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CHARACTERISTICS OF A SMALL STREAM DURING SEVERE DROUGHT CONDITIONS. Williams, Andrew and Avard, Margaret, Southeastern Oklahoma State University, Durant, Oklahoma 74701.

Chuckwa Creek is a second order stream in Bryan County that runs northwest – southeast through the city of Durant and flows into Mineral Bayou. Even though primarily fed by surface water runoff, it normally has some baseflow throughout the year. This study examines the nature of the stream under extreme drought conditions. Performing biweekly water quality measurements, examining previous water quality studies, comparing 2011 climate data with historical averages, sampling for fish species, and identifying the location of pools along the length of the stream yielded a comprehensive picture of Chuckwa Creek during drought conditions. Results identified several distinct stream reaches, the location of isolated pools of various sizes, variations in water quality over time, and the presence of drought-persistent fish communities.

DETERMINING DRY MATTER INTAKE OF ANNUAL AND PERENNIAL COOL-SEASON GRASSES HARVESTED AS HIGH MOISTURE HAY AND FED TO LAMBS. Tuthill, C. and Phillips, B., Science Department, Redlands Community College, El Reno, Oklahoma 73036.

Over 6 million acres of winter wheat are planted in Oklahoma annually. Although low- and no-till production practices reduce the amount of fossil fuel inputs required to establish a wheat crop, as an annual crop fossil fuel investment must be made each year. Wheat is a multiple purpose crop that can be grazed by sheep or cattle in the fall and winter, harvested for grain in early summer or grazed or cut for hay. Multiple use crops are an important economic tool that increases agricultural enterprise diversity, lowers economic risk and adds stability to the economy of rural communities. Perennial cool-season grasses do not have to be established each year and can be used just like winter wheat to support grazing livestock in the fall and grazed or cut of hay in early summer. Perennial cool-season grasses can be established on erodible land to reduce soil erosion and used to replace some wheat acreages to decrease fossil fuel inputs. However, in animal performance trials at the USDA-ARS Grazinglands Laboratory in El Reno, OK perennial cool-season grasses were not able to provide as much daily body weight gain as winter wheat. Possible reasons for the differences in daily gain between winter wheat and perennial cool-season grasses may be due to differences in digestibility and/or feed intake.

To answer this question, an experiment was conducted to measure differences in forage intake between winter wheat and a perennial cool-season grass (*Triticum aestivum* Var. Pioneer 2174 and *Festuca arundinaceae*) harvested at the same stage of maturity in the spring and fed as high moisture hay.

DEVELOPMENT AND CHARACTERIZATION OF TRANSITION METAL COMPLEXES AS CXCR4 ANTAGONISTS. Baker, C.¹ and Hubin, T.J.², ¹Science Department, Redlands Community College, El Reno, Oklahoma 73036. ²Department of Chemistry, Southwestern Oklahoma State University, Weatherford, Oklahoma 73096.

CXCR4 chemokine receptors, together with their specific natural ligand, CXCL12, play a role in a number of disease states. We have developed efficient symmetric CXCR4 antagonists in prior work. Our objectives were to synthesize unsymmetric bis-tetraazamacrocycle metal complexes and to characterize their chemical properties prior to determining if linking two different macrocycles enhances the antagonism of CXCR4. Synthetic routes extending our bis-linked ligand syntheses to use a step-wise linking process where two different macrocycles can be successively added to the linking xylene group were developed. Copper(II), nickel(II), cobalt(II), and zinc(II) complexes were made using our previous methods. Electro-spray mass spectra, UV-Visible spectra, cyclic voltammograms, magnetic moments, X-Ray crystal structures, and ¹H and ¹³C NMR spectra were collected to characterize the complexes. The ligand syntheses of the side-bridged and cross-bridged unsymmetric ligands proceeded similarly to the previously developed bis-ligand routes. Complexation with the desired metal ions proceeded as expected. Characterization of the metal complexes is ongoing. Unsymmetric bis-linked bridged tetraazamacrocycles are easily produced, using the new step-wise linking procedure. Metal ion complexation proceeds smoothly following known procedures. The resulting complexes will inform our understanding of the requirements for producing even more efficient CXCR4 antagonists of this class. This work was made possible by Grant Number P20RR016478 from the National Center for Research Resources (NCRR), a component of the National Institutes of Health (NIH).

THAT'S RIGHT WE'RE NOT FROM TEXAS: THE SEARCH FOR AN OKLAHOMA IDENTITY. Newcomer, R., Department of Cartography/Geography, East Central University, Ada, Oklahoma.

Since statehood, Oklahomans have struggled to establish a state identity that was more than "Okies" from the dustbowl where the "wind comes sweeping down the plain" in the state shaped like a pan north of Texas. This presentation examines those Oklahoma cultural characteristics it has in common with its larger neighbor to the south that casts something of a shadow over us, but also those cultural attributes that contribute to and define a uniquely Oklahoma identity.

MAPPING GENOMIC LIBRARIES OF DRILL MONKEY CYTOMEGALOVIRUS DNA TO ASSEMBLE THE GENOME. Blewett, Earl L. and Reddig, B.J., Department of Biochemistry and Microbiology, Oklahoma State University – Center for Health Sciences Tulsa, Oklahoma 74107.

The long term goal in our laboratory is to sequence and analyze the genome of Drill Monkey cytomegalovirus (DrCMV) OCOM6-2. The genome, believed to be >200,000 base pairs, has been cloned in plasmid vectors and bacterial artificial chromosomes. Roche 454 sequencing has begun using viral DNA. We wish to map the genomic clones to isolate several genes and to provide DNA for finishing the last 5% of the genome. Plasmid libraries were constructed by cloning *NotI* fragment of purified BaCMV genomic DNA into pBluescript SK II (+). Viral genomic DNA was partially digested *BamHI* or *EcoRI* then dephosphorylated and cloned into pBAC e 3.6. Unique clones were identified and sent to the OSU Core facility for end sequencing. Clones were placed on a map using homology to those CMV DNA's present in GenBank, primarily African Green Monkey CMV and Rhesus monkey CMV.

EFFECT OF JASMONIC ACID ON BIOMASS ACCUMULATION AND ENZYME ACTIVITY IN SWITCHGRASS. Bidlack, J., Olson, P., Cowo, C., Ralstin, E., Dinger, R., and Bidlack, J. University of Central Oklahoma, Edmond, Oklahoma 73034.

'Alamo' and 'Kanlow' switchgrass (*Panicum virgatum* L.) cultivars are high-yielding perennials with substantial lignocellulosic content applicable for biofuel production. However, these cultivars are indigenous to moist, lowland areas and possess negligible tolerance to drought conditions. A physiochemical effect of drought in plants is the generation of "reactive oxygen species" (ROS), which damage membranes, proteins, and nucleic acids of the cell. The oxylipin hormone, jasmonic acid (JA) may be exogenously applied as potentially effective treatment to enhance drought tolerance through elicitation of ROS-scavenging enzyme activity. An initial study was conducted to determine effective JA concentrations for elicitation of significant changes in biomass yield and enzyme activity in switchgrass. Four concentrations of JA (0.0 mM, 0.5 mM, 1.5 mM and 5.0 mM) were evaluated by assessing biomass yield and the activity of enzymes essential for production of phenolics (phenylalanine ammonia lyase; PAL) and terpenoids (hydroxylmethyl glutaryl CoA reductase; HMGR). Results indicated a significant effect on biomass accumulation in some JA treatments. Results also showed that PAL activity decreased and HMG-CoA activity increased as a result of JA application. Data from this experiment will be utilized to formulate a reliable method of JA treatment applicable for increasing switchgrass tolerance to drought conditions.

JAGUAR REPRODUCTION IN A MANAGED TROPICAL PINE FOREST IN BELIZE: PRELIMINARY REPORT FROM 2010. Terdal, E.¹and Martinez R.², ¹Northeastern State University, Broken Arrow, Oklahoma and ²Blancaneaux Lodge, Mountain Pine Ridge Forest Reserve, Cayo, Belize.

We present preliminary results of a camera-trap survey of jaguar (*Panthera onca*) reproduction in the Mountain Pine Ridge area of the Maya Mountains in Cayo District, Belize. This is largely a tropical pine savanna habitat managed for commercial timber production. We placed 14 cameras in seven sites approximately three km apart in a loose grid. Camera traps consisted of motion-activated digital cameras placed on opposite sides of logging roads. We examined 3358 images taken between 18 January and 12 August, 2010. The mammal fauna recognizable in the images encompassed 7 orders, 13 families, 16 genera and 17 species. The most commonly photographed animal was the grey fox. Other carnivores included four felids (jaguar, margay, ocelot, puma) plus mephitids, mustelids and procyonids. Large mammals also included white-tailed deer, collared peccary and Baird's tapir. Most jaguars were males, consistent with their larger home-ranges. Two photos, from different locations, showed juvenile jaguars. One photo showed one and the other two cubs. Spotting patterns indicate that these are three individuals. We are continuing the survey in 2011 to confirm successful jaguar reproduction in this managed tropical pine forest.

PERFORMANCE ON 8-FT. UP-AND-GO TEST IMPROVED AFTER USE OF DYNAVEC MD MACHINE IN ELDERLY. Barber, J.¹, Nole M.², and Vincent, S.¹, ¹ Department of Biology and Chemistry, Oral Roberts University, Tulsa Oklahoma 74171, ² Saint Simeon's Episcopal Home, Tulsa Oklahoma 74106.

Six residents in assisted living at Saint Simeon's were recruited to participate in a study of whether use of the Dynavec MD multidimensional hip system machine (Dallas, TX) would improve lower body tasks. Pre- and posttests used were 1) sit-to-stand test, 2) 8-ft up-and-go test, and 3) number of repetitions on the Dynavec Machine (# repetitions in 60 sec with 10 lbs. resistance). Participants used the machine twice a week for six weeks. The Wilcoxon

paired nonparametric statistical test was used to evaluate changes. After six weeks of using this machine, four participants improved on the 8-ft up-and-go test on an average of 42.2% (two participants were not able to complete the posttests) ($p = 0.068$, significant using 1-tailed test). Sit-to-stand measures either stayed the same (three participants) or improved (14.3% and 50%) ($p = 0.180$, NS). Numbers of repetitions on the Dynavec MD machine stayed the same or improved by 6-20% ($p = 0.109$, NS). It would seem conditioning of the gluteal muscle group using this machine helped elderly participants improve their walking speed.