European Journal of Molecular & Clinical Medicine
ISSN 2515-8260 Volume 07, Issue 11 , 2020

AN ASSESSMENT OF GROUND WATER QUALITY IN PACHAMALAI HILLS, TAMILNADU, INDIA.

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ABSTRACT : Groundwater is the essential require in the earth without which life does not exist. The global goal of ensuring that human beings have access to acceptable quality water and sufficient quantity faces a number of challenges in the years to come. India has been facing gradually more serious water crisis in many portion of the country and many people's are affecting different waterborne diseases due to consuming deteriorated water. So its needs to develop sustainably in order to meet the growing stress in its domestic, agricultural, and industrial sectors. Ground water is considered a daily essential property due to its use for drinking water, water systems and mechanical works. Groundwater has been the best and by volume a major version in relation to lifestyles. Water quality assessment was carried out by estimating the physico-chemical parameters of ground water (34) samples were collected from different sampling stations of Pachamalai hills. The results shows that all the samples are well within the permissible limits and fit for drinking and irrigation purposes.

Keywords: Groundwater, Physico – chemical parameters and Pachamalai hills.

INTRODUCTION

Water is a way of life of all kinds. It is the key to the human lifestyle, biological balance, and miles to the true fate of our planet. Water covers about 70% of humans, and exceptional creatures have created colleges that allow them to determine the concentration of water by staying away from water. Water plays an important part in the economy of these planets. Groundwater is a commodity in which life exists as an air within which fashionable society is able to access property without fear and without hindrance to their actions. Groundwater is an important quality in meeting our country's water needs. It is imperative to sustain life, wellbeing and horticulture. Groundwater is a basic necessity of the earth, which cannot exist without it. The global goal of making sure people use good and adequate water is going to face many challenges in the coming years.

In India many parts of the area hydrological cycle is modified due to natural processes such as dissolution and weathering of bedrock, increasing rate of evaporation and deficiency of rainfall and anthropogenic processes; domestic sewages, irrigation return flow, Industrial wastes etc, however, the complex reactions of water with soil and mineral springs restore energy and release conditions, further affecting groundwater satisfactorily (Kazakis *et al.,* 2017). The groundwater quality of hilly regions is naturally depends on geological formation of underling strata, soil characteristics and meagerly populated because they are less favorable to irrigation, construction, transportation and are more susceptible to risk. The grounds for groundwater scarcity and depletion consider population improvement, financial expansion, reduction of groundwater recharge, and a rough expansion through the number of open wells and cylindrical wells and the development of siphon innovation to be almost rough. Are The difference between groundwater source and place of birth and information on biochemical measures affecting groundwater quality is essential for an affordable groundwater supply (Selvakumar *et al.,* 2015).

However, a detailed hydro geochemical characteristics and groundwater suitability studies have not been reported so for. Under the circumstances, the present study was carried out to assess the groundwater suitability for drinking and irrigation purposes and to evaluate the geochemical processes regulating groundwater chemistry in the Pachamalai hills and its adjoining regions by using spatial, graphical and multivariate statistical analysis.

STUDY AREA

The Pachamalai slope is distributed in the three regions of Salem, Perambalur and Trichy of Tamil Nadu. The ultramodern research district is located in the interior areas eleven ° 7'47 " N-11 ° 29'26"N and 78 ° 24'22"E - seventy-eight ° 51'10'E 'around a Topographic area is 14,122 Ha. There are towns on Gangavalli Square in Salem and numerous separate towns on Uppiliapuram and Thuraiyur squares in the Trichy region. Insufficient heat and humidity win out with a better temperature of 23 ° C to 31 ° C and a base hotness choice of 12 ° C to 18 ° C. once a year rain varies from 12 months to year. In the last ten years, so far a limit of 1250mm has been recorded. Typically, the maximum level of precipitation throughout the northeast typhoon (i.e.) is clearly reached in the long stretches of September, October, and November. Rainfall in the southwest rains for long periods of June and August.

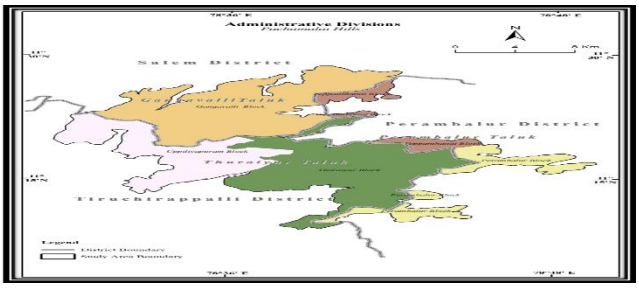

Fig: 1 "Administrative divisions (source: published survey of India's open series Map)"

Tamil Nadu, Tamil Nadu, 34 best cities in India. Selection of Pammali Hills (Fig. 2) for trial. Has been selected. The test sites are rural locations and examples of this are residents' large-scale injection springs, all of which can be actual water tests. Example jokes are given figure 2.

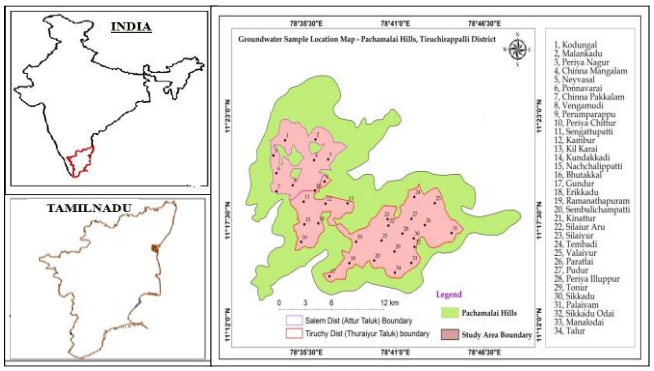

Fig. 2 Ground water sample location map with Taluk boundary

Sample Collection

The water sampling of water taken in pre cleaned polyethylene bottles as per APHA, 2005. The quality of groundwater in the study area was assessed by collecting groundwater samples from 34 locations.

Physico- Chemical Analysis of ground water

Modern reviews manage the condensed matter properties of groundwater assessments

for several water checks in the Pachamarai Hills. Control of water accumulated on the ground has been tested for various physical material barriers such as pH, electrical conductivity, and electrical conductivity, Alkalinity, Hardness, DO, BOD, COD, Chloride and Nitrate.

METHODOLOGY (APHA, 2005)**:**

The pH estimates in the examples are guided by the use of a pH meter (pH 6000-Utech version). All alkalinity, RO, BOD, COD and chloride were evaluated in the same way. Nitrate content is determined using a spectrophotometer (Sistronix - model of a two-beam spectrophotometer - 2202). The altered nitrate was estimated using the Brucin sulfonyl corrosion method and the optical thickness of 410 nm is assumed.

RESULTS AND DISCUSSION

The ground water sampled from different stations has been characterized in terms of pH, Conductivity, Alkalinity, Hardness, Chloride, Dissolved Oxygen, Organic Oxygen Demand, Chemical Oxygen Demand, Nitrate. A large portion of groundwater in the study area with minimum maximum values are presented in the following figure 3 to 11.

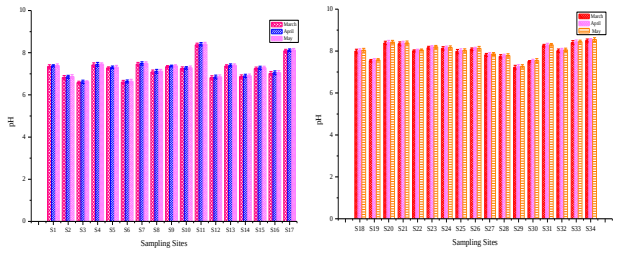

Fig: 3 pH in different ground water samples collected from Pachamalai hills (Premonsoon period March – May 2020)

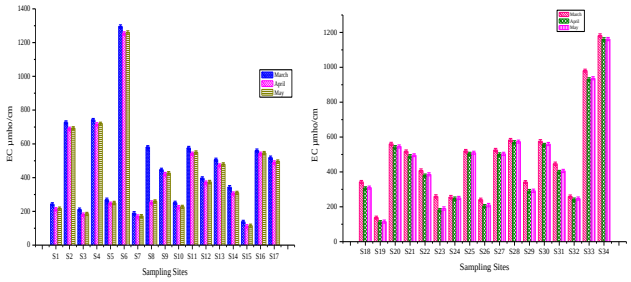

Fig: 4 Electrical Conductivity in different ground water samples collected from Pachamalai hills (Premonsoon period March – May 2020)

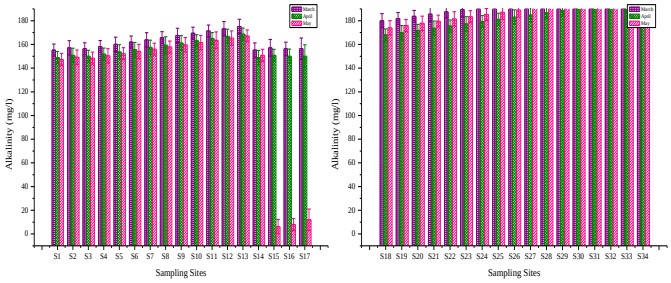

Fig: 5 Alkalify in different ground water samples collected from Pachamalai hills (Premonsoon period March – May 2020)

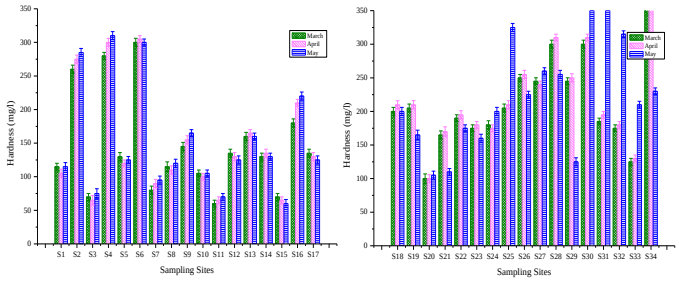

Fig: 6 Hardness in different ground water samples collected from Pachamalai hills (Premonsoon period March – May 2020)

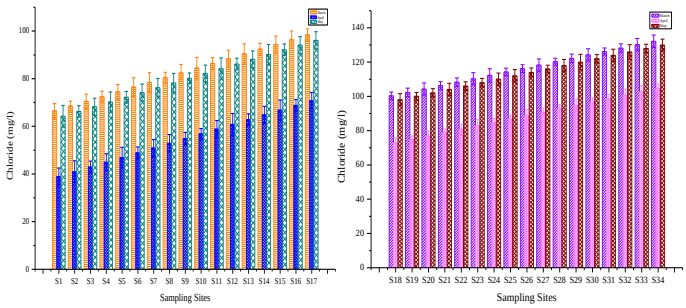

Fig: 7 Chloride in different ground water samples collected from Pachamalai hills (Premonsoon period March – May 2020)

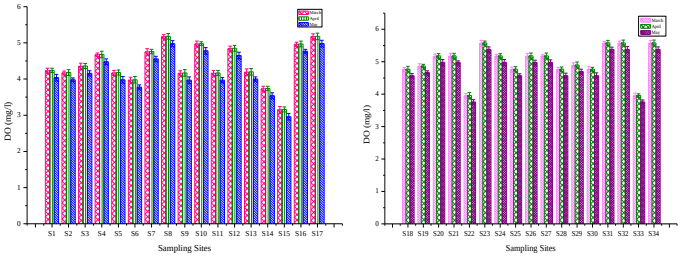

Fig: 8 Dissolved Oxygen (DO) in different ground water samples collected from Pachamalai hills (Premonsoon period March – May 2020)

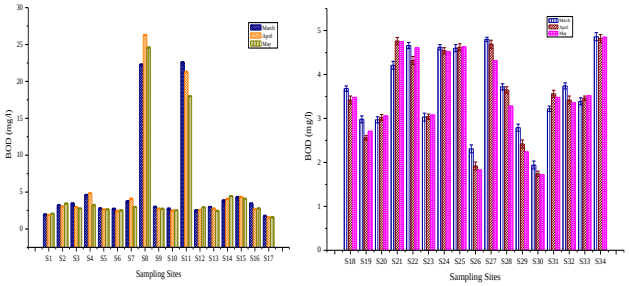

Fig: 9 Biological Oxygen demand (BOD) in different ground water samples collected from Pachamalai hills (Premonsoon period March – May 2020)

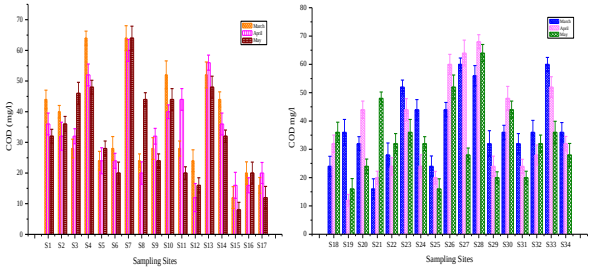

Fig: 10 Chemical oxygen demand (COD) different ground water samples collected from Pachamalai hills (Premonsoon period March – May 2020)

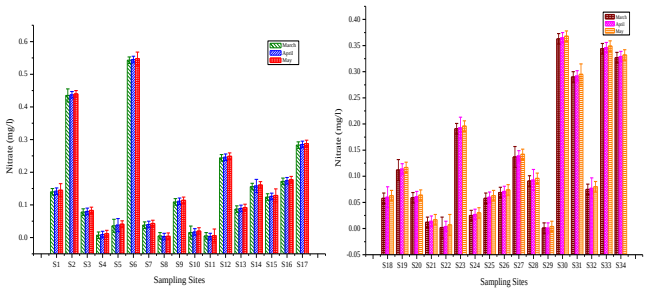

Fig: 11 Nitrate in different ground water samples collected from Pachamalai hills (Premonsoon period March – May 2020)

The motivation for determining pH value is whether drinking water is acidic or basic in nature. Within the modern test, the pH test with floor water was between 6.13 and 8. The electrical conductivity (EC) of water depends on the wages of the debris and its completion (Saffal Islam et al., 2015). The European Union's estimates range from 120 to 12,774 millimetres / cm. Within the European Commission's Presence Study, all water assessments are considered complete, as far as possible, established by the WHO. It is often composed of carbonate (CO32-) and bicarbonate (HCO3-). Alkalinity acts as a pH stabilizer. Alkalinity, pH and hardness affect the toxicity of certain substances in water. The roughness of groundwater ranges from 108 mg / l to 221 mg / l.

Hardness is one of the great groundwater houses that fit the software trends of many tasks. Hardness ranged from 85 mg / l to 480 mg / l. Hardness is directly recognized by the irregularities of water and the properties of the purified water structure, whether it is natural or inorganic, high altitude, more frightening, using water or living. Affects how to use it (Ganeshkumar et al., 2017)). Water hardness is a limitation of water that reacts with clusters and requires considerable additional cleaner to supply hard water, mechanical balm, and

nagarnaik (2012). Water is basic and great water is essential to satisfaction. Modern examples have been reported in the DO honour range of 19 mg / l to 5.58 mg / l.

The need for natural oxygen increases as the biodegradable natural product in water increases (Sunita and Dendweight, 2012). In today's groundwater tests, BOD was estimated in the range of 1.32 mg / liter to 5.8 mg / l. During this test, a COD in the range of 12 mg /l to 68 mg / l was determined. Excessive COD can also lead to a decrease in oxygen, as the organism breaks down to a level that interferes with marine life (Imamuddin Ustad, 2015). Nitrate levels range from zero, 005 mg / l to 343 mg / l. The farthest nitrate reach in groundwater is 45 mg / l, which shows that all examples were found at the lifting adequacy limit. In large quantities, an increase in nitrate in groundwater is a sign of bacterial contamination. (Srinivasamoorthy *et al.*, 2014).

CONCLUSION

The groundwater assessment is carried out from 34 separate stations in the Pachamalai hills. Physico-synthetic limitations such as pH, electrical conductivity, alkalinity, hardness, chlorides, dissolved oxygen, organic oxygen demand, chemical oxygen demand, and nitrates have been investigated using generalized systems. Some barriers exhibit more quality than is possible. Results show that most groundwater testing is suitable for potable and potable water systems.

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