

Eurasian Watermilfoil Phenology and Endophyte Abundance and Diversity

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Abstract

Eurasian watermilfoil (*Myriophyllum spicatum* L.) plants were collected monthly from late May through late October 2007 from a culture pond located at a United States Army Corps of Engineers research facility in Lewisville, Texas and examined for endophytes in the roots, root crowns, stems, and leaves. At each collection period, ten randomly selected plants were partitioned into 2 cm segments and sequentially plated onto Martin's agar starting from the root tip and progressing to the plant apex. A total of 1479 endophytic fungi comprising 59 species in 36 genera were isolated over the six month period. Of the 12 most frequently isolated genera (i.e. those isolated greater than 30 times), *Mycocleptodiscus* had the highest relative frequency (18 %) in milfoil tissues followed by *Penicillium*, *Plectosphaerella*, *Aspergillus*, and *Trichoderma*. The 12 most frequently isolated genera were all found in roots, stems, and leaves but were often absent from root crowns. In general, the number of isolates and species steadily decreased from stem base to plant apex. The Jaccard coefficient (J_c) was used to determine similarities between endophyte communities from month to month and between tissue types. The highest monthly overlap ($J_c = 0.439$) was observed for the fungal communities from the June/July collections. The similarity of the June collections compared to other months was much lower ($J_c = 0.225$ to 0.289). The highest similarities ($J_c = 0.707$) were observed for the endophyte communities in stems and leaves indicating that their close proximity on the host apparently resulted in a higher number of shared common endophyte species. This value was almost 20% higher when compared to either of the root tissues. The study of endophytes offers great potential to find new biological control agents. Agents that can colonize and impact all plant tissues would be more effective than those that can only attack specific tissues.