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EVALUATION OF PHYSICOCHEMICAL PARAMETERS OF GROUNDWATER OF THE VILLAGES ARALI, NANDUR AND SIDHAPUR OF TALUKA MANGALWEDHA DIST.SOLAPUR

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Abstract:

The analysis deals with the investigation of physicochemical parameter of ground water of the different villages of dist. Solapur (MS). The physicochemical parameter like, temperature, pH, electrical conductivity, total dissolved solids, turbidity, total hardness, calcium, magnesium, sodium, potassium, chloride, fluoride, Nitrate, Sulphate was determined. The results were compared with standards given by WHO and IS 10500. In the investigation, it is found that the ground water of all villages gets slightly polluted.

KEY WORDS:

Physicochemical Parameters , Human ecology , traditional environmental health problems.

INTRODUCTION

Rural living is the key stone of Human ecology. Large villages in the less developed countries typically combine the traditional environmental health problems especially due to polluted water. Physicochemical analysis is very importance to know the quality of water. Water is a good polar solvent and is often referred to as the universal solvent. Substances that dissolve in water, e.g., salts, acids, alkalis, and some gases- especially oxygen, carbon dioxide are known as hydrophilic (water-loving) substances, while those that are immiscible with water (e.g., fats and oils), are known as hydrophobic (water-fearing) substances. Water quality refers to the chemical, physical and biological characteristics of water. It is a measure of the condition of water relative to the requirements of one or more biotic species and or to any human need or purpose. It is most frequently used by reference to a set of standards against which compliance can be assessed. The most common standards used to assess water quality relate to health of ecosystems, safety of human contact and drinking water. The ground water sample collected from sources like bore well. These bore wells are situated in the vilages like Arali. Nandur and sidhapur.

MATERIALAND METHODS:

The sample was collected in the month of October into the sterilized glass bottle in the morning from above villages and the collected sample brought to the lab immediately for the experiment to study about the various water quality parameters as per the standard procedures (APHA, AWWA and WEF, 1992). pH of the samples was recorded using a pH meter (Toshniwal Instr. Pvt. Ltd., No. 54). Acidity and alkalinity values determined by titration methods (APHA et al., 1995), calcium and magnesium by EDTA method (APHA et al., 1995), chloride by argentometric method (APHA et al., 1995, Manivasakam, 1996) and nitrate by brucine method (Manivasakam, 1996). Three sample of were collected from each vilages in all dirctionsand named as 1,2,3

**Physicochemical Parameters of Different Villages
Table**

| village | Tem | Color | Odou | Turb | pH | T.H | T.D.S | Ca | Mg | Fe | Na | K | Cl | F | S0 ₄ |
|------------|------|-------|------|------|-----|-----|-------|-----|----|-----|-----|--------------|-----|------|-----------------|
| Arali 1 | 27.5 | CLR | ods | 1.3 | 7.4 | 542 | 887 | 127 | 48 | 0.2 | 140 | 2 | 156 | 0.17 | 53 |
| Arali 2 | 27.0 | CLR | ods | 2.2 | 7.6 | 482 | 850 | 117 | 48 | 0.2 | 144 | 2 | 140 | 0.15 | 50 |
| Arali 3 | 27.4 | CLR | ods | 2.1 | 7.4 | 552 | 852 | 118 | 66 | 0.2 | 134 | 2 | 182 | 0.12 | 55 |
| Nandur 1 | 27.5 | CLR | ods | 2.4 | 7.8 | 800 | 718 | 200 | 86 | 0.5 | 129 | ³ | 156 | 0.14 | 58 |
| Nandur 2 | 27.5 | CLR | ods | 2.9 | 7.8 | 580 | 760 | 161 | 81 | 0.3 | 149 | ³ | 124 | 0.31 | 63 |
| Nandur 3 | 27.8 | CLR | ods | 2.7 | 7.8 | 650 | 722 | 177 | 76 | 0.3 | 129 | ³ | 160 | 0.13 | 61 |
| Sidhapur 1 | 27.0 | CLR | ods | 2.3 | 7.8 | 640 | 665 | 148 | 88 | 0.3 | 130 | ² | 126 | 0.25 | 68 |
| Sidhapur 2 | 27.5 | CLR | ods | 2.1 | 7.7 | 572 | 656 | 183 | 89 | 0.2 | 129 | ² | 144 | 0.30 | 69 |
| Sidhapur 3 | 27.3 | CLR | ods | 2.6 | 7.7 | 660 | 654 | 172 | 75 | 0.2 | 128 | ² | 149 | 0.25 | 67 |

CLR= Colouless ,ods = odourless T.H. = Total Hardness

RESULTS AND DISCUSSION:

The physico-chemical parameters of the water sample of above villages shown in table .

TEMPERATURE:

According to the biological importance temperature plays a very important role. The temperature of the collected sample of different villages are noted by thermometer on the spot and shown in above table and it is about 27.50C .Similarly the colour and odour also observed samples were of odorless and colorless respectively

pH:

The pH is very important parameter to decide the water quality. The standard range for ground water 7.0 to 8.5 according to the WHO. The pH values of the sample were recorded during the study of the above villages in lab by pH meter. The pH is in the standard range .

Turbidity : It is measured in NTU. Turbidity of the water is due to the colloidal and extremely small dispersion particles. But in the study of turbidity in the water sample of these villages it is found that the turbidity in the water sample of some villages is more than of standard range given by the ISI (10500-91), this is because of farmers are using large quantity of fertilizers. Turbidity lies in the of 1.2 to 2.7 even sample shows the clear.

Electrical Conductivity :Electrical conductivity (EC) is a measurement of the dissolved material in an aqueous solution, which relates to the ability of the material to conduct electrical current through it and the higher the dissolved material in a water sample, the higher the EC .

Total Dissolve Solid (TDS) in mg/L: The TDS is the total amount of dissolved material salts, including minerals, salts or metals dissolved in water. If Water containing more than 500 mg/L of TDS is not considered desirable for drinking water In the study of ground water of these villeges the TDS at high level

TOTAL HARDNESS (TH) IN MG/L:

Water becomes hard by being in contact with soluble metallic cations. The two main salts that cause water hardness are calcium (Ca²⁺) and magnesium (Mg²⁺). Hardness of water leads to heart

diseases and kidney stone. The total hardness range given by WHO up to 500 mg/L. The hardness of ground water of villages is in the more than required.

SULPHATE IONS:

Sulphate may result in intestinal discomfort, diarrhea and consequently dehydration, when someone drinks water that contains greater than 250 milligrams per litre (mg/L) of sulphate. But in the analysis it is found that the concentration of sulphate is under the limit in all samples.

Iron (Fe) in mg/L: Iron concentration in drinking water is typically less than 0.3mg/L. Iron concentrations are acceptable range
And all other ions are in acceptable range

CONCLUSION:

In the present investigation it is found that the ground water of some of these villages are more hard.

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