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Anna E. Marchand & Carrie L. Woods

Introduction

• When a fallen log becomes a site for tree seedling growth, it is called a “nurse log”
• Seedlings are found in much higher densities on nurse logs than the forest floor
• Why? Seedlings may experience less competition with mosses on nurse logs than the forest floor
• Hylocomium splendens (“stairstep moss”) is a unique and abundant moss species in Pacific Northwestern forests
  • Could compete with seedlings:
    • Unusual height reduces light for plants beneath
    • Unique nitrogen sequestering abilities
  • Not much known about microhabitat selection (small-scale environmental factors that determine where a plant is successful) or how it could influence substrate characteristics to inhibit seedlings

Research Questions

1. Do the microhabitat choices of H. splendens affect tree seedling distributions?
   • Substrate
   • Canopy openness
2. How does stairstep moss compete with tree seedlings?
   • Nitrogen reduction
   • Light reduction (previous research)

Methods

Microhabitat survey:
• Substrate: forest floor, nurse log
• Canopy openness (light)
• Nitrogen content of substrate (paired)
  • Total nitrogen: elemental analyzer
  • Inorganic nitrogen: Hach nitrate vials
• Stairstep moss percent cover
• Seedling density (not shown)
• Twenty 0.5 m x 0.5 m plots

Results

A: Plots on the forest floor tended to have a higher percent cover of H. splendens than plots on nurse logs (2-sample t-test, p = 0.058).

B: Stairstep moss was more abundant in areas with high canopy openness (regression, p = 0.003).

C: Plots on the forest floor had higher canopy openness on average than plots on nurse logs (2-sample t-test, p = 0.058)

Discussion

• Seedlings are found in high abundance on nurse logs and in low abundance on the forest floor (C. Woods, unpublished data).
• Inversely, H. splendens is found in high abundance on the forest floor and in low abundance on nurse logs. This implies that the microhabitat choices of step moss may influence where tree seedlings are successful, thus playing a key role in forest succession.
• The presence of H. splendens does not limit the amount of nitrogen in the substrate available to seedlings.
• The presence of H. splendens does limit the amount of light that reaches tree seedlings (C. Woods, unpublished data).

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