Plant Defenses in an African Savanna

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Savanna Ecosystem
Barleria

Photo: T. Coverdale
Associational Defense

Associational defense:
• Protection conferred by individual’s surroundings

Expectation:
• Association leads to less grazing pressure

Branch removal experiment (pictured at right)

Photos: T. Coverdale
Removing Associational Defense Leads to Increased Herbivory

Effects of tree removal on grazing intensity

- Herbivore exclusion
- Control
- Removal w/o understory clearing
- Removal w/ understory clearing

Graph: T. Coverdale
What About Unassociated Plants?

- Individuals cannot always rely on protection from other plants

- Another defense mechanism is necessary

- Induced defense
  - Herbivory leads to greater defense investment
Defense Investment is Higher Among Unassociated Plants

![Bar graph showing spine density (Control only) among different regions: North, Central, South. The graph compares spine density between plants associated with Acacia and unassociated with Acacia. The Central region shows a significantly higher spine density for unassociated plants.](Graph: T. Coverdale)
Higher Levels of Herbivory Lead to Greater Defense Investment

Change in Spine Densities After Simulated Herbivory

Percent Change in Spine Density

-20 -10 0 10 20 30 40 50 60 70 80

Control  Half Clipping  Full Clipping  Stem Clipping
Conclusions

• Numerous external factors impact the defense strategies employed by *Barleria*

• Variation across individuals of the same population

• Level of defense investment may affect plant-herbivore dynamics
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Questions