WATER QUALITY VARIATIONS AND DECAY RATES OF *E. COLI* IN WATER AND SEDIMENT OF THE SERIN RIVER

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INTRODUCTION

Intensive livestock farming is known to produce pollution problems due to poor waste management (Hooda *et al.* 2000). In Malaysia, studies on swine farming carried out in West Malaysia, Sarawak and Sabah showed that raw wastewater was high in solids, organic matter, nitrogen and phosphorus (Taiganides *et al.* 1986; Kinson *et al.* 2001; Ling *et al.* 2008). Lagoon effluent quality depends on the number and size of lagoons and the management of the system (Ling *et al.* 2008). Undersized lagoons and poor management was reported to lead to poor effluent quality and pollution in the receiving river (Kinson et al. 2001). In Sarawak, Sg. Serin in Serian district is an important river as it is a source of drinking water. According to a studies conducted, it was reported that the tributary receiving farm lagoon effluents have significantly lower water quality than other tributaries which did not receive any farm lagoon effluents and the river water was contaminated by *E. coli* (Ling *et al.* 2006). However, variations of water quality at that tributary and decay rate of *E. coli* in the river were not known. Therefore, the objectives of this study were to determine the variations of water quality in the river water in the daytime and to determine the decay rate of *E. coli* in river water and sediment.

MATERIALS AND METHODS

Sampling of river water was conducted continuously from 8:30am to 4:30pm on 4th November 2003. In situ parameters measured were temperature, pH, and DO (dissolved oxygen). Water samples were placed in polyethylene sterile bottles and stored in an icebox before transportation to the laboratory for analysis. BOD_5 was analyzed according to Standard Methods (APHA 1998). *E. coli* population in the water samples was analyzed using spread plate method. Sampling of water and sediment for laboratory experiment was conducted at the Serin River between 29 October and 11 November 2003 using a grab sampler. In the decay study, a wild strain *E. coli* was isolated from swine waste. It was grown and cultured on Lauryl Sulphate broth (LB broth) (Fluka, Switzerland), nutrient agar (Oxoid, England) and Eosin methylene blue (EMB) agar (Oxoid, England). Inoculum concentration of 10^5 to10^6 cell/mL was determined by calibration. A hundred gram of river bottom samples with river water was placed in a 250 ml beaker. After settling, 1-2 cm of water column appeared above the sediment. One millilitre of inoculum was added to the sediment and mixed. One millilitre of the water was sampled for *E. coli* count. The beakers were covered with aluminium foil and incubated separately at 20°C and 30°C. For sterile condition, the beaker containing sediment was autoclaved before inoculation. The experiment was performed in triplicate. Sampling was done daily for a week after which alternate days until all *E. coli* colonies were undetectable. For the sterile condition, it was sampled until 29 days for 30^0C setup and 43 days for 20^0C