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Evaluating the effects of aquatic plant decomposition on the water quality of lakes

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In an aquatic system, macrophyte die-off may occur as a result of plant maturity, or herbicide application. Some of the detritus produced falls beneath the plant canopy and accumulates at the sediment-water interface. By both solubilization and microbial processes the nutrients potentially become available to the adjacent living plants. Retention and decomposition of aerial water hyacinth (*Eichchornia crassipes* (Mart) Solms) tissues may serve as an efficient means of nutrient cycling from dead to living tissues. Temperature and dissolved oxygen content of the water are probably one of the most important factors influencing the extent and rate of nutrient release from detritus plant tissue. However, very little is known on the effect of these factors on nutrient release from decomposing aquatic plants in aquatic systems. The objectives of this experiment were to find the rate of decomposition, losses of dry weight and mineral nutrients release from leaf, petiole, and root of water hyacinth under aerobic environment.

Roots, petiole, and leaf of water hyacinth were enclosed separately in one liter polypropylene bottles of which contain 500 mL of lake water. We observed that decomposition of leafs and petioles were relatively rapid through day 61, with almost 92.7% and 97.3% of the dry mass removed respectively. Decomposition of litter in lake water indicate that after 94 days 2.5 %, 0 %, and 6.0 % of leaf, petiole, and root nitrogen is dissolved in leachate, while 90.7%, 97.2%, and 59.7% of leaf, petiole, and root nitrogen is either volatilized or remain as particulate organic nitrogen. Moreover, 6.2 %, 0 %, and 2.9% of leaf, petiole, and root phosphorus remains dissolved in the leachate, while 89.4 %, 94.3 %, and 68.5 % of leaf, petiole, and root phosphorus is either precipitated or remain as particulate organic phosphorus. The carbon dynamics during the decomposition indicate that 3.0 %, 12.3 %, and 2.3 % of leaf, petiole, and root carbon remains dissolved in the leachate after 94 days while 91.6 %, 84.2 %, and 65.0 % of leaf, petiole, and root carbon is either diffused or remain as particulate organic carbon.

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