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Research Article

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Rice Husk is use to Treatment of Gray Water

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Abstract

All over world the grey water problem is observed due to house hold activities i.e. bathing, cloth washing, etc. The treatment of grey water is very easy for now a days. The study shows that fresh rice husk can be used to treatment of grey water as a certain level and that water is used for domestic purpose like washing or irrigation purpose. The results of phisico-chemical like temperature, turbidity, viscosity, solids, pH, electrical conductivity, alkalinity, acidity, hardness, DO, BOD and COD results of experimental analysis of before and after treatment of grey water has been very satisfactory and shows that waste of paddy field (rice husk) is very much effective for treatment of grey water.

Keywords: Rice, Husk, Treatment, Gray, Water.

Introduction

Globally, water use bigger six-fold during the twentieth century and by the year 2025 about 1.8 billion population will live under absolute condition lack of water. In Asian and African continent, people under a beginning of water pressure would Rice to three billion in 2025 (United Nation Water, 2006). It is one of the most chief agricultural unused material in quantity. It is about 20% of the whole rice production, on mass basis of the entire rice (Daifullah *et al.*, 2003). The estimated annual rice production of 500 million tonnes in developing countries, approximately 100 million tonnes of rice husk are available annually for utilization in these countries alone. Practically all social activities that use water causes wastewater and vast majority is directly out to the nature without proper treatment. This is a communal exercise of the evolving countries because of low eco-friendly rules. The effects are always on human strength, economy and ambient quality of the ecosystem. The repeated let-down of the struggle to report the problems of wastewater and gray water and its inferences on humans and the nature may affect other efforts to achieve the 2030 Agenda for sustainable goals. Thus, there is need for workable Integrated Water Resource Management (IWRM) to explore substitute water properties such as emerging a system to reuse of wastewater.

The main aim for select rice husk is due to its coarse construction, chemical solidity and its locally available material at very low cost (El-Nemr *et al.*, 2005). Daifullah *et al*., 2003 and Rhman *et al.,* 1997reported that rice husk structures are cellulose is 32.24%, hemicellulose is 21.34%,lignin is 21.44%, extractives is 1.82%, water is 8.11% and mineral ash is 15.05%. The mineral ash contain SiO_2 is 94.5–96.34%.

The rice husk can be excellently used as adsorptive material for treatment of dairy effluent as it could bring about a removal up to 92.5% which could be attained using an adsorptive material dosage of 5 g/L, pH of 2, and temperature of 30°C. Moreover, it is a cost-effective method since it is cheaply offered raw material (Pathak *et al.*, 2016).

The gray water is treated with rice husk means it is very cheapest and easy technique used in this present work. This technique is easily applicable in those area where the rice paddy field is occurred.

Materials and Methods

The material media is used in this work for treatment of gray water is Rice Husk. It is the wastage material after collection of rice from rice mill. This is very cheapest material and easily available any ware in our country. It is absorbent in nature. It absorbs impurities from waste water and convert hard water to soft water at certain level. This treatment was done on lab scale on transparent 12 inches length, 12 inches breadth and 30 inches height diameter rectangular shaped container, which is used as a trickling filter bed for gray water treatment by rice husk media. In this transparent rectangular trickling filter container, lower layer is field with stone and gravels up to 3-5 inches, after that 3-5 inch layer of sand and after that upper layer filled with rice husk up to 8-10 inches. The tap is set on bottom layer bellow the stones for filtered outlet. The gray water was spread on upper layer with 5 litter/ hrs speed by flow controlling knob. The gray water is treated slowly after drop-by-drop percolate from rice husk to sand and after that stone gravels layer and the treated water is collected in container. This filtered collected water was scientifically analysed for physico-chemical parameters of before and after treatment.

Results and Discussion

The results of physico-chemical characteristics of before and after treatment of gray water by rice husk media are as follows:

The average temperature of gray water already in the sewage system is about 15°C. Over the summer it increases 20°C and can be effectively used as an substitute energy source (Joniec, 2007), in this research work results shows that before filtration the temperature of gray water was found to be 24^0C and after filtration 23^0C **(Table 1)**. Turbidity of before filtration was found to be 15.9 NTU and after filtration was found to be 6.5 NTU **(Table 1)**. The turbidity of grey water from the treatment system was relatively decreases (Kandu *et al.*, 2015). Viscosity of before filtration was found to be 0.9216 mPa.s and after filtration was found to be 09125mPa.s **(Table 1)**. Total dissolved solids of before was found to be 2580 mg/l and after filtration was found to be 721 mg/l **(Table 1)**. The pH of before filtration was found to be 8.8 and after filtration was found to be 6.5 **(Table 1)**. Electrical conductivity of before filtration was found to be 692 µS/m and after filtration was found to be 1034 **(Table 1)**. The conductivity of effluent grey water from the treatment system was relatively decreases respectively (Kandu *et al.*, 2015).

Table 1: Physical characteristics of before and after treatment of gray water:

Sr. No.	Parameter	Unit	Before Treatment	After Treatment	Quality improves (%)
1	Temperature	^{0}C.	24	23	Below 5
2	Turbidity	NTU	15.9	6.5	50
3	Viscosity	mPa.s	0.9216	0.9125	15
4	Total dissolved solids	mg/l	2580	721	72
5	pH	--	8.8	6.5	26
6	Electrical Conductivity	µS/m	692	1034	150

The alkalinity of before filtration was found to be 246 mg/l and after filtration was found to be 105 mg/l **(Table 2)**. The alkalinity of grey water from the treatment system was relatively decreases with an average of 492.4 with deviation of ± 69.40 for the raw grey water (Kandu *et al.,* 2015). The acidity of before filtration was found to be 134 mg/l and after filtration was found to be 98 mg/l **(Table 2)**. The hardness of before filtration was found to be 226 mg/l and after filtration was found to be 146 mg/l **(Table 2)**, The hardness of grey water from the treatment system was relatively decreases (Kandu *et al.,* 2015).

The dissolved oxygen of gray water before filtration was found to be 0.8 mg/l and after filtration was found to be 4.6 mg/l **(Table 2)**, the dissolved oxygen of grey water from the treatment system was relatively increases with an average of 2.54 with deviation of ± 0.74 (Kandu *et al.,*2015). The biochemical oxygen demand of gray water before filtration was found to be 25.45 mg/l and after filtration was found to be 8.8 mg/l **(Table 2)**. and the chemical oxygen demand of gray water before filtration was found to be 36.9 mg/l and after filtration was found to be 28.0 mg/l **(Table 2)**, chemical oxygen demand of grey water from the treatment system was relatively decreases with an average of 30.80 with deviation of ± 4.74 (Kandu *et al.,*2015). Treatment and filtration of wastewater are significant to deliver water that is safe and aesthetically appropriate for reuse (NEERI, 2007).

Table 2: Physical characteristics of before and after treatment of gray water:

Sr. No.	Parameter	Unit	Before Treatment	After Treatment	Quality improves (%)
1	Alkalinity	mg/l	246	195	21
2	Acidity	mg/l	134	102	25
3	Hardness	mg/l	226	146	35
4	Dissolved Oxygen (DO)	mg/l	0.8	4.6	575
5	Biochemical Oxygen Demand (BOD)	mg/l	25.4	8.8	35
6	Chemical Oxygen Demand (COD)	mg/l	36.9	28.0	24

Conclusion

In this research work, results were making a substantially upgraded superiority of grey water. The physical characteristics effectiveness and quality was improving with parameter *i.e.,* turbidity is about 50%, viscosity is about 15 %, total dissolved solids are about75 %, pH is about 26 % and electrical conductivity improves is about 150% and the efficiency of chemical characteristics was improving *i.e.,* alkalinity is about 21 %, acidity 25 %, hardness 35 %, dissolved oxygen 575 %, BOD 35 % and COD 24 % respectively. Day by day public are mentally ready for the recycle of grey water. The grey water filtration by rice husk was directly used to agricultural field but it may cause health risk. If using coagulant in filtered water then that will be removes solids at certain level. This present research work *i.e.* gray water treatment with the help of rice husk as a filtered media will be very useful in the future as a lots of gray water is being produced day by day.

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