winkler method; BOD also analyzed using BOD incubator; COD measured using open reflux method.

Results and Discussion

The results of study have been reported in the given table. The values of all the parameter were found to be within the limits. The pH value observed at S-I was 7.6 and S-II was 7.8. Value of temperature at S-I was 29.2 ºC and S-II was 29.6 ºC. Conductivity observed at S-I was 272 µs/cm and S-II was 290 µs/cm. Turbidity observed at S-I was 0.12 NTU and S-II was 0.17 NTU. Total dissolved solids (TDS) observed at S-I was 162 mg/l and S-II was 172 mg/l. Total suspended solids (TSS) observed at S-I was 13 mg/l and S-II was 16 mg/l. Alkalinity observed at S-I was 108 mg/l and S-II was 136 mg/l. Total hardness observed at S-I was 92 mg/l and S-II was 114 mg/l. Calcium Hardness observed at S-I was 69 mg/l and S-II was 82

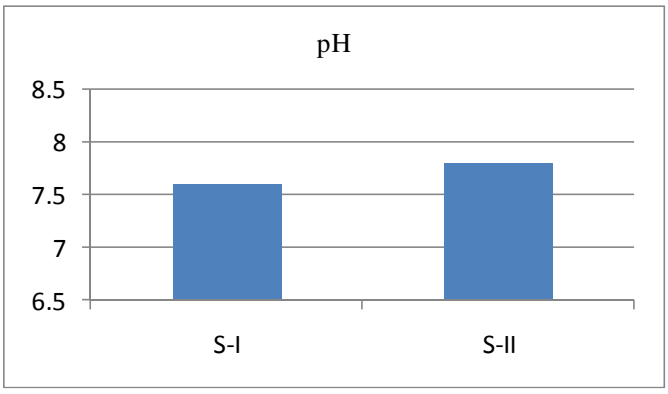
mg/l. Magnesium hardness observed at S-I was 23 mg/l and S-II was 32 mg/l. No Nitrate was recorded at S-I. Its value observed at S-II was 0.003 mg/l. Chloride observed at S-I was 22 mg/l and S-II was 32 mg/l. Fluoride observed at S-I was 0.10 mg/l and S-II was 0.13 mg/l. Dissolved oxygen (DO) observed at S-I was 8.3 mg/l and S-II was 7.8 mg/l. Biological oxygen demand (BOD) observed at S-I was 0.9 mg/l and S-II was 1.3 mg/l. Chemical oxygen demand (COD) observed at S-I was 12 mg/l and S-II was 16 mg/l. The results denoted that all values were increased at S-II as compared to S-I.

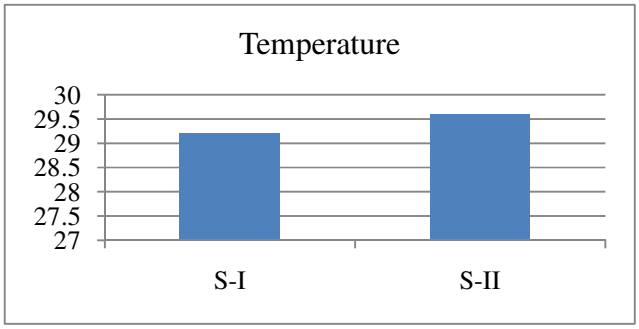
Table 1
Water quality parameter of Narmada River Sample from study area

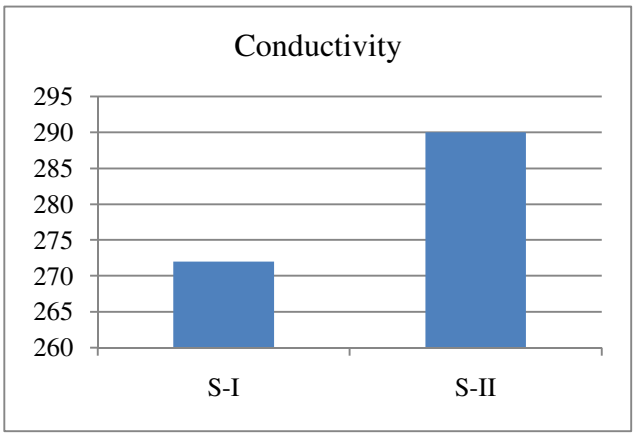
S. N.	Parameters	Rajghat, Barwani (M.P.) S-I	Khalghat, Dhar (M.P.) S-II
1.	pH	7.6	7.8
2.	Temperature (°C)	29.2	29.6
3.	Conductivity (µs/cm.)	272	290
4.	Turbidity (NTU)	0.12	0.17
5.	T.D.S. (mg/l)	162	172
6.	Suspended Solid (mg/l)	13	16
7.	Alkalinity (mg/l)	108	136
8.	Total hardness (mg/l)	92	114
9.	Calcium hardness (mg/l)	69	82
10.	Magnesium hardness (mg/l)	23	32
11.	Chloride (mg/l)	22	32
12.	Fluoride (mg/l)	0.10	0.13
13.	Nitrite (mg/l)	Nill	0.003
14.	Dissolve Oxygen (mg/l)	8.3	7.8
15.	B.O.D. (mg/l)	0.9	1.3
16.	C.O.D. (mg/l)	12	16

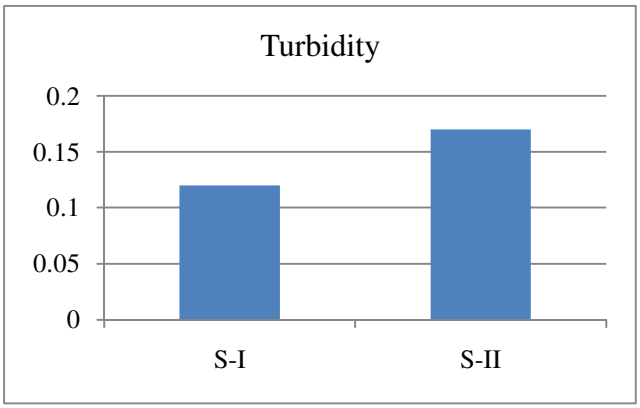
Conclusion

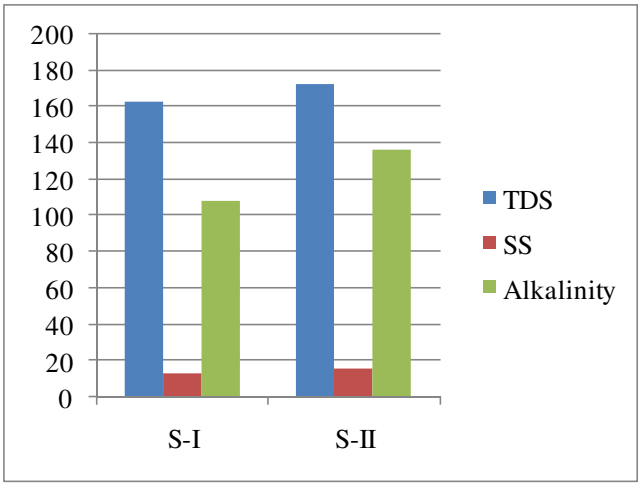
The quality parameters determined for sources of the area show that the water of Narmada river at Rajghat, Barwani (S-I) and Khalghat (S-II) quite within the acceptable range and shows that the overall quality of water is suitable and safe for domestic and irrigation purposes.











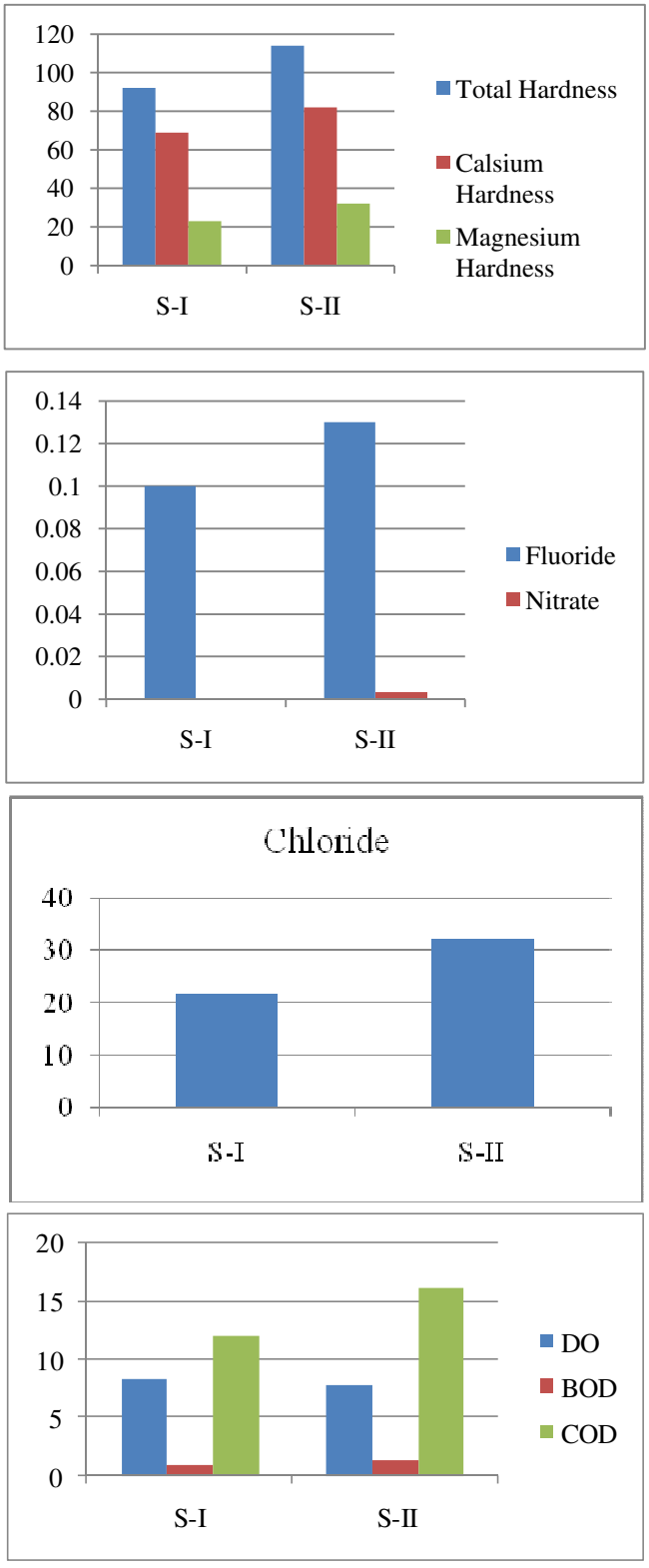


Figure 1-9
Showing the comparative values of different parameters of sites

Acknowledgement

The authors are grateful to Pollution Control Board, Indore (M.P.), India, for Providing Necessary Research Facilities.

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