Abstract

The water hyacinth (Eichhornia crassipes (Mart.) Solms.) plants in lakes and reservoirs have gained considerable attention in tropical and sub-tropical parts of the world due to its rapid growth. The amount of nutrients released from the dead plant materials is of particular interest. Thus, decomposition of water hyacinth plant parts under aerobic conditions was studied in the laboratory. Roots, petioles, and leaves of water hyacinth were enclosed separately in one litre polypropylene bottles which contained 500 ml of lakewater. To study the influence of bacteria on the decomposition, antibiotics were added to half of the bottles. We observed that decomposition of leaves and petioles without antibiotics were relatively rapid through day 61, with almost 92.7 and 97.3% of the dry mass removed, respectively. Weight loss due to bacterial activities during 94 days decomposition was 22.6, 3.9, and 30.5% from leaf, petiole, and root litter. Decomposition of litter in lake water indicated that after 94 days 0.6, 0, and 0.6 g m$^{-2}$ of leaf, petiole, and root N was dissolved in leachate, while 23.1, 14.4, and 6.0 g m$^{-2}$ of leaf, petiole, and root N was either volatilized or remained as particulate organic N. Moreover, 0.2, 0, and 0.1 g m$^{-2}$ of leaf, petiole, and root P remained dissolved in the leachate, while 3.1, 3.4, and 1.1 g m$^{-2}$ of leaf, petiole, and root P was either precipitated or remained as particulate organic P. The carbon dynamics during the decomposition indicated that 7.4, 28.8, and 3.7 g m$^{-2}$ of leaf, petiole, and root C remained dissolved in the leachate after 94 days while 228.0, 197.6, and 107.4 g m$^{-2}$ of leaf, petiole, and root C was either diffused or remained as particulate organic C. These findings are useful for quantifying the nutrient cycles of very shallow lakes with water hyacinth under aerobic water environment. Further examination of the fate of the plant litter as it moves down in deep anaerobic water environment, is necessary to understand the leaching process better.