

# EVALUATION OF PHYSIO-CHEMICAL PARAMETERS OF KOLLERU LAKE WATER FOR DRINKING

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The present study is on the purification of kolleru lake water for drinking purpose by using various chemicals and natural absorbent (rice husk charcoal). The lake water is collected from various locations of kolleru lake and conduct pre-treatment test for various parameters like p<sup>H</sup>, Turbidity, Hardness, Total dissolved solids, Total suspended solids, Electrical Conductivity, Dissolved Oxygen, Chlorine content. Then coagulant with rice husk charcoal, the charcoal is prepared by using muffle furnace at 100°C.

The rice husk is low in cost and easily available. Treating of lake water with rice husk charcoal helps to decrease the turbidity and p<sup>H</sup>. The filtration is done by using what's man filter paper. After the filtration, filtered water is boiled and check the parameters like p<sup>H</sup>, Hardness, Turbidity, Chloride, Total Dissolved solids, Total Suspended solids. After post treatment process p<sup>H</sup>, Turbidity, and Hardness are decreased. After coagulation, dissolved solids are increased and then decreased after filtration. By using natural absorbent (rice husk char) chlorine content does not change. The natural absorbent (rice husk char) not able to neutralize completely. The rice husk char is used only for neutralization of turbidity and p<sup>H</sup> parameters.

**Key word:** Human Power, Rice Husk, Chemicals.

## 1. INTRODUCTION

Water is considered as one of the most important nature of the earth. It is one of the most important things that is required by every living organism. Water covers about 71% of the land on the earth's surface, of which 96.5% of the planet's crust water is found in seas and oceans, 1.7% in form of ground water, 1.7% in the glaciers and the ice caps of Antarctica and Greenland, a small fraction in other large water bodies, 0.001% in air as vapour, clouds and precipitation. Only 2.5% of this water is fresh water, 98.5% of water is in ice (excepting ice in clouds) and ground water. Less than 0.3% of all freshwater is in rivers, lakes, and in the atmosphere, and even a smaller amount of the earth's fresh water (0.003%) is contained within biological bodies and manufactured products.

### 1.1 Kolleru lake water

Kolleru Lake, the biggest fresh water lake in the country is unable to provide drinking water to the island villagers. Increasing pollution with mushrooming fish tanks, inflow of water from Upputeru (a small rivulet) in the absence of flood water in Kolleru Lake are said to be main reasons for shortage of drinking water in the region.

### 1.2 Importance of lake water treatment

The principal aim of waste water treatment is generally to allow the human and industrial effluents to be disposed of without danger to human health and natural environment. We consider wastewater treatment as water use because it is so interconnected with other uses of water. Most of water used by homes and industries must be tested before it is released back to the environment. If we didn't treat the billions of gallons of wastewater and sewerage produced everyday then it will cause huge quantity of water pollution.

Treatment plants reduce pollutants in wastewater to a level nature can handle. Wastewater is used water.

Bagasse is one of the natural adsorbent which is used in the wastewater treatment as filtrate material. Bagasse is the waste produced from the sugarcane industries at the time of production of sugar. It shows good results in the removal of the physical and chemical parameters of waste water and make it fit for reuse, which can be used in secondary purposes.

The various stages involved in the treatment process are:

- a. Preliminary treatment
- b. Primary treatment
- c. Secondary treatment
- d. Tertiary treatment

Here we are treating the wastewater using natural adsorbents like rice husk and bagasse. Rice husk ash is used as coagulant, the multilayer of rice husk and bagasse is used as filtering material. Rice husk is one of the available in rice growing countries. Also contribute their share of used water that must be cleaned. The treatment of the wastewater depends on the character and quality of sewage and sources of Generation of rice husk in India is 18-22 include substance such as human waste, food scraps, oils, soaps and chemicals in homes, this includes water million tons. Studies on the adsorption of various pollutants by rice husk are reviewed. Paddy rice (*Oryza sativa*) is grown on every continent except Antarctica and the extent of paddy cultivation covers about 1 percent of the earth’s surface. More than half of the world’s population depends on rice as a staple food and it ranks second to wheat in terms of cultivation area and production. The quantum of global production of paddy is close to 650 million tons per annum. Paddy, on an average, consists of about 72 percent of rice, 5-8 percent of bran, and 20-22 percent of husk of all the plant residues, the ash of rice husk contains the highest proportion of silica. It is estimated that every tonne of paddy produces about 0.20 tonnes of husk and every tonne of husk produces about 0.18 to 0.20 tonnes of ash, depending on the variety, climatic conditions and geographical location.

**II. LITERATURE REVIEW**

In this paper, it is concluded that the low cost natural adsorbent materials have good performance on the removal of bad contaminants from waste water. The multimedia filtering process gives good results in the removal of parameters like pH, Total Solids, Suspended Solids, Dissolved Solids, Biochemical Oxygen Demand, Chemical Oxygen Demand and turbidity from the effluent.

Differences in varietal characteristics have significant effects on the chemical properties of rice husk the basic properties of rice husk are as follows:



**Fig.1 Rice husk**

**Table 1 Properties of rice husk**

S.No	Properties	Range
1.	Bulk Density(kg/m <sup>3</sup> )	96-160
2.	Length of the husk(mm)	2.0-5.
3.	Hardness(Mohr’s scale)	5.0-6.0
4.	Ash(%)	22.0-29.0
5.	Carbon(%)	35.0

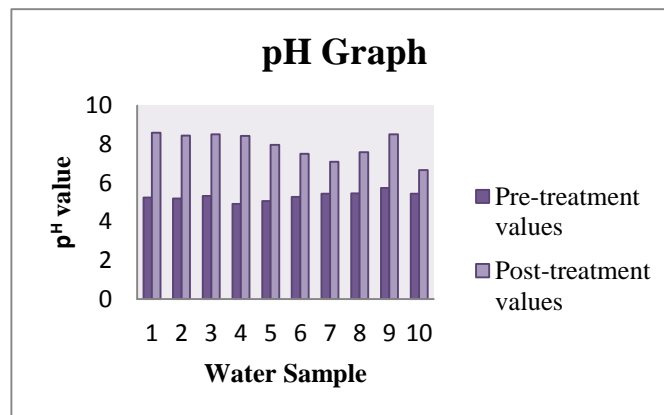
6.	Hydrogen(%)	4.0-5.0
7.	Oxygen(%)	35.0-37.0
8.	Nitrogen(%)	0.23-0.32
9.	Sulphur(%)	0.04-0.08
10.	Moisture(%)	8.0-9.0



**Fig.2**Water samples coagulation with rice husk char

**III. RESULTS AND DISCUSSIONS**

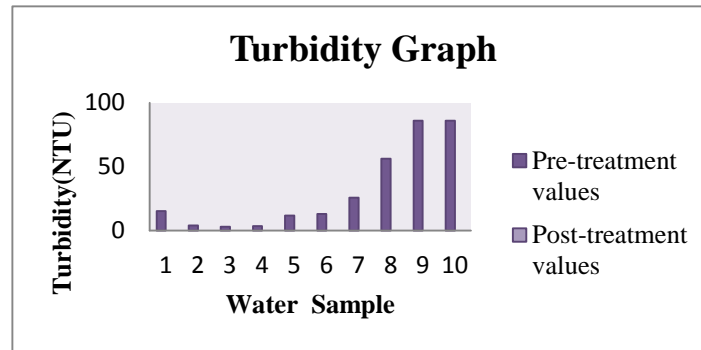
The results are analyzed by conducting the pre- treatment and post-treatment of following samples.



**Graph 1. Ph Value**

graphs shows the difference between pre-treatment values and post-treatment values of pH. The Post-treatment values are neutralize when compare to pre-treatment values. The pH values are in permissible limits as per BIS – 10500:2012.

Graph 2: The Turbidity graph shows the variation between pre-treatment and post-treatment values of the water samples.



**Graph 2. Turbidity Value**

The above graphs show the difference between pre-treatment values and post-treatment values of Turbidity. The Post-treatment values are neutralized when compared to pre-treatment values. After the post –treatment process Turbidity values are in permissible limits as per BIS – 10500:2012.

**TABLE 2:** Analysis of different parameters of kolleru sample1 (Akivedu)

Sl. No	Parameters	Pre-treatment value	Post-treatment value
1	Ph	5.24	8.6
2	Electric conductivity	1.37	0.68
3	Turbidity (NTU)	15.2	0
3	Hardness (ppm)	262.77	238.78
5	Dissolved oxygen	2	2
6	Total dissolved solids (ppm) After filtration	430	622
	Boiling	-	592
7	Chloride content (ppm)	213	468
8	Total suspended solids (ppm)	4600	-

In above table, pH, Hardness and turbidity values are neutralized in post-treatment tests when compared to pre-treatment tests. But, Total dissolved solids are increased due to coagulation with char.

**IV. CONCLUSIONS**

1. The kolleru lake water is treated by using natural absorbent (rice husk char).Rice husk have carbon property, due to that property pH and Turbidity are neutralized
2. Hardness is partially neutralized but total dissolved salts are increased. After filtration process total dissolved are partially decreased.
3. Rice husk char does not effect on treatment of chlorine content in water sample

4. In our analysis kolleru lake before the water treatment, soil tests are important to evaluate the chemicals in water because after the 30 days of collection the sample water without any treatment (like oxidation also) some physical parameters like pH, Turbidity and electrical conductivity are neutralized.

5. By using natural absorbent(rice husk char) alone as the treatment material, the kolleru lake water is not fit for drinking.

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