Report for 2005DE62B: Restoring Coastal Bay Water Quality via Native Eelgrass Micropropagation

Publications

- Water Resources Research Institute Reports:
    - Gallagher, John L., and Katherine M. Tigani, 2006, Restoring Coastal Bay Water Quality via Native Eelgrass Micropropagation, Delaware Water Resources Center, University of Delaware, Newark, Delaware, 12 pages.
- Other Publications:
    - Boyd, Amy, ed., 2005, Delaware Water Resources Center WATER NEWS Vol. 6 Issue 1 "DWRC Announces New Undergraduate Interns for 2005 – 2006", http://ag.udel.edu/dwrc/newsletters/Summer2005.pdf, p. 4-5.
    - Boyd, Amy, ed., 2006, Delaware Water Resources Center WATER NEWS Vol. 6 Issue 2 "2005-2006 DWRC Undergraduate Internships News: Spotlight on Three Projects: Spring Internship Winners", http://ag.udel.edu/dwrc/newsletters/Fall 2005 - Winter 2006.pdf, p. 5.

Report Follows

Undergraduate Internship Project #9 of 17 for FY05

"*Restoring Coastal Bay Water Quality via Native Eelgrass Micropropagation*" was the title of ***Katherine Tigani's*** internship, co-sponsored by the ***DWRC*** and ***University of Delaware*** College of Marine Studies ***(CMS)*** under the advisement of Dr. John L. Gallagher of the ***UD CMS,*** Lewes, Delaware. Katherine had worked during the summer of 2004 in the ***UD*** Halophyte Biotechnology Laboratory, Lewes, with plant tissue cultures. In this 2005 project, she used that experience to attempt to devise a methodology that can regenerate eelgrass in volume.

"This DWRC internship has been an amazing experience. Not only has it led to some exciting results in the lab, but the project has developed into a thesis for my Masters degree at the College of Marine Studies. Through the internship I was able to gain valuable contacts in the field and have now arranged to begin field collections along both coasts of the US." -- Katherine Tigani

Abstract

Preliminary advancements were made in the development of a tissue culture protocol for the temperate seagrass species *Zostera marina* (eelgrass) which plays a fundamental role in reducing nutrient load and turbidity in coastal waters. The tissue culture of this submerged macrophyte would provide an abundance of viable transplant material necessary for restoration projects in locations such as the Delaware Inland Bays. Trials for both callus induction and micropropagation were conducted using various media combinations, phytohormones, and environmental factors. Regardless of media, test cultures only survived when incubated at 10˚C. A two-phase solid/liquid MS-based media was developed for *Z. marina*, was successful at supporting culture growth for over six months, and has future implication for growth regulator dosing. Phytohormones (2,4-D, IAA, and KT) in any concentration appear to have a detrimental effect on the plant when absorbed from the water column. A preliminary trial using the algal media ASP-8A have shown substantially positive growth response during seedling development and is now in further trials to determine if this vitamin formula is suited best for callus induction and micropropagation of *Z. marina*.