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INFLUENCE OF HISTORIC COFFEE CULTIVATION ON TERRESTRIAL SNAIL COMMUNITIES IN THE LUQUILLO EXPERIMENTAL FOREST, PUERTO RICO. Renee Morse-Heenan and Craig R. Zimmermann, Department of Biology, Rogers State University, Claremore, OK

Terrestrial gastropods have been censuses in the Luquillo Forest since 1989, showing variation in spatial distribution of snail species. The causing factor of this variation has not been completely explored. The influence of historic coffee cultivation may have long-term effects on forest habitat and thus impacting snail diversity. Snail diversity was surveyed in an area that supported coffee cultivation until ~1930. Two consecutive summers snails were sampled along three transects which run perpendicular to known plantation boundaries. *Caracolus caracolla* and *Nenia tridens* were the most common snails in both land uses. Coffee *C. caracolla* populations also supported numerous juveniles, while very few sampled on the uncultivated forest were juveniles. Differences in habitat, as influenced by land-use history, may underlie these observed differences. Previous surveys of these transects found distinct differences in tree species composition and soil properties between land uses.

MODULATION OF CELL DEATH BY CARVACROL IN VARIOUS TUMOR CELL LINES AND PRIMARY CELLS. Joel Gaikwad, Oral Roberts University, Dept. of Biology and Chemistry, Tulsa, OK; Julie Marino and Kent Teague, Oklahoma University, Dept. of Surgery, Tulsa, OK

Our lab has been interested in studying the effects carvacrol, an essential oil extracted from the seeds of *Carrum copticum* in modulating apoptosis in HT29 colon cancer cell line. Flowcytometry and cell proliferation assays performed in our lab using HT29 cells have shown that treatment of these cells with carvacrol induced cell death in a dose dependent manner. The present study was carried out to see the effect of carvacrol on other tumor cell lines and primary cells isolated from mice lymph node. In addition to HT-29, Jurkat and NIH/3T3 cells were subjected to treatment with varying concentrations (100micromolar-500 micro molar) of carvacrol. All tumor cell lines tested showed a dose dependent decrease in cell proliferation based on the cellular mitochondrial dehydrogenase activity. The primary cells isolated from lymph node also showed a decrease in cell proliferation. Flowcytometry analysis of HT-29 and Jurkats using PI staining indicated cell death by apoptosis. The RT-PCR analysis of HT-29 cells indicated a down regulation of survivin mRNA in the carvacrol treated cells.

CYTOPATHOLOGICAL EFFECTS OF A UNIQUE *TYMOVIRUS* (AsAV) ISOLATED IN THE TALLGRASS PRAIRIE PRESERVE, OKLAHOMA. Michelle Miller and Akhtar Ali, University of Tulsa; Michelle Miller, Department of Biological Sciences, University of Tulsa, Tulsa, OK, 74104.

Plant viruses are responsible for causing billions of dollars in crop losses annually. In order to prevent and control plant virus disease, it is critical to identify the effects of the emerging viral diseases on our crops. During a recent study, a unique *Tymovirus*, tentatively named *Asclepias Asymptomatic Virus* (AsAV), was isolated from milkweed (*Asclepias viridis*) in the Tallgrass Prairie Preserve (TPP) in Osage County of Oklahoma. The virus shows little

to no symptoms in its natural weed hosts but produced symptomatic infection in an experimental host (*Nicotiana benthamiana*). The purpose of this research is to study cytopathological effects of AsAV in natural and experimental hosts. Using scanning electron microscopy (SEM) and transmission electron microscopy (TEM), cytopathological effects of AsAV were evaluated in two different host plants. SEM results showed a significant difference between healthy and infected host plants in stomata/guard cell function and morphology. TEM results showed greater cytopathological changes in the symptomatic host compared to the asymptomatic host.

INVESTIGATING ALTERNATE ISOMERS IN THE GENOMES OF FIVE STRAINS OF BABOON CYTOMEGALOVIRUS. Susan R. Neubauer, William J. Reddig, and Earl L. Blewett, Oklahoma State University Center for Health Sciences, 1111 W. 17th St., Tulsa, OK 74107

Cloning, sequencing and DNA trace alignment of the baboon cytomegalovirus (BaCMV) strain OCOM4-37 has led to construction of a genome map that allows comparison with other primate CMV strains. Analysis of the BaCMV genome has shown that rhesus monkey CMV (RhCMV) and BaCMV are more closely related to each other than either is to human CMV (HCMV). Typically primate CMVs which are most closely-related show greatest similarity in gene location and genome orientation. In the human cytomegalovirus genome, four different isomers exist which result from inversions of the unique long (UL) gene-coding region and the unique short (US) gene-coding region. The UL and US regions are flanked by repetitive sequences where the inversions occur. These isomers have not been identified in other animal CMVs and do not exist in RhCMV. For the OCOM4-37 BaCMV strain, however, an alternate isomer has been identified which is more similar to one of the four HCMV isomers than it is to the RhCMV genome orientation. This finding was based on the presence of an inversion locus in three different BaCMV clones produced with different restriction enzymes. BaCMV OCOM4-37 was isolated from an Olive baboon, *Papio cynocephalus anubis*. Four other strains of baboon CMV were evaluated to determine whether isomers exist in these strains of BaCMV.

TECHNIQUES TO EXPRESS AND PURIFY INSOLUBLE RECOMBINANT PROTEINS IN PROKARYOTE EXPRESSION SYSTEMS. E.L. Blewett, Biochemistry and Microbiology, OSU-CHS 1111 W 17 St. Tulsa, OK 74107.

In the study of Baboon Cytomegalovirus strain OCOM4-37 (BaCMV) we have cloned and sequenced much of the genome. We wished to raise mono and polyclonal sera to specific viral genes for the study of structure-function relationships and to provide diagnostic reagents. In human CMV (HCMV) The UL82 gene family contains several important structural genes that have been shown to be major immune targets. We have cloned and sequenced this gene family in BaCMV and identified an additional member gene. We wished to express proteins for ELISA assays and to elucidate the function of the newly identified gene. Prokaryote expression systems were chosen to maximize protein production at reasonable costs. However, each gene expressed in E. coli produced highly insoluble proteins that formed inclusion bodies. Different expression systems, gene sub-cloning and extraction methods using strongly denaturing solutions were developed to dissolve and purify the proteins.

A BIODIVERSITY INVENTORY OF AN URBAN WILDERNESS: OKLAHOMA CITY UNIVERSITY'S GAMBLE-BUCHANAN OUTDOOR LAB. PHASE I: FLORISTIC AND HERPETOLOGICAL SURVEYS. A.K. Ryburn, B. Landon, and B. Lettenmaier, Oklahoma City University, Oklahoma City, OK 73106

E.O. Wilson writes in his book *Biodiversity* (1988) that "biological diversity must be treated more seriously as a global resource, to be indexed, used, and above all, preserved."

The focus of this multi-year project is to realize this concept at a 27 acre urban wilderness in southwest Oklahoma City known as the Gamble-Buchanan Outdoor Lab. Managed by the Oklahoma City University Department of Biology, very little is known of the biodiversity of this relatively new education and research facility that is surrounded by industrial and housing development. As protected lands such as the Gamble-Buchanan Outdoor Lab become the refuges of biodiversity it is essential to have an accurate picture of what species are present and that by identifying species and adapting management practices to preserve biodiversity, future generations are provided a baseline of information to assess the success of management practices. The biodiversity of this natural area is being inventoried in the following three phases, with the first starting in June 2010: Phase I – flora and herpetofauna; Phase II – mammals, fish, and birds; and Phase III – invertebrates and fungi.