



CHAPTER 1

INTRODUCTION

In recent years public attention has been focused increasingly on environmental pollutions and its effects on man and other creatures. Domestic wastewater is one of the major causes of pollution. Several treatment methods for domestic wastewater have been proven to be effective means, for example, stabilization pond, activated sludge, trickling filter, anaerobic digestion and septic tank or land disposal. The last method is the simplest and oldest one. Investigations concerning land disposal in Thailand (1, 2, 3) and many countries (4, 5, 6) indicated that several pollutants from domestic wastewater could be reduced to an acceptable level. Soil contamination by certain pollutants may affect the quality of soil such as salt forming, salt balance and microbial population. Therefore, general understanding of the pollutants themselves, their reactions in soil, and the mean of increasing, destroying or inactivating them are essential.

1.1 Objective

The objective of this study were:

1.1.1 to determine the chemical and biological properties of domestic wastewater i.e., N-form, P-form, Ca, Mg, Na, K, Cl, SO_4 and fecal coliform (*Escherichia coli*. or E.coli);

1.1.2 to monitor the physical, chemical and biological properties of different soil series before and after have passage domestic wastewater for at least 20 weeks ;

1.1.3 to determine the characteristics of effluent after passing through the tested soil columns. The monitoring parameters

were $\text{NO}_3\text{-N}$, $\text{NH}_4\text{-N}$, orthophosphate, Ca, Mg, Na, K and Cl, SO_4 and E.coli and

1.1.4 to compare the efficiency of different soil series as a living filter for domestic wastewater disposal.

1.2 Scope

The scope of the study were:

1.2.1 the experiments were performed in laboratory scale only ;

1.2.2 soil types were packed in 60 cm long and 7.5 cm ID PVC pipes, to be used as tested columns and domestic wastewater were feed through soil columns everyday at least 20 weeks ;

1.2.3 soil samples were Pak Chong, Khamphaeng Saen, Muak Lek and Ban Bung series ;

1.2.3 domestic wastewater was collected from Grit Chamber at Huaykwang Treatment Plant ;

1.2.4 to determine pH, N-form, P-form, Ca, Mg, Na, K, Cl, SO_4 COD and fecal coliform in influent and effluents; and

1.2.5 to determine the parameters in different soil series before and after treatment, i.e., CEC, organic carbon, pH, N-form, P-form, Ca, Mg, Na, K, Cl, SO_4 and E.coli.

1.3 Laboratory

The experiment set and analyzing of influent and effluent were performed at General Science Department, Faculty of Science, Chulalongkorn University. Different parameters of soil columns before and after treatment were examined at Ecology section, Chemical Soil Analysis Division, Land Department of Ministry of Agriculture and Cooperation.

1.4 Benefit and Application

1.4.1 Different several capacities of each soil series approximated and may be used as basic information for wastewater treatment in horizontal flow seeping method.

1.4.2 The results of certain soil series that were not suitable for wastewater treatment may be used to guide for soil improvement by soil texture mixing.

1.4.3 It may be possible to use soil and vegetation for wastewater treatment.



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