Aquatic Plant Surface Micro-Flora and the Coliform Response

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Why is water a limited resource? High water demand requires greater time to filter the water for return to the environment. Pollution limits freshwater filtration. Many aquatic plants filter water in wetlands. Three years of previous research identified aquatic plants that were exceptional filters, determined that Equisetum hyemale was more effective than Typha as an E. coli filter, and looked for additional bacterial flora on plant stems that might contribute to bacterial control. Testing found differences in bacterial colonization in the different plant species. The current project will identify the bacteria present on Equisetum hyemale that filters and kills E. coli in its freshwater environment. The project will also demonstrate what natural bacterial flora is on the surface of aquatic plants to choose the best species of plants for wetland reserves. The experimental protocol magnifies the bacterial genes (using PCR with 16s rRNA primers), which then will be sequenced and imported into the NIH's Basic Local Alignment Search Tool to identify bacterial species on each plant's surface. The stems of the two plants were inoculated with E. coli, then incubated for 48 hours. Next, equal areas of the epidermis of the treated plants will be removed and transferred to vials of Luria broth and incubated overnight, then plated to identify the bacteria on the plants' surface. The hypothesis stated that PCR and Coliscan could identify the Staphylococcus species found on the surface of Equisetum Hyemale; however, although the techniques identified possible bacterial species, more refining tests are required.

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