

SEDIMENT OXYGEN DEMAND OF THE SERIN RIVER

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ABSTRACT

Stream sediment is a sink for organic materials. Though Serin River is a source of drinking water, agricultural activities in the watershed may impact the sediment of the river thus affecting its water quality. Therefore, the objective of this study was to investigate the organic matter and oxygen demand of the sediment at three selected stations (1: upstream station, 2: downstream of fish culture, and 3: downstream of pig/chicken farm). Sediment was sampled from the selected stations and the oxygen demand measurement was conducted in the laboratory. Results of this study indicate that organic matter ranged from 0.8 to 4.7% and sediment oxygen demand (SOD₂₀) ranged from 6 to 11 g O₂/m²/d. Among the stations, oxygen demand of the sediment was the highest at the station downstream of fish aquaculture site and the second highest downstream of chicken and pig farming. Station 1 with sandy sediment had the lowest concentration of organic matter and oxygen demand of all stations. Sediment oxygen demand was negatively correlated with sand content. This study indicates that animal farming and fish aquaculture have impacted the organic matter content and oxygen demand of the sediment of the river. There is evidence of positive effects of pig farm oxidation ponds wastewater treatment as sediment oxygen demand downstream of the discharge was not the highest among the stations. Agricultural effluents should be well-treated to protect the river sediment from being polluted.

Key words: Sediment oxygen demand, sediment organic matter, sediment pollution, river sediment

INTRODUCTION

River sediment is a sink for organic materials, sources of which include waste discharged into the water bodies and naturally occurring aquatic plants and animals (Truax et al., 1995). The Serin River is a source of drinking water. However, agricultural activities including pig, chicken and fish farming may have an impact on the sediment quality. Studies indicated that the water at the tributary that received animal farm effluent showed low dissolved oxygen and high nutrient content (Ling et al., 2006). However, no study has been conducted on the sediment of that river.

Organic materials in the sediment may exert a demand on the oxygen of the overlying water resulting in low dissolved oxygen in water which can threaten the lives of aquatic organisms. Organic phosphorus liberated by bacterial communities will result in an increase in total phosphorus in the upper layer of sediment which may lead to