

# Transactions of the Kansas Academy of Science

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## Abstracts

- **Wood-Waste Residues and Energy Use Potential in Northeastern Kansas.**

W.P. Walawender, Department of Chemical Engineering, Kansas State University, Manhattan, Kansas 66506.

W.A. Geyer, Department of Forest Science, Kansas State University, Manhattan, Kansas 66506.

D. Bruton, District Forester, Kansas State University, Manhattan, Kansas 66506.

During the fall of 1994 and winter of 1995, we investigated the distribution, quantity, and quality of wood residues generated by primary and secondary wood processors in the Glacial Hills Resource Conservation and Development (RC&D) Region of northeastern Kansas. A regional, annual generation of 17,200 tons of wood waste represents a significant energy resource. Although much of this residue presently is placed in county landfills, environmental regulations will force closure of many of them. Thus, implementation of an energy conversion system to consume the residue is important.

- **A Rural Mail Carrier Survey Index for Kansas Wild Turkeys.**

Roger D. Applegate, Kansas Department of Wildlife and Parks, Research and Surveys Section, P.O. Box 1525, Emporia, Kansas 66801-1525.

A rural mail carrier survey (RMCS) index is tested for wild turkeys in Kansas. Correlation and regression indicate that RMCS indices collected during the second week of October provide a good predictor of turkey harvests the following spring. An RMCS during the third or fourth week of January also provides a predictor of harvest in the subsequent April season. Spring harvest in southwestern Kansas where there are fewer roads and rural carriers, and low turkey populations, cannot be predicted by RMCS.

- **An Intelligent Plasma/Ion Source Controller.**

R. Jones, Physics Dept., Emporia State University, Emporia, Kansas 66801.

Linked neural networks can learn to control the operation of a plasma ion source.

- **Fall Point Counts: Time of Day Affects Numbers and Species of Birds Counted.**

Daniel L. O'Leske & Robert J. Robel, Division of Biology, Kansas State University, Manhattan, Kansas 66506-4901; and Kenneth E. Kemp, Department of Statistics, Kansas State University, Manhattan, Kansas 66506-0801.

Time of day is known to affect results of avian surveys during breeding season and winter. Because little is known of the effects of time of day on avian

surveys conducted between breeding season and winter, we conducted a series of point counts during early morning, midmorning, midafternoon, and late afternoon from mid September through early December. Numbers of birds counted and species richness differed by time of day and season, but only 1 of 16 time-of-day differences in numbers of birds counted was significant ( $P < 0.05$ ) because the number of birds counted fluctuated widely during the study. Point-count data collected during early morning and late afternoon produced similar avian assemblages, but significantly different ( $P < 0.05$ ) from assemblages created by data collected during midmorning and midafternoon periods, which were significantly different ( $P < 0.05$ ) from each other. Caution is urged when using point-count data collected at different times of the day in the fall to describe avian abundances and compare avian assemblages in the Plains States.

- **The Beckerdite Local Biota (Early Hemphillian) and the First Tertiary Occurrence of a Crocodylian from Kansas.**

Gregory A. Liggett, Sternberg Museum of Natural History, Fort Hays State University, Hays, Kansas 67601.

The Beckerdite local biota in Clark County, Kansas yields fossil plants, invertebrates, and vertebrates of late Miocene (early Hemphillian) age. The age of the site was determined by biostratigraphy. The genus *Osteoborus* limits the biota to Hemphillian age, and the presence of *Epicyon*, *Nimravides*, and *Procamelus* indicates that the biota is early Hemphillian because these latter taxa did not survive the mid-Hemphillian extinction event.

Taphonomic evidence suggests that the bones were exposed to weathering from four to 15+ years prior to burial. Selective preservation, favoring robust elements, is indicated. Evidence of water transport and carnivore processing is abundant. Based on studies at other fluvial sites, the time span of bone deposition at the site is from less than one to several thousands of years.

The Beckerdite local biota contains the first reported crocodylians from the Miocene of Kansas. Crocodylians have been reported previously in Oklahoma and Nebraska, so the find in Kansas fills in this taxon's biogeographic range in the Midcontinent during the late Tertiary. Additionally, the presence of crocodylians supports previous interpretations of the climate on the Great Plains during the late Miocene as being warm-temperate to subtropical.

- **Dielectric Characterization of Binary Solvent Systems Containing Acetonitrile Paired with Benzonitrile and Propylene Carbonate.**

Orland W. Kolling, Natural Science Division, Southwestern College, Winfield, Kansas 67156-2499.

The two aprotic highly dipolar solvents, benzonitrile and propylene carbonate, when paired with acetonitrile (AN) form cosolvent mixtures covering a variable dielectric constant interval from 25.18 to 65.20 units at 25°C. Trends for reaction field functions in dielectric constant with changing cosolvent composition were compared for the AN:benzonitrile and AN:propylene carbonate systems along with literature results on other AN:cosolvent pairs. The first pair is one of four binary solvents containing acetonitrile studied so far which behave as dielectric continua with respect to the Kirkwood-Onsager and Block-Walker reaction field models.

- **Discovery of the Federally Endangered American Burying Beetle (*Nicrophorus americanus*) in the Chautauqua Hills of Southeastern Kansas.**

Hank Guarisco, Kansas Biological Survey, 1041 Constant Ave., Lawrence, Kansas 66047.

The recent rediscovery of the American Burying Beetle (*Nicrophorus americanus*) in three counties in the Chautauqua Hills of southeastern Kansas makes Kansas the sixth state where extant populations of this federally endangered species have been located. The development of a recovery plan at the state level is suggested to ensure the continued survival of this species in Kansas.

- **Selected Records of Stream Fishes from the Kansas River Basin in Kansas.**

Mark E. Eberle, Thomas L. Wenke and Tim L. Welker, Department of Biological Sciences, Fort Hays State University, Hays, Kansas 67601.

We summarize noteworthy records for nine species of fishes taken during stream surveys conducted in the Kansas River basin within Kansas from 1992 through 1995.

- **Shark-Tooth-Bearing Coprolite from the Carlile Shale (Upper Cretaceous), Ellis County, Kansas.**

Kenshu Shimada, Department of Biological Sciences (M/C 066), University of Illinois at Chicago, Chicago, Illinois 60607-7060.

A coprolite containing a tooth of an extinct shell-crushing shark, *Ptychodus* sp., was collected from the Blue Hill Shale Member of the Upper Cretaceous Carlile Shale in Ellis County, Kansas. The *Ptychodus* tooth lacks enameloid, probably as a result of etching through digestion in some animal. This specimen suggests that isolated ptychodontid teeth without enameloid which occur occasionally in other Upper Cretaceous deposits may be attributed to animal digestion.

- **Stratigraphic Record of the Late Cretaceous Lamniform Shark, *Cretoxyrhina mantelli* (Agassiz), in Kansas.**

Kenshu Shimada, Department of Geosciences, Fort Hays State University, Hays, Kansas 67601-4099.

The Late Cretaceous lamniform shark, *Cretoxyrhina mantelli* (Agassiz), occurs in the Graneros Shale, Lincoln Limestone, Jetmore Chalk, Pfeifer Shale, Fairport Chalk, Fort Hays Limestone, and Smoky Hill Chalk in Kansas. The crown heights of anterior teeth of geologically older *C. mantelli* generally are smaller than those of geologically younger ones, but taxonomic division at the subspecific level cannot be made. *Cretoxyrhina mantelli* is thought to prefer offshore environments.

- **Growth of the Winter Population of Canada Geese in Wichita, Kansas, Between 1983-1997.**

Alan D. Maccarone and George D. Potts, Environmental Studies Graduate Program, Friends University, Wichita, Kansas 67213.

Numbers of Canada Geese within the Wichita city limits were counted each winter beginning in 1983. The goose population increased from 1600 birds in 1983 to >13000 birds in 1997. Smaller flocks were more usual than were larger aggregations. Mean flock size differed significantly among three major habitats (water, grass, and agricultural fields); however, flock sizes were similar under conditions of clear and frozen or snow-covered ground. The number of flocks differed significantly among years, but was not correlated with year of census. Some possible causes for the eight-fold increase in the number of geese is discussed, as well as the implications for cities such as Wichita from the continued growth of winter Canada Goose populations.