

Insect Herbivores Alter Soil Microclimate and Root and Needle Litter Decomposition in a Semi-arid Woodland.

(S08-lassen184123-Oral)

Authors:

- A.T.Classen - *Department of Biological Sciences, Northern Arizona University*
- S.C.Hart - *School of Forestry, Northern Arizona University*
- G.W.Koch - *Department of Biological Sciences, Northern Arizona University*

Abstract:

Herbivore effects on nutrient cycling have been examined primarily in terms of altered litter inputs, but herbivory can also alter abiotic conditions that regulate decomposition and nutrient dynamics. The scale insect chronically infests pinyon pines in Northern Arizona causing premature abscission of all but the current year's needles, resulting in an open canopy architecture. We used a long-term herbivore removal experiment to determine how this herbivore-caused change in architecture alters soil microclimate and decomposition. Scale herbivory significantly reduced leaf area index by 40%, thus increasing soil insolation and mean maximum soil temperature by 5°C. Further, herbivory significantly decreased canopy interception of precipitation and increased volumetric soil water content. Together these data demonstrate that insect herbivory significantly alters soil microclimate. After one year, scale insects had no effect on root litter decomposition but increased needle litter decomposition by 17%. We propose that these indirect effects of herbivory interact with herbivore-caused changes in root and needle litter quality to alter litter decomposition and soil nutrient dynamics.

Corresponding Author Information:

Aimee Classen	phone: 928-523-2420
Northern Arizona University	fax: 928-523-7500
Department of Biological Sciences	e-mail: atc4@dana.ucc.nau.edu
Flagstaff, AZ 86011	

Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 8:30 am

Keywords:

insect herbivory, soil microclimate, root and litter decomposition