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A STUDY OF GROUND WATER QUALITY OF AKOLA ROAD WARD IN MUNICIPAL AREA OF AKOT DIST. AKOLA MAHARASHTRA

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ABSTRACT

Ground water is the main source of water supply for drinking, irrigation and for industrial purpose. Five sampling points i.e. Shivaji colony, Gurudeo colony, Krushnarpan colony, Gokul colony, and Shri colony at different depths were selected for the study in Akola road ward in Municipal area of Akot. The parameters studied were temperature, pH, chloride, total hardness, total alkalinity, turbidity and TDS.

Key words: Ground water quality, Municipal area.

INTRODUCTION

Water plays an essential role in human life**.** According to statistics of WHO reports, approximately 36% of urban and 65% of rural area of India are without access to safe drinking water[1]. Fresh water is one of the most important resources for the survival of all the living beings. It is even more important for the human being as they depend upon it for food production, industrial and waste disposal, as well as cultural requirements[2]. Human and ecological use of ground water depends upon water quality. Human alteration of the landscape has an extensive influence on watershed hydrology[3]. Ground water play a vital role in human life. The consequences of urbanization and industrialization leads to spoiling water for agricultural purposes. Ground water is explored in rural area, especially in those areas, where other sources of water like dam and river or a canal is not available. During last decade, this has been observed that ground water gets polluted drastically because of increased human activities. Consequently, number of cases of water borne diseases have

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been seen, which causes health hazards. An understanding of water chemistry is the basis of the knowledge of the multidimensional aspect of aquatic environmental chemistry, which involves the source, composition, reactions and transportation of water. The quality of water is of vital concern for the mankind, since it is directly linked with human welfare. It is a matter of history that facial pollution of drinking water caused water-borne diseases, which wiped out entire population of the studied area[4,5].

Main source of water is rain. After rainy season, the main source of water is ground water, which is available for domestic and agriculture purpose. The natural quality of ground water tends to be degraded by human activities. Municipal and industrial water entering in to an aquifer is the major source of organic and inorganic pollutants. Due to rapid growth of Akot, much sewage water is disposed off that generates fair chances of ground water pollution, and hence, it is essential to study quality of water.

EXPERIMENTAL

Water samples were collected in cleaned borosilicate bottle washed with acetone in the month of May- 2015 at selected sampling sites (Dunk-Hand pump) between 10.00 to 11.30 a.m. at different depths and brought to the Chemistry Laboratory, Shri Shivaji Art's, Commerce & Science College, Akot for study.

Temperature of the water was measured in Equiptronic digital auto temperature meter. Borosilicate glasswares, double distilled water and E. Merck reagent were used thought out the testing. pH values of water sample under investigation were measured using Equiptronic pH meter, Type No. 611[6]. The pH was standardized by buffer solution of 4.0 pH and 9.3 pH by E. Merck buffer tablet.

The chloride ions were generally determined by titrating the water samples against a standard solution of $AgNO_3$ using potassium chromate as an indicator[7]. Sulphate was estimated by UV-Visible spectrometer, Type-II at Biochemistry Department of Sant Gadge Baba Amravati University, Amravati. The total hardness was determined by complexometric titration with EDTA using eriochrome black-T as an indicator[8]. Total alkalinity of the water was determined by titrating with N/50 H_2SO_4 using phenolphthalein and methyl orange as indicators.

Turbidity was measured by digital turbidity meter, Type No. 611. TDS was estimated by digital TDS meter[9], Type No. 703.

RESULTS AND DISCUSSION

The water from the study area had no colour, and odour. Taste of the water of the water sample in most of the locations was pleasant in taste. The results of the chemical analysis of water in the present study are given in Table 1, so it is necessary to a make a comparison of water quality with WHO standards. Theses parameters are shown in Table 1. The pH of water indicates the degree of deterioration of water quality. The desirable pH range necessary for drinking water is from 7.0 to 8.5. The pH value of water sample in the study area ranged from 7.1 to 9.5. Thus, it shows that pH of water sample was slightly alkaline in this area.

Table 1: Properties of ground water

S. No.	Properties	Shivaji colony	Gurudeo colony	Krushnarpan colony	Gokul colony	Shri colony
1	Depth (meters)	54	64	55	60	53
2	Temperature (^{o}C)	31	31	31	31	31
3	pH value	7.8	7.1	9.5	8.5	8.3
4	Chloride (mg/L)	349	350	384	503	475
5	Sulphate (mg/L)	21	23	34	60	58
6	Total hardness (mg/L)	342	402	245	475	385
7	Total alkalinity (mg/L)	465	398	300	590	321
8	Turbidity (NTU)	21	15	19	81	54
9	TDS (mg/L)	1243	1097	1055	1800	1254

The concentration of chloride in the sample was found to 349 to 503 mg/L. High chloride contents have toxic effect to plants, animal, and human beings. The concentration of sulphate was found to 21 to 60 mg/L.

Total hardness was found in the sample water in the range of 245 to 475 mg/L. The desirable limit for total alkalinity of ground water samples varied from 300 to 590 mg/L.

Turbidity is one of the common forms of pollution. This prevents growth of the aquatic plants by reducing rate of their photosynthesis. This creates problems in self purification of water.

Turbidly in the water sample was found between 19 to 81 NTU. The value of TDS was found in the sample water between 1055 to 1800 mg/L.

CONCLUSION

Ground water is the only source for people in the study area, and the results of the chemical analyses of ground water indicate considerable variations in quality parameters of water. Most of the water samples do not comply with ICMR standards for drinking purpose. The water quality in the investigated area was found to be suitable for drinking only in few locations, while as out prior treatments. It must be noted that a regular chemical analysis must be done to ensure that the quality of water in this area is not contaminated. Research about new walls in the area is required in order to get additional water for the residents of this area.

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