Nutrient accumulation by litterfall in mangrove forest at Klong Khone, Thailand

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Abstrak

Litter production is one of the major nutrient enrichments in a mangrove forest. Investigation on nutrient components in litter will lead to evaluation of nutrient accumulation. Therefore, this research aimed to 1) evaluate litter production in tropical mangrove forest at Klong Khone, Samut Songkhram province, Thailand; 2) investigate carbon, nitrogen and phosphorus contents in litter; and, 3) observe sediment quality and existing mangrove condition in the study area. Litter and sediment were collected at Klong Khone, Samut Songkhram province in September-October 2015. Litter samples were analyzed for biomass production, and composition of carbon, nitrogen and phosphorus. Sediment samples were analyzed for pH, salinity, water content, grain size composition, organic carbon, total nitrogen and total phosphorus. Results showed that leaf, branch, and fruit litter production were 65.02, 47.94 and 19.03 g DW/m2/month, respectively. Carbon, nitrogen, and phosphorus content in the litter were 20.36, 0.37 and 4.47 mg/g DW leaf litter, respectively. The value of pH, salinity and water content of sediment ranged from 6.66-7.50, 3.30-9.28 ppt and 52.24-69.65%, respectively. Sediment was composed of fine sand (0.125-1 mm) 7.68%, silt (0.06-0.125 mm) 6.13%, and clay (smaller than 0.06 mm) 86.19%. By using statistical analysis (t-test), results showed no difference of all parameters between months. However, during the research, it was found that organic carbon decreased 2.37 mg C/g DW sediment; meanwhile nitrogen and phosphorus increased 0.44 mg N and 0.12 mg P /g DW sediment, respectively. Finally, carbon, nitrogen and phosphorus accumulation by litterfall were found to be 1877, 34 and 734 mg/m2/month, respectively. These results will help in clarifying nutrient dynamic pathway by mangrove trees which play an important role in coastal and estuarine ecosystem restoration.