

OCCURRENCE OF FLUORIDE CONCENTRATION IN GROUND WATER AND IMPACT OF FLUORIDE ON HUMAN HEALTH IN SURAJGARH SUB. DIVISION OF JHUNJHUNU, RAJASTHAN. (INDIA)

Anil Kumar* and Dr. Man Vir Singh

Research Scholar Department of Chemistry, Singhania University, Pachheri Bari - Jhunjhunu, Rajasthan, 333515.

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***Corresponding Author**

Anil Kumar

Research Scholar

Department of Chemistry

Singhania University,

Pachheri Bari - Jhunjhunu,

Rajasthan, 333515.

ABSTRACT

This paper analyzes the most extensive database on fluoride occurring in Surajgarh sub. Division. Total 28 water samples are tested; 53.6% water samples are show greater fluoride concentration compared to WHO but 46.4% water samples are safe for drinking. The higher concentration of fluoride in ground water causes many waters born disease such as fluorosis of skeleton, dental carries in children, small pits in teeth and joint problems in old men and women. Hence Rajasthan Government are helpful to provide safe drinking water in every place which are suffering from higher concentration of fluoride in drinking water. So, this area is very interesting for research.

KEYWORDS: Concentration, Ground water, Dental carries, fluorosis.

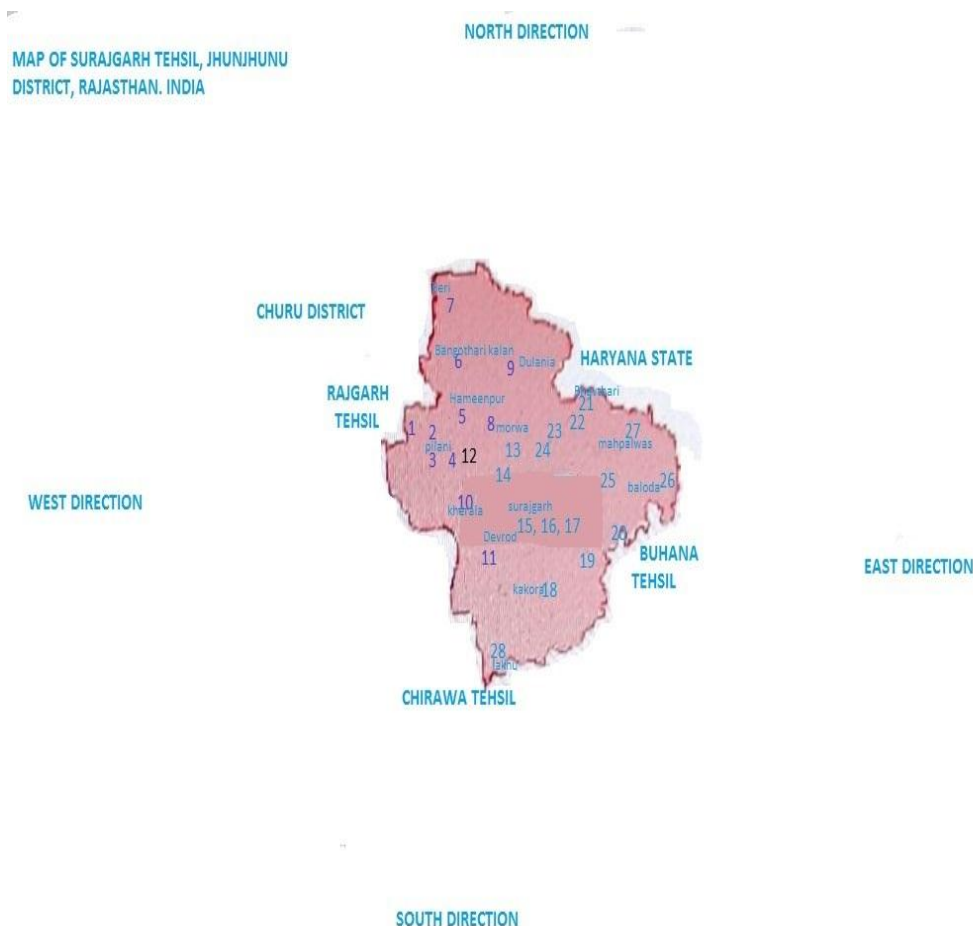
INTRODUCTION

Surajgarh sub. Division in Jhunjhunu District of Rajasthan state, India. It belongs to Jaipur division. It's located 44 km. towards East from Jhunjhunu. This sub. Division surrounded by Chirawa towards West, Buhana towards East and Bhiwani District of Haryana state towards North. This sub. Division depends up on groundwater because there are no other sources of water. Ground water ply an important role in all activities of human beings, such as its used in irrigation, used in industries and domestic purpose. Therefor day by day the level of groundwater falls down and affected by fluoride and other parameters. But fluoride concentration compared to other parameters are higher in groundwater. Ground water is the most important source of fluoride other sources are related to pollution from industries,

agricultural activities and chemical fertilizer which are made from phosphate and potassium. Fluoride is the most electronegative and reactive of all the element due to its small atomic radius. Its present in 0.06 to 0.09% of weight of the earth crust. It is 13th most abundant element in the earth's crust. Fluoride play an important role in the mineralization of our bones and teeth, a process essential for keeping them hard and strong. At about 99% of the body's fluoride is stored in bones and teeth. Now a day's higher concentration of fluoride in ground water generated many water problems. Thus, the human beings suffered from several water born disease such as fluorosis of skeleton, dental carries, abnormal origin of teeth, joint pain in people and skin disease. Hence the author has chosen this area for this research.

TEHSIL MAP OF JHUNJHUNU DISTRICT, RAJASTHAN





Note: This map area is select for research paper.

MATERIAL AND METHODOLOGY

In the Present study, Surajgarh sub. division of Jhunjhunu district were selected. 28 water samples were collected from different location of these sub. Division. These samples were collected from tube well, deep well and bore well. The samples were collected in wide mouth plastics bottles. Before collection of water samples, bottles were washed with water and detergent after that soaked in 1% Nitric acid for one day and then again washed with clean water. After collecting samples were send AMBAY TESTING LABORATORY JAIPUR. In this laboratory ion selective method and APHA-23nd Ed-2017 methods are used for get fluoride concentration in ground water. Name of water sample and fluoride data are given below in table no. 1st.

S.No.	Site of water samples	Fluoride conc.in mg/lit.in water samples
1	JHERLI	0.8
2	PILANI WATER BOX	0.7
3	PILANI BUS STAND	0.8
4	PILANI HOSPITAL	0.9
5	HAMEENPUR	0.9
6	BANGOTHARI KALAN	0.8
7	BERI	1.0
8	MORWA	0.7
9	DULANIA	0.8
10	KHERLA	0.9
11	DEVROD	0.9
12	DHINDHWA AGUNA	0.9
13	KAJARA	1.3
14	JEENI	1.2
15	BARASIA COLLEGE	1.1
16	SURAJGARH MANDI	1.2
17	SURAJGARH RAILWAY ST.	1.2
18	KAKORA	1.4
19	KHEDARO KI DHANI	1.3
20	CHORODI	1.3
21	BHAVTHARI	1.3
22	PILOD	1.2
23	BIJOLI	1.3
24	FARAT	1.2
25	JAKHOD	1.2
26	BALODA	1.3
27	MAHPALWAS	1.3
28	LAKHU	0.9

CAUSES OF INCREASE OF FLUORIDE IN GROUND WATER

- Presence of low or high concentration of fluoride in ground water is because of natural or anthropogenic causes or a combination of both.
- Natural sources are associated to the geological conditions of an area. Several rocks and infiltration of rainfall through it increases fluoride concentration in ground water.
- Another causes of more fluoride in ground water is volcanic ash is readily soluble in water.
- Anthropogenic sources of fluoride include agricultural fertilizers and combination of coal.
- Phosphate fertilizer as like DAP contribute to fluoride in lands.
- Coal which is a potential source of fluoride is used for combustion in various industries and brick kilns.

EFFECT OF FLUORIDE ON HUMAN

Ground water is the main source for various purposes of the world. Presence of low or high concentration of certain ions is a major issue as they make the ground water unsuitable for various purposes.

- Fluoride ion causes health problem in people at about 25 countries around the world.
- Fluoride concentration of at least 0.6mg/l is required for human consumption as it will help to have stronger teeth and bones.
- Fluoride concentration more than 1.5mg/l in ground water results in acute to chronic dental fluorosis where the tooth becomes coloured from yellow to brown.
- Skeletal fluorosis which causes weakness and bending of the back bone, also called “Hunch back disease”.

RESULT

Water samples from deep well, tube well and bore well were collected from all parts of this tehsil. In this area 28 water samples were collected. Out of 28 water samples 53.6% water samples have higher fluoride concentration compared to WHO guideline 2012. The maximum fluoride concentration in potable water is 1.0mg/l, (According to WHO 2012). 46.4% water samples are included WHO guideline. It seems that southern and eastern part of this sub. Division has high fluoride concentration in ground water while western – northern part of this area is safe for drinking. All water samples were found within desirable limit compared to BIS 2012.

CONCLUSION

The study of all parameters shows that 53.6% water samples are not potable for human beings while 46.4% water samples are potable for human beings. Therefore Indian and State Government are doing good work in this field for potable water. Government established water filtration plant (RO PLANT) in every village panchayat before six years.

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