REUSE OF WASTEWATER TREATMENT TO IRRIGATE CONOCARPUS PLANT

Bushra A. Giadh*

College since – Thi-Qar Univ. Iraq.

ABSTRACT

This study used cheap and available fiber palms filter in limiting or reducing some properties (Total Suspended Solids), chemical characteristics (PH, biological oxygen demand, total phosphates and nitrates and some positive and negative ions), Bacterial (fecal coli bacteria) and some of the trace elements (zinc, lead, nickel, copper, cadmium) of sewage from the sewage treatment center in nasrya city - South Iraq. This filter scored a remarkable increase in the removal of the values of the properties mentioned above, compared with raw sewage, the Loyalty to the increase in the total dry weight of the root and vegetative conocarpus plant irrigated with wastewater treatment.

KEYWORDS: Sewage; Trace element; fiber palms filter.

INTRODUCTION

The problem of water quality and quantity of the problems that have emerged in the developing world are increasingly and continuously so is the re-use of wastewater process for agricultural purposes an integral part of strategies for water use in development projects, and is well-known for thousands of years practices, as defined since the eras of the ancient Egyptians, In countries such as China and Greece this practice, and it continues to this day, that the use of sewage water for irrigation saves a lot of expenses for fertilizer, and (Shahlam et al, 1998) shawed that the waste water rich in nutrients, leading to a lack of fertilizer requirements. Rowell (2006) Saied that There are many ways to remove contaminants from water, such as reverse osmosis and ion exchange and adsorption on carbon activated, as researcher found the possibility of the use of agricultural plants remnants of which are low cost and available to reduce metal ions from contaminated water, have been confirmed.
(Mahvi, 2008) on the high efficiency of agricultural fibers in the removal of heavy metals and phenols from wastewater.

The possibility of the use of palm fiber to remove heavy metals from waste water, which is an effective way to remove large amounts of heavy metals (Tan et al, 1993).

It has become a sewage treatment is an urgent need because of the shortfall in the waters of the rivers and the deterioration of their quality and this study was conducted to achieve the following objectives 1-The efficiency of the proposed transaction filter primary or secondary transaction after sewage to pass the palm fiber filter in the reclamation of wastewater characteristics. 2-For the purpose of the maximum benefit of this water for agricultural purposes rather than leaked to the neighboring station of abandoned land and then to the Euphrates River. 3-Reduce the pollution of putting waste water directly into the Euphrates River. 4- The *conocarpus* tree is evergreen, fast-growing, weather-tolerant and can be cultivated as a green belt around the cities for its bright greens and against desertification.

**MATERIALS AND METHODS OF WORK**

**Create and set up filter**

Pot 250 ml diameter 4 cm and length 20 cm and ends with a valve Triangle cone end of repression (Larson and schierap, 1981).

**Filter setting**

Wash filter with distilled water + Remove impurities + Drying + Grinding + sifting (1mm)

20g palm leaves are placed in a pot and add 200 mm of raw sewage, Then plug the nozzle down for up to an hour.

**Sampling**

Samples of wastewater were collected from the collection center of the sewage plant (1-1-2015) of the inner tubing to avoid differences that can be obtained at different times. The samples are placed in clean plastic bottles and stored in the refrigerator Under the temperature of 4°C until the required measurements, the method (Standard Method, 2005) In determining the chemical and physical properties and microbiological properties.
**Chemical properties**
- Water pH pH.
- Electrical connections (EC).
- Bio-oxygen requirement (BOD5).
- Total Nitrogen (TN).
- Total content of heavy metals.
- Total phosphorus (TP).
- Positive and negative ions (sodium ions, sulphates and chlorides).

**Physical properties**
Total solids (TS).

**Microbiology properties**
Fecal coli.

**RESULTS**
The results are as tables and forms below.

**Table 1: Chemical and physical properties of wastewater treatment Filtered as described in the study.**

<table>
<thead>
<tr>
<th>Properties filter</th>
<th>CL-(mg / L)</th>
<th>SO-(mg / L)</th>
<th>Na++(mg / L)</th>
<th>TPμg/l</th>
<th>TNμg/l</th>
<th>TS (mg / L)</th>
<th>EC Semens/m</th>
<th>Ph</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw wastewater</td>
<td>66.22</td>
<td>2.56</td>
<td>25.989</td>
<td>1.800</td>
<td>3.10</td>
<td>5009</td>
<td>8.12</td>
<td>6.55</td>
</tr>
<tr>
<td>fiber palm filter</td>
<td>25.45</td>
<td>2.10</td>
<td>17.50</td>
<td>1.55</td>
<td>1.5</td>
<td>3990</td>
<td>7.15</td>
<td>7.10</td>
</tr>
</tbody>
</table>

**Table 2: the concentration of heavy metals in sewage after passing on the study filter (μg/l).**

<table>
<thead>
<tr>
<th>heavy metals filter</th>
<th>Zn</th>
<th>Pb</th>
<th>Ni</th>
<th>Cu</th>
<th>Cd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw wastewater</td>
<td>7.9</td>
<td>6.44</td>
<td>3.03</td>
<td>0.11</td>
<td>0.45</td>
</tr>
<tr>
<td>fiber palm filter</td>
<td>4.9</td>
<td>3.4</td>
<td>2.5</td>
<td>0.6</td>
<td>0.22</td>
</tr>
</tbody>
</table>
Figure (1) the preparation of fecal coliform (cell / 100 ml) and the values of the biological oxygen demand (mg/L) in the raw sewage and after passing on the study filter.

Figure (2) compared to the total dry weight of shoot and root (g/pot) to plant wheat irrigated with wastewater filtered with palm fiber and irrigated with water piped.

DISCUSSION

PH

The pH value of the samples compared with the candidate wastewater, The study showed that the reason for the rise is due to the decrease in the microbiological analysis of the organic matter that produces acids due to the filtration process (Rockson, 2007).
**Biological oxygen demand (BOD₅)**

The efficiency of removal of the filter used in the study has been demonstrated in Figure 2 and is important in the removal of contaminants. This is consistent with Eljamal et al (2006).

**Total nitrogen (TN)**

Table 1 shows the efficiency of the palm fiber filter in total nitrogen removal due to the nature of the filter used in the study as opposed to the nitrification process, due to organic carbon, one of the factors affecting the reverse nitrification Eljamal et al (2006).

**Total phosphorus (TP)**

The results showed the efficiency of the filter in the removal of phosphoralky in wastewater. Table (1) due to filtration and adsorption process (Metcalf, 2003).

**Positive and negative ions**

The fiber palm filter played a prominent role in the removal of sodium ions, chloride and sulfate table (1) due to the efficient removal of most biodegradable elements when the pH of the water is reduced making it easier to separate the ionic materials with the filter components Imram (2005).

**Total dependence solid**

Table (1) shows the candidate's efficiency in removing the total suspended materials from the drainage due to the filtration process and adsorption process and this is consistent with the results of Imram (2005).

**Fecal coliform (FC)**

The results of the study show that (1) the number of bacteria (FC) in the wastewater before the filtration high numbers and the candidate has a prominent role in the removal of bacteria to no more than 60 cells / 100 ml and according to the specifications of the United States Environmental Protection Agency (2004).

Removal of bacteria from wastewater after use of filters due to the physical size of the bacteria due to their small size or process of adsorption as a result of Imram (2005).

**Heavy metals**

The results shown in Table 2 show that heavy metal concentrations (Zinc, lead, nickel, copper, cadmium) in wastewater above the proposed boundary (EPA-US, 1992). This
indicates that drinking water is not suitable for drinking, irrigation and purposes, and that the filter used to reduce the concentration of heavy metals Feris et al. (2003) and improve the quality of wastewater can be explained. For example, mechanical work where fiber is a palm tree that contains carboxylic groups and is an effective part of adsorption of heavy metals (Korshin et al., 1998).

The dry weight of the vegetative and root of the *conocarpus* plant

The results show in Figure (3) the dry weight of the vegetative and root populations, respectively (4.66) g and (1.55) g. He pointed out that no significant differences were recorded in the production of dry matter with the comparison of treatment (water of the area) (4.42 g) and (1.53) g. EPB (2004) confirmed that wastewater is a source of beneficial nutrients for plants, such as nitrogen and phosphorus, and contributes to increased crop production for heavy metals, Krichmer et al. (2003) reported that when irrigating with irrigation water, heavy metals did not accumulate in the soil and increased agricultural crops. Wang et al (1994) concluded that total soil content of heavy elements is important, but the most important factor is the extent of their readiness and melting in the soil.

CONCLUSIONS

1. Treated wastewater used in irrigation to protect the surface water from pollution and reduces the concentration of heavy metals to enter these waters.
2. Increase the value of irrigated plants by sewage treatment.
3. The efficiency of the palm fiber filter in the reclamation of wastewater and improve its quality.

REFERENCE


