

## **DANIEL BENNETT**

Mampam Conservation, 118 Sheffield Road, Glossop, SK13 8QU. UK.

### **Gray's Monitor Lizard**

Monitor lizards usually eat animals, but two species in the Philippines have evolved into specialised fruit eaters. No other living reptile depends on fruit to the extent of these lizards and few vertebrates that live on fruit lack wings. A 20lb lizard that feeds on a very narrow range of fruits within a very complex and diverse forest structure seems an almost certain candidate for extinction, especially if its flesh has a reputation for being particularly delicious. The extinction process can be observed on Polillo Island where Gray's monitor lizard, *Varanus olivaceus*, is being extirpated from forest fragments as their food and shelter trees are destroyed. At current rates of logging the lizard will disappear from the area within about 50 years.

This project began in 1999 and is ongoing, currently supported by a number of US zoos. Learning about the habitat requirements of this lizard is difficult because they are notoriously shy and spend all but 40 minutes per week in tree canopies 20-40m above the ground. The only previous study of the species involved methods that are not appropriate today and so non destructive techniques were developed to investigate population status and structure, movement, habitat, diet and feeding behaviour. Results suggest that the lizards respond to habitat degradation in a number of ways before eventually being forced out by lack of resources. In this presentation I will give an overview of the project and suggest some practical strategies for conservation of the animal and its habitat.

## **DANTÉ FENOLIO**

Department of Zoology  
University of Oklahoma

### **The Herpetofauna Exploiting Termite Mounds of the Upper Tocantins River Valley**

The second largest ecosystem in Brasil's vast expanse is a poorly studied xeric habitat known as cerrado. Made of a mosaic of gallery forest, granitic outcroppings, palm clusters, and open grasslands, cerrado has surprised biologists with its biodiversity, including that of its herpetofauna. Until recently, research emphasis in Brasil had been placed on the last few patches of Atlantic forest and the Amazon; cerrado had taken a back seat and had been labeled as "wasteland." Contemporary efforts to study and document the environment have taken a feverish pace in light of its murky future. The unique biome has suffered an unprecedented rate of habitat alteration; over 60% has been seriously altered or destroyed in the last decade alone.

Of the mechanisms employed by many cerrado organisms to withstand scorching day time temperatures, chilly night time temperatures, massive temperature fluctuations within a 24 hr. cycle (up to a 45° C swing), expansive wildfires, dehydrating winds, and long dry seasons is the inhabitation of termite mounds. Since 1995, over 1,500 termite mounds have been examined from the Upper Tocantins River Valley. Of 39 amphibian species documented from a site known as "Serra Da Mesa," 19 (49%) were found to inhabit termite mounds. Of 75 reptile species from the same locality, 27 (36%) were found to do the same. Ongoing research may shed light on the specific advantages gained through the exploitation of the resource.

**KATIE HAMPSON**

Department of Ecology and Evolutionary Biology  
Princeton University  
Princeton, New Jersey 08544 USA  
E-mail: khampson@Princeton.EDU

**Forest Fragmentation and Effects on Amphibian Communities in the Philippines**

Collecting accurate information about the relative abundance and density of amphibians in rainforests communities presents considerable difficulties because they occupy a wide range of microhabitats in a very complex environment. Some species congregate in large numbers or are otherwise conspicuous but others are rare, cryptic or widely dispersed, sometimes so difficult to find they are completely overlooked. Data sets that are even remotely comparable for all species in the community are scarce and as a result it has been difficult to describe the ways communities change when habitat is destroyed or fragmented. Here I describe methods used to sample amphibian communities in Coorg (India) and Polillo (Philippines) and demonstrate an important edge effect in the latter, whereby forest specialists are eventually exterminated by increasing fragmentation.

**ERIC HAUG**

Pets-A-Plenty "The Ultimate Reptile Store"  
6763 Highway 6 S #1400  
Houston, Texas 77083 USA  
Ph: (281) 568-4849

**Captive...Wild...What's the Real Issue? Assume Nothing!**

With more than 25 years experience in herp retail sales, I have had the opportunity to work with a tremendous diversity of amphibians and reptiles and I've been able to observe first-hand which species have fared better than others under captive conditions. There are two major factors in this type of work; understanding the biology and natural history of the herptile and understanding the needs and capabilities of the customer. Considering the broad range requirements of both entities, it is often a difficult and uphill battle to satisfy all involved. It is a given that not all herp species will be suitable or even appropriate for all clients. Therefore, it is incumbent that a screening process be adopted that will best suit a chosen pet to its prospective owner. This presentation will highlight some of the more unusual, humorous, as well as serious situations that I have dealt with over the past quarter century.

**RICK HUDSON**

Conservation Biologist  
The Forth Worth Zoo  
1989 Colonial Parkway  
Fort Worth, Texas 76110 USA  
(817) 759-7555

**A Comprehensive Response to the Global Turtle Crisis**

Turtles and tortoises are in trouble globally but nowhere is the situation more publicized than in Southeast Asia. The past ten years have seen the advent of a huge commercial market for chelonians to supply the food markets of southern China. Described as one of the greatest wildlife catastrophes of modern times, the Asian Turtle Crisis is unprecedented in its enormity and its risk. Measured in tens of tons of turtles per day, the trade is clearly unsustainable and the far-reaching impacts are predictably dire. Not restricted to this region, the tentacles of this network are now extending to other regions including Madagascar, Africa and the U.S. Though the situation is most acute in Southeast Asia, populations globally are undergoing rapid declines as well due to the activities of man.

A challenge of this magnitude demands a global response. This presentation will highlight some of the progress that has been made in recent years to address this crisis, focusing on some of the organizations that have emerged to take action, primarily the Turtle Survival Alliance (TSA) and the Turtle Conservation Fund. Examples of the myriad conservation actions being utilized including CITES regulation and enforcement, training workshops, confiscations, range-country rescue centers, captive assurance colonies, capacity building in range countries, and conservation biology research

Will be described.

**WILLIAM W. LAMAR**

University of Texas - Tyler  
Tyler, Texas USA

**Herping the Amazon in Peru**

Want to get an idea what it is like to work in the world's largest rainforest with the world's most diverse herpetofauna? With nearly 400 species in an area smaller than east Texas, this is as exciting as it gets. If you can't experience it first-hand, this is the next best thing.

**DR. DAVID LAZCANO**

Universidad Autonoma de Nuevo Leon  
Facultad de Ciencias Biologicas, Laboratorio de Herpetologia  
Apartado Postal – 513, San Nicolas de los Garza, Nuevo Leon, C.P.66450 Mexico  
Ph: (81) 8376-27-875, Lab: (81) 8332-2889, E-mail: [dvlazczno@hotmail.com](mailto:dvlazczno@hotmail.com)

**The Effects of Habitat Burning on Mexican Herpetofauna**

(No Abstract Submitted)

**BILL LOVE**

Blue Chameleon Ventures  
P.O. Box 643  
Alva, Florida 33920 USA  
Ph: (239) 728-2390 E-mail: [bill@bluechameleon.org](mailto:bill@bluechameleon.org)  
[www.bluechameleon.org](http://www.bluechameleon.org)

**New Caledonia's Gecko Grandeur**

The islands of New Caledonia have been isolated for eons, allowing a unique herpetofauna to evolve free of competition from virtually all forms of terrestrial predators. Only a few families of herps ever made it there to colonize the isolated islands. Subsequently, those couple groups - the geckos and the skinks - radiated out to include the largest members of the endemic terrestrial vertebrate fauna.

Bill Love was the expedition photographer on a biological survey of the small islands of southern New Caledonia with Philippe & Gigi de Vosjoli and Frank Fast for three weeks in 1997. His slide program will follow the group's explorations over the islands, focusing on the many species of animals encountered in the field, their macro and microhabitats, and other natural history observations concerning food, shelters, activity periods, etc. He will make you feel like you were there as he familiarizes you with all aspects of his voyage to a remote land harboring herps very popular in the pet trade today, but that few hobbyists will probably ever visit in person.

**KATHY LOVE**

CornUtopia  
P.O. Box 643  
Alva, Florida 33920 USA  
Ph: (239) 728-2390  
E-mail: [kathy@corbutopia.com](mailto:kathy@corbutopia.com)  
[www.corn-utopia.com](http://www.corn-utopia.com)

**A Cornucopia of Corn Snakes**

Over the past several decades, corn snakes have risen to claim the title of most commonly kept pet snakes in the world. The many qualities that have contributed to their immense popularity will be examined to demonstrate how they reached that status. The extremes of the current variation in color and patterns will also be shown. A brief history tracing the corn snake's evolution since the late 1950s (when the first 'albino' was found) will be presented as a prime example of a quintessential success story of modern herpetoculture.

Kathy Love has been keeping and breeding *Elaphe guttata* for over a quarter of a century. She is responsible for creating and refining some of the many morphs that have fueled their prevalence in the market. Her continuous work to improve husbandry and breeding techniques, and her renowned efforts of sharing her knowledge with all who have sought her help, have made her a major contributor to corn snakes' dominance of the pet snake trade today.

**JOHN MALONE**

Department of Biology,  
University of Texas – Arlington  
Box 19498  
Arlington, Texas 76019 USA

Two species of *Smilisca* place eggs in basins while the other four species lay eggs as a surface film in ephemeral pools. I tested two hypotheses concerning the evolutionary function of depoisting eggs in basins. The microenviornment modification hypothesis targets potential abiotic benefits of depoisting eggs in basins which may lead to increased metamorphic rates. The predator avoidance hypothesis predicts that eggs depoisted in basins are segregated from predators and thus have increased survivorship. Results from field observations and egg palatibility experiments support a predator avoidance hypothesis but also reveal trade offs from conspecific tadpoles and invertebrate predators that colonize basins.

To understand the origin and distribution of the basin construction reproductive mode, I constructed a phylogeny of *Smilisca* using mtDNA data. These data produced a novel phylogenetic hypothesis which shows that the basin construction reproductive mode is constrained to a monophyletic unit composed of *S. sila* and *S. sordida*.

**JIM O'REILLY**

**CAECILIAN NATURAL HISTORY**  
(No Abstract Submitted)

**DR. MARK PECKHEM**

Houston, Texas

**A Day in the Life of a Reptile Veterinarian**  
(No Abstract Submitted)

**JOHN C. PÉREZ and ELDA E. SÁNCHEZ**

Natural Toxins Research Center (NTRC)  
Texas A&M University-Kingsville  
Campus Box 158  
Kingsville, TX 78363 USA

**A Review of an Internet Database of Venoms Found in the United States**

Snake venoms are complex mixtures of pharmacologically important molecules, some of which may have potential therapeutic agents. Snake venoms are rich, stable sources of disintegrins, metalloproteases, and fibrinolytic enzymes. The literature contains many references on how

venom components are being used in medicine. Within the United States, there are 27 recognized species of venomous snakes. Despite this rather vast diversity of venomous snakes in North America, most of the biomedical research is conducted on a limited number of the more common venoms (*Crotalus atrox*, *C. adamanteus*, *C. viridis viridis*, *Agkistrodon contortrix contortrix*, *A. contortrix laticinctus*, and *A. piscivorus piscivorus*). The venoms from many of the North American species are not available for research. Therefore, the composition and potential usefulness in medicine has not been explored. The Natural Toxins Research Center (NTRC) serpentarium presently houses over 400 venomous snakes composed of 25 species and 33 subspecies. These snake venoms are cataloged in an Internet database along with their geographical location, sex, size, biological activities, high performance liquid chromatography profiles and electrophoretic titration profiles. These venoms can be queried through an on-line search routine. The objectives of the NTRC are to: 1) provide reliable information about venoms and related products from a wide variety of venomous snakes, 2) characterize venoms, and 3) develop a database which will be useful to investigators worldwide. Most of the snake venoms in the database are from the North American continent and all the venoms tested thus far are complex mixtures of many different toxins. The database will be expanded to include those antivenoms used to neutralize specific venoms. This information will be useful to the practitioner, herpetologist, poisonous control center technicians and forensic scientists.

**ANDREW H. PRICE, Ph.D.**

Natural Resources Scientist  
Wildlife Diversity Program  
Texas Parks and Wildlife Department  
4200 Smith School Road  
Austin, Texas 78744 USA  
Ph:(512) 912-7022 Fax:(512) 912-7058

**The Houston Toad: A Case Study in Conservation Biology and Realpolitik**

The Houston Toad (*Bufo houstonensis*), a small member of the *Bufo americanus* species group endemic to east-central Texas, has resided longer on state, national, and international endangered species lists than most other taxa. This species disappeared from most of its historically know range following its discovery in the Houston, Texas, area following World War II, and was known from only a single locality during the three decades prior to 1990. Intensive surveys by Texas Parks and Wildlife Department personnel and associates has resulted in the discovery of new populations in 9 counties in central Texas. This species is restricted to deep sandy soils supporting ephemeral wetlands within native post oak/loblolly pine woodlands and savannas that have been subjected to minimal landscape-scale disturbance. Except for 2 sites, nothing is known about the demographics of the newly-discovered populations; the most robust population known still resides in Bastrop County. A total of 2833 adult Houston Toads have been marked with PIT tags in one watershed within Bastrop State Park from 1990-2002. Breeding choruses of up to 200 individuals form under specific climatic conditions over 1-4 nights during February and early March, separated by intervals of several days to several weeks. Individual females are rarely recaptured during the same breeding season, whereas males have been recaptured as often as 22 times in one year. Maximum longevity appears to be 6 years for

males and 5 years for females. Individual toads have been recorded traveling distances of up to 1.3 km during the breeding season. Regional climatic regimes have a profound effect upon Houston Toad recruitment and survivorship, compounded by the current fragmented status of the species' populations. The conservation implications of these data and the contentious history of ongoing community efforts to implement a Habitat Conservation Plan for the Houston Toad in Bastrop County under the U.S. Endangered Species Act will be discussed.

## **MAHMOOD SASA**

Instituto Clodomiro Picado

Universidad de Costa Rica, San Jose, Costa Rica.

email:sasa@cro.ots.ac.cr

### **The Status and Conservation of Crocodylians in Costa Rica: An Upgrade**

Two species of crocodylians occur in Costa Rica, sharing wetlands, rivers, and marshes: the American crocodile *Crocodylus acutus*, and the spectacled caiman *Caiman crocodilus*. Both species are sympatric in the country, but microhabitat partition is evident in most localities along their distribution. Despite the long history of herpetological research in Costa Rica, it was not until recent that studies about the captive management, population ecology and behavior have been conducted in the country. In general, both species are common throughout their distribution in the country. Pacific populations of the American crocodile seem to be denser in Costa Rican than in other countries, probably reflecting conservation efforts that began late 1970's. In the Caribbean coast, most studies have focused in the spectacle caiman. Recent interests on the conservation biology and management of crocodylians have produced a national association of professionals, interested in the study of natural populations and management in captivity. In conjunction with colleagues from USA, an extensive campaign to demystify crocodylians has been in place. Nevertheless, recent reports reveal that conservation status of these populations is in jeopardy, especially in the north part of the country. Future research lines and conservation efforts are addressed here.

Patti Shoemaker  
Supervisor, Children's Zoo  
Houston Zoo  
1513 N. MacGregor  
Houston, Texas 77030 USA  
Ph:(713) 533-6500

### **The Natural History of the Alligator Snapping Turtle**

Long a subject of folklore and southern culture, the Alligator Snapping Turtle, *Macrolemys temminckii*, with its worm-like lure, still fascinates young and young at heart herpetologists alike. Alligator Snapping Turtles are most common in the southeastern United States, from southern Georgia and northern Florida west to Texas and Oklahoma. They can even reach as far north as Illinois, Indiana and Kansas. The habitat of Alligator Snapping Turtles is rivers, lakes, ponds, swamps and bayous of the river systems of the Gulf of Mexico. Not much is known about the behavior and movements of America's largest freshwater turtle, but one thing is clear, the numbers of Alligator Snapping Turtles is declining at an unsustainable rate.

**JIM STOUT**

Herpetarium Supervisor  
Oklahoma City Zoo  
2101 NE 50<sup>th</sup> Street  
Oklahoma City, Oklahoma 73111 USA  
Ph: (405) 424-3344

**Madagascar Canopy Wildlife**

In October 2001 the French run "Canopy Raft Program" gave us the opportunity to explore one of the last remaining, primary rain forest in Madagascar. On the Masoala Peninsula we examined the herpetofaunal community with vertical and horizontal transects. We searched in emergent, upper, mid, lower and ground level habitats. Special attention was paid to phytotelmata and the fauna associated within. The Raft Program offered an assortment of unique collecting methods which will also be discussed.

**R. KATHRYN VAUGHAN, Ph.D. and  
JAMES R. DIXON**

Curator  
Reptiles and Amphibians  
Texas Cooperative Wildlife Collection  
Texas A&M University  
College Station, Texas 77843-2258 USA

**Natural history and taxonomic status of Mexican and southwestern United States blind snakes allied with *Leptotyphlops dulcis***

The tiny, burrowing blind snakes of the genus *Leptotyphlops* are represented in the Americas by two species. One of these species, *Leptotyphlops dulcis* is distributed across the southwestern United States and the eastern half of Mexico. Aspects of the natural history of these secretive snakes will be discussed. In addition, the taxonomic status of *Leptotyphlops dulcis dulcis*, *L. dulcis dissectus*, and *L. dulcis myopicus* have been reexamined and updated, and these results will be presented.

**HAROLD K. VORIS**

Division of Amphibians and Reptiles  
Field Museum of Natural History  
Chicago, Illinois 60605 USA

**Evolution Across Life Zones: Reptiles Invade the Sea**

Among vertebrate historians, amphibians are known for colonizing the land while reptiles are renowned for completing the transition to a fully terrestrial way of life. Several key physiological and morphological innovations such as a leathery egg, and water-conserving kidneys and integument, made the latter transition possible. Since achieving this great evolutionary milestone

many reptile lineages have experimented with a return to the sea. Why has this happened? A comparison of the various evolutionary experiments and an exploration of the common trends reveal that exploitation of a new food source seems to be a common factor and perhaps a driving force in the reptiles' return to an aquatic environment. This comparison also reveals that the return to the sea has been accompanied--not by reversals to previous conditions--but by novel adaptations that accomplish the old functions, as exemplified by the variety of specializations among the sea snakes. If abundant nutritional resources have been an important draw, what has limited these evolutionary reversals? A working hypothesis involving predation is explored to begin to try to answer this question.

**Edward J. Wozniak D.V.M., Ph.D.**

### **Venom-derived Disintegrins: A New Generation of Anti-tumor Peptides with Potential Therapeutic Value**

Disintegrins are a class of non-toxic venom-derived peptides that are potent inhibitors of platelet aggregation. The mechanism of platelet aggregation inhibition is brought about by a complex cascade of subcellular reactions that are initiated by disintegrin engagement of integrin receptors on the platelet surfaces. Through their interaction with the integrins on tumor cells, disintegrins have recently been shown to exhibit anti-cancer activities. Some disintegrins have been shown to arrest tumor growth and prevent metastasis by inhibiting cell proliferation, blocking cell motility, arresting vasculogenesis, and inducing endothelial cell apoptosis in human neoplasms. The net effect of these changes is a smaller, more localized tumor that is less likely to metastasize. Because of their therapeutic potential in the treatment of some cancers, there is biotechnological interest in developing some disintegrins as anti-neoplastic drugs.

While numerous disintegrins have been isolated from Asian Crotalinae, with the exception of the southern copperhead from which the anti-tumor peptide contortrostatin was derived, few disintegrin surveys have been done on New World species and no comparative studies have been done at the specific, subspecific and population levels of resolution (biotypes). With the rather extensive degree of geographic isolation and evolutionary divergence evident in the New World Crotalinae, the probability for unique disintegrins with anti-tumor properties in the vast array of known genera and species is predicted to be high. The purpose of this study was to characterize and compare the primary structure of disintegrins in a specified group of New World Crotalinae at the specific, subspecific and population levels of resolution. The specific aims were to test the following three hypotheses: 1) The structural features of venom-derived disintegrins vary between species and subspecies of the New World *Agkistrodon* species complex, *Crotalus lepidus* and *Atrypoides nummifer nummifer*, 2) Structurally different disintegrins will have different integrin affinities and biological activities, 3) Some members of the New World Crotalinae undergo ontogenetic shifts in disintegrin expression.

Venom samples from each age-specific snake biotype were collected in chilled receptacles, centrifuged, sterile filtered and snap frozen at -70 C. Aliquots of raw venom were analyzed by polyacrylamide gel electrophoresis and the disintegrin fractions identified by Western blot using rabbit anti-contortrostatin antibodies. Fractions with proteolytic activity were identified by zymography. Initial analysis of the structural features of each disintegrin was accomplished by characterizing the corresponding mRNA sequences by high fidelity RT-PCR using custom designed oligonucleotide primers. Each resulting cDNA construct was inserted into a plasmid and cloned in competent JM-109 *E. coli* from which it will be recovered for sequence

analysis. The amino acid sequences deduced from the cloned cDNA sequence information will be used in the initial comparison of primary structures.

Western blot analysis demonstrated similarly sized disintegrin-positive proteins (45-55 kDa and 13-16 kDa) in the venoms from all of the copperhead and cottonmouth subspecies in the study population. Both *A. bilineatus bilineatus* and *A. taylori* had disintegrin fractions that were easily distinguishable (150 kDa and 14.5-15 kDa) from those in the copperheads and the western cottonmouth. All of the non-enzymatic disintegrin-positive fractions identified in *Agkistrodon* sp. venoms approximate dimeric variants in size. *Crotalus lepidus lepidus* venom was found to contain disintegrin-positive proteins approximately 55 kDa and 8 kDa. The 8 kDa band is approximately the size of a monomeric disintegrin. Zymographic analysis with casein and type-A gelatin demonstrated proteolytic activity in all of the high molecular weight disintegrin-positive fractions in each of the venoms sampled. Interestingly, no disintegrins that were reactive with anti-contortrostatin antibody were demonstrated in *A. nummifer nummifer* venom. This finding suggests that this family of proteins to be either structurally different from those in other North American and Mexican Crotalinae or lacking all together.

High fidelity RT-PCR demonstrated similar RNA sequences in the venom glands of all of the coralline species sampled including *A. nummifer nummifer*. All resulting cDNA sequences were approximately 175 bp in size which very closely approximates the predicted size of the product sequence in contortrostatin. Each resulting cDNA construct (N=10 thus far) was successfully incorporated into a plasmid and used to transform competent *E. coli*. The average transformation efficiency was with the protocol used in our laboratory was 96%. This is an ongoing study.