بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

TREATABILITY OF DOMESTIC WASTEWATER BY WATER HYACINTH AND FISH AQUACULTURE

Thesis

Submitted To the High Institute of Public Health in

Partial Fulfillment for the Requirements of the Degree of

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(Environmental Chemistry and Biology)

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DEDICATION

To my husband, my daughter and my son for their patience and support, and for allowing me to take the time to complete this study.

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Chapter I

Introduction

I. Introduction

Water pollution is a concern of governments all over the world. Sewage and industrial effluents discharged into rivers and lakes have become a serious problem, which will take sometime to solve. Nevertheless, researchers are putting their efforts into finding solutions, which are economically feasible; since in less developed countries conventional methods are very expensive and cannot usually be used [1]. In many arid and semi arid countries water is becoming an increasingly scarce resource and planners are forced to consider any additional sources of water which might be used economically and effectively to promote further development. At the same time, with population expanding at a high rate, the need for increasing food production is apparent [2]. In addition the amount of human waste potentially available for reuse in developing countries is prodigious and if utilized effectively, could play a tremendous role in food production [3].

Egypt is facing serious water quality and quantity problems. These problems can lead to many economic and political problems especially with other neighboring countries, which share Egypts the Nile River, especially where the predictable next war in the world is about water resources. The need to use modified scientific ideas to combat water pollution and improve sanitation in urban and rural areas in Egypt, have recently become apparent. These ideas would potentially adopt simple and easy to operate technique for wastewater treatment especially in remote urban and less densely populated rural areas.

With increasing urbanization and industrialization the volume of wastewater including sewage, industrial effluents, agricultural wastes and urban runoff are steadily growing. All these wastewater must be assimilated into the environment without impairing the health and well being of man. It is therefore necessary to facilitate natural processes of purification through the use of biological wastewater treatment systems [4].

In this sense, an appreciable research has been carried out in the field of wastewater purification by means of oxidation ponds or waste stabilization ponds, and be reused in aquaculture which are considered, reliable, efficient, economical and simple process of sewage treatment.

Wastewater stabilization ponds (WSPs) system is a man-made pond (treatment unit) in which wastewater is allowed to stand for a time, under the influence of microorganisms and the forces of nature, so that it is converted into an effluent that meets the quality standards established for final disposal or reuse.

Oxidation ponds are one of the best ways for domestic wastewater treatment plant, which comprise anaerobic, facultative and maturation ponds. These ponds are simple to operate and do not need highly skilled labors. Water coming out of the maturation ponds can be reused for land irrigation or for fish culture [5].

Climatic conditions of Egypt are characterized by abundant sunshine throughout most months of the year, and by rainfall which generally is limited to winter months. This climate favors the use of stabilization ponds as a practical method for treatment and water reclamation.

Stabilization pond systems are known to have advantages over other types of wastewater treatment processes. One major advantage is their ability to provide enhanced removal of pathogens, which is of great benefit to health. The effluent is safer than that from many other processes, allowing it to be reused in agriculture and aquaculture.

Furthermore, the pond process is appropriate for both large and small populations; for example, some of the world's largest pond installations treat wastewater from more than a million person [5].

The one disadvantage of stabilization ponds is that they require large areas of relatively flat land. Increasing pond depth is one example to reduce the pond area required [3].

The increasing global importance of aquaculture as a food-producing activity is mirrored by the continuing decline in wild fish stocks [6]. Cultivation of fish in domestic wastewater is logic both to control pollution and to obtain a cheap supply of protein [5].

Furthermore fish aquaculture reared in created domestic wastewater is one means of producing a large amount of protein material in a relatively small space. Economic benefits from fish culture are usually higher than those from traditional agriculture crops [5]. Millions of persons, particularly in Asia, depend on reuse of treated wastewater and for the provision of food through agriculture and aquaculture[3]. In India there are more than 132 wastewater fertilized fishpond system covering an area of 12000 ha, most are located in west Bengal. The largest wastewater based aquaculture system in the world is that in Calcutta. Mean annual yields are more than 1000 Kg/ha from a pond system with an area of 4400 ha.