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## GR<sup>T</sup> AN ASSESSMENT OF THE PHYSICO – CHEMICAL PROPERTIES AT THE ORIGIN OF PRAVARA RIVER (RATANGAD) IN AKOLE TEHSIL, AHMEDNAGAR DISTRICT, M.S. (INDIA)

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**Abstract:** The present study deals with an assessment of the physico – chemical paratmeters of Pravara river at Ratangad, Akole tehsil Ahmednagar district, M.S. (India).The physico – chemical parameters were assessed such as pH, E.C., Calcium, (Ca<sup>+</sup>) Magnesium (Mg<sup>++</sup>), Sodium (Na<sup>+</sup>), Potassium (K<sup>+</sup>) Sulphate (SO<sub>4</sub><sup>2-</sup>) All the parameters were compared with standards prescribed by WHO (1973) and ISI (10500-91). It was found that the water samples collected from sites at the origin of Pravara river were in the permissible limits and water quality is quite good.

**Keywords:**Physico-chemical parameters, origin, Pravara River, pH, E.C. etc.

### INTRODUCTION

Water has prime importance in the life of human and ecology. Water is the good solvent for life. Water on the earth surface is never found in pure form. Only rain water is the nearest approach to chemically pure water. Without water there is no imagination of life. Water is present in ocean, glaciers, rivers, wells, lakes etc.on the surface of the earth. 71% of the earth surface is occupied by water and 29% is covered by land. Out of 1% fresh water,79% of fresh water is used for irrigation purpose,13% water is used for industries and 8% water is used for drinking purposes.. When rain water flows over the surface of soil, the soil consists of mineral, salt etc. which are dissolved by water. So water consists minerals, salts etc. which affect on physic-chemical properties of water. Due to the same, the entire eco-system gets disturbed.



### MATERIAL AND METHODS –

The samples were collected at the origin of Pravara river (Ratangad) . It is located at latitude 19.32 and

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longitude 73.18, also the mean sea level at Ratangad is 3523 Ft. Akole tehsil is full of Historical places like Ratangad, Kalsubai peak, highest in M.S., Patta fort, Amruteshwar Temple etc. At Ratangad there are some manmade small ponds built under stone, construction known as 'Take'. These 'Take' consist of water. This water is source of drinking water for Human as well as for animals.

**Sample Collection –**

The samples were collected in the plastic bottles of a liter size. Prior to collection the bottles were cleaned by soap solution and then they were treated with 5% HNO<sub>3</sub> acid over night and finally washed with de-ionized water repeatedly to avoid contamination. All the samples were analyzed within 24 hrs. The analyses were carried out as per methods described by APHA(1998) and NEERS (2007). The samples were partially tested in the field as well as the laboratories.

**RESULT AND DISCUSSION**

– The physico-chemical parameters of the Pravara river at origin

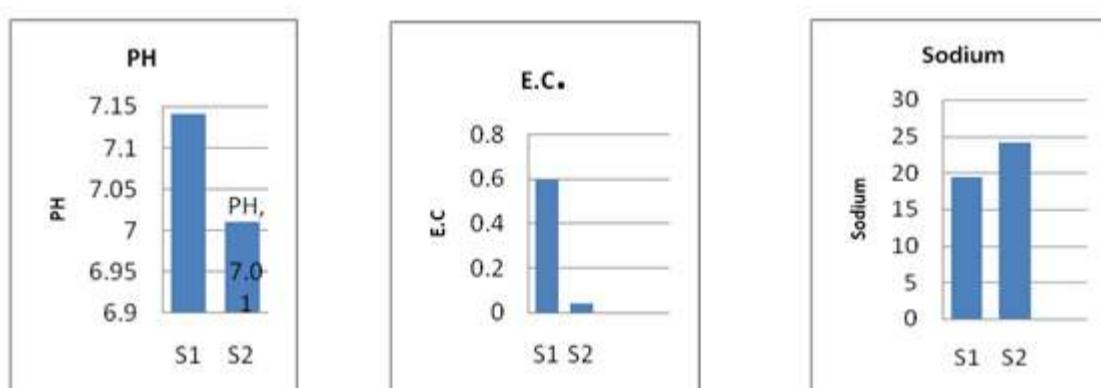
**Table No. 1**

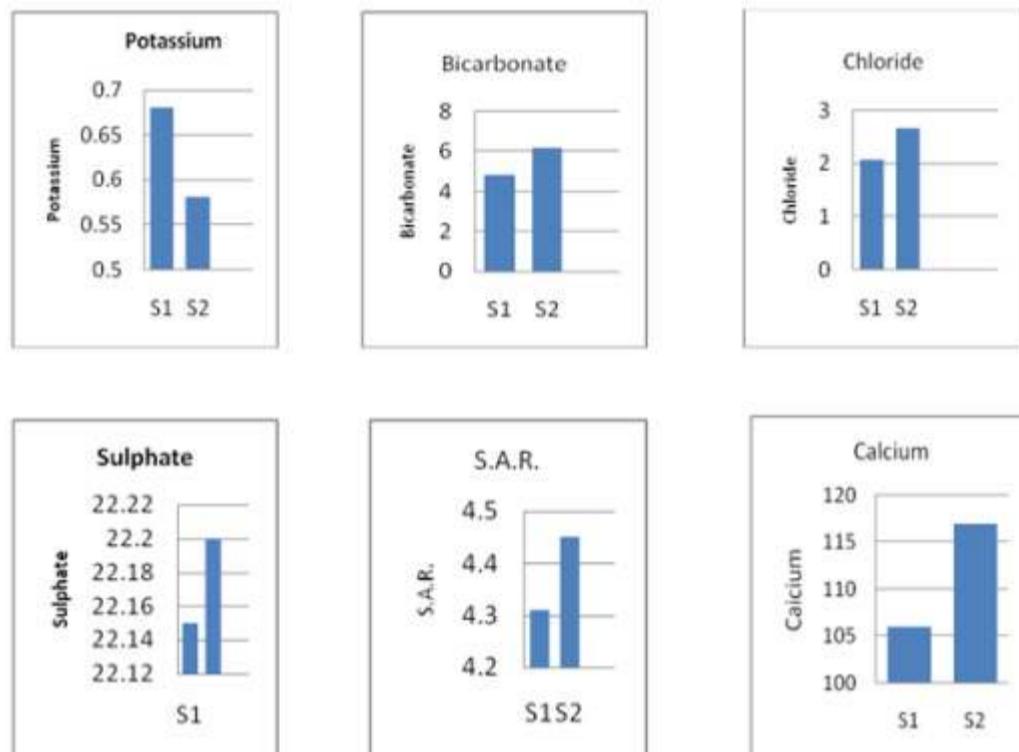
Particulars	Test Values/Unit
pH	7.14
E.C.	0.06 dsm <sup>-1</sup>
Calcium	106.00 P.P.M.
Magnesium	98.59 P.P.M.
Sodium	19.38 P.P.M.
Potash	0.68 P.P.M.
Carbonate	---- meq/L
Bicarbonate	4.83 meq/L
Chloride	2.07 meq/L
Sulphate	22.15 meq/L
Sodium Absorption Ratio	4.31 meq/L

**Table No. 2**

Particulars	Test Values/Unit
pH	7.01
E.C.	0.04 dsm <sup>-1</sup>
Calcium	117.00 P.P.M.
Magnesium	100.00 P.P.M.
Sodium	24.12 P.P.M.
Potash	0.58 P.P.M.
Carbonate	---- meq/L
Bicarbonate	6.18 meq/L
Chloride	2.68 meq/L
Sulphate	23.20 meq/L
Sodium Absorption Ratio	4.45 meq/L

**Graphical presentation of physico chemical parameters**





**pH** – Means the hydrogen ion concentration. Most natural waters will have pH values from pH 5.0 to pH 8.5. The freshly fallen rain water may have a pH value of 5.5 to 6.0. If water reacts with surface of soil, consisting of minerals and salts, these salts get solubalized with water and contaminate introduced in water. pH scale is a useful index for physical property of water (substances).

**Electrical conductivity** – Pure water will not carry a substantial electric charge. Several factors influence the E.C. of water like temperature, mineral, salinity. Water can conduct electricity. Water consists salt, mineral from soil and higher is the concept of salts higher is the E.C. salt ion conduct electrons conductivity can measure of water quality. Higher E.C. stones that water consists higher conc. of minerals, salts and water becomes saline. Salt ion conducts electrons.

**Calcium** – Calcium occurs in water naturally under normal conditions.  $\text{CaCO}_3$  is water in soluble. Water gets contact with rock such as limestone, marble, calcite, dolomite, gypsum. Then calcium gets dissolved in water. Higher is the conc. of  $\text{Ca}^{2+}$  water becomes harden. The  $\text{Ca}^{2+}$  is correspondant for water hardness. Calcium is a dietary requirement for all organisms apart from some insects and bacteria.  $\text{Ca}^{2+}$  is responsible for water hardness. Water hardness influences and aquatic organisms. Water hardness decreases detergent efficiency.  $\text{Ca}^{2+}$  is dietary mineral that is present in the human body. Calcium phosphate needs for growth of tooth, bone, along with vitamin D. Higher in the conc. of  $\text{Ca}^{2+}$  ion in drinking water it makes adverse influence on human health.

**Magnesium** – A large number of minerals contains magnesium like dolomite, magnesite. The magnesium present in water as  $\text{Mg}^{2+}$  (aq.)  $\text{Mg(OH)}_2$  (aq.) Environmental problems indirectly caused by Magnesium in water. It has negative impact on the health of human and animals.

It corresponds to water hardness. As concentration of Magnesium increases water becomes more harden. Magnesium is useful for bones and muscles in human body. Higher dose of Mg may show personality changes, nerve problem muscles, slackening.

**Chloride** – Large quantities of Chloride can be found in the drinking water. Chlorine plays an important role in medical science. It can be use as disinfectant in drinking water. A normal adult human body contains approximately 81.7 g chloride. A dietary intake for adults of 9 mg of chloride per kg of body weight has been recommended. Chloride increases the electrical conductivity of water and thus increases its corrosivity. In metal pipes, chloride reacts with metal ions to form soluble salts.

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**Sodium** – Sodium is the sixth most abundant element in the Earth's crust. The sodium salts found in nature are Sodium chloride. Sodium carbonate, Sodium borate, Sodium nitrate, Sodium sulphate. Higher the conc. of Sodium in drinking water, it gives harmful effect on human body like high B.P. kidney damage. Sodium is required for nerve and muscles functionality.

**CONCLUSION–**

It is found that the water at the origin of river Pravara is in permissible limits prescribed by WHO. It is pure, it can be used for drinking purpose, domestic use, agriculture purpose.

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