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RESEARCH ARTICLE

The possibility of fertilizing the wheat plant by watering with wastewater treatment.

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Abstract

The present study addressed the use of filter inexpensive and available, a fiber palm in reducing or reduction of some physical property values (total suspended solids), and chemical properties (pH, bio-oxygen demand, total phosphate and total nitrate and some positive ions and negative) and germ (fecal coliform) and some trace elements (Zn, Pb, Ni, Cu, Cd) of wastewater taken from a sewage treatment center in the city of Nasiriyah - southern 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 plant wheat irrigated with wastewater treatment

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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) showed 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.

Methods and Materials Materials & Methods:-

Create and prepare the filter:

Bowl a 250 mL with a diameter of 4 cm and length of 20 cm and ends with a valve triangle cone to end repression prepares columns used in the filter depending on the style adopted by the (1981 Larson and schierap,) were selected for this study filter a fiber palm in various transactions in terms of configuration As set out in the table below

Filter	The filter weight material	prepare the filter
fiber palm	20 gm	It washes with distilled water + impurities removal + aerial drying +grinding +sieve (1mm)

Filter put in a bowl and add the nomination has 200 mm of raw sewage, and then seal the bottom nozzle was left up to an hour.

It took wastewater samples from Synthesis Center for the station sewage treatment to the province of Nasiriyah in (1-1- 2015) from the inner basin once to avoid differences that can get different times

Water and placed in containers, plastic clean and stored in the refrigerator under heat 4 M° hold until the required measurements, according to the method (Standard Method, 2005) in determining the chemical , physical and microbiological properties sewage

Chemical properties

The pH of water-

-Electrical Connectivity (EC)

(BOD5) -Biological Oxygen Demand-

-Total nitrogen (TN)

-Total phosphorus (TP)

- Positive and negative ions(Sodium , sulfate ions and chloride)

Total solids (TS)--Physical properties

-Microbiological properties -Thermo tolerant fecal Coliforms (FC)

-The total content of heavy metals

Results:-

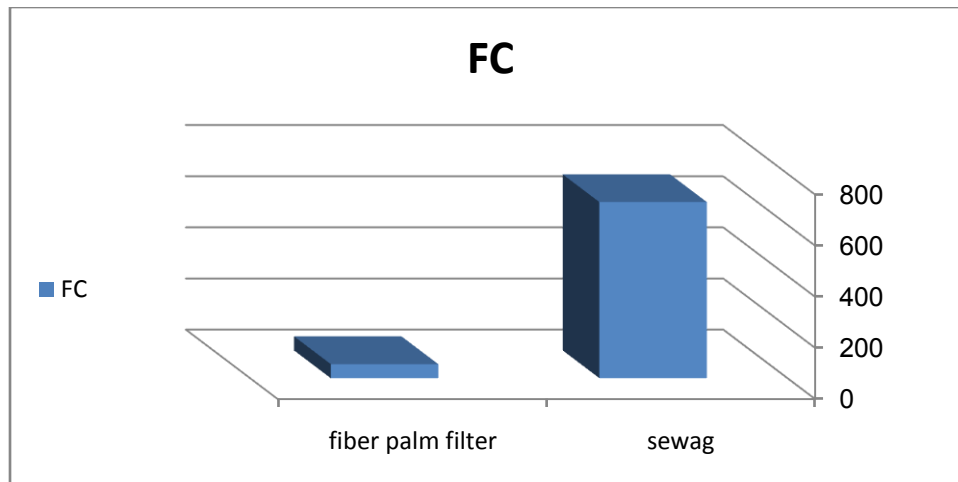
The results were found as tables and forms below :

Table (1)the chemical and physical properties of wastewater-treatment filtered as stated in the study

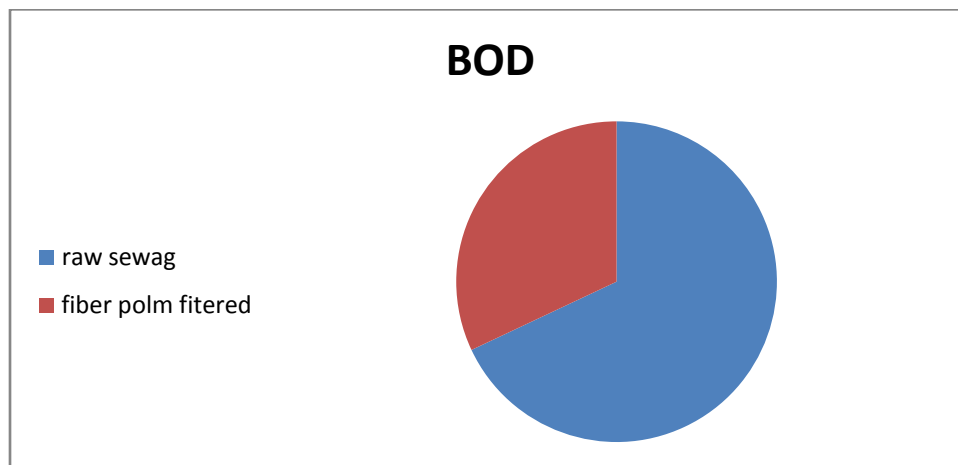
Properties filter	CL ⁻ (mg / L)	SO ₄ ⁻ (mg / L)	Na ⁺⁺ (mg / L)	TP µg/l	TN µg/l	TS (mg / L)	EC Semens/ m	Ph
Raw wastewater	66.22	2.56	25.989	1.800	3.10	5009	8.12	6.55
fiber palm filter	25.45	2.10	17.50	1.55	1.5	3990	7.15	7.10

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

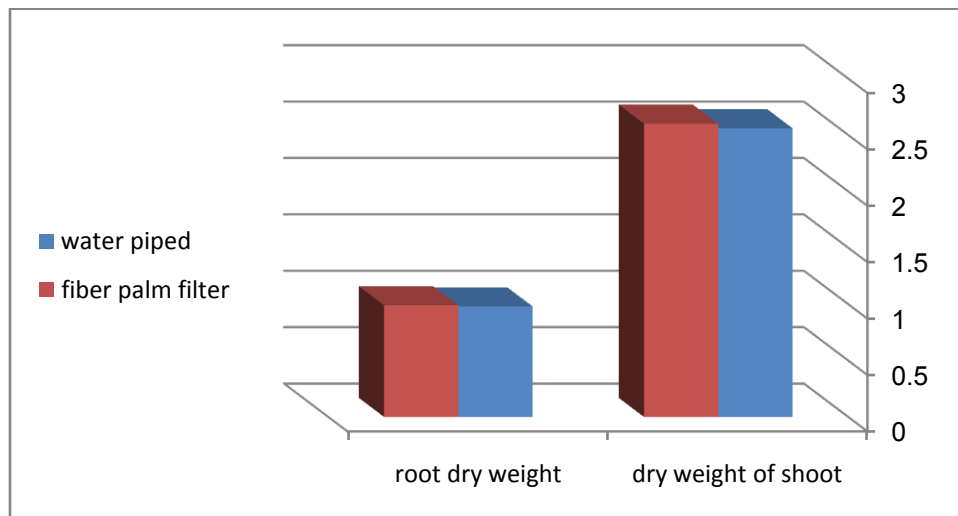
heavy metals filter	Zn	Pb	Ni	Cu	Cd
Raw wastewater	7.9	6.44	3.03	0.11	0.45
fiber palm filter	4.9	3.4	2.5	0.6	0.22



Form (1) the preparation of fecal coliform in the sewage after passing on the study filter (cell / 100 ml)



Form (2) the values of the vital requirement for oxygen in the raw sewage and wast water filtered (mg / L)



Form (3) 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 rose in the samples compared to the sewage filtered, and the study showed that the reason for the rise is due to a decline in microbiology analyst for organic mater and producing acids because of the filtration process (2007 Rockson

- Biological oxygen demand (BOD₅)

It proved the efficiency of removal of the filter used in the study form (2) function returns the formation coagulant and effective materials and are important in the removal of pollutants and this is in line what he got Eljamal etal(2006)

Total Nitrogen (TN)

The table(1) shows the efficiency of fiber palm filter in removing total nitrogen (TN) due to the filter nature used in the study in which you get reverse the process of nitrification, because of an organic carbon source, one of the factors that affect the reverse nitrification This is consistent with the Eljamal etal(2006)

Total phosphor (TP)

The results show the efficiency of the filter in the removal of total phosphorus in waste water table (1) returning to the filtration and adsorption process (Metcalf ,2003)

-Positive and negative ions

The fiber palm filter a prominent role in the removal of sodium and chloride and sulfate ions table (1) the reason for removal efficiency due to that most of the elements are dissolved and ready when low water Ph making it easier separated ion exchange material with components filter Imram(2005)

Total suspension mater(TS)

table(1) shows the efficiency of the filter in the removal of total suspended material from sewage because of the filtration process and the process of physical adsorption This is consistent with the findings of the Imram(2005).

Fecal coliform

Evidenced by the results of the study are described in the form (1) that the number of bacteria (FC) in the wastewater before treatment was too high has contributed user filtered in a prominent role and efficient in the removal of bacteria so that no more than 60 cells / 100 ml according to EPA specifications United States (2004) and can be explained by the removal of bacteria from sewage water after using the filters due to the physical size of the bacteria because of their small size or the process of adsorption as a result of (Imram, 2006).

-Heavy metals

Results shown in the table (2) that the heavy metals concentrations (Zn, Pb, Ni, Cu, Cd) in waste water was higher than the ranges proposed for the Environmental Protection Agency of the United States (1992 EPA- US), and this indicates a lack of wastewater validity for drinking purposes and irrigation, shares of the filter used in the study to reduce the concentration of heavy elements Feris et al., (2003) and improve wastewater quality in accordance with the regulation and parameters used in the study can be explained by the example of mechanical working whereby material fiber palm is that they contain carboxyl groups (Carboxyl group) which is effective portion with including heavy elements which they are also (Korshin et al,1998)

Dry weight of shoot and root of wheat crop

Results show described in Figure(3) parts dry weight in shoot and root for the wheat crop irrigated water palm fiber filter (1.45) and (0.55) g / pot respectively noted that he did not record significant differences in the production of dry matter with treatment comparison (water piped) as the percentage (1.42) and (0.53) g / pot of shoot and root in a row and this was confirmed by EPB(2004) in the sewage source of useful nutrients for the plant, such as nitrogen and phosphorus, and contribute to the increase crop production and pointed out AL-Shadieyal et al(2009) study, which was carried out during the years (2003-2002) to be reclaimed sewage-added has increased the concentration of nitrogen and phosphorus compared with Fresh water irrigation . As for the heavy elements have Kretschmer et al(2003) that when irrigation sewage did not get any accumulation of heavy metals in the soil and led to the increase of some agricultural crops. Wang et al(1994) Concluded that the total soil content of heavy elements is important, but the most important factor is the extent of their readiness and their solubility in the soil solution and then readiness of the plant

Conclusions:-

- 1-The treated wastewater for irrigation use to protect surface water from pollution and reduces the heavy metals concentration entering these waters.
- 2-Increase the quotient of plants irrigated with sewage treatment.
- 3-Soil that can suffer from a lack of nutrients particularly useful, including the plant in case of non-fertilizer use or reclamation when the farmer is unable to add commercial fertilizer.
- 4-Efficiency fiber palm filter in the reclamation of waste water and improve its quality.

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