CHAPTER I

INTRODUCTION

1.1 Background

The Nile tilapia is one of the most important aquatic economic animals in Thailand. Consumption and export of Nile tilapia has expanded recently with more than half of the total freshwater fish exported consisting of Nile Tilapia (Customs Department, 2007). Besides its high demand amongst consumers, Nile tilapia is popular with framers as they are easy to grow, resistant to diseases, fast to harvest, and can tolerate a wide range of environmental conditions.

In raising the tilapia, an all male population is preferred as the male tilapia grows faster by more than 25 percent than the female tilapia (Penpan, 2004). There are many ways to produce an all male population of Nile tilapia. Some of the ways include interspecific hybridization, use of supermale tilapia (genetically altered male tilapia, (GMT)), and use of male-inducing hormones such as methyltestosterone (MT). Use of male-inducing hormones is common and popular. Hormones can be administrated to fish by dipping them into a solution containing the hormone, or by mixing the hormones with fish feed. Examples of hormones used are 19-norethyltesterone, fluoxymestirone, ethyltestosterone, and MT. MT is the most common hormone used and is effective, easy to use, and of low cost. More than 90% of fish can be changed to male after hormone treatment (Kriangsak et al., 2006).

Farmers use 0.06 mg of MT for every 1 kg of feed during the first 30 day after the birth of tilipia. After the yolk sac starts to disappear (3-4 days), the frys are fed 5 times a day with the impregnated food. In the first week, the amount of feed provided is approximately equal to 30% of the body weight of the tilapia. In the second week, the amount of feed provided is reduced to 20% of the tilapia body weight and in the third week, the amount of feed provided is about 15% of the tilapia body weight. After 30 to 60 days, the percentage of male population is around 86-100% (Kere, 1999; Penpan, 2004)

Methyltestosterone is an immiscible compound with a solubility of about 3 mg/L in water. As shown in the study by Fitzpatrick et al., (1999), MT remained in

soils at concentrations between 2.8 and 2.9 ng/g, eight weeks after ending treatment with methyltestosterone-impregnated food. It is possible that MT is sorbed onto the sediments of the fish pond and may contaminate the environment and impact other aquatic organisms, if the sediments are released. To date, there are not much information on the sorption of MT onto sediments and soils.

1.2 Objectives

The specific objectives of this study are:

- To study sorption of MT onto different types of soils and sediment
- To study effect of pH on sorption of MT
- To study effect of salinity on sorption of MT

1.3 Scope of the study

Batch sorption experiments were conducted to study the sorption of MT onto different types of soils with different physical-chemical charcateristics. The soils used include sand, lateritic soils, garden soil-1, garden soil-2, garden soil-3, clay, and sediment. The soils have different organic carbon content, surface area, sand and clay fractions, and initial pH. Sorption of MT onto the sediments and soils were studied at different pHs and at various salinity of the water.

1.4 Hypothesis

Sorption of MT to soils and sediment is a function of not only organic control but also pH, and salinity.