Semi Quantitative Studies of Underground Drinking Water Contamination at Kadipur Block in Sultanpur before Mansoon, estimated as per IS:10500-2012

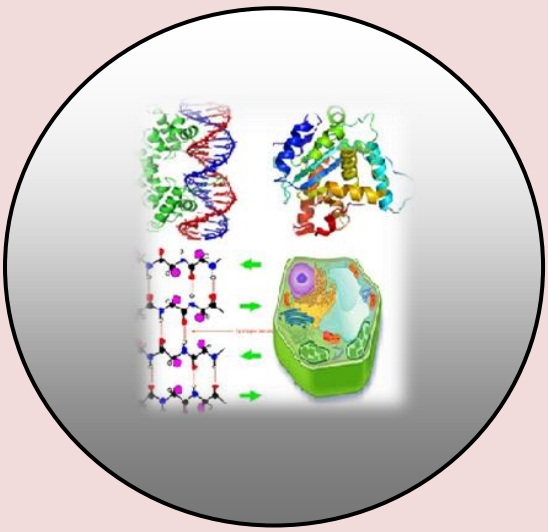
By

Sandeep Kumar Singh and R.P. Singh

ISSN 2319-3077 Online/Electronic
ISSN 0970-4973 Print

UGC Approved Journal No. 62923
MCI Validated Journal
Index Copernicus International Value
IC Value of Journal 82.43 Poland, Europe (2016)
Journal Impact Factor: 4.275
Global Impact factor of Journal: 0.876
Scientific Journals Impact Factor: 3.285
InfoBase Impact Factor: 3.66

J. Biol. Chem. Research
Volume 36 (1) 2019 Pages No. 232-234



Journal of Biological and Chemical Research

An International Peer Reviewed / Referred Journal of Life Sciences and Chemistry

Indexed, Abstracted and Cited in various International and National Scientific Databases

Published by Society for Advancement of Sciences®

J. Biol. Chem. Research. Vol. 36, No. 1: 232-234, 2019
(An International Peer Reviewed / Refereed Journal of Life Sciences and Chemistry)
Ms 36/01/1056/2019

ISSN 2319-3077 (Online/Electronic)
ISSN 0970-4973 (Print)

Sandeep Kumar
http:// www.sasjournals.com
http:// www.jbcr.co.in
jbiolchemres@gmail.com

RESEARCH PAPER

Received: 25/02/2019 Revised: 30/03/2019 Accepted: 31/03/2019

Semi Quantitative Studies of Underground Drinking Water Contamination at Kadipur Block in Sultanpur before Mansoon, estimated as per IS:10500-2012

Sandeep Kumar Singh and R.P. Singh
Department of Chemistry K.N.I.P.S.S. Sultanpur (U.P.) India

ABSTRACT

Ten different underground drinking water samples were collected during the year 2018 from different Indiamark-II handpumps of public places at Kadipur block in Sultanpur (U.P.) following standard method of sampling. The drinking water was found to be excessively contaminated with iron at sites I, II, IV, VI, VII which is more than acceptable limit. All drinking water sites were deficient of micronutrient zinc. Drinking water sites had calcium more than acceptable sites are prone to health hazards of metal toxicity and water quality management is needed.

Keywords: Underground water, Kadipur, water quality, Monsoon and Water quality parameters.

INTRODUCTION

Kadipur is a block in Sultanpur district of U.P. state India. It is located 43 Km. to words East from district head quarter Sultanpur, 194 Km. from state capital Lucknow toward west. Kadipur is located at 26.17^0N, 82.38^0E. It has on average elevation of 90 meter (295 feet). Underground drinking water of Kadipur is contaminated with Iron, calcium sulphate, fluoride etc. TDS and total hardness in all sites are alarming. This makes water unfit for drinking. It is found that places where pollution is more, such sites have high contamination in underground drinking water. It means as the development of Kadipur increases, it increases water contamination due to our activities.

EXPERIMENTS

Kadipur is a developing block in Sultanpur, to check the level of underground drinking water contamination in Kadipur ten different samples of underground drinking water are taken from ten India Mark-II handpump before mansoon during year 2018 from 10 different public places following standard methods of sampling.

The estimated physico-chemical parameters are P^H value, Turbidity, total dissolved solid, fluorides, Iron, Magnesium, Sulphats, total hardness, total alkalinity, calcium, conductivity, zinc Dissolved oxygen, chemical oxygen demand, Biochemical oxygen demand. These physico-chemical parameters are estimated by using test method IS: 3025.

Descriptions of sampling sites are given in table: 1- which is as follows.

Table 1. Description of sampling sites.

Sl. No.	Site No.	Location	Type of Source India Mark-II Handpump	Depth of Boring (Feet)	Apparent water quality	Use of water
1.	Bus Stop	At the centre of Kadipur	India Mark- II Hand Pump	120	Colourless	Drinking
2.	Ohm Shanti Automobiles	400m East from Bus Stop	"	120	"	"
3.	Kashiram Aawas	240m South from Bus Stop	"	"	"	"
4.	Tribhuvan Devi Academy	1.8 Km South from Bus Stop	"	"	"	"
5.	Tehsil Kadipur	300m North from Bus stop	"	"	"	"
6.	Block Pramukh Office	750m North from Bus stop	"	"	"	"
7.	Primary School Andaraypur	3.5 km North from Bus stop	"	"	"	"
8.	Primary School Hingungaura	4 Km North-East from Bus stop	"	"	"	"
9.	Central Bank Kadipur	550m North-West from Bus stop	"	"	"	"
10.	Sant Tulsi Das PG College	2 Km West from Bus stop	"	"	Colour less but turns yellowing on standing	"

RESULT AND DISCUSSION

Site-wise estimation amount of different Physico chemical parameter in pre monsoon period with their IS standards are present in table 2.

The underground drinking water of study area at sites II, IV, V and VII have turbidity more than acceptable limit, amount of iron at sites I, II, IV, VI, VII are more than acceptable limit.

All sites are deficient of micronutrient zinc. Total hardness is more than permissible limit in sites I & II. Amount of calcium is higher than acceptable limit in all sites except at sites IX.

Drinking water sites are contaminated & not very good for drinking therefore water quality management is needed, people, especially children, pregnant women and elderly persons exposed to the polluted water of study area are prone to health hazard drinking water. Some steps must be taken urgently to check the underground water quality at Kadipur block in Sultanpur district U.P.

Table 2.

S. No.	Parameters	I	II	III	IV	V	VI	VII	VII I	IX	X	Acceptable limit	Permissiable Limit
1.	pH Value	6.56	6.81	6.77	6.90	6.70	6.89	6.95	7.18	6.87	6.93	6.5-8.5	No Relaxation
2.	Turbidity NTU	1.0	1.5	0.5	2.6	2.8	1.2	8.6	0.9	0.6	0.8	1 Max	5 Max
3.	TDS (PPm)	1070	524	444	356	628	378	384	376	450	360	500 Max	2000 Max
4.	Fluoride (PPm)	0.27	0.23	0.13	0.43	0.24	0.19	0.03	0.46	0.47	0.10	1 Max	1.5 Max
5.	Iron (PPm)	0.85	0.52	0.25	0.87	0.28	0.79	0.70	0.45	0.22	0.14	0.3 Max	No Relaxation
6.	Sulphate	79.4	36	20.8	23.9	57.5	29.3	32.5	30.2	15.8	26.7	200 Max	400 Max

	(PPm)												
7.	Total Hardness (PPm)	978	642	542	424	590	484	386	366	484	388	200 Max	600 Max
8.	Total Alkalinity (PPm)	62.0	58	46.0	38.0	50.0	36.0	40.0	34.0	40.0	36.0	200 Max	600 Max
9.	Calcium (PPm)	184	123	106	99.0	125	107	77.0	69.0	96.0	83.0	75 Max	200 Max
10.	Conductivity (us/cm)	1336	778	645	513	853	624	526	437	598	486	-	-
11.	Zinc (PPm)	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	5.0 MAX	15.0 MAX
12.	Magnesium (PPm)	25	8.4	6.9	5.1	7.1	6.0	4.8	4.6	6.1	5.5	30 Max	100 Max
13.	DO (PPm)	ND	ND	ND	ND	ND	ND	3.2	ND	ND	ND	-	
14.	COD (PPm)	ND	ND	ND	ND	ND	ND	14.2	ND	ND	ND	-	
15.	BOD (PPm)	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND	-	

ACKNOWLEDGEMENTS

Authors are grateful to Associate Professor Dr. R.P. Singh head of Chemistry Department, K.N.I.P.S.S. Sultanpur, U.P. for taking pain in proof reading and suggesting constructive comments for improving the manuscript. The authors are grateful to Dr. A.K. Srivastava Principal of K.N.I.P.S.S. , Sultanpur for his kind support. The authors are thankful to Dr. P.K. Singh, Dr. Prashant Singh, Dr. Rajneesh Singh for providing the necessary facilities required in the study. Authors are thankful to technical staff Mr. S.K. Srivastava, Mr. Anand Srivastava, Mr. Manveer Singh for his valuable support.

REFERENCES

Behera et at., 2012 B. Behra, M. Das, G.S. Rana studies on ground water pollution due to iron content and water quality in and around Jagdalpur, Bastar district Chattisgarh, India. J. Chem. Pharm. Res., 4(8) (2012), pp. 3803-3807.

APHA, 2012 APHA standard method for examination of water and waste water (22nded) Washington, DC (2012).

Gangwar et. al., 2012 R.K. Gangwar, P. Khare, J. Singh, A.P. Singh. Assessment of Physico-chemical properties of water river Ramganga at Bareilly, U.P. J. Chem. Pharm. Res., 4(9) 2012, pp. 4231-4234.

Sinha and Kumar, 2006 D.K., Sinha, N. Kumar Monitoring of trace metals in Ganga river water at Moradabad. Indian J. Environ. Prot., 26(6) (2006), pp. 516-520.

Ra OR., Satyanarayan T. and Machiraju P.V.S. 2012. Assessment of ground water quality for application in Kakinada Coast, Der Chemica Sinica, 3:287 – 291.

Standards methods for examination of water and waste water. 2012. American Public health association American water work association and water pollution control Federation, 22nd, Washington, DC.

Sinha, D.K., Rajneesh Singh and R.P. Singh K.G.K. (P.G.) college department of Chemistry. Moradabad- 24401 Level of trace metals in underground drinking water at Sultanpur; Estimation by ICP-HES Technique, IJEP30 (6)-499-501 (2010).

Corresponding author: Dr. Sandeep Kumar Singh, Department of Chemistry K.N.I.P.S.S. Sultanpur (U.P.) India

Email: sandeeps15584@gmail.com