

SHRIMP (*PENEAUS VANNAMEI*) POND SLUDGE CHARACTERISTICS

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ABSTRACT

Shrimp aquaculture is an important aquaculture industry in Sarawak as it brings income and provides protein for the local population. However, during harvesting, sludge at the bottom of the pond had to be removed from the pond before the next stocking occurs. The characteristics of pond sludge had to be studied so that nutrients can be recycled. Therefore, the objective of this study was to determine the characteristics of shrimp pond sludge. Sludge from five ponds was analyzed for particle size, organic matter and total phosphorus. Results indicate that sediments from the five ponds were classified under silt and clay loam with 15-29% clay, 36-62% silt and 18-35% sand. pH ranged from 6.5-7.5. Electrical conductivity ranged from 1691-2779 μ S. Bulk density ranged from 1.3-1.6 g/cm³. Sludge was rich in organic matter ranging from 11-19%. As for total phosphorus, the values ranged from 203 to 294 μ g/g. Zinc concentrations (9-21 mg/kg) was higher than copper (6-10 mg/kg). Regression indicated that total phosphorus is significantly correlated with clay content in the sludge with R² of 87.3%. This shows the association of phosphorus with clay fraction in the sludge. This study shows that sludge contains macronutrient such as phosphorus and micronutrients such as Zn and Cu for plants and those nutrients need to be recycled to prevent water pollution and replenish the depleting non-renewable resource.

Keywords: pond sludge, shrimp culture, phosphorus, zinc, copper

INTRODUCTION

Aquaculture has become an important industry for meeting the food demand of the world population due to the inability of marine fish and prawn landings to meet the increasing demand (Currie, 2000). Shrimp farming is one of the aquaculture industries meeting such demand. Major shrimp producing countries are in Asia, where the black tiger shrimp (*Penaeus monodon*) is the predominant farmed

species and Central America where white shrimp (*Penaeus vannamei*) is the predominant species (Flaherty *et al.*, 2000). Due to the abundant natural resources, Sarawak is a key producer of black tiger shrimp (Nyanti *et al.*, 2002). However, in recent years, many farm operators culturing tiger shrimp previously shifted their focus to white shrimp culture due to slow growth and diseases affecting tiger shrimp production whereas the white