A STUDY ON PHYSICO-CHEMICAL PARAMETERS OF WATER IN MACHILIPATNAM MUNICIPALITY

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ABSTRACT

Water is one of the abundantly available substances in nature and also called elixir of life. Water plays an important role in the wealth of a nation, particularly like India, Which is predominantly an agriculture dependent economy. The importance of water for the existence of life need not be over emphasized. Quality of water is an important criterion for evaluating the suitability of water for drinking and irrigation. The ground water samples were collected and subjected for a comprehensive physico – chemical analysis. The following 10 parameters have been considered viz. pH, Electrical Conductivity, colour, odour, appearance, ammonia, dissolved oxygen, chloride, nitrate, iron. On comparing the results against drinking quality standards laid by World Health Organization (WHO), it was found that some of the water quality parameters were above the permissible limit and some were not. More over this study may help other regions in understanding the potential threats to their ground water resources.

KEYWORDS: pH, Electrical Conductivity, colour, odour, appearance, ammonia, dissolved oxygen, chloride, nitrate, iron, spectrophotometer, Conductometer.

INTRODUCTION

Machilipatnam known as Masulipatnam under British rule and as Bandar in folklore is a city and a special grade municipality and the District Administrative Head-Quarters of the Krishna district, Andhra Pradesh, India. It is located 62 kilometers (39 mi) east of Vijayawada. Machilipatnam city is located at 16.17°N 81.13°E on the southeast coast of India and in the east corner of Andhra Pradesh. The city has an average elevation of 14 meters (45 feet).

Major source of water in machilipatnam are ground water, Krishna River water and rain water. The average normal rainfall in the district is 959 mm (37.8 in). Machilipatnam is a coastal area in Andhra Pradesh and is having 960 km long coastline. Due to the presence of sea, ground water in Machilipatnam is salty in nature.

MATERIALS AND METHODS

Sample collection Locations: In the present work, we can study the physiochemical parameters of Water collected in Machilipatnam municipality. In all the selected locations, we can collect the ground water, Domestic and canal water.

Instrumentation: Spectral and absorbance measurements were made on shimadzu double beam spectrophotometer UV-140 with matched 1cm quartz cells and pH measurements were carried out using on Systronics pH meter-335 and Systronics Conductivitymeter-304.

Physical parameters: By studying the physical parameters of the water samples under the study, it was found that bore water in the college campus was found to be light yellow color, pond water collected in the Industrial estate was found to be green due to the presence of algae and it give unpleasant smell due to the decay of organic and inorganic material in the pond. Remaining all the samples were colorless and odourless. pH of all the samples were found to be in between 6.3 to 6.7, indicates all the samples were slightly acidic in nature. The electrical conductivity of Kalekhanpet canal water and Municipal water was found to be very high. This indicates that the water samples contain high amount of conducting electrolytes. Results of the physical parameters were shown in the given table.

Table.1.Results of the physical parameters of water collected at various places of Machilipatnam municipality

Sample Name	Color	Odour	Appearance	pH	Electrical conductivity
Kalekhanpet (Canal)	Color less	odourless	Cloudy with solid particles	6.3	115
Kalekhanpet (bore)	Color less	odourless	transparent	6.6	100
Noble College Campus (bore)	Light yellow	odourless	transparent	6.4	96
Noble College Campus (tap)	Color less	odourless	transparent	6.5	94
Industrial estate (bore)	Color less	odourless	Non transparent with solid particles	6.6	90
Industrial estate (pond)	green	Unpleasant	Non transparent with solid particles	6.3	70
Municipal water	Color less	odourless	transparent	6.7	114
Pampula cheruvu (bore)	Color less	odourless	transparent	5.6	155
Pampula cheruvu (canal)	green	odourless	transparent	5.3	166

Chemical parameters:

i. The amount of ammonia levels in the water samples was spectrophotometrically studied by Nessler`s reagent by taking ammonium chloride as standard.
ii. The amount of Chloride in the water samples was studied by Argentometirc method.
iii. The amount of nitrate in the water samples was studied by Sodium salicilate in the presence of sulphuric acid spectrophotometrically.
iv. The amount of Iron content in the water samples was studied by 1,10-Phenanthroline by the help of standard Ferrous Ammonium Sulphate spectrophotometrically.
v. The amount of DO content in the water samples was studied by Winklers method.

The results of the chemical parameters were found in all the samples under study were shown in table

Table.2.Results of the chemical parameters of water collected at various places of Machilipatnam municipality

Sample name	Ammonia	Chloride	Nitrate	Iron	Dissolved Oxygen
Kalekhanpet (canal)	0.047	163.77	0.065	0.019	0.449
Kalekhanpet (bore)	LDL	369.88	0.959	0.021	0.901
Noble College Campus (bore)	0.119	479.85	0.022	0.022	0.901
Noble College Campus (tap)	0.065	249.92	0.022	0.027	0.901
Industrial estate(bore)	0.055	884.72	0.102	0.025	0.901
Industrial estate (pond)	0.119	784.75	0.006	0.054	0.750
Municipal water		144.95	0.021	0.017	0.750
Pampula cheruvu(bore)	0.731	254.92	0.061	0.019	0.600
Pampulacheruvu(canal)	0.513	194.93	0.055	0.016	0.600

CONCLUSION

According to WHO, nearly 80% of all the diseases in human beings are caused due to water. The water quality parameters of the various areas of Machilipatnam, in Krishna District were studied. Results indicate that the water samples are industrial estate bore and canal water contaminated with high amount of chemicals and the quality is poor for drinking purpose. After purification treatment only this water can be used for drinking. Kalekhanpet bore water contain high amount of nitrate levels and is not suitable for drinking and proper purification method must followed for purification and drinking purpose. Reaming samples under the study are suitable for the drinking and don't contain high amount of harmful chemicals. Drinking water pollution in the studied area should be controlled by the proper environment management plan to maintain proper health conditions of people.

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