HYBRID BIOLOGICAL REACTOR FOR WASTE WATER TREATMENT

A Thesis Submitted To Faculty of Engineering Ain Shams University for the Fulfillment of the Requirements of M.Sc Degree in Civil Engineering

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Dedication

I wish to dedicate this work to whom suffered to educate, prepare, build capacity and help myself to be as I am,

To

MY FATHER

&

MY MOTHER

Also thanks to

MY WIFE

&

MY SISTERS & BROTHERS

For their encouragement and support to complete this work

STATEMENT

This dissertation is submitted to Ain Shams University, Faculty of Engineering for the degree of M.Sc. In Civil Engineering.

The work included in this thesis was carried out by the author in the department of Public Works-Sanitary, Faculty of Engineering, Ain Shams University from 2006 to 2013.

No part of the thesis has been submitted for a degree or qualification at any other University or Institution.

The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

Date / / 20

Signature

Mostafa Mamdouh Mohamed Mohamed Abd El Latief.

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ABSTRACT

Name: Mostafa Mamdouh Mohamed Mohamed Abd EL LAtief.
Title: "Hybrid biological reactor for waste water treatment"
FACULTY: Faculty of Engineering Ain, Shams University
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ABSTRACT

The increasing demands for more stringent water quality effluent standards during the last decades in both developed and developing countries led to the rehabilitation and/or upgrading of many existing wastewater treatment plants in addition to increasing investments in constructing new plants.

In the past few years, many efforts have been made to improve and enhance the efficiency of conventional biological processes dedicated for wastewater treatment coupled with trials to reduce reactor volume and land area requirements. A recent development in this domain is the hybrid system.

Therefore pilot plant experimental program has been conducted in Zenien waste water treatment plant aiming at verifying the enhanced efficiency of adding attached biomass inside the aeration tank.

The experiment's target was as following:

- Analysis and study the results of a pilot plant of the hybrid system and compared it with the conventional activated sludge system.
- Developing a mass balance analysis based on COD to determine the utilization rates of bacteria.

The results proved that the COD removal values reached 85.17%, 84.97% and 80.83% at a hydraulic retention time of 6, 4, and 2.

Corresponding BOD removal values reached 88.52%, 88.32% and 86.94%at a hydraulic retention time of 6, 4, and 2.

Corresponding TSS removal values reached 85.48%, 85.28% and 83.89% at a hydraulic retention time 6, 4, and 2.

The results proved that the system could accommodate the increasing of organic loading rate and was efficient for removal of COD, BOD and TSS.

SUPERVISORS
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