Building a Successful Student Experiential Learning Program

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What We Are.
TREE Program

Established in 2008

TEACHING AND RESEARCH IN ENVIRONMENTAL ECOLOGY
Our Mission

To educate and assist students of diverse background to become leaders in natural resources and conservation in order to protect our natural resources and promote sustainability.
Participants

- UTSA Roadrunners
- USDA Forest Service
- Southern Research Station
- CPS Energy
- Northside Independent School District
- The City of Grey Forest
- Girl Scouts of Southwest Texas
- City of Boerne
About Bexar County

- Largest City – San Antonio
- Population in 2013 – ~ 1.8 million
- 59.1% Hispanic or Latino
- Median household income - $49,141
- 17.8% persons below the poverty level
About UT San Antonio

- Relatively young University within the UT System – Established in 1969
- Current enrollment – 30,300
- 65 bachelor’s, 49 master’s, and 21 doctoral degrees
About UT San Antonio

- Bexar County: 3%
- Other Texas counties: 48%
- Out-of-State: 2%
- International: 47%
About UT San Antonio

Ethnicity of Student Body

- White: 15%
- Hispanic: 9%
- Black: 29%
- American Indian: 47%
- Other: <1%
About UT San Antonio

- UT San Antonio ranks No. 7 in the nation for the number of undergraduate degrees awarded to Hispanic students*
- No. 10 nationally in the number of master's degrees awarded to Hispanics.

*Hispanic Outlook in Higher Education magazine rankings.
About UT San Antonio

UTSA

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in degrees awarded to Hispanic students in science, technology, engineering and mathematics (STEM) fields.

According to the University of Southern California Center for Urban Education
Demographics of Students in TREE Program
What We Do
Recruit

Fishing for your Future?

Fellowship in Conservation and Natural Resources
To apply, go to http://www.utsa.edu/educationhsi/app.htm

T R E E Program
Teaching and Research in Environmental Ecology
James K. Bush, Director
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Want to be a Forest Ranger?

Fellowship in Conservation and Natural Resources
To apply, go to http://www.utsa.edu/educationhsi/app.htm

T R E E Program
Teaching and Research in Environmental Ecology

Looking for your Future?

Fellowship in Conservation and Natural Resources
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Fellowships Available!!
Funding is now available for a limited number of UTSA students interested in careers in conservation and natural resources!
Apply NOW!

The University of Texas at San Antonio
Workshops

• Study Skills
  – Time management
  – Motivation and Procrastination
  – Note Taking
  – Communicating with professors
Workshops

Research Boot Camp
Workshops

• Scientific Writing
  – General science writing
  – Use of reference management software
Workshops

• Research Skills
  – Preparing poster presentations
  – Preparing oral presentations
Workshops
Workshops

Media Training
Role-Model Seminars

- Research Scientists from across the country
- Local, State and National Conservation/Natural Resource Employees
  - City of San Antonio Conservation Biologists
  - Texas Parks and Wildlife Biologists
  - US Forest Service Biologists
Role-Model Seminars

Francisco Ayala, Ph. D.
University of California – Irvine
Member: National Academy of Sciences
Role-Model Seminars

Adam Sepulveda, Ph. D.
University of Montana
Herbivory Effects on Quercus species

Fernando A. Martínez, Ph.D.
The University of Texas at San Antonio
Volatileization of Camphor from Juniperus ashei

Joshua Christopher Conner, J. K. Bush, and J. Engelberth
The University of Texas at San Antonio, San Antonio TX, 78249

Abstract
Volatiles organic compounds (VOCs) emitted from the leaves of
Juniperus ashei were collected using a custom
inlet with a Teflon filter prior to measurement using a
Tylan gas chromatograph (GC) equipped with a flame
ionization detector (FID). The sample was then
eluted at 200°C for 10 minutes. The GC was then cooled
slowly to 150°C and the sample was then eluted at 150°C for
10 minutes. The resulting chromatograms were then
analyzed for peaks corresponding to camphor.

Methods
Collection of VOCs: VOCs were collected from J. ashei using
two methods: a) direct sample and b) sample dilution.
A Tylan gas chromatograph (GC) equipped with a
flame ionization detector (FID) was used to
measure VOCs. The sample was then eluted at 200°C for
10 minutes. The GC was then cooled slowly to 150°C and
the sample was then eluted at 150°C for 10 minutes. The
resulting chromatograms were then analyzed for peaks
corresponding to camphor.

Results
Camphor was not detected in the direct sample
method. However, when the sample was diluted
with an internal standard, camphor was detected in
the diluted sample.

Conclusions (Disc. or Summary)
Camphor is emitted from Juniperus ashei
leaves. The dilution method was more effective
for detecting camphor than the direct sample
method.

Purpose
The purpose of this study was to determine the
amount of camphor emitted by Juniperus ashei.

Acknowledgments
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Science Foundation.

References

Figure 1: Tylan gas chromatograph with eluted peaks.
In vivo analysis of the Tomato Golden Mosaic virus AL2 promoter

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Abstract
Tomato Golden Mosaic virus (TGMV) is a member of the Gemmiviridae family of single stranded (ss) DNA viruses, which infect plants. TGMV belongs to the genus Begomovirus, with two genome components, A and B. DNA component A directs expression of the AL2 and AL3 genes, while DNA B directs expression of genes required for the movement of the virus in plants. AL2 directs coat protein expression and AL3 is a replication enhancing protein. Promoters for transcripts initiating at nucleotides 1935 and 1629 regulate expression of AL2 and AL3, as determined using promoter (β-glucuronidase (GUS) fusions to transgenic leaves). We have generated transgenic N. benthamiana plants harboring the AL1935 and AL1629 promoter-GUS fusions to determine tissue specificity of each promoter. Plants will be analyzed using histochemical staining to determine whether each promoter is expressed in mesophyll cells and phloem cells.

Purpose
New resistance strategies to plant pathogens require increased knowledge of molecular mechanisms that regulate expression of genes involved in pathogenesis. The purpose of this work is to understand how the gemmiviruses are regulated, interfering with expression of coat protein encoding genes. Our results show that the AL1629 promoter could promote resistance to this virus.

Introduction
The Gemmiviruses are classified based on their host specificities. In the family, the Begomovirus is the most diverse, with a broad host range. Some gemmiviruses are more host specific and others can infect a wide variety of host species. (Figure 1. Range of Almofadas and classification). The family contains the TGMV, which is the most widespread gemmivirus, infecting a wide range of plant species.

2) Activity of the TGMV AL1629 and AL1935 promoters. To define sequences necessary and sufficient for AL1629 and AL1935 promoter activity, a series of truncated promoters linked to the GUS reporter in a translational fusion, were used. (Figure 4B). AL1629 promoter deletions were made that contained either 655bp (AL1629b: AL2680, AL2490) or 208bp (AL1629a: AL2286) of TGMV sequence upstream of the AL2 promoter. An AL1629a construct was generated containing 326bp sequence upstream of GUS (AL1935: AL2286) and was expressed in GUS mesophyll cells.

Future Work
1) DNA binding studies using electrophoretic mobility shift assays (EMSA) will be performed to confirm binding of ERF protein to the AL1629 promoter. We are currently expressing his-ERF in both E. coli and plant cells.
Research Experiences
What We Have Found.

• Qualitative Case Study
• Three focus groups
  – After one, two, and three years
• Semi-structure interview
  – Open-ended questions
• Used coding to identify common themes
Why the Students Wanted to Participate

1) Sense of Identity
2) They get to do research
3) They get to do organized community service
3) Having a faculty mentor
4) Financial support
What was most helpful

Most: Resume building, travel to scientific meetings, routine group meetings, media training, role-model seminars, conducting their own research

Least: Study skills
Resume Building

Not an exercise in how to build a resume, but rather exposing them to activities they can add to their resumes.
Travel to Scientific Meetings

- Travel to new places
- Calibrate their level of experience and knowledge to students from other areas
- Interacting with others of similar interest
- Creating a sense of empowerment
Group Meetings

• Creating the sense of identity
• Sharing their experiences and learning from others to help manage their college experience
• Educate and motivate for obtaining advanced degrees
Role Model Seminars

- Opened their eyes to career options
Research Experience

- Opened their eyes to the possibilities
- Experience ‘hooked’ them on doing research
Quotes from the External Reviewer
Dr. Richard McGee,
Associate Dean for Faculty Recruitment and Professional Development

“To be candid, I have been working with students and student programs, and serving as external evaluator, for more than 20 years.”
“I can honestly say the students in the TREE are the most uniformly positive, appreciative, and committed to their program I have ever seen”
Quotes from the External Reviewer

“... the opportunities provided to them are life-changing.”

“... most feel they would have been severely challenged to find their way in their field at UTSA without TREE.”
Quotes from the External Reviewer

“Most striking are the bonds and commitment to helping each other, and their very strong desire to engage in the community”

“I have never seen a group of students, particularly this mixture of undergraduates through graduate students, so eager to do more even though they are all stretched thin with school and life activities.”
Final Thoughts

• Importance of the acronym.
• Problems when establishing the program.
• Establishing relationship with governmental or non-governmental agency to over support.