Hydrobiologia 541 (2005) Decomposition of Eichhornia crassipes

Abstract

The water hyacint h (Eichhornia crassipes (Mart.) Solms.) plants in lakes and reservoirs have gained con-siderable attention in tropical and sub-tropical parts of the world due to its rapid growth. The amount ofnutrients released from the dead plant materials is of particular interest. Thus, decomposition of waterhyacinth plant parts under aerobic conditions was studied in the laboratory. Roots , petioles, and leaves ofwater 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 throughday 61, with almost 92.7 and 97.3% of the dry mass removed, respectively. Weight loss due to bacterialactivities during 94 days decomposition was 22.6, 3.9, and 30.5% from leaf, petiole, and root litter.Decomposition of litter in lake water indica ted that after 94 days 0.6, 0, and 0.6 g m)2of leaf, petiole, androot N was dissolved in leachate, while 23.1, 14.4, and 6.0 g m)2of leaf, petiole, and root N was eithervolatilized or remained as particulate organic N. Moreover, 0.2, 0, and 0.1 g m)2of leaf, petiole, and root Premained dissolved in the leachate, while 3.1, 3.4, and 1.1 g m)2of leaf, petiole, and root P was eitherprecipitated or remained as particulate organic P. The carbon dynamics during the decomposition indicatedthat 7.4, 28.8, and 3.7 g m)2of leaf, petiole, and root C remained dissolved in the leachate afte r 94 dayswhile 228.0, 197.6, and 107.4 g m)2of leaf, petiole, and root C was either diffused or remained as par-ticulate organic C. These findings are useful for quantifying the nutrient cycles of very shallow lakes withwater hyacinth under aerobic water environment. Further examination of the fate of the plant litter as itmoves down in deep anaerobic water environment, is necessary to understand the leaching process better