

Top-down and Bottom-up Regulation in a Detritus-based Aquatic Food Web: A Repeated Field Experiment Using the Pitcher Plant (*Sarracenia purpurea*) Inquiline Community

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ABSTRACT.—The aquatic food web found within the leaves of the purple pitcher plant (*Sarracenia purpurea*) is useful for studying top-down and bottom-up effects. The food web has an omnivorous top-predator and is fueled by invertebrates drowned in the pitfall trap of the pitcher plant. Modeled on a previous experiment for the purpose of comparison, I conducted a 3×3 factorial press experiment over 4 wk, using 45 pitcher leaves in a bog in Michigan. Treatments included 3 levels (none, low and high) of both resource input and top-predator density. Both top-down and bottom-up treatments had significant effects on populations within the inquiline food web. Rotifer, mite, protozoan and bacterial density and protozoa richness increased when resources were added. Top-predator density negatively affected rotifer, protozoa and bacteria density. These findings suggest that in this food web bottom-up forces predominate, but top-down forces are also important. A similar study conducted in Florida is used to make a latitudinal comparison of food web regulation and temperature is hypothesized to be responsible for observed differences between the inquiline food webs.