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First Report of Brazilian Free-tailed Bat Maternity Colonies in Arkansas

David A. Saugey
United States Forest Service, dasnightwing@gmail.com

Darrell R. Heath
University of Arkansas at Little Rock

Clark Efaw
University of Arkansas at Little Rock

Gary A. Heidt
University of Arkansas at Little Rock

Teresa E. Beggs
National Park College

are generally seen with alkylating agents or agents which intercalate with DNA (Drewinko, et al., Cancer Res. 33:3091, 1973). This particular line of cells appears somewhat less sensitive to Cisplatin than the lymphoma cells used by Drewinko, Brown and Gottleib (Cancer Res., 33:3091, 1973), however, variations in sensitivity among different cell lines are common occurrences.

The cis-isomer of Cisplatin was about 50-60 times more toxic than the trans-isomer, a phenomenon which has been noted by other workers (Zwelling, et al., Cancer Res., 39:365-369, 1979). This phenomenon is only partially understood. Both agents cause extensive DNA-protein cross linkage and intra- and interstrand DNA cross linkage, however, the degree of interstrand cross linkage more closely correlated with cytotoxicity. The trans-isomer is actually more mutagenic. The mechanism of the specificity for certain tumors which alkylating agents such as Cisplatin display is not understood in view of the wide spectrum of reactions in which these compounds take part. It would appear that the platinum coordination compounds as alkylating agents, must react with very specific sites to produce their characteristic effects.

CLIFTON ORR, JOSEPH E. STONE, and MAXINE L. POLK, Department of Pharmacology and Interdisciplinary Toxicology, University of Arkansas for Medical Sciences, Little Rock, AR 72205.

FIRST HOST PLANT RECORDS FOR *Chelysomidea guttata* (HERRICH-SCHAEFFER) (HEMIPTERA:SCUTELLERIDAE), WITH NOTES ON THE BIOLOGY AND DISTRIBUTION

Chelysomidea is primarily a tropical-subtropical genus distributed from the southern United States through Mexico, Central America, and into South America. As with most genera of Scutelleridae, little work has been done with *Chelysomidea* aside from species descriptions. The purpose of this paper is to report host plant data and new information concerning the biology of *C. guttata*.

C. guttata has been collected from the southern parts of Louisiana, Mississippi, Alabama, and Georgia; throughout Florida; and from eastern North and South Carolina. One other species in this genus, *C. stictica* (Dallas), is known to occur in the United States from a small area in the vicinity of Brownsville, Texas, which is thought to be the northern limits of its range (Lattin, The Scutellerinae of America north of Mexico (Hemiptera:Heteroptera:Pentatomidae), Unpubl. Ph.D. dissertation, p. 350, 1964).

Blatchley (Heteroptera or true bugs of eastern North America with especial reference to faunas of Indiana and Florida, p. 1116, 1926) reported *C. guttata* being collected from *Ipomoea pes-caprae* (Roth) and scrub oak in Florida. Lattin (1964) reported collecting the species from *Kosteletzkya virginica* (L.) in South Carolina and from *Althaea rosea* (Cav.) in Florida. No feeding activity for *C. guttata* has previously been reported.

Adults and late nymphal instars were observed feeding on *Croton capitatus* (Michx.) and *C. glandulosus* (L.) in September of 1982 in Choctaw County, Alabama and Covington County, Mississippi. All five nymphal instars as well as adults were found on all parts of *Croton* but mainly in groups on the flowering portion of the plants. Gregarious adults and late nymphal instars were also observed.

Several live adults and nymphs were collected from *C. capitatus* and *C. glandulosus* and brought back to the laboratory for rearing. Different stages of nymphal instars were separated and put in pint mason jars with screen tops. Field collected adults were sexed and placed in mason jars, two pairs per jar. Nymphal instars and adults were first fed fresh green beans and raw peanuts. McPherson (The Pentatomoidea [Hemiptera] of northeastern North America with emphasis on the fauna of Illinois, p. 240, 1982) reviewed the literature concerning lab rearing practices for the Pentatomoidea. A high mortality rate occurred within the first month of rearing. In an effort to reduce high mortality, *C. capitatus*, which is abundant in northeastern Arkansas, was collected and placed in the mason jars in lieu of green beans and peanuts. The insects fed on flowering portions of *C. capitatus* which were clipped and placed in small test tubes filled with water. Cotton was used to plug the openings of the test tubes. Food along with paper towelling was replaced three times a week or as necessary. All jars were washed once a week. Specimens were incubated at 25 ± 1°C, 12:12 LD photoperiod and ambient humidity.

The purpose of rearing efforts was to determine the length of the development of the insect, from egg to adult stage, and to determine the length of each individual instar. This part of our study was not completed due to the high mortality rate which occurred within the first month of rearing.

A pair of insects was observed mating on January 3, 1983, but as yet no eggs have been deposited. Further collections of *C. guttata* will be made in order to continue the study into the life cycle of this insect.

JULIA L. REID and HARVEY E. BARTON, Department of Biological Sciences, Arkansas State University, State University, AR 72467.

FIRST REPORT OF BRAZILIAN FREE-TAILED BAT MATERNITY COLONIES IN ARKANSAS

Three maternity colonies of the Brazilian free-tailed bat (Molossidae: *Tadarida brasiliensis cynocephala*) have been found in central Arkansas. Previously reported records of *Tadarida* in Arkansas are of individual specimens collected from Ashley, Hempstead and Pulaski counties, either roosting singly or in maternity colonies of the evening bat, *Nycticeius humeralis* (Sealander, A guide to Arkansas mammals, pp. 99-102, 1979; Sealander and Price, J. Mamm., 45:152, 1964).

On July 28, 1982 we investigated a reported bat infestation in the attic of an old two story apartment building in downtown Hot Springs, Garland County. The colony was estimated to have contained 100 individuals. Forty-two bats were captured, examined and released. Six of the bats captured were volant juvenile *Tadarida* and three were volant juvenile *Nycticeius*. Juvenile status was determined by non-closure of the epiphyses of the third and fourth digits. All bats were roosting on the west wall of the attic at the ceiling joist/rafter junction, rendering them extremely difficult to capture. When a light was shone in this area, many of the bats moved outside the attic proper and roosted behind an exterior facer board. It was from behind this facer board that most of the bats launched themselves into flight when initiating their nightly foraging activities. During January, 1983, a check of this roost revealed a portion of the colony used the attic as overwintering quarters.

The second maternity site was found in the attic of an old dormitory building on the campus of Central Baptist College in Conway, Faulkner County, during October, 1982 and represents the northern most distribution of *Tadarida* reported in Arkansas. The colony numbered several hundred individuals and used a 30 centimeter wide air space between a double brick wall and the ceiling joist/rafter junction at the edge of the attic for roosting. Similar roosting sites were selected by *Tadarida* in Louisiana (LaVal, Am. Midl. Nat., 89:112-120, 1973). Both of these roosting sites were located on the west side of the building and warmed considerably during afternoon hours. Judging from the guano that has accumulated to a depth of over 30 centimeters in places, the colony had probably inhabited the attic for a number of years. Verification of this roost as a

General Notes

maternity site was accomplished by sifting through guano piles and recovering skeletal and mummified remains of juvenile *Tadarida* during the fall of 1982.

Several hundred newborn *Tadarida*, many with umbilicus still attached, were observed and voucher specimens collected in June, 1983 (specimens deposited in UALRMZ). The colony shared its maternity and hibernating quarters with approximately 500 (October estimate) big brown bats, *Eptesicus fuscus*. *Eptesicus* roosted near the apex of the attic or high up on the sloping rafters in more open areas, segregating themselves from the free-tails. However, in both October, 1982 and March, 1983, several *Eptesicus* and *Tadarida* were observed roosting side by side on rafters halfway between the two colonies and during the maternity period juveniles and adults of both species often shared roosting sites. Apparently *Eptesicus* has occupied these same areas of the attic during maternity periods as skeletal remains of juveniles and adults littered the manure piles below. Mixed roosting of these two species in man-made structures has been reported as a common occurrence from the western states according to Barbour and Davis (Bats of America, p. 209, 1969).

The third maternity site was located in the old lion house of the Little Rock Zoo in Pulaski county. The exact size of the colony was unknown, but Zoo personnel reported the accumulation of dislodged juveniles on the floor of the building as a daily occurrence during the pre-volant maternity period. Roosting sites selected by this colony were similar to those previously described. A portion of the colony overwintered in the building as evidenced by the capture of adult females in mist nets which had been set up to remove sparrows from the building in February, 1983 (pers. comm., Bob Cooper, Zoo Director).

The close proximity of this colony to the University of Arkansas Medical Science campus probably explains the 1962 occurrence of an adult female *Tadarida* captured while roosting on the latticework of a research building (Sealander and Price, 1964).

The presence of these colonies have resulted in two additional county distribution records (Faulkner and Garland), firmly established the species as a resident mammal and extended the known northern distribution of the bat approximately 40 kilometers within the state.

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DAVID A. SAUGEY, United States Forest Service, Hot Springs, AR 71901; DARRELL HEATH, CLARK EFAW and GARY HEIDT, Department of Biology, University of Arkansas-Little Rock, Little Rock, AR 72204; and TERESA E. BEGGS, Division of Nursing, Garland County Community College, Hot Springs, AR 71901.

ZOOPLANKTON POPULATION STRUCTURE IN THREE RESERVOIRS NEAR THE OUACHITA MOUNTAIN - GULF COASTAL PLAIN INTERFACE

Zooplankton are important food for young-of-the-year and certain adult fish and may serve as an indicator of trophic status (McNaught, Verh, int. Ver. Limnol. 19:724-731, 1975). In 1979, the National Reservoir Research Program and the Waterways Experiment Station of the U.S. Army Corps of Engineers conducted a cooperative study of the effects of reservoir operations on tailwater environments. The study included seasonal measurements of water quality and zooplankton populations in three reservoirs (Pine Creek Lake, Oklahoma; and Gillham and Greeson Lakes, Arkansas).

The lakes are in different river drainages near the interface of the Ouachita Mountains and the Gulf Coastal Plain physiographic provinces. Pine Creek and Gillham Lakes are multi-purpose, flood control impoundments in the Little River system. Pine Creek Lake (2,023 ha) is a mainstem reservoir on the Little River in southeast Oklahoma; Gillham Lake (554 ha) impounds the Cossatot River in southwest Arkansas; and Lake Greeson (2,940 ha), is a Corps of Engineers hydroelectric project on the Little Missouri River in the Ouachita River basin in west central Arkansas. Selected physicochemical characteristics of the three lakes include low conductivity (34-52 umhos/cm), low alkalinity (6-13 mg/1 as $CaCO_3$), and nearly neutral pH (ca. 6.5).

In 1979, zooplankton densities were estimated for Pine Creek Lake from April through November, for Gillham Lake from June through October, and for Lake Greeson from May through October. Vertical tows at depths of 15-10 m, 10-5 m, and 5-0 m were made with an 0.08-mm mesh, 0.3-m closing net. Samples were immediately preserved in 3% formalin. Two 1-ml subsamples were later placed in a Sedgwick-Rafter counting cell where all organisms were identified and counted. Dry weight biomass estimates (from the upper stratum) were calculated by regression equations (Dumont et al., Oecologie 19:75-97, 1975). Cladocera and Rotifera (except Conochilidae) were identified to species, and Copepoda were identified to suborder. All estimates were expanded to number and milligrams per cubic meter.

Daphnia rosea, D. catawba, Leydigia quadrangularis, and *Synchaeta* sp. were found only in Gillham Lake, where a total of 12 species of cladocerans and 17 species of rotifers were collected. *Daphnia galeata mendotae* and *Keratella americana* were collected only in Lake Greeson, where 9 cladoceran and 17 rotifer species were identified. Nine cladoceran and 18 rotifer species were found in Pine Creek Lake. Copepoda ranked high in density throughout the study period (Table); however, comparisons of the copepod suborders (Calanoida and Cyclopoida) to the cladoceran and rotifer genera were not considered valid, and relationships were not analyzed. *Chaoborus* appeared in zooplankton collections from all three reservoirs.

Zooplankton densities in the upper stratum of Pine Creek Lake peaked in spring and early summer (Figure). Conochilidae were the most abundant zooplankters throughout the sampling period (Table), and composed over 50% of the population during April and July. However, *Daphnia parvula* (23%) and *Holopedium amazonicum* (29%) were responsible for the greatest biomass in April and July, respectively.

Population densities of rotifers, copepods, and cladocerans peaked in the upper stratum of Gillham Lake simultaneously in July. The populations progressively decreased through the fall. Conochilidae and *Kellicottia bostoniensis* were the most abundant zooplankters (Table). *Holopedium amazonicum* composed the greatest mean biomass, although it dominated the biomass (65%) only in June. *Hexarthra mira, Ceriodaphnia* spp., and *Daphnia ambigua* and *D. Laevis* contributed the greatest biomass in July, September, and October, respectively.

In Lake Greeson, the copepods peaked in May, rotifers in July, and cladocerans in September. Total zooplankton densities were highest and biomass lowest in the upper stratum during July (Figure), when *Collotheca* sp. made up 90% of the total density and 44% of the total biomass.