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Treatment of greywater using banana peel, corn cob and orange peel as major filter media.

Tratamiento de aguas grises utilizando cáscara de plátano, mazorca de maíz y cáscara de naranja como principales medios filtrantes.

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ABSTRACT

Water is the most important element required for the existence of all living beings on earth. As the population increases, water demand also increases. About 75-80% of water through distribution pipe reaches the sewer as waste water. So it is a need of mankind to recycle and reuse waste water. The domestic water (Grey Water from TIST campus) from household can be treated and can be used for irrigation rather than disposing into river. This paper focus on grey water filtration using Banana Peel, Orange Peel and Corn cob as a filter media. All are good natural absorbent which can remove excess nutrients suspended solids and can even remove pollutants and sediments from wastewater. Orange peel is a great biosorbent. The orange peels biosorbent is one of the best biosorbent for removal of ammonia and nitrate present in water. Banana peels are capable of adsorbing various metals and other pollutants present in industrial waste waters, provided the peels are pre-treated with proper surface-active agents. Corn cobs have the efficiency to adsorb contaminants from grey water. The purpose of this paper is Treatment of Greywater using Banana Peel, Orange Peel and Corn cob as major filter media

Keywords: Water Treatment, Banana Peel, Corn cob, Orange Peel

RESULTS

El agua es el elemento más importante necesario para la existencia de todos los seres vivos en la tierra. A medida que aumenta la población, también aumenta la demanda de agua. Alrededor del 75-80% del agua que pasa por las tuberías de distribución llega al alcantarillado como agua residual. Por eso es una necesidad de la humanidad reciclar y reutilizar las aguas residuales. El agua doméstica (agua gris del campus de TIST) del hogar se puede tratar y utilizar para riego en lugar de desecharla en el río. Este artículo se centra en la filtración de aguas grises utilizando cáscara de plátano, cáscara de naranja y mazorca de maíz como medio filtrante. Todos son buenos absorbentes naturales que pueden eliminar el exceso de nutrientes, sólidos en suspensión e incluso pueden eliminar contaminantes y sedimentos de las aguas residuales. La piel de naranja es un gran biosorbente. El biosorbente de cáscaras de naranja es uno de los mejores biosorbentes para eliminar el amoníaco y el nitrato

presentes en el agua. Las cáscaras de plátano son capaces de adsorber varios metales y otros contaminantes presentes en las aguas residuales industriales, siempre que las cáscaras estén pretratadas con agentes tensioactivos adecuados. Las mazorcas de maíz tienen la eficacia de adsorber contaminantes de las aguas grises. El propósito de este artículo es el tratamiento de aguas grises utilizando cáscara de plátano, cáscara de naranja y mazorca de maíz como medios filtrantes principales.

Palabras clave: Tratamiento de Agua, Cáscara de Plátano, Mazorca de Maíz, Cáscara de Naranja

INTRODUCTION

In the existing situation, wastewater treatment is a challenging issue for living organism and biophysical environment. The polluted water sources posture a serious issue concerning the various health hazards they bring along. Renewable methods involving the use of ecofriendly and natural materials for pollutant removal from wastewaters can offer a satisfactory solution suitable well with the characterization of sustainability. A water purification process is designed to remove or reduce existing water contaminants to the point where the water is fit for use. The purification technologies used in this experiment will help to remove the contaminants and give clear appearance to water in addition to the improvement in its smell and taste. Due to low cost and local availability of the materials used, this method is easy and can be preferred by everyone. All are good natural absorbent whichcan remove excess nutrients, suspended solids and can even remove pollutants and sediments from waste water.

MATERIALS AND METHODS

The study involved the collection and preparation of major filter media, including banana peel, corn cob, and orange peel. They were then dried in an oven at 120°C for 2 hours. Three tanks were constructed for the experiment with different dimension.

Table 1- Synthetic grey water sample 1

Compound	Composition
Glucose (mg/l)	300
Sodium acetate trihydrate (mg/l)	400
Ammonium chloride (mg/l)	225
Disodium hydrogen phosphate (mg/l)	150
Potassium dihydrogen phosphate (mg/l)	75
Magnesium sulphate (mg/l)	50
Cow dung (ml/l)	0.2

Each synthetic grey water sample was poured into the holding tank, and the grey water was then passed through the filtration tank. After a detention period of 60 minutes, the outlet valve was opened, and the filtered

water was collected in the collection tank. The physicochemical characteristics of the filtered water were tested before and after filtration.

Overall, the study aimed to evaluate the effectiveness of the constructed filter using various filter media in removing contaminants from synthetic grey water. The physicochemical characteristics of the filtered water were assessed to determine the filtration efficiency of the system.

RESULTS AND DISCUSSION

Physicochemical characteristics of the five samples before and after the filtration were tested and the results are compared with irrigation standards.

Table2.Comparison of Physicochemical characteristics of grey water sample1 before and after filtration with irrigation standards

Physio chemical characteristics of greywater	Irrigation Standards (IS:11624-2009)	Beforefiltration	After filtration
pH	5.5-9.0	6.95	6.2
TDS(mg/l)	500-2000	1661	1503
BOD(mg/l)	100	91	43
Hardness(mg/l)	150	151	121
Turbidity(NTU)	5-10	8.5	10.1
ElectricConductivity (µS/m)	<750	700	350

From the table 6, it is understood that the Physicochemical characteristics get reduced after filtration. Thus Corn cob, orange peel and banana peel can be used as filter media to treat grey water.

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