SUBLETHAL EFFECTS OF GLYPHOSATE EXPOSURE ON THE NATIVE FLORIDA MACROPHYTE *VALLISNERIA AMERICANA*

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Glyphosate is the most used herbicide in South Florida, where it is used as a sugar cane ripener, and to control invasive aquatic plants. Low light penetration, high phosphorous content, and periodic brackish conditions common to Everglades water bodies suggest that Florida waterways may be particularly vulnerable to increased residence time due to slowed breakdown. Glyphosate is a non-selective broad-spectrum herbicide, which means it controls target and non-target broad-leaf weeds and grasses. It blocks plastidial uptake of ESPS synthase, inhibiting the plant's ability to synthesize essential aromatic amino acids required for growth. Glyphosate is also thought to inhibit d-aminolevulinate synthetase, an enzyme implicated in chlorophyll synthesis. It is absorbed through leaf surfaces in low doses, and can be accumulated by non-target plants.

Glyphosate translocation throughout non-target plant tissues could represent not only a route of exposure to herbivores, but could also be an environmental stressor impacting submerged plant abundance and quality, which would negatively impact valuable ecosystem services they provide in the Everglades. To assess these effects, we exposed the native Florida submerged plant *Vallisneria americana* (tapegrass) to three concentrations of glyphosate and an aquatic formulation, Rodeo. We will present findings on 1) glyphosate accumulation in sink tissues, 2) inhibition of photosynthetic efficiency and machinery, and 3) enzymatic inhibition. We will quantify translocation of glyphosate and Rodeo® (glyphosate formulated for invasive aquatic plants) to plant tissues where they may be consumed by herbivorous grazers. In addition, we will analyze the consequences of these exposures at the gene and metabolite level. We expect glyphosate blocks biosynthetic pathways in plants required for growth, photosynthesis, plant defense, and carbon fixing ability. This study will help us to identify sublethal effects of glyphosate exposure to plant health and growth ability, and to determine whether it may be transferred up trophic levels in SAV tissues.

PRESENTER BIO: Megan Opincarne is a graduate student at UF's School of Natural Resources and Environment. She is working towards a master's degree in Interdisciplinary Ecology with a concentration in biochemistry and molecular biology. Her work focuses on sublethal impacts of exposure to environmental chemicals in an ecosystem context.