

## Assessment of Ground Water Quality of Different Study Sites Located in Indore City of Madhya Pradesh as Influenced by Pollution

Megha Gupta<sup>1\*</sup> and Archana Agrawal<sup>2</sup>

1. Vidhyabharti Trust College of Pharmacy, Umrakh, Bardoli
2. Shri Aurobindo Institute of Pharmacy, Indore

### Abstract

Water is the very basic necessity of human life. Man needs water for domestic as well as industrial purposes. Water is not just useful but it is indispensable for every walk of human life. The Present Study deals with the assessment of ground water of Indore as influenced by the pollution. The investigation was done from July 2012 to December 2012. All the study sites were visited regularly and water samples were collected. The parameters studied were: colour, odour, temperature, pH, dissolved oxygen, biochemical oxygen demand, chemical oxygen demand, chemical oxygen demand, alkalinity, total hardness, sulphate and chloride.

**Key Words:** Water, Indore, Pollution

### Introduction

Man needs water for domestic as well as industrial purposes. Water is not just useful but it is indispensable for every walk of human life. Since ancient times, man is using one more major source of water - *groundwater*. Water is present within the rock systems beneath the earth's surface, which we define as groundwater. Because of its local and regional existence, groundwater has become a prime source and its utilization is increasing day by day. The use has increased demand, which leads to extraction (and sometimes over-abstraction) of groundwater resources.<sup>1</sup> The overexploitation of groundwater has had impacts on all water resources, in different ways. Groundwater sources are depleting progressively in many areas, with an imbalance between recharge and discharge. Rapid development, increase in population of the metro cities and urbanization of their suburbs have resulted in the manifold increase in environmental pollution. The most affected are the water bodies which become highly polluted by addition of foreign materials such as plant and animal matter, and domestic sewage and industrial effluents.<sup>2</sup> Thus, for the sake of sustainability of water resources, there is need for planning these resources at local as well as regional level. Such planning will include all parameters related to ground and surface water, in terms of both quantity and quality. Indore District of Madhya Pradesh is situated in Malwa region and due to industrialization; the ground water is polluted due to industrial waste, day to day

garbage etc. Therefore, the present study was undertaken to reveal the quality of the ground water. The present study was done to evaluate the ground water quality of Indore city of Madhya Pradesh.

### Material and Methods

3 Study sites (Rajendra Nagar, Vijay Nagar and Kalani Nagar) were selected for the present study. These study sites were located in Indore City catering to a large population. The water samples were collected for a period of 6 months, starting from July 2011 to December 2011. Samples were collected in triplicate from each study site and analysis was made as per standard procedures<sup>3-4</sup>.

### Results and discussion

The results of the assessment of ground water of Indore city during July- Dec, 2011 are shown in Table 1. The water quality of these area has to be maintained for the sake of human health. Because a large number of people use this source of water for drinking and recreational purposes. From now public awareness have to be created to develop a safe guard against any type of contamination and pollution of these areas. To achieve the above mentioned goals the foremost prerequisite is to study the water bodies limnologically. Thus, it requires a continuous monitoring and study of algae existing in waters of various quality in order to determine what controls, what changes or what uses can be instituted for benefit of man and for the conservation of waters and desirable aquatic life. Periodic determination of parameters of important water is essential for assessing the suitability of water for human and animal use as well as for aquatic biota. Discharge of domestic, municipal and industrial effluents combined with dumping of solid wastes affects the water quality severely. It causes a verity of health problems to humans as well as to other organisms dependent either directly or indirectly on these ecosystems.

### \*Corresponding Author

E-mail: meghagrawal84@gmail.com,  
archanadgr8@gmail.com

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**Table 1: Analysis of ground water quality**

Parameters	S-1	S-2	S-3
Colour (visual)	Unclear	Unclear	Unclear
Odour (sensory)	Agreeable	Agreeable	Agreeable
Temperature (°C)	9.0±1.9	11.0±2.1	13.0±1.2
pH	6.9±2.1	8.1±0.37	7.4±1.1
DO (mg/L)	4.9±1.40	4.1±0.42	5.2±0.1.9
BOD (mg/L)	90.3± 17	89.9± 20	85.1± 21
COD (mg/L)	55.3±1.00	51.3±1.22	50.7±1.4
Alkalinity (mg/L)	120±10.0	110±12.0	109±10.0
Total Hardness (mg/L)	162±8.10	159±7.32	146±6.51
TS (mg/L)	601±3.10	599±4.90	590±4.10
TDS (mg/L)	499±6.0	490±5.0	449±5.0
TSS (mg/L)	96±13.0	90±15.0	97±11.0
Sulphate (mg/L)	350±5.0	329±7.0	333±3.0
Chloride (mg/L)	132±6.0	129±5.0	121±4.0