

Impact of walking catfish (*Clarias batrachus*) on growth of water chestnut (*Trapa bispinosa*) and waterhyacinth (*Eichhornia crassipes*) in waterlogged ecosystem

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In an integrated aquaculture and aquatic crop cultivation system, comparative growth analysis of aquatic crop, water chestnut (*Trapa bispinosa* Roxb.) and waterhyacinth [*Eichhornia crassipes* (Mart.) Solmes], a weed in waterlogged areas, was carried out to understand the extent of interference of waterhyacinth on growth and fruit yield of water chestnut and associated yield of fish. Growth of water chestnut was faster during the first 2 months after planting, and thereafter the growth rate of waterhyacinth was faster and suppressed growth of water chestnut. Fast-growing waterhyacinth restricted leaf area development and affected crop growth rate of water chestnut. Flowering frequency of the water chestnut plants, which had an influence on fruit initiation and yield, was also severely reduced in the presence of waterhyacinth vegetation. Fruits were smaller, with pale-colored peels. The coexistence of waterhyacinth caused 93% decrease in the yield of water chestnut from 3.96 t ha⁻¹ to 0.25 t ha⁻¹. Survival rate of walking catfish [*Clarias batrachus* (Magur)] was highest (68%) in plots with water chestnut followed by waterhyacinth-infested plots (44%). The highest fish yield (1.8 t ha⁻¹) with higher mean body weight (360 g) was noted in plots with water chestnut compared to fish yield of 0.79 t ha⁻¹, with average mean body weight of 224.5 g in plots with both water chestnut and waterhyacinth. Gut contents analysis showed 25 to 30% natural food from the ambient ecosystem when fish was reared with water chestnut. Infestation of waterhyacinth not only suppressed growth and yield of water chestnut, but also significantly reduced the growth and yield of fish, probably due to competition for space and nutrients, very low primary productivity, and low-intensity light penetration. However, walking catfish and water chestnut could be grown together, as fish with water chestnut recorded the highest production size index (648), performance index (194.9), and apparent feed conversion ratio (1.39). Therefore, a fish þ water chestnut system provided better aquatic environment than a fish + water- hyacinth system, and a reduction of supplemental fish feed of 25 to 30% by this fish + water chestnut coproduction system increases productivity of the system.