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RESEARCH ARTICLE

COMPARATIVE ANALYSIS OF PHYSICO-CHEMICAL PROPERTIES OF WATER FROM DIFFERENT LOCATIONS OF DISTT. ALWAR, RAJASTHAN, INDIA

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ABSTRACT

Water plays very important role in the sustenance of life. Due to economic and population growth, water resources has became polluted in India. In the present study, comparative analysis of physico-chemical properties of water from different locations of Distt. Alwar of Rajasthan was done. Physico-chemical properties were pH, Conductivity, Total Hardness, Dissolved Oxygen, Residual Chlorine, Chlorides, Alkalinity, Acidity, Free CO_2, Total Solids and Fluoride.

INTRODUCTION

Water is most important compound for living organisms to survive. Water is an indispensable part of biological life of mankind. Water is liquid of life because life is not possible without water. Water plays an indispensable role in sustenance of life and 80% of diseases in developing countries are due to lack of good quality water (Cheesbrough, 2006). Pure water is a real curse for living beings (Hussain *et al*., 2012). A number of people in the developing countries lack access to potable water (Waziri and Bomai, 2012). About 95% of rural population living in India depends on ground water for domestic use (Moharir *et al*., 2002). India is facing a serious problem of natural resource scarcity, especially that of water in view of population growth and economic development (Yadav *et al*., 2013). Water quality is defined in terms of the physical and chemical properties. Water quality guidelines provide basic scientific information about water quality parameters and ecologically relevant toxicological threshold values to protect specific water uses (Lawson, 2011). Keeping in view importance of water, present study was done to check physico-chemical properties of water collected from different locations of Distt. Alwar i.e. Rajgarh, Hazipur, Alwar station, Institute of Engineering and Technology (IET) Hostel and Alwar city (Figure 1) of Rajasthan, India.

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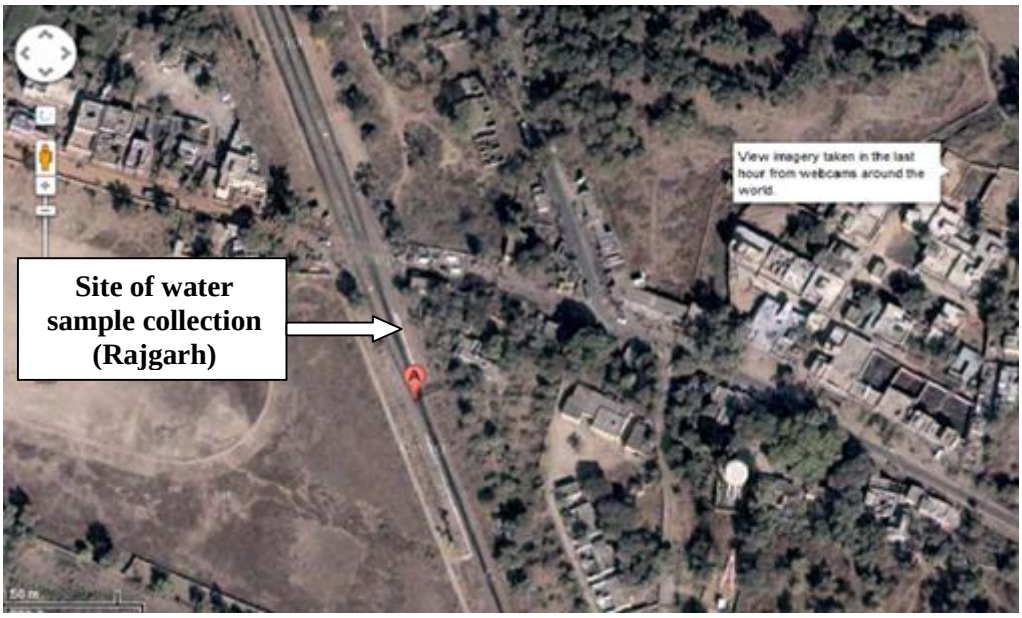
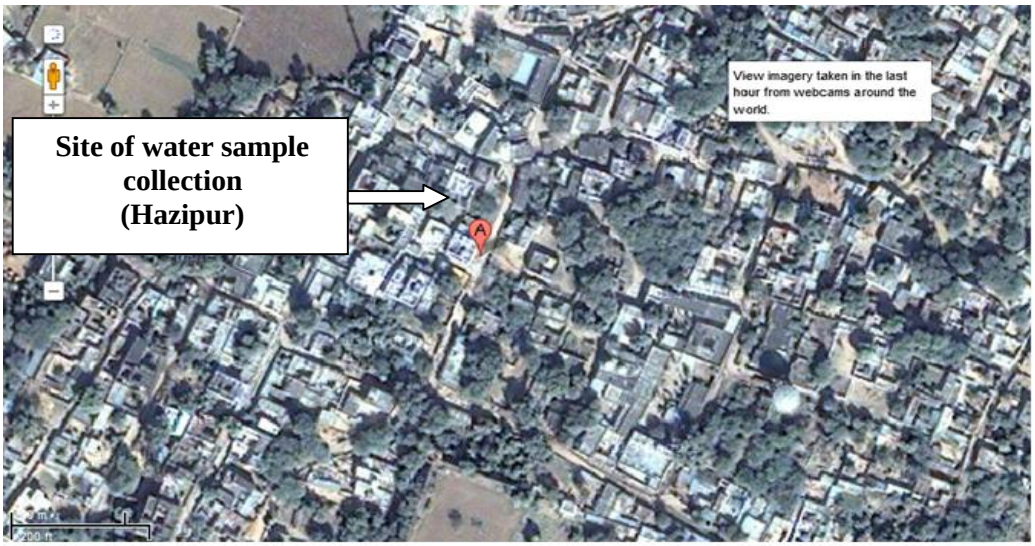
MATERIAL AND METHODS

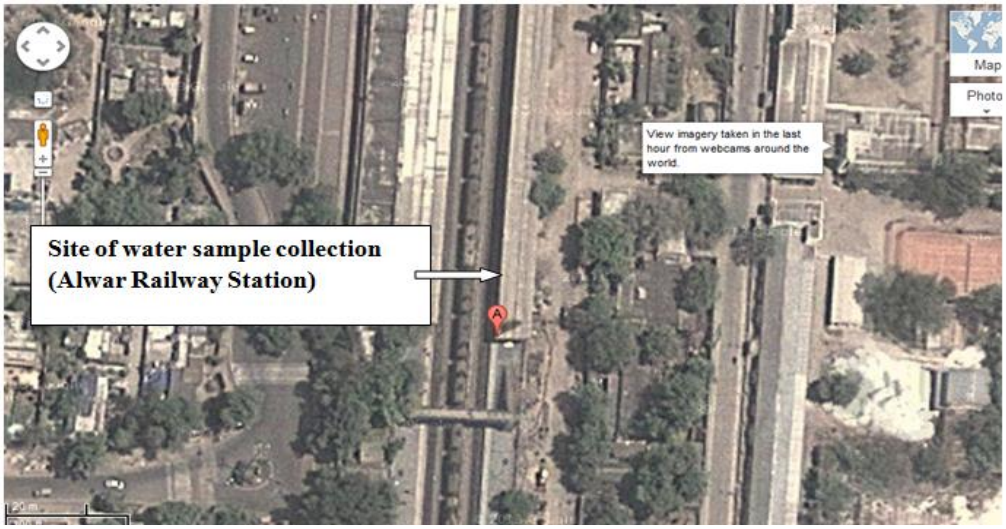
Water sample was collected from different locations of Alwar District i.e. Rajgarh, Hazipur, Alwar station, Institute of Engineering and Technology (IET) Hostel and Alwar city of Rajasthan, India. Different physico-chemical parameters were checked: pH, Conductivity, Total Hardness, Dissolved Oxygen, Residual Chlorine, Chlorides, Alkalinity, Acidity, Free CO_2, Total Solids and Fluoride. pH was measured by glass electrode, Conductivity of water was checked by conductivity meter, Total Hardness was determined by titration with EDTA, Dissolved oxygen was measured by sodium thiosulphate titration method (Aneja, 2003), Residual chlorine was checked by sodium thiosulphate titration, chloride in water sample was measured by $K_2Cr_2O_4$ titration, Alkalinity was determined by titrating a known volume of water sample with N/10 HCl using phenolphthalein and methyl orange indicators, Acidity was measured by using phenolphthalein and methyl orange indicators, Free CO_2 was measured by NaOH titration, Total dissolved solids (TDS) were determined gravimetrically by evaporating a known volume of water to dryness in a preweighed crucible on a steam bath (Aneja, 2003) and fluoride was measured by Spands method.

RESULTS AND DISCUSSION

Five types of water samples from Distt. Alwar in Rajsthan were studied for physico-chemical analysis. Samples were:
Sample A – Rajgarh


View imagery taken in the last hour from webcams around the world.
Site of water sample collection (Rajgarh)


View imagery taken in the last hour from webcams around the world.
Site of water sample collection (Hazipur)


View imagery taken in the last hour from webcams around the world.
Site of water sample collection (Alwar Railway Station)
Map
Photo

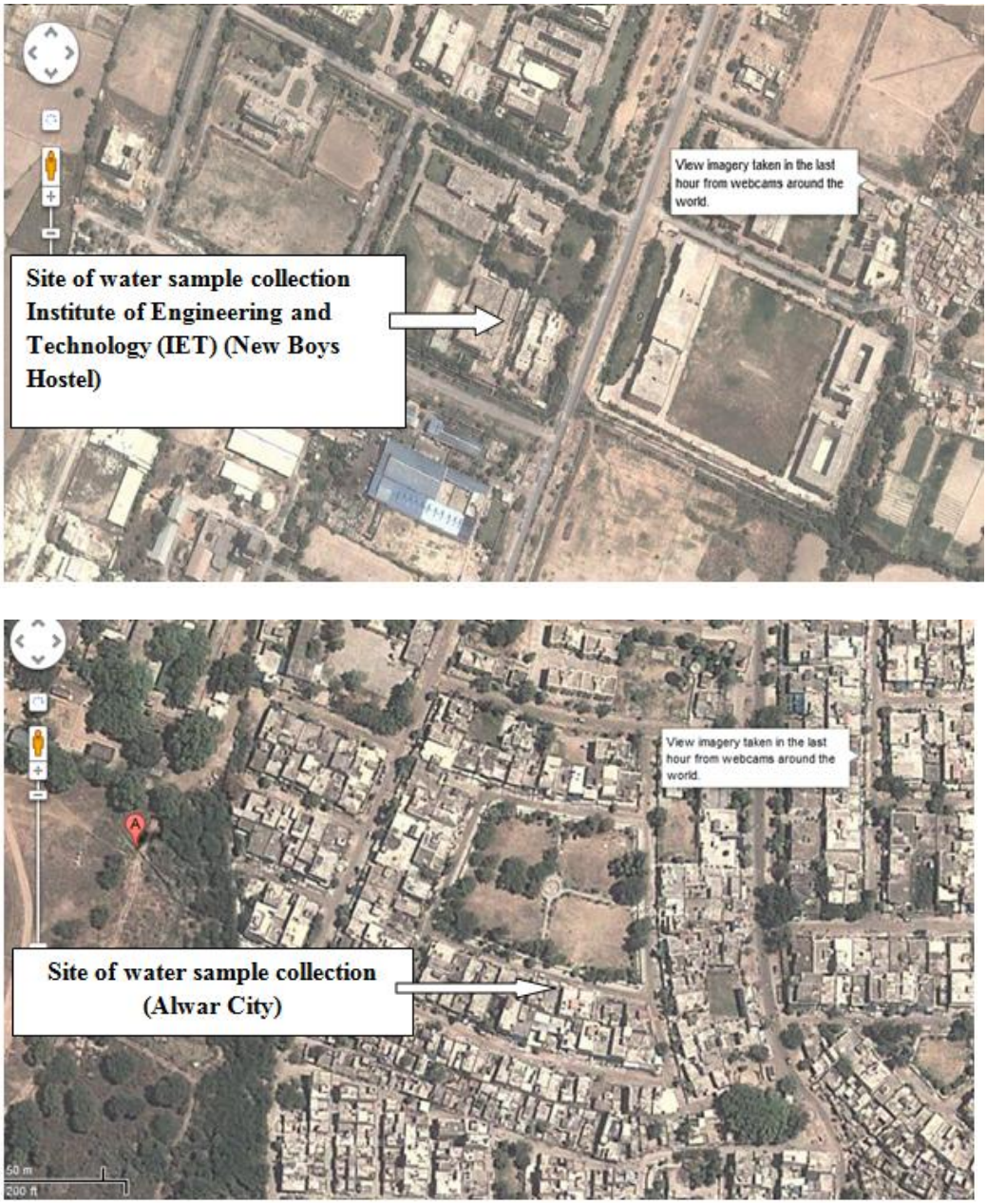


Figure 1. Water sample collection sites

Table 1. Physico-chemical analysis of water

Physico-Chemical Properties	Sample A	Sample B	Sample C	Sample D	Sample E
pH	7.36	7.55	6.79	7.51	7.14
Conductivity	0.770	0.710	1.000	0.878	1.993
Total Hardness (ppm)	83.33	75	150	166.66	83.33
Dissolved Oxygen (mg/l)	0.6	0.4	0.6	1.2	0.6
Residual Chlorine (ppm)	0	0	0	0	0
Chlorides (mg/l)	149.1	127.8	568.0	120.7	397.6
Alkalinity (mg/l)	575	450	500	625	600
Acidity (mg/l)	12.5	12.5	37.5	25	25
Free CO_2 (mg/l)	44	44	66	66	66
Total solids (mg/l)	0.01	0.03	0.09	0.02	0.02
Fluoride (mg/l)	0.216	0.201	0.208	0.172	0.220

Sample B – Hazipur
Sample C – Alwar station
Sample D – IET Hostel
Sample E – Alwar city

As shown in the Table 1, the highest pH shown by the water sample of Hazipur and the lowest pH was shown by Alwar station water sample. The conductivity of Alwar City water was the most whereas the conductance of water sample of Hazipur was least. The total hardness of Institute of Engineering and Technology (IET) hostel water was high whereas the temporary hardness of Hazipur area water was least. Institute of Engineering and Technology (IET) hostel area water showed highest amount of Dissolved Oxygen in it whereas the water of Hazipur area showed the lowest amount of Dissolved Oxygen. Residual chlorine were not found in all the water samples. The water sample of Alwar station area showed the highest amount of chlorides in it and the water sample from Institute of Engineering and Technology (IET) hostel showed the least amount of chloride in it. The alkalinity was found grater in Institute of Engineering and Technology (IET) hostel water whereas the alkalinity of Hazipur area was founded the least. The acidity of Alwar station water was high whereas the acidity of Rajgarh, Hazipur area was least. Institute of Engineering and Technology (IET) hostel, Alwar station, Alwar City area water contained highest amount of free CO_2 in it whereas water of Rajgarh and Hazipur area contained least amount of free CO_2 in it. The total solids were found more in Alwar station water and least in Rajgarh area water. The concentration of fluoride was found the highest in the Alwar city area water and found least in Institute of Engineering and Technology (IET) hostel water.

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