

MORPHOLOGICAL ADAPTATION OF AQUATIC MACROPHYTES IN RESPONSE TO DIFFERENT  
FLOW VELOCITIES

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Abstract

Many studies have verified that the presence of plants affects flow velocities. In several prior studies, planting materials were used as a buffer zone to prevent riverbank erosion. However, there has been relatively little research conducted for studying the adaptation of plant characteristics to flow conditions. The study described herein was carried out in an artificial channel. Study objectives were: (1) to examine how aquatic *Oenanthe javanica* DC. (water celery) macrophytes respond to different channel flow velocities through changes in their morphology; and (2) to clarify the tolerance limit of the aquatic macrophytes at different flow velocities. Study results show that *Oenanthe javanica* DC. (water celery) experienced morphological variations at different flow velocities. In particular, as flow velocities increased, growth rate slowed and plant shoots became shorter and softer, to increase plant flexibility. Root length and root anchorage decreased. Root, stem, and shoot mass were found to be inversely proportional to flow velocity. Study results also show that the number of vascular bundles in new shoots decreased in flowing water environments compared to terraneous planting environments and average number of vascular bundles per square mm increased as flow velocity increased.

Keyword : Morphological adaptation, Flow velocity, Aquatic macrophyte, Artificial channel, Ecological engineering.