

**PROCEEDINGS OF THE  
29th INTERNATIONAL  
HERPETOLOGICAL SYMPOSIUM  
on  
CAPTIVE PROPAGATION and HUSBANDRY**

Hosted by  
**The Phoenix Zoo  
and The Arizona Sonora Desert Museum  
Phoenix, Arizona**

**July 27th - July 30th, 2005**

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# **International Herpetological Symposium**

**29th Annual Meeting**



**Hosted by**

**The Phoenix Zoo  
Phoenix, Arizona USA**

**July 27 - 30, 2005**

**Program and Abstracts**

International Herpetological Symposium, Inc.  
29th Annual Meeting

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Welcome to the  
29<sup>th</sup> Meeting of the  
International Herpetological Symposium



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BILL LOVE**

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**INTERNATIONAL HERPETOLOGICAL SYMPOSIUM  
29<sup>TH</sup> ANNUAL MEETING**

**PROGRAM**

**Wednesday, July 27<sup>th</sup>**

7:00 - 9:00 p.m. Registration – Chaparral Suites Resort Hotel  
7:00 p.m. - ? Ice Breaker – Hospitality Room

**Thursday, July 28<sup>th</sup>**

8:30 a.m. - 3:30 p.m. Open Registration – Chaparral Suites Resort Hotel

9:00 - 9:15 a.m. Opening Remarks and Introductions

9:15 - 10:00 a.m. **David G. Barker**  
“Keynote Address - The History of Breeding Pythons and the Role of the International Herpetological Symposium”

10:00 - 10:45 a.m. **Jon Coote**  
“Photobiology and UV Lamps”

10:45 - 11:00 a.m. *Morning Break*

11:00 - 11:45 a.m. **Charlie Painter**  
“Commercial Trade in New Mexico Herps”

11:45 a.m. - 12:15 p.m. **Stephane Poulin**  
“Husbandry and Breeding of Horned Lizards, *Phrynosoma spp.* - Five Years of Fascination and Frustration”

12:15 - 1:30 p.m. *Lunch Break*

1:30 - 2:15 p.m. **Robert L. Carmichael**  
“Husbandry of the Great Lakes Viper, *Atheris nitschei*”

2:15 - 2:45 p.m. **Jim Rorabaugh**  
“Conservation of the Chiricahua Leopard Frog *Rana chiricahuensis* and the Tarahumara Frog *R. tarahumarae*”

2:45 - 3:00 p.m. *Afternoon Break*

3:00 – 3:45 p.m. **Jude McNally**  
“Clinical Update in the Management of Snakebite”

3:45 – 4:30 p.m. **Tell Hicks**  
“The Herps of Australia and New Zealand”

**Friday, July 29th**

9:00 a.m.- 3:30 p.m. Open Registration

9:00 - 9:45 a.m. **Jeff Ettling**  
“Operation Armenian Viper: Radio-Tracking Vipers in Khosrov Reserve”

9:45 - 10:30 a.m. **Robert L. Carmichael**  
“Natural History, Husbandry and Captive Breeding of the Eastern Indigo Snake, *Drymarchon couperi*”

10:30 - 10:45 a.m. *Morning Break*

10:45 - 11:30 a.m. **William Griswold, DVM**  
“Natural History and Captive Management of the Rough Green Snake, *Opheodrys aestivus*”

11:30 a.m. - 12:15 p.m. **Dan Pearson**  
“Keeping and Breeding the Malagasy Spider and Flat-tailed Tortoises, *Pyxis arachnoides* and *P. planicauda*”

12:15 - 1:30 p.m. *Lunch Break*

1:30 - 2:15 p.m. **Paul T. Andreadis, Ph. D.**  
“I Like to Watch: Insights from Observing Herps”

2:15 - 3:00 p.m. **John Scott Foster**  
“Conserving the Ricord’s Iguana, *Cyclura ricordi* – Partnerships and the Gestalt of *In-situ* Conservation”

3:00 - 3:15 p.m. *Afternoon Break*

3:15 - 3:45 p.m. **Craig S. Ivanyi**  
“From Mind-numbing to Mind-Boggling: Wildlife and Television Programming in the New Millennia”

3:45 - 4:30 p.m. **J. Daren Riedle**  
“Sonoran Desert Turtle Conservation”

- 5:30 p.m. Shuttle Buses leave for **Field Trip to the Phoenix Zoo and Hosted Picnic at the Phoenix Zoo**
- 6:00-9:45 p.m. **The Phoenix Zoo Reptile Department Open House**
- 10:00 p.m. Shuttle Buses Return to Chaparral Suites Resort Hotel

**Saturday, July 30<sup>th</sup>**

- 9:00 a.m. - 12:00 p.m. Open Registration
- 9:00 - 9:45 a.m. **Dante Fenolio**  
 “A Protocol for Keeping and Breeding Frogs of the Genus *Theioderma* with Comments on an Experiment Design to Clarify the Benefits of Tadpole Tea”
- 9:45 -10:30 a.m. **Tell Hicks**  
 “The Herps of Cyprus”
- 10:30 – 10:45 a.m. *Morning Break*
- 10:45 – 11:30 a.m. **William Griswold, DVM**  
 “Hiding in Plain Sight: Florida’s Overlooked Herpetofauna”
- 11:30 a.m. – 12:15 p.m. **Andrew T. Holycross**  
 “Preliminary Results from Gartersnake Surveys Along the Mogollon Rim”
- 12:15 – 1:30 p.m. *Lunch Break*
- 1:30 – 2:15 p.m. **John Scott Foster**  
 “Take the Next Step -- Moving from Herp Enthusiast to Citizen Conservationist”
- 2:15 – 3:00 p.m. **Richard S. Funk, MA, DVM**  
 “Reptile Reproductive Medicine”
- 3:00 – 3:15 p.m. *Afternoon Break*
- 3:15 – 3:45 p.m. **Dante Fenolio**  
 “The Biodiversity of the Subterranean Ecosystems of the Ozarks and the Edwards Plateau”
- 3:45 – 4:30 p.m. **Jay D. Johnson, DVM**  
 “Respiratory Diseases of Tortoises”

6:30 p.m. - ?

Banquet Buffet – Chaparral Suites Resort Hotel

Announcement of the Photo Contest Winners

Banquet Speaker – **Daniel D. Beck**

“Monstersaurs, Heloderma, and the Biology of Bumpy Lizards”

Auction - Proceeds benefit next year’s IHS!

(Credit Cards Accepted)

Presentation of the Joseph Laszlo Memorial Award

Closing remarks



## Abstracts

### PAUL T. ANDREADIS, Ph. D.

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#### I Like to Watch: Insights from Observing Herps

From the perspective of E. O. Wilson's Biophilia Hypothesis, we all are critter fanciers by nature. Herpetologists seem to have a particularly strong dose of this tendency; the capturing and examining of herps up-close is a compulsion for many of us. However, the manifestation of this biophilia that I find the most compelling is to watch them. I get the most satisfaction and scientific insight from being a herp ethologist in wild or naturalistic settings. Watching wary animals is a challenge. I have been using night vision technology to observe nocturnal herps without disturbing them. I will show field video of various herps (and other animals), with an emphasis on my work on foraging behavior of cottonmouths. Night vision camcorders, and video in general, are underused by field researchers, zoo researchers/exhibitors, and captive husbanders. My strong suggestion to all is, "In captivity, admire them, but admire what they do as well as how they look. In the field, catch if you must, but watch first if you can".

### DAVID G. BARKER

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#### The History of Breeding Pythons and the Role of the International Herpetological Symposium

Prior to the mid 1970s, pythons were seldom purposely reproduced in captivity. However, at that time there was a dramatic acceleration of the captive reproduction of all reptiles, including pythons. This talk provides an overview of the history of the captive reproduction of pythonid snakes. There is a discussion of the events and factors that lead to the various milestones and successes of python husbandry. The contributions of the I.H.S. are highlighted, and the publications of this organization are examined as a historical record of the events that contributed to the extraordinary success of modern python husbandry. This talk will be strong on herp stories and weak on graphs.

### DANIEL D. BECK

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#### Monstersaurs, *Heloderma*, and the Biology of Bumpy Lizards

No two lizard species have spawned as much folklore, wonder, and myth as the Gila Monster, *Heloderma suspectum*, and the Beaded Lizard, *H. horridum* -- the two sole survivors of an ancient group of predacious lizards called the *Monstersauria*. More like snakes on legs, monstersaurs are a walking contradiction. Most other genera that were here on earth 23 million years ago have either moved on to extinction, or have evolved into new lineages. But the monstersaurs have persisted as a distinct taxonomic group since even before many dinosaurs appear in the fossil record. In recent decades, considerable work in the field, laboratory, and vivarium has helped us to answer a number of puzzling questions about *Heloderma*. And what we've discovered might be even more fascinating than the folklore.

Monstersaurs are venomous, yet don't appear to use their venom for subduing prey, as do nearly all venomous snakes. Their venom produces excruciating pain, but it also contains a peptide that has become a promising new drug for treating type-2 diabetes. The mottled patterns of monstersaurs mingle with their surroundings, making them difficult to distinguish from the broken shadows and textures of their desert and tropical dry forest habitats. On the other hand, approach more closely and a bright open mouth will hiss a bold warning that a nasty bite awaits anyone who advances further. Monstersaurs emerge from long periods spent inactive within shelters to take occasionally-extended forays looking for food or mates. Sometimes they are out by day and other times at night. Debate continues over the timing of hatching. Gila Monsters lay their eggs in the summer but hatchlings do not emerge until the following Spring, no earlier than late April.

We can now answer a number of paradoxes about monstersaurs. Are these lizards cryptic, or do they show warning coloration and behavior? Do they use their venom for defense or for feeding? Are they diurnal or are they nocturnal? Are they sedentary, or are they active foragers? The answer to these questions is obviously "yes they are." The monstersaurs provide a fine example of how nature seldom presents black and white answers to simple questions. The most revealing answers, however, are seldom a simple yes or no, but more often a combination of "both" "and." Perhaps it is a similar paradox of our relationship with reptiles and amphibians— creatures that to many are at once *both* sinister *and* wonderful, grotesque yet beautiful, fascinating yet misunderstood – that draws many of us to learn more about them.

#### **ROBERT L. CARMICHAEL**

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#### **Husbandry of the Great Lakes Viper, *Atheris nitschei***

Members of the Atherini tribe are rarely kept in public zoological institutions despite their beautiful appearance and tremendous appeal as a display animal. One of the most difficult species to maintain on a long-term basis is the Great Lakes Viper, *Atheris nitschei*. One of the primary causes for this lack of success is most likely due to heavily parasitized animals being imported accompanied by subtle environmental cues that are lacking in the captive environment. Few zoological institutions have successfully kept this species alive for any appreciable time period and breeding is even rarer. The Wildlife Discovery Center, Lake Forest, Illinois, acquired a trio of imported specimens in 2002. Although they arrived emaciated, dehydrated and heavily parasitized, the trio has thrived over the years and is now sexually mature. The WDC plans on attempting to breed them for the first time in 2006.

Some of the keys to successful keeping of this snake in captivity include: proper quarantine, stress management, proper exhibit set up, providing proper thermal gradients and humidity levels and diet. It must be noted that there is no commercially available antivenin for all of the *Atheris* clan. As such, very few facilities have kept them and those that do, must have sound safety protocols in place. It is important to take this into consideration when keeping members of *Atheris*. With the African rainforest in imminent danger of being over-harvested, it is important to bring awareness to this destruction and exhibiting *Atheris nitschei* is a nice way to bring this to light.

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**Natural History, Husbandry and Captive Breeding of the Eastern Indigo Snake, *Drymarchon couperi***

The eastern indigo snake is a symbol of American herpetological natural history; it is also the largest non-venomous snake in North America. Once widespread throughout the entire southeastern United States, the eastern indigo snake is now relegated to several disjunct populations in Georgia and Florida. The primary cause for this decline includes habitat destruction and fragmentation, road kills and overcollecting (despite their protected status). Current field research taking place has revealed a number of interesting behaviors and habits; most notably it is the only colubrid whose breeding season takes place during the winter months. Habitat preference, diet and range have indicated a need for more aggressive conservation management strategies to save this species.

While field research is unlocking the secrets of this jet black serpent, recent advances, based on knowledge we have acquired in the field, is now helping us to successfully keep and breed this snake in captivity. The Wildlife Discovery Center has successfully kept and bred eastern indigo snakes for the past 10 years. Some of the most important considerations for successfully keeping and breeding this species are: specimen acquisition, quarantine, proper caging and set-up, proper temperatures and humidity levels, diet and feeding schedules, vitamin supplementation, cycling for preparation for breeding, methods for introductions, egg management and care of hatchlings.

The likelihood of saving this species will depend on how aggressively we incorporate conservation education programs in zoos, museums and nature centers. The WDC places many of its captive produced hatchlings with these institutions while a few make their way into the private sector. Conservation education, captive breeding, and proper management tools for wild populations and their habitat will be some of the key factors in the long-term health of these populations. Due to a (presumably) limited gene pool, it is important to closely monitor and manage these animals to maintain genetic integrity and diversity.

**JON COOTE**

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**Photobiology and UV Lamps**

UVB light, in the range 290 to 300 nanometres, produces the majority of photochemically formed pre-vitamin D<sub>3</sub>, from cholesterol in the skin, with an apparent maximum production at around 297nm. This range of UV wavelength is now popularly described as the D-UV range of UVB light. More interestingly UV light in the range 300 to 330 nanometres is responsible for the photodestruction of excess pre-vitamin D<sub>3</sub>. This excess pre-vitamin D<sub>3</sub> is further photoisomerized, by the actinic activity of this range of radiation, into the pre-vitamin D<sub>3</sub> metabolites lumisterol<sub>3</sub> and tachysterol<sub>3</sub>. This rapid photochemical reaction is photo-reversible, converting tachysterol<sub>3</sub> back to pre-vitamin D<sub>3</sub>, if required, but at a much slower rate. Lumisterol<sub>3</sub> is a much less photoreactive isomer and is generally the excess sterol accumulated in the plasma. This negative feedback system controls and prevents the excess photobiosynthesis of vitamin D<sub>3</sub> under prolonged UVB and UVA exposure. The spectral character of UV lamps, designed for use in artificial reptile environments, is examined, in the light of this subtle, radiation induced, physiological and biochemical response.

**JEFF ETTLING**

Curator of Herpetology & Aquatics  
Saint Louis Zoo, One Government Drive, St. Louis, MO 63110

**Operation Armenian Viper: Radio-Tracking Vipers in Khosrov Reserve**

The Armenian viper is one of eight species belonging to the Mountain Viper complex distributed throughout the Near and Middle East. Very little is known about their biology in nature, due in part to their isolated, restricted distribution. Like other species of snake, Armenian viper populations have experienced a steady decline over the past twenty years as a result of human pressures. The two most serious threats have been conversion of habitat for agricultural use and human persecution. Although some populations of Armenian viper are afforded protection by Nature Reserves, biologists have noted that for long-term viability additional habitat with corridors is required. However, it is not known exactly how much habitat is needed. That's where our study comes into play. By implanting transmitters into the body cavity of several Armenian vipers we are able to monitor their seasonal movements and habitat use. The data collected may then be used to prepare a conservation management plan for the species, which would include recommendations for the establishment of additional nature reserves.

**DANTE FENOLIO**

Director: Amphibia Research Group, P.O. Box 607 Saratoga, California USA 95070  
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**The Biodiversity of the Subterranean Ecosystems of the Ozarks and the Edwards Plateau**

The United States sport a tremendous subterranean biodiversity. Included in this categorization, the region is the world's premiere hotspot for salamanders only found below ground. Comprising some of the most bizarre and imperiled North American wildlife, most cave and groundwater dwelling organisms have gone unnoticed by the American public. However, an effort is emerging in American zoological institutions to display some of these threatened life forms. I hope to present a broad range of troglobites (terrestrial subterranean animals) and stygobites (groundwater dwelling life forms), perhaps bringing about more thought of public displays. Conservation of these communities can only come about through broadened public awareness. In addition, I hope to demonstrate some of the many unique modifications in physiology and morphology observed in troglobites and stygobites for life in perpetual darkness. I will focus on creatures from the Ozark Uplift of the Central United States and the Edward's Plateau in Texas.

**DANTE FENOLIO**

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**A Protocol for Keeping and Breeding Frogs of the Genus *Theلودerma* with Comments on an Experiment Design to Clarify the Benefits of "Tadpole Tea"**

Frogs of the genus *Theلودerma* are becoming increasingly popular with European, Japanese, and US zoological institutions. Demonstrating amazing crypsis in appearance and in behavior, they are proving to be captivating display animals in well designed enclosures. As well, the public at large has taken to the group with decided interest. Pioneering efforts to keep and breed *Theلودerma* first took place in Russia, primarily through the genius of Evgeny Ryboltovsky. I will present my protocol for the captive reproduction of several members of the genus. My design has been modified from the Russian protocol and simplifies maintenance and reproduction. Of importance, my protocol highlights the use of tannic acids with all stages of these frogs.

Many anurans reproduce in aquatic habitats rich in tannic acids. Frogs of the genus *Theioderma* are no exception. A captive protocol for breeding frogs in the lab requires a translation of conditions in the wild to captive accommodations, including larval habitat conditions. A review of the literature on tadpole physiology in tannic waters revealed an absence of empirical studies clarifying the effects of using tannic acids to make “tadpole tea” in captive circumstances. Knowing that the use of tannins in tadpole aquaria is common, I decided to perform a series of experiments to determine: (1) the advantages gained through the use of tannic acids and (2) the best use of tannic acids when rearing tadpoles. The first group of test subjects have been tadpoles of *Theioderma corticale*, the Vietnamese Moss Frog. Preliminary results from my ongoing experiments at the University of Miami will be presented.

#### **JOHN SCOTT FOSTER**

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#### **Conserving the Ricord's Iguana, *Cyclura ricordi* - Partnerships and the Gestalt of *In-situ* Conservation**

The Caribbean island of Hispanola is home to two indigenous species of rock iguana, *Cyclura cornuta* and *Cyclura ricordi* – the Ricord's Iguana. Ricord's iguana is listed as critically endangered with the current population divided into two isolated ranges. The known range is very limited and the total population is estimated to be as low as 2,000 animals. The Indianapolis Zoo is playing a significant role in the conservation of the Ricord's Iguana in the Dominican Republic. Partnering with local NGO's and the ZooDom – the Dominican National Zoo has resulted in a number of projects focused on the conservation of this species, including research on baseline health parameters, reproductive endocrinology, captive breeding, population assessment, and educational initiatives.

#### **JOHN SCOTT FOSTER**

##### **Take the Next Step – Moving from Herp Enthusiast to Citizen Conservationist**

Most herp enthusiasts started out flipping boards, slogging through marshes and driving deserted roads during rainstorms in search of the reptiles and amphibians native to our region. Today, as interest in native flora and fauna increase and tax payer funds to support such research shrink, the skills we developed early on can now be put to use in serious conservation endeavours. This presentation will highlight a number of citizen science projects, with a herpetological focus, that have occurred or are currently occurring across the nation.

#### **RICHARD S. FUNK, MA, DVM**

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#### **Reptile Reproductive Medicine**

The ultimate goal of many herpetoculturists is to successfully breed their captive reptiles. Therefore we as veterinarians need to have a working knowledge of reptile reproductive biology and captive propagation techniques to facilitate helping our clients and their pets. In addition to physical exams and diagnostic tools, a review of husbandry practices is essential to managing a breeding program.

##### Sexing -Some basic guidelines:

Crocodylians---can palpate penis of males of sufficient size/age, or evert.

- Chelonians---impossible to sex morphologically as hatchlings; endoscopy?
  - mature males---longer tails, anal openings further from plastron
  - some mature males with concave plastrons
  - some aquatic species (emydids), males with very long front toenails
  - iridial eye colorations
  - a few with seasonal sex colorations such as elongated tortoises
- Lizards---larger pores in some males---femoral, precloacal
  - hemipenial bulges in many males
  - sexual dimorphism in coloration and in display behavior
  - can probe males of some species
  - radiography of mineralized hemipenes in many male monitors
  - endoscopy, ultrasonography
- Snakes---probing excellent and reliable in most species
  - manual eversion (“popping”) of male hemipenes
  - hemipenial bulges in many males, or wider tail bases
  - anal spurs in boas and pythons often larger in males, absent in female rosy boas

Oviparity and Viviparity, and Parthenogenesis: Oviparity is the act of laying eggs, while viviparity is giving birth to living young without an eggshell. All crocodylians and chelonians are oviparous. Among the lizards and snakes are both oviparous and viviparous species, occasionally within the same genus. Parthenogenesis is reproduction without males, and is known in a couple of snakes and in several groups of lizards, all of which are rarely kept in captivity.

Clutches: Clutch size may vary from 1 to over 200 in various species. Clutch size is invariable in certain species (leopard and African fat-tailed geckos, for example), but in others may increase as the female increases in age and size. Generally, females that produce fewer young produce proportionately larger young. Most reptiles are reproductively active throughout their adult lives, but the increased stresses of captive “farming” may shorten the lives of some females such as veiled chameleons and Burmese pythons.

Reproductive season: Most reptiles have a distinctive breeding season, which may correspond to seasonal climatic events. Some oviparous species produce multiple clutches. For example, leopard geckos may lay for about 220 days, producing clutches of two eggs every 21-30 days.

Maternal care: Maternal care of eggs or young is the exception in reptiles. But female crocodylians defend nests and hatchlings, even helping them to hatch. Some lizards do tend their eggs until hatching (including glass lizards and skinks of the SE USA), and the live-bearing prehensile-tailed skink cares for its young perhaps for as long as two years. Female pythons brood their eggs and keep them at a constant 89° F, rainbow snakes (SE USA) and some SE Asian pit vipers tend their eggs, and king cobras and Burmese mountain tortoises tend their nests. Certain rattlesnakes have recently been found to stay with their babies until the latter shed their skins and disperse.

Brumation: Many temperate zone reptiles need a winter cooling period for successful reproduction to occur. Many North American snakes are kept at about 55°F for 2+ months, for example. Some tropical species require a temperature shift or rainfall to stimulate breeding.

Pregnancy determination: First, is the patient a female? Methods for determining “pregnancy” include: observation of physical changes such as girth changes, behavioral changes---appetite, hiding, digging, nest-building, pacing etc., palpation, radiology, ultrasonography

Parturition or oviposition: It is unusual for a female reptile to lay eggs or give birth over a prolonged period of time. Suitable nesting sites and media must be available for the female to complete, and perhaps isolation from other animals.

Egg incubation: Plastic storage boxes work well for incubating eggs, and the medium may be potting soil, vermiculite, paper toweling, Perlite, peat or sphagnum moss, or combinations. Slightly damp vermiculite works well and offers many contact points to facilitate water transport to the eggs. Half-bury the eggs in the same orientation as they were laid, do not rotate them. Open the lid and inspect the eggs at least twice weekly. Weigh the box and its eggs periodically and add water as needed to keep the weight constant. Incubators may be home-made or commercially purchased; incubation temperatures depend

upon the requirements of the species involved. Temperature-dependent sex determination known in crocodylians, chelonians, and some lizards.

**Dystocias:** By definition, dystocias are difficult births or layings. An entire clutch, or one egg or fetus, may be retained. While it may be difficult to determine the cause of a particular dystocia, the following have been associated with dystocias: lack of suitable nesting/birthing site, improper temperature or no gradient, obesity, inactivity, poor physical condition, obstructions, “pushed” (too young, too small), malnutrition, concurrent disease, uterine infection, presence of infertile ova, dead conceptus, misshapen or fractured pelvis, dehydration, parasitism, deformities (of mother).

#### **WILLIAM GRISWOLD, DVM**

Staff Veterinarian - Emergency Animal Clinic, PLC  
2260 West Glendale Avenue, Phoenix, AZ 85201

#### **Natural History and Captive Management of the Rough Green Snake, *Opheodrys aestivus***

The rough green snake, *Opheodrys aestivus*, is a small, slender, insectivorous serpent native to much of the Eastern United States. While “serious” herpetoculturists often avoid keeping insectivorous snakes, green snakes are frequently offered for sale in pet stores due to their attractive coloration, gentle disposition, insect diet, and low cost. Many green snakes die in the care of well-meaning novice keepers who are unprepared for the care of this interesting species. Green snakes may languish under husbandry conditions provided for most colubrid snakes, but thrive under housing and nutrition protocols typically used for arboreal lizards. Naturalistic vivaria, unfiltered sunlight or artificial lighting containing both ultraviolet A and B wavelengths, and a varied diet of domestic and wild insects are essential to the successful captive care and reproduction of *Opheodrys aestivus*. Properly maintained, green snakes become fascinating members of the reptile collection due to their diurnal activity patterns, feeding behavior, and beautiful coloration. Husbandry techniques used to care for this relatively common snake are applicable to many insectivorous and lizard-eating arboreal snakes, and may be used in the captive management of similar species.

#### **WILLIAM GRISWOLD, DVM**

Staff Veterinarian - Emergency Animal Clinic, PLC  
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#### **Hiding in Plain Sight: Florida's Overlooked Herpetofauna**

Although few states can rival the diversity of reptiles and amphibians found in Florida, many of the Sunshine State's rarest, most unusual, and most unique reptiles and amphibians remain unknown to the average herpetologist. While American alligators (*Alligator mississippiensis*), corn snakes (*Elaphe guttata*), sea turtles (Cheloniidae), and bullfrogs (*Rana catesbeiana*) are readily identified by even the uninitiated, only those intimately familiar with the state's herpetofauna would recognize an American crocodile (*Crocodylus acutus*), a short-tailed snake (*Stilosoma extenuatum*), a loggerhead musk turtle (*Sternotherus minor*), or a little grass frog (*Pseudacris ocularis*) at first glance. Both scientific and popular literature have historically focused most of their attention on only the most beautiful and rarest of the 170-odd native and exotic species inhabiting the state. In some instances, very little is known of the natural history of abundant but “uninteresting” species. Large or small, common or rare, endemic or introduced—Florida's “other” reptiles and amphibians may not be ideal candidates for captive management or poster children for conservation, but each is fascinating in its own right. Join the author as he shares photographs, natural history vignettes, and personal experiences from eighteen years of field herping from the farthest reaches of the Florida panhandle to the southernmost point of Key West.

## **TELL HICKS**

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### **The Herps of Australia and New Zealand**

For an artist/herpetologist Australia has a powerful attraction. This illustrated talk combines some of the highlights of several extensive trips to both Australia and the unique islands of New Zealand. With well over 1,000 recognized species, it is possible, within the scope of this talk, to show just a glimpse of some of the remarkable reptiles and amphibians to be found there. Together with photos of the star attractions (many of which have become the subject of Tell's artwork), some of the problems that may befall a travelling herpetologist are discussed. Mention will also be made of the effects of the recent spread of the Cane Toad into the Northern Territory. The talk will include accounts of visits to several private and public reptile collections and reference will be made to how some of the difficulties encountered in maintaining and displaying specialist feeders, such as the Thorny Devil (*Moloch horridus*) and the Bandy-Bandy (*Vermicella annulata*) have been overcome. There will also be some anecdotal references to the various expert herpetologists whose knowledge, hospitality and generosity has made visiting both countries such a rewarding experience.

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### **The Herps of Cyprus.**

Situated only 68 miles off the coast of Syria, Cyprus is the third largest island in the Mediterranean. A transition zone amongst the three continents of Europe, Asia and Africa, it has a rich and diverse Herpetofauna, including several endemic taxa. This illustrated account is based on three separate fieldtrips to the island, and covers all of the indigenous species. There will be information on the status of the recently discovered Cyprus Whip Snake (*Coluber cypriensis*) and the conservation issues which still threaten Europe's rarest snake, the re-discovered Cyprus Grass Snake (*Natrix natrix cypriacus*) (thought to have been extinct for over thirty years). The talk will also include an account of visits made to the Reptile Park, established near the town of Paphos in the south of the island, and the important work carried out by its owner herpetologist/conservationist Hans-Jorg Wiedl. Known to the locals as "Snake George", Austrian born Jorg has lived in Cyprus for twenty years, during which time he has led a campaign to protect its unique reptiles. He was founder and president of the Cyprus Herpetological Society and still works tirelessly to educate the Cypriot people in an attempt to deter them from what is almost a national pastime of killing snakes.

## **ANDREW T. HOLYCROSS (Presenter)**

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### **Preliminary Results from Gartersnake Surveys Along the Mogollon Rim**

We determined the historical distribution of two gartersnakes (*Thamnophis eques* and *Thamnophis rufipunctatus*) in central Arizona by querying 70+ institutional collections, plotting vouchered localities, and consulting previous survey reports. Using these data, we prioritized sites for survey/resurvey over the



course of a two-year period (2004-2005). We specifically included all vouchered localities (exclusive of those on tribal lands) as well as select sites where suitable habitat exists or reliable sightings have been reported. During July and August of 2004 we surveyed ca. 40 sites for *T. rufipunctatus* and/or *T. eques*. *Thamnophis rufipunctatus* was found in 2 of 9 historically occupied watersheds surveyed and *T. eques* was found at 2 of 3 historically occupied watersheds surveyed. Preliminary results suggest that sub-Mogollon populations of *T. eques* are persisting, while *T. rufipunctatus* populations appear to be dramatically declining, and may be extirpated from several streams. Most sites had been invaded by exotic crayfish (*Orconectes virilis*), which we posit might figure prominently in *T. rufipunctatus* declines and/or extirpations.

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**From Mind-numbing to Mind-Boggling: Wildlife and Television Programming in the New Millennia**

In the past decade or so, animals have become increasingly popular subjects for television programming. With the advent of a variety of cable networks, including Animal Planet, the Discovery Channel and others, more outlets for wildlife-related programs are available than ever before. Snakes – once relegated to an occasional and infrequent program – have become one of the most common subjects explored by programs such as *The Crocodile Hunter*, *Austin Stevens: Snakemaster*, etc. But do these programs help snake conservation or hinder it? Do they explore the fascinating nature of serpents in a positive way or do they unintentionally exploit them and fuel some of the general public's deepest fears? Though anyone watching a single episode of these shows would certainly sense the hosts' passion and devotion to wildlife of all kinds, unwittingly, these nature enthusiasts may be doing these animals a disservice.

Many of these programs take viewers from their living rooms out into the wild on a virtual safari. Electronically, we are lifted off the couch and transported hundreds or thousands of miles into the deserts or tropics of the Americas, Africa or Australia. We ride shotgun as the host makes his or her way to remote corners of the earth, ostensibly to share with us the natural world through their loving eyes. But, what is the purpose of this journey? What are the goals of the hosts and what effect does this have on wildlife conservation? During this presentation we will explore these and other questions.

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**Respiratory Diseases of Tortoises**

Respiratory diseases are one of the most common ailments of tortoises. The respiratory tract of tortoises can be divided into two basic components, the upper and lower. The upper respiratory tract begins at the nares, extends through the nasal vestibule, and into the choanae. The lower respiratory tract begins

with the trachea and extends down into the lungs. A variety of diseases can affect the upper or lower respiratory tracts.

Upper respiratory tract diseases are the most common respiratory diseases seen in the Southwestern United States and in my hospital. Upper respiratory tract diseases can occur due to bacteria, viruses, fungus, and poor husbandry. One of the most common causes of upper respiratory tract disease is mycoplasmosis. *Mycoplasma agassizii* and a few other *Mycoplasma* spp. have been identified as cause for disease. The most frequently seen abnormality is nasal discharge. Decreased appetite, lethargy, and inflammation of the choanae may also occur. Diagnosis of upper respiratory tract disease is made based on physical examination and nasal discharge present. Identification of the cause of the disease usually requires blood tests and cultures. Treatment includes appropriate medications based on diagnostics, nasal flushes, fluid therapy, and nutritional support as needed.

Lower respiratory tract diseases are less common than upper however much more serious. Pneumonia can occur due to viruses, bacteria, fungus, parasites, and aspiration. Pneumonia frequently occurs secondary to large fluctuations in environmental temperature, wet environments, or improper husbandry. Symptoms of pneumonia in tortoises can be variable. Most frequently tortoises are not feeding, lethargic, dehydrated, and losing weight. Occasionally tortoises will have open mouth breaths. Diagnosis is made based on percussion of the shell in combination radiographs (x-rays), blood tests, and cultures. Treatment needs to be aggressive for a successful outcome. Treatment includes proper medication based on test results, fluid therapy, and nutritional support.

Early identification, diagnosis, and treatment are the key to successful management of respiratory diseases. The longer the problem has been occurring and left untreated, the longer recovery will take, and the worse the prognosis becomes. Anyone keeping reptiles should identify and initiate a relationship with a qualified reptile veterinarian in their area prior to illness occurring.

#### **JUDE McNALLY**

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#### **Clinical Update in the Management of Snakebite**

The mainstay of hospital treatment for venomous snakebite is antivenom. There is currently two antivenoms available in the United States for the treatment of pit viper envenomation, Antivenin (Crotalidae) Polyvalent (ACP) and Crotalidae Polyvalent Immune Fab, Ovine, (CroFab). The general indication for the administration of either antivenom is the presence of progressive venom injury. Progressive injury is defined as worsening local injury (e.g., swelling, ecchymosis), a clinically important coagulation abnormality, or systemic effects (e.g., hypotension, altered mental status).

Unfortunately, there are no prospective data available regarding the efficacy of the whole IgG antivenom, ACP. The efficacy of the newer antivenom (CroFab) composed of purified Fab fragments has been demonstrated in prospective trials. CroFab appears as effective as IgG antivenoms. However, Fab molecules have a shorter half-life than IgG molecules and may allow recurrence of venom effects, if additional doses are not administered. It has also been found that other antivenoms, including ACP, also allow recurrence of venom effects. The CroFab preparation has produced fewer acute or delayed (serum sickness) allergic reactions; however, further experience is needed to confirm this observation. Fab fragments enter solution quickly, thereby shortening the time to antivenom administration and are remarkably stable under extreme conditions of heat and handling. Evaluation of the Fab antivenom has led to advances in our understanding of antivenoms in terms of matching the pharmacokinetics of an antivenom with a venom. A new Fab2 preparation is under clinical investigation at the University of Arizona. An Fab2 antivenom may combine the safety of an Fab antivenom with the favorable kinetics of and IgG antivenom.

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**Commercial Trade in New Mexico Herps**

The commercial trade in native amphibians and reptiles in the United States received little attention in the past and was poorly regulated by state and US governments. However, select amphibian and reptile populations have benefited from increased protection with passage of the Endangered Species Act and the subsequent establishment of state wildlife management agency “non-game” programs. The commercial trade is now being monitored in some states and the data these programs provide presents difficult challenges to wildlife managers to formulate science-based bag limits on most species. During September 2001 the New Mexico State legislature passed legislation allowing for the establishment of a permit system to regulate and in some cases prohibit commercial collecting of native amphibians and reptiles. Since that time (2002-2004) commercial collectors have reported 27,419 specimens legally collected in New Mexico under this legislation. I will provide data on the 57 species taken and discuss challenges to further regulate this commercial trade using science-based management.

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**Keeping and Breeding the Malagasy Spider and Flat-tailed Tortoises, *Pyxis arachnoides* and *P. planicauda***

Tortoises of the genus *Pyxis* have limited ranges along the southwestern coast of the island of Madagascar. The genus includes *Pyxis planicauda* (Kapidolo or Flat-tailed Tortoise), and *Pyxis arachnoides* (Kapika or Spider Tortoise). *Pyxis arachnoides* includes three subspecies, *P. a. arachnoides*, *P. a. brygooi*, and *P. a. oblonga*. *Pyxis planicauda* and *Pyxis arachnoides* are listed as Endangered and Vulnerable, respectively, on the IUCN Red Data List and are listed on CITES Appendix I. Both species were exported from Madagascar in large numbers during 2000 and 2001. The numbers exported from Madagascar during that time period greatly exceeded the CITES quotas. This pulse of exports along with a naturally low reproductive rate and an increasing loss of native habitat have generated concern over the status of this species in the wild and in captive collections. Both species occur in tropical dry forests with pronounced wet and dry seasons. Replicating the seasonal cycles appears important for successful reproduction, and may play a role in an extended embryonic diapause. High hatching rates have been achieved by exposing fertile eggs to cooler and drier conditions for several weeks following an initial warm period. A shift back to warmer and more humid conditions appears to trigger or reinstate embryonic development. Other important factors in a successful breeding program include detection of cryptic nests and maintenance of a dry season aestivation period for adults and juveniles.

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**Husbandry and Breeding of Horned Lizards, *Phrynosoma spp*: Five Years of Fascination and Frustration**

Horned lizards are one of the few reptiles that the public is enamored with. Almost any kid that grows up in the Southwest has either attempted to keep or thought of keeping a “horny toad”. Unfortunately, because these animals are notoriously difficult to keep, almost all of these attempts end in heartbreak for the keeper and slow death for the lizards. For this same reason, horned lizards are rarely kept in public zoological institutions despite their beautiful appearance and tremendous public appeal. Few zoological institutions have successfully kept these species alive for any appreciable time period and breeding is even rarer.

Since 1999, the Arizona-Sonora Desert Museum has invested considerable resources in developing a better understanding of the biology and husbandry of species that occur in the Sonoran Desert Region. During this period of time we have maintained 7 species, five of which have bred. Some of these species have lived multiple years and have bred on several occasions, while others have only bred once or were difficult to keep without intensive management practices. We’ve discovered that successful keeping and breeding of adult horned lizards does not translate to successful rearing of the young. They appear to have a completely different set of parameters that allow them to develop into adults. During this presentation we will describe our husbandry methods, our successes and failures along with areas that we plan to focus on in the future.

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**Sonoran Desert Turtle Conservation**

Arid southwestern North America supports about 18 species of turtles and tortoises, and conservation trends here are like those for chelonians elsewhere, with several species exhibiting widespread declines with varied causes. Three species are critically endangered (CITES Appendix I: *Apalone ater*, *Terrapene coahuila*, and *Gopherus flavomarginatus*); one is listed as threatened under the U.S. Endangered Species Act (*G. agassizii*, Mojave Desert populations); and most species have undergone significant declines on either a regional or range-wide basis. The most common threats facing these arid adapted species are drought, urbanization and invasive species. The Arizona Game and Fish Department (AGFD) is tasked with managing those species occurring within the Sonoran Desert region of the state. Two high priority species for AGFD are the Sonoran population of *G. agassizii* and *Kinosternon sonoriense longifemorale*, which are both the focus of multi-national, interagency conservation efforts. An overview of collaborative conservation efforts on both those species will be presented.

**JIM RORABAUGH**

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**Conservation of the Chiricahua Leopard Frog, *Rana chiricahuensis* and the Tarahumara Frog, *R. tarahumarae***

The Chiricahua leopard frog (*Rana chiricahuensis*), listed as a threatened species under the U.S. Endangered Species Act, and the Tarahumara frog (*R. tarahumarae*), listed as vulnerable on the IUCN red list, have much in common in terms of causes of decline and conservation needs. Both are native to the Southwestern U.S. and adjoining portions of Mexico; and both have declined due to predation and possibly competition from introduced species, an apparently introduced fungal disease – chytridiomycosis, and to a lesser degree, habitat loss and degradation. Additional factors such as pollutants from copper smelters, climate change, and altered fire regimes may be important causes of decline, as well. The U.S. Fish and Wildlife Service and its partners are preparing a recovery plan to alleviate or avoid causes of decline and improve the status of *Rana chiricahuensis*. *Rana tarahumarae* has been the subject of status surveys, studies to determine causes of decline, and efforts to reestablish the species in Arizona. Some key threats to these species are very difficult to reverse (i.e. chytridiomycosis and introduced predators) and often the best recovery strategy will be to find recovery sites where these threats are not present or are manageable. Both species have been the subject of successful (thus far) population reestablishment projects, including reestablishment of *Rana tarahumarae* back into one of its few historical localities in the U.S. in June 2004. Partnerships among a variety of federal and state agencies, non-governmental organizations, zoos and museums, tribes, and others are needed to implement recovery because of the budgetary constraints of individual entities, often multiple jurisdictions with authorities over access or species reestablishments, and the need to develop public support for recovery programs, particularly in regard to reestablishment of federally-listed species.

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**Western Miniatures**

Is there a herper worth his salt who has never had the impossible dream of keeping a *T. rex* for a “pet”? Or a salt water croc? How about a reticulated python? It would take a super shoehorn to squeeze one of these into your hole-in-the-wall apartment —if you could slip it past your nosey neighbors after midnight. Let’s be practical. Sometimes even a corn snake or a king snake requires more space than is convenient for small quarters. But an addicted herper has to have his (or her) scaly fix no matter what! As luck would have it, here in the west (as well as some other parts of the world) there are some very accommodating species of snakes that never exceed a meter in length. Many are from the desert. They have been kept successfully in gallon jars or other small enclosures for fairly long periods of time and can live quite happily on a diet of meal worms, crickets, spiders, scorpions or other small invertebrates. When observed closely they are quite beautiful and some, even spectacularly so. Some of the local species will be illustrated.