

Bacterial Status in The Ground Water of Ramachandrapuram and Serilingampally, Telangana, India.

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Abstract

Groundwater plays an important role to cater the needs of the consumer when there is shortage of municipal water supply or potable water. In the present investigation, two groundwater samples, S I at Ramachandrapuram (Medak district) and S II at Serilingampally (Rangareddy district) were studied to assess the Total Coliform bacteria, Faecal Coliform bacteria and Escherichia coli. The average number of Total Coliform Bacterial colonies were 279/100ml at Station I and 843/100ml at Station II. The Faecal Coliform bacteria and Escherichia coli were completely absent at both the Stations during the study period. It is interesting to note that at Station I, Total Coliform Bacteria were highest i.e. 517/100ml during the pre - monsoon season. At Station II, Total Coliform Bacteria were highest in post - monsoon season i.e. 1207/100ml which can be attributed to the seepage entering into the groundwater. According to BIS 1983 and WHO 1984, the bacteria must be < 10/100ml. The average Total Coliform Bacterial colonies at Ramachandrapuram, S I were 279/100 ml and 843/100 ml at Serilingampally, S II respectively. Hence this study clearly indicated that the groundwaters cannot be used for drinking purposes.

Key Words

Total Coliform Bacteria, Faecal Coliform Bacteria, Escherichia coli, Groundwater.

Introduction

Groundwater is very important for the growing population of Hyderabad district and the surrounding districts of Rangareddy and Medak. In Rangareddy and Medak district, drinking water is supplied only on alternate days. So man depends on water for drinking, bathing, cooking and other purposes. Industries and agricultural fields mainly depend on groundwater when there is no other source of water. Groundwater plays a key role in human habitations, industries and irrigational purposes.

In the present study, bacteria was studied in two groundwater sampling stations: S I at Ramachandrapuram (Medak district) and S II at Serilingampally (Rangareddy district). When bacteria is present, it affects the health of the consumer. If Escherichia coli is present, it leads to dysentery and diarrhoea.

Material and Methods

Total Coliform Bacteria : Multiple Tube Fermentation technique—

APHA 1995

Faecal Coliform Bacteria : Multiple Tube Fermentation technique—

APHA 1995

Escherichia coli : Multiple Tube Fermentation technique—

APHA 1995

Results and Discussion

During the period of investigation of groundwater, the number of Total Coliform Bacterial colonies for station I sample recorded minimum of 11/ 100ml and maximum of 1609/ 100ml and averaged to 279/100 ml while at station II groundwater sample recorded a minimum of 20/ 100ml and maximum of 1609/ 100ml and averaged to 843/ 100 ml. The faecal coliform bacteria were completely absent during the study period at both station I and station II. Similarly Escherichia coli was completely absent at both station I and station II (Table 1)

Table 1: Total Coliform Bacteria, Faecal Coliform Bacteria and Escherichia coli in Groundwater of Ramachandrapuram and Serilingampally

		RANGE		AVERAGE
		MINIMUM	MAXIMUM	
Station I, S I Ramachandrapuram	Total Coliform Bacteria	11	1609	279
	Faecal Coliform Bacteria	Absent	Absent	Nil
	<u>Escherichia coli</u>	Absent	Absent	Nil
Station II, S II	Total Coliform Bacteria	20	1609	843

Serilingampally	Faecal Coliform Bacteria	Absent	Absent	Nil
	<u>Escherichia coli</u>	Absent	Absent	Nil

During the pre-monsoon period, Total Coliform Bacteria at station I was 517/100 ml and 575/100 ml at station II respectively. During the monsoon period at station I, Total Coliform Bacteria were 41/100 ml and 749/100 ml at station II respectively. In the post-monsoon period, Total Coliform Bacteria were 278/100 ml and 1207/100 ml at station I and station II respectively. It is interesting to note that at station I, Total Coliform Bacteria was highest in pre monsoon season. A similar observation was made by Sudha and Johnson (1998). At station II, highest Coliform bacteria was during post monsoon season. Probably at station II, the rain water entering by seepage into the groundwater might have increased the bacterial concentration. A similar observation was made by Malini (2002) at the second residential site (R₂) of Vanasthalipuram.

Faecal coliform bacteria was completely absent during the pre-monsoon, monsoon and post-monsoon seasons at both station I and II. This clearly indicated that the groundwaters were not contaminated by sewage.

Escherichia coli which are an important bacteria causing dysentery and diarrhoea in human beings were studied. Escherichia coli were absent during the pre-monsoon, monsoon and post-monsoon seasons at both station I and II.

According to the BIS 1983 and WHO 1984 the bacteria must be < 10/100 ml. During the present investigation, at Station I and Station II, the average were above the permissible limit. Hence the groundwater samples at Station I and Station II cannot be used for drinking purpose.

Table 2: Seasonal variations of Total Coliform bacteria, Faecal Coliform bacteria and Escherichia coli at station I and II

	Pre Monsoon	Monsoon	Post Monsoon
<u>Total Coliform Bacteria</u>			
Station I Ramachandrapuram	517	41	278
Station II Serilingampally	575	749	1207
<u>Faecal Coliform Bacteria</u>			
Station I Ramachandrapuram	Absent	Absent	Absent
Station II			

Serilingampally	Absent	Absent	Absent
<u>Escherichia coli</u>			
Station I Ramachandrapuram	Absent	Absent	Absent
Station II Serilingampally	Absent	Absent	Absent

Conclusion

During the present investigation, the number of Total Coliform Bacterial colonies for station I groundwater sample averaged to 279/100 ml while at station II groundwater sample averaged to 843/100 ml. According to the BIS 1983 and WHO 1984 the bacteria must be $< 10/100$ ml. But the bacteria at Station I and Station II, were above the permissible limit. Hence the groundwater at Station I and Station II cannot be used for drinking purpose.

The average bacterial values at both the stations clearly indicate that the waters cannot be used for drinking purpose.

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