# Proteomic Signatures of Experimentally Manipulated Pitcher Plant Communities and Their Corresponding State Changes

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## ABSTRACT

Since a fully functioning ecosystem produces numerous biomolecules, protein biomarkers have the potential to serve as early warning indicators before tipping points are reached and ecosystems undergo irreversible change. To test this potential, we used the fully functioning micro-ecosystem found within the rain-filled pitcher shaped leaves of the *Sarracenia purpurea* (the Northern Pitcher Plant). In a controlled press experiment, we imposed treatments that mimicked the effects of eutrophication from nutrient enrichment, loss of top predators from hunting and over-harvesting, and isolation of the ecosystem from nutrient and material exchanges across ecotones. Respectively, these treatments included the daily additions of ground up prey, the manual removal of the food-web's top predators, and the cutting of the plant stem to reduce its inputs and outputs. Microbial community samples were collected both before and after two weeks of treatment application. Samples were analyzed using SDS-PAGE and mass spectrometry techniques to identify and quantify protein change between treatments and over time. Initial results show promising differences in signature protein bands that could serve as important biomarkers. Final results will allow for detailed temporal studies on specific ecosystem management and conservation techniques.