

Increasing risk of heavy metal contamination in silvofishery ponds

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Abstrak

This research aims to observe the concentration of organic matter, Pb and Cd in a silvofishery pond, to study the toxicity level status, to analyze changes in their concentration within a year's period, and to analyze the correlation between the concentration and changes. The research was conducted through field observation and laboratory analysis from May 2016 to July 2017, which included five observation activities. Statistical analysis was conducted by using ANOVA and correlation tests. The results show that the concentration of organic matter, Pb and Cd, was increasing in all five observations. Throughout the research, the ranges of organic matter, Pb and Cd, were recorded at 1.60–3.30 mg/kg, 3.130–8.230 mg/kg, and 1.089–2.820 mg/kg, respectively. In all observations, toxicity level showed that Cd concentration in the sediment had exceeded the standards recommended by US EPA (≈1.0 mg/kg) and ANZECC & ARMCANZ (≈1.5 mg/kg), while Pb was within the safe range (≈21 mg/kg and ≈50 mg/kg). The correlation analysis showed that the concentration and accumulation of Pb and Cd were highly related, which indicated the possibility of the same pollutant sources. Recommendations for a better management plan to avoid heavy metal accumulation in silvofishery ponds would include the arrangement of mangrove plants in inlet canals and periodic pruning to hinder heavy metal from returning to the environment through litter fall.