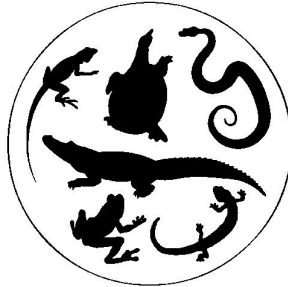


**Welcome to the
28th Meeting of the
International Herpetological Symposium**



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(410) 792-9840

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**INTERNATIONAL HERPETOLOGICAL SYMPOSIUM
28TH ANNUAL MEETING**

PROGRAM

Tuesday, August 10th

5:00 - 8:00 p.m. Registration – Adam’s Mark Hotel
7:00 p.m. - ? Ice Breaker – Hospitality Room

Wednesday, August 11th

8:30 a.m. - 3:30 p.m. Open Registration – Adam’s Mark Hotel

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

9:15 - 10:15 a.m. **Dr. Peter Pritchard**
“Keynote Address - Lonesome George and the Con Gai:
Turtles Staring Extinction in the Face”

10:15 - 11:00 a.m. **Chuck Schaffer**
“Field Observations of *Manouria emys emys* in Malaysian
Borneo, and *Manouria emys phayrei* in Thailand”

11:00 - 11:15 a.m. *Morning Break*

11:15 - 12:00 a.m. **Paul Moler**
“Current Herpetological Conservation Issues in the
Sunshine State”

12:00 a.m. - 12:45 p.m. **Ray Ashton**
“Using Behavior to Determine the Type and Size of
Enclosures for Semi-wild Assurance Colonies of Upland
Tortoises”

12:45 - 2:00 p.m. *Lunch Break*

2:00 - 2:45 p.m. **Dean Alessandrini**
“Limiting Factors and Recovery Efforts of the Eastern
Indigo Snake”

2:45 - 3:30 p.m. **Vin Russo**
“Dwarf Boas of Central America and Mexico”

- 3:30 – 3:45 p.m. *Afternoon Break*
- 3:45 – 4:30 p.m. **John Cann**
“Australian Herps and Herpers ”
- 5:30 p.m. Shuttle Buses leave for **Field Trip to Central Florida Zoo and Hosted Picnic at the Central Florida Zoo**
- 6:30-10:00 p.m. **Central Florida Zoo Reptile Department Open House**
- 8:00- 9:30 p.m. Mystery Herp Quiz at Zoo – **John Tashjian** (Prize to winner!)
- 10:00 p.m. Shuttle Buses Return to Adam’s Mark Hotel

Thursday, August 12th

- 9:00 a.m. - 3:30 p.m. Open Registration
- 9:00 - 9:45 a.m. **Dr. James B. Murphy**
“Intelligence in Varanid Lizards”
- 9:45 - 10:30 a.m. **Steve Conners**
“Breeding and Husbandry of Komodo Dragons at Miami MetroZoo”
- 10:30 - 10:45 a.m. *Morning Break*
- 10:45 - 11:30 a.m. **Dr. Muhammad Sharif Khan**
“Present Status of the Angular-toed Geckos of Pakistan”
- 11:30 a.m. - 12:15 p.m. **Dr. James B. Murphy and Dr. Gary Ferguson**
“Chameleons: Biology and Captive Management”
- 12:15 - 1:30 p.m. *Lunch Break*
- 1:30 - 2:15 p.m. **Kent Vliet**
“Neurobiology and Learning in Crocodylians ”
- 2:15 - 3:00 p.m. **Arianne Parton and Joclynn July**
“Training as a Management Tool for Nile Crocodiles”
- 3:00 - 3:15 p.m. *Afternoon Break*

- 3:15 - 4:00 p.m. **Flavio Morrissiey**
 “Training Crocodiles for Entertainment and Husbandry”
- 4:00 - 4:45 p.m. **Bruce Shwedick**
 “Husbandry and Captive Reproduction of *Tomistoma schlegeli*”
- 6:30 p.m. - ? Banquet Dinner – Adam’s Mark Hotel
- Announcement of the Photo Contest Winners
- Banquet Speaker – **Dr. James B. Murphy**
 “Herpetological Time Travel”
- Auction - Proceeds benefit next year’s IHS!
 (Credit Cards Accepted)
- Friday, August 13th**
- 9:00 a.m. - 12:00 p.m. Open Registration
- 9:00 - 9:45 a.m. **William Becker**
 “Neotropical Pit Vipers”
- 9:45 -10:30 a.m. **Dr. Stephen Mackessy**
 “Oral Glands of Reptiles: Venoms, Toxins and Saliva”
- 10:30 – 10:45 a.m. *Morning Break*
- 10:45 – 11:30 a.m. **Dr. Chris Parkinson**
 “Pitviper Systematics and Why Their Names Change”
- 11:30 a.m. – 12:15 p.m. **Al Cruz**
 “Exotic Snakebite Envenomations”
- 12:15 – 1:30 p.m. *Lunch Break*
- 1:30 – 2:15 p.m. **Dr. Bruce Means**
 “For the Love of Frogs: Exploring the Lost Worlds of Gondwana”

- 2:15 – 3:00 p.m. **Dr. Brad Lock**
“An Epizootic of Chronic Regurgitation Associated with
Chlamydophilosis in Recently Imported Emerald Tree Boas
(*Corallus caninus*)”
- 3:00 – 3:15 p.m. *Afternoon Break*
- 3:15 – 4:00 p.m. **John Tashjian**
“Scientific Nomenclature”
- 4:00 – 4:15 p.m. Presentation of the Joseph Laszlo Memorial Award
- Closing remarks

Saturday, August 14th and Sunday, August 15th

- 10:00 a.m. – 5:00 p.m. **2004 National Reptile Breeders’ Expo at the Ocean
Center**

Abstracts

DEAN ALESSANDRINI

Private Breeder and Vice President, Greater Cincinnati Herpetological Society

Phone: (513) 347-0099

E-mail: dalessandrini@hubert.com

Limiting Factors and Recovery Efforts of the Eastern Indigo Snake

The Eastern Indigo Snake, *Drymarchon couperi*, is the longest and arguably most beautiful snake native to the United States. Man-made circumstances including habitat destruction and road mortality have caused significant population declines and in some regions, extirpation. In 1979, the eastern indigo was listed federally as a threatened species. Since the early 1990's I have been maintaining and successfully reproducing these remarkable animals in my collection. The introduction to this talk will provide a description of the eastern indigo snake; providing range, habits, feeding etc. I will then outline the limiting factors of the indigo to provide an understanding of why this species is in trouble. Conservation and recovery efforts of the indigo snake have been sporadic since its federal listing in 1979. I have been fortunate enough to have been invited to spend time in the field with researchers in both Florida and Georgia, as they track and study this species. Other conservation efforts are underway. In the closing section of the talk, I will describe conservation programs, and discuss methods for YOU to get involved. This talk contains MANY photos of indigo snakes habitat, and should appeal to a wide range of audience members.

RAY E. ASHTON, JR. and PATRICIA S. ASHTON

Ashton Biodiversity Research and Preservation Institute

14260-331 W. Newberry Rd., Newberry, FL 32669

E-mail: Tortfarm2@aol.com

website: www.ashtonbiodiversity.org

Using Intensive Natural History Studies to Establish Tortoise Assurance Colonies

Our research currently is centered on savannah or dry forest dwelling species of tortoises, in particular Indian star tortoises (*Geochelone elegans*), radiated tortoises (*G. radiata*), spider tortoises (*Pyxis a. brygooi*), and marginated tortoises, (*Testudo marginata*). At our field station, we have more than 400 wild gopher tortoises (*Gopherus polyphemus*) roaming the natural savannah habitat. The exotic tortoises are roaming in natural habitat that is broken up into eight .25-acre study plots. The research that we have been doing on gopher tortoises has been underway for more than 30 years. Along with just about all aspects of gopher tortoise behavior, we have been intensively studying forage and foraging behavior. We have also been studying tortoise social behavior and how these two things are the foundation for tortoise distribution on the landscape and the keys on how to manage tortoises in both natural and manmade habitats. If we are going to use captive breeding as an important conservation tool, much of the work we have been doing should be done on each species, both in the wild and in captivity. For example we have found that gopher tortoises feed on more than 400 species throughout their range. Interestingly enough, so do the other tortoises that we are working with. We know that any one tortoise in a habitat will feed on approximately 200 species of plants. In doing so, the gopher tortoise may travel over several hectares per year, just to find the right plants at the right time to

eat. Under the captive conditions that are usually found in most zoos and private collections tortoises are fed at most 18-20 species of plants, all at the same stages and usually artificially grown. This simplistic forage and other conditions such as eliminating an animal's home range and its ability to maintain distance from others, and a long list of other unnatural conditions may possibly be leading to rapid genetic changes in breeding stock and offspring which is then passed on in the altered genetic material. This may be why few species of tortoises or other reptiles rarely breed successfully in captivity after the second generation. This research is vital for the successful long term maintenance of Tortoise Assurance Colonies with individuals retaining the characteristics that make them well-suited for returning to the wild rather than living in captivity.

WILLIAM E. BECKER

Radiation Biologist, Becker Reptiles, 4054 Victoria Ct., Columbia, MO 65201 USA
Ph: (573) 874-3818, Fax: (573) 442-1712, E-mail: beckerherps@socket.net

Captive Husbandry of Neotropical Pit Vipers

The number of venomous snakes that have become commercially available to private herpetoculturists in the past decade has increased exponentially. The number of snake species that have become available during the same period has at least quadrupled. Neotropical pit vipers are ever increasing in popularity among venomous hobbyists. Popular literature regarding the proper captive husbandry techniques for these species is often conflicting or not available. The optimum captive condition for any species is to emulate its natural habitat. A discussion of these conditions will be presented for a number of species in the genera *Agkistrodon*, *Atropoides*, *Bothriechis*, *Bothriopsis*, *Bothrops*, *Crotalus*, *Lachesis*, and *Porthidium*. Natural history, allopatry and sympatry of congeners, captive versus wild dietary considerations, and captive breeding techniques for each species will be presented. The accelerated rate of habitat deforestation and the increasing difficulty to import these species from their native countries will be emphasized to encourage propagation of existing captive populations.

JOHN CANN

26 Yarr Road, Phillip Bay, New South Wales, 2036 Australia
Phone: 61 2 9661 3904 FAX: 61 2 9311 2990

Australian Herps and Herpers

This presentation is a travelogue of Australian reptiles which also includes some of the interesting human characters encountered along the way. Australia is host to many of the world's deadliest snakes and also boasts a long tradition of devil-may-care snake pit entertainers and antidote sellers. There are many amazing stories of individuals in the days of snake showmen and snake oil remedies in downunder Australia. John Cann is especially well-qualified to tell this story since he is a snake pit performer himself as was his brother, mother and father.

STEVE CONNERS

Miami Metrozoo

1 Zoo Boulevard, 12400 SW 152 Street, Miami, FL 33177

Tel: (305)-251-0400 Fax: (305)-378-6381

E-mail: sconner@miamidade.gov

Captive Breeding and Husbandry of Komodo Dragons at Miami Metrozoo and Its Connection to Dragon Conservation

An adult pair of wild caught Komodo dragons (*Varanus komodoensis*) was acquired by Miami Metrozoo in 1995. Exhibit design and husbandry decisions resulted in successful reproduction two years later. Egg incubation techniques produced a 93% hatch rate of fertile eggs. Incubation period ranged from 212-246 days. Hatchlings were raised under two different artificial lighting regimes, and natural sunlight. Blood measurements of vitamin D levels were comparable to samples from wild specimens in hatchlings from all groups. A total of twenty seven offspring (100%) were reared successfully in variety of enclosures, without health problems. This breeding event was important for the genetic vigor and diversity of the captive North American population of this species. The majority of the young dragons were transferred to other zoos over the ensuing years. In return donations to Metrozoo's Conservation and Research Fund from the recipients have been used to support conservation and research projects in the dragons' natural habitat. This event illustrates how captive reproduction can support species conservation in several ways.

ERNIE JILLSON

Lieutenant, Miami-Dade Fire Rescue Antivenom Bank".

(formerly the Florida Antivenin Bank) ENVENOMATION EMERGENCY Phone Number:
(305) 596-8576

Non Emergency Phone Number: (786) 331-4444

E-mail: cruza@miamidade.gov

Exotic Snakebite Envenomations

Miami-Dade County is the largest importer of exotic venomous snakes in the United States, and possibly the world, importing more than 1,500 snakes annually. From 1946 through 1988, the Miami Serpentarium handled the needs for antivenin throughout the state of Florida. Due to the closure of the facility in 1988, South Florida had no access to antivenin with a 250 mile radius and there has been an alarming increase of envenomations (venomous snakebites) and subsequent need for antivenin. Shortly after the closing of Miami Serpentarium, an adult male was bitten by a cobra, and it took 17 public and private agencies to bring this individual back to life. To date, the State of Florida has issued approximately 100 venomous reptile licenses to residents in Miami-Dade County, and an additional 400 permits have been issued throughout the entire state. According to the Florida Fresh Water & Game Commission, 3 to 5 times more people are keeping venomous snakes without acquiring permits. Venomous snakebite incidents continue to occur at an average rate of 300 per year in the state of Florida and at the rate of 8,000 nationally. According to the Florida Poison Control Center, Miami-Dade, Broward and Palm Beach counties average 150 snakebites a year, 40 percent of which are poisonous. However, there is a drastic reduction in the stocking of antivenin serum, and most hospitals are at a disadvantage when confronted with an envenomation incident.

BRAD A. LOCK, DVM, DIPL. ACZM

Zoological Medicine Service, College of Veterinary Medicine
Kansas State University, Manhattan KS 66506, USA

Chlamydophilosis in Recently Imported Emerald Tree Boas (*Corallus Caninus*)

Over a 4-mo period, one hundred and five wild-caught emerald tree boas (*Corallus caninus*) were added to a collection of 15 others in Central Florida. Eighty-one boas (67%) developed repetitive regurgitation during the 23 mo period after the initial addition of wild-caught boas and 61 (75%) of these died. Prevalence of regurgitation in this population of snakes was 25% /mo (range 0 - 42%) and incidence was 3.52/mo (range 0 - 13/mo). The cumulative mortality, for those boas developing repetitive regurgitation (61/120), over the 23 mo epizootic was 51%. Histologic evaluation of gastrointestinal tracts showed positive immunohistochemical staining for chlamydial antigen characterized by multifocal to diffuse lymphoplasmacytic inflammation with the formation of granulomas. Electron microscopic evaluation of granulomas identified organisms consistent with *Chlamydophila* sp which were later identified as *Chlamydophila pneumoniae* by polymerase chain reaction (PCR) and sequence analysis.

DR. STEPHEN P. MACKESSY

Department of Biological Sciences, University of Northern Colorado
2480 N. Ross Hall, CB 92
Greeley, CO 80639-0017 USA
Tel: (970)-351-2429 Fax: (970)-351-2335
E-mail: stephen.mackessy@unco.edu
http://www.unco.edu/biology/faculty/mackessy_stephen.htm

Oral Glands of Reptiles: Venoms, Toxins and Saliva

The oral mucosa of squamate reptiles is richly adorned with glands, many producing lubricant compounds (polysaccharide-rich mucus) which assist in swallowing of bulky prey. However, in numerous lineages, specialized oral glands have differentiated into producing primarily serous (protein-rich) secretions, and several of these glands, notably the Duvernoy's and venom glands, have become specialized for producing toxin-rich venoms which incapacitate, precondition and/or kill prey. Venom glands are most well-known in the front-fanged snakes (families Viperidae, Elapidae and Atractaspididae), but rear-fanged snakes of the polyphyletic family Colubridae and lizards of the family Helodermatidae also produce venoms with potent effects. Examples of venoms and toxins from each of these groups will be discussed, particularly with regards to new compounds from colubrid snake venoms. It appears that venoms arose very early in the evolutionary history of advanced squamate reptiles, and evidence exists for venom production in several fossil lineages, dating from the Cretaceous and the Triassic. Modern venomous reptiles represent the current stage in an evolutionary arms race between predator and prey, and continual coevolutionary adjustments likely drive the high degree of complexity in composition seen among many venoms. Additionally, the ancient occurrence of venom systems, the frequent motif of specific toxicity of certain venoms and the broad distribution of a wide variety of such systems among squamates suggests that venom production may also be present in lineages not commonly considered venomous.

D. BRUCE MEANS, PH.D.

President and Executive Director, Coastal Plains Institute and Land Conservancy
1313 Milton Street, Tallahassee, FL 32303

Ph: 850-681-6208; Fax: 850-681-6123

and

Adjunct Professor, Department of Biological Science

Florida State University

E-mail: means@bio.fsu.edu

For the Love of Frogs: Exploring the Lost Worlds of Gondwana

In March and April I backpacked for 30 days on a National Geographic Ultimate Explorer expedition to the "Prow" of Mt. Roraima, the famous 9,000-foot high tepui that inspired Sir Arthur Conan Doyle's novel, "Lost World." On that trip I discovered at least two frogs new to science, plus some other really amazing frogs that were poorly known. The hour-long documentary has been airing on MSNBC since late January. I used my Roraima experience to pull together grant monies to return and climb a wholly unexplored tepui (name for cliff-fringed mesas rising mysteriously out of Orinocoan and Amazonian rainforests of Venezuela and Guyana) called Mt. Wokomung. It doesn't even occur on maps of the region. I collected there by myself for an additional 30 days and found at least 6 frogs new to science.

PAUL MOLER

Florida Fish and Wildlife Conservation Commission, Wildlife Research Lab

4005 South Main Street, Gainesville, Florida 32601-9099

Phone: (352) 955-2230 Fax: (352) 376-5359

E-mail: paul.moler@fwc.state.fl.us

Current Herpetological Conservation Issues in the Sunshine State

As in most of the world, the single greatest threat faced by Florida's herpetofauna is the anthropogenic loss and degradation of habitat. In addressing this problem, particularly in the case of the gopher tortoise, conflict arises between those wishing to focus maximal resources on habitat protection and those more focused on the rescue of wildlife displaced by development. On another front, Florida has not seen the levels of mysterious amphibian decline reported for some regions, although desmognathine salamanders appear to have disappeared from many areas where seemingly suitable habitat remains, and the long-term impacts of the recent, prolonged drought in the southeastern U.S. are largely undetermined. Commercial harvest of reptiles and amphibians, particularly turtles, remains controversial, although current levels of harvest have not been shown to be excessive. Another matter of concern perhaps unique to Florida, at least in scale, is the introduction of exotic herpetofauna. Florida now supports more non-native than native species of lizards, ranging from small, seemingly innocuous geckos to green iguanas, spiny-tailed iguanas, and Nile monitors. High-volume trafficking in exotic species from throughout the world, which has mushroomed in recent decades, risks not only the establishment of exotic herpetofauna but also introduction of alien diseases with the potential to decimate native wildlife populations.

FLAVIO MORRISSEY

General Curator, Gatorland

14501 South Orange Blossom Trail, Orlando, Florida 32837

Phone: (407) 855-5496

E-mail: flaviomorrissey@gatorland.com

Training Crocodiles for Entertainment and Husbandry

Three case studies of crocodile training can enhance entertainment value and husbandry. The case studies are the means of managing large reptiles in captivity. Many conditions affect the way we care for crocodilians. With nutrition control, discipline, consistency of the programs, crocodiles can be trained to be less aggressive to their keepers and controlled to perform in an orderly fashion with the correct communication. With the ideas of the past and present the future of crocodilian training along with reptile training may provide safety to keepers of the dangerous animals.

JAMES B. MURPHY

Smithsonian Research Associate, Department of Herpetology

National Zoological Park, Washington DC USA

(202) 265-2976

E-mail: jbmurphy2@juno.com

Banquet - Herpetological Time Travel Through The Zoo And Aquarium World

As a retired zoo person, there were four reasons why I was motivated to prepare this presentation. The first was my fear that much of our history, beginning with the first reptile building at the London Zoo in 1849, was in danger of being lost. The second was that many of my zoo and aquarium colleagues, especially those new to the profession, did not have a sense of the unique contributions of their predecessors; their accomplishments should be celebrated. The third was that some of my academic and museum associates had the perception that the work done in zoos and aquariums was not very important. Finally and most importantly, I am concerned that many zoo administrators view zoo and aquarium herpetological collections and buildings as a relict from the past; as a result, there has been a significant decline in new facilities, emphasis and financial support.

JAMES B. MURPHY and GARY W. FERGUSON

Department of Herpetology

National Zoological Park, Washington DC USA

(202) 265-2976

E-mail: jbmurphy2@juno.com

Chameleons: Biology And Captive Management

This presentation focuses on the biology and captive management of chameleons by using rare historical illustrations and photographs mostly from the Smithsonian Institution libraries, beginning with woodcuts fashioned in the mid-1500s. Our 1991 study on natural history and color variation in the panther chameleon in Madagascar is included.

JAMES B. MURPHY, TROOPER WALSH and CLAUDIO CIOFI

Department of Herpetology
National Zoological Park, Washington DC USA
(202) 265-2976
E-mail: jbmurphy2@juno.com

Are Komodo Dragons Different From Other Reptiles?

We had two reasons for preparing this presentation: 1) Monitors have been our focus for many years and we have become intrigued with their prominent place in herpetological art and literature; 2) Our studies on Komodo dragons, both *ex situ* and *in situ*, have revealed some hitherto unknown aspects of their biology, especially play behavior and interaction with humans. In addition, we offer recommendations for captive maintenance and future research with varanid lizards.

CHRIS PARKINSON

University of Central Florida
Orlando, Florida
(407) 823-2000
E-mail: cparkins@pegasus.cc.ucf.edu

Pitviper Systematics and Why Their Names Change

The venomous snake family Viperidae includes 260 species in four subfamilies: Azemiopinae, Causinae, Crotalinae, and Viperinae. The Crotalinae (pitvipers) is the most species rich subfamily, containing over 190 species. Pitvipers are also the widest geographically distributed of the viperid subfamilies, ranging throughout Asia and the Americas, where they inhabit an impressive variety of ecosystems. Innumerable changes have been made to the taxonomy of pitvipers over the last several decades and the systematics of pitvipers continues to remain a dynamic work in progress. For example, prior to 1971 there were six recognized genera, by the mid 1970's this increased to 14 genera, and currently 29 genera are recognized. Here, I present the latest hypotheses for relationships among pitvipers based on mitochondrial DNA data. With these evolutionary perspectives I discuss the rationale behind the last 40 years of taxonomic changes and argue for the importance of revising taxonomy as more information about evolutionary relationships becomes available.

ARIANNE PARTON and JOCLYNN JULY

Animal Keepers, Disney's Animal Kingdom
P.O. Box 10000, Lake Buena Vista, FL 32830-1000
Phone: (407) 938-2590
E-mail: Arianne.P.Parton@disney.com

Training as a Management Tool for Nile Crocodiles (*Crocodylus niloticus*) at Disney's Animal Kingdom

At Disney's Animal Kingdom, animal programs staff uses animal training as an integral part of their animal management. While animal training has been readily applied to mammalian and avian species, we are in the early stages of applying it to our reptilian species. We have found the benefits of using training as a management tool to be vast. Animal care staff is able to obtain better visual and tactile access to the animals in a protected contact situation that decreases the stress to the animals while increasing the safety of keepers and animals. In addition to these

benefits, we have found these animals to learn quickly making the initial time commitment to training the behaviors low and the payoffs high. This presentation will describe how we use training as a management tool for our crocodiles and will discuss the benefits that have been reaped from the program. Additionally, we will discuss the training of basic husbandry behaviors including: shifting off exhibit into the holding area on cue, shifting back into the exhibit on cue, shifting into crates for weights and visual inspection, and allowing for physical restraint within the crate to enable staff to access various body parts for procedures.

DR. PETER PRITCHARD

Chelonian Research Institute, 402 South Central Avenue, Oviedo, Florida 32765 USA
Phone: 407-365-6347 Fax: 407-977-5142
E-mail: ChelonianRI@aol.com

Keynote - Lonesome George and the Con Gai: Turtles Staring Extinction in the Face
(Abstract not available)

VIN RUSSO

Professional Boa and Python Breeder, Cutting Edge Herpetological, Inc.
E-mail: russov51@bigplanet.com Website: <http://www.cuttingedgeherp.com/>

Dwarf Boas of Central America and Mexico
(Abstract not available)

CHUCK SCHAFFER

13811 Tortuga Point Drive
Jacksonville, FL 32225
(904) 220-0678
E-mail: chelonian1@aol.com

Field Observations of *Manouria emys emys* in Malaysian Borneo, and *Manouria emys phayrei* in Thailand.

Poorly known since its description in 1844, *Manouria emys*, the Asian Forest Tortoise, is severely underrepresented in modern scientific literature, most of which restates old data. In comparison to other tortoises, even from the same region, it is virtually unknown. Considering the plethora of unique characteristics, it is astounding that only two in-situ and 12 ex-situ studies exist. *M. emys* constructs and guards nest mounds, modifies nesting material, and is the largest Southeast Asian tortoise. Of terrestrial genera, it is the fourth largest worldwide with largest single clutches. Cryptic habits and decreased or disjunct populations make it virtually impossible to locate in the wild. This study covered sites in Sabah, Malaysian Borneo, Peninsular Malaysia, and Thailand. Objectives achieved were observation of in and ex-situ animals, preserved specimens, food markets, and in-range researcher interviews. Additions to known diet included *Alocasia*, *Begonia*, Civet and Leopard scat. The extremely hilly terrain and 85%+ canopy cover were unexpected, yet nest mounding behavior now makes more sense. Only four in-situ tortoises were observed in over 300 man-hours of survey time and none in food markets. It seems clear that populations of *M. emys* have declined even since receiving endangered status in 2000.

DR. MUHAMMAD SHARIF KHAN

Professor of Zoology, Talimul Islam College, Rabwah, Pakistan
Apt # A17, 151-S. Bishop Ave
SECANE, PA 19018
E-mail: typhlops99@hotmail.com

Present Status of Angular-toed Geckos of Pakistan

Several assemblages of fragile gekkonid lizards inhabit deserts, scrublands, and alpine habitats throughout Pakistan (Khan, 1999). Taxonomy of these animals is yet little understood (Bauer and Russell 1991; Szczerbak and Golubev 1977, 1986, 1996; Khan 1997, 2001). Kluge (1983) placed Pakistani geckos in genera *Agamura*, *Alsophylax*, *Bunopus*, *Crossobamon*, *Hemidactylus*, *Stenodactylus*, *Cyrtopodion* and *Tropiocolotes*, *Microgecko*, *Ptyodactylus*, and *Teratoscincus*. With recent descriptions of several new angular-toed geckos from Pakistan (Szczerbak, 1991; Khan, 1980, 1988, 1989, 1991, 1993, 2001; Khan and Baig, 1992; Khan and Tasnim, 1990, my concept of the relationship among angular-toed geckos has been changed. My phylogenetic conclusions regarding angular-toed geckos of the Himalayan region have been expressed elsewhere (Khan 2001, 2003, and Khan and Rösler 1999). They are distinguished in four genera: *Altigekko* Khan 2003, are confined to high altitudes in the Greater Himalayas; *Siwaligekko* Khan 2003 are confined to the sub Himalayan Siwalik Range; *Indogekko* Khan 2003 are confined to the sandstone rocks at the bed of ancient rivers; while genus *Cyrtopodion* Fitzinger, 1843 constitutes the ground geckos in the Indus Valley.

BRUCE SHWEDICK

Crocodile Conservation Services
P.O. Box 3176, Plant City, Florida 33563
E-mail: shwedick@aol.com

Husbandry and Captive Reproduction of the False Gaviel, *Tomistoma schlegelii*

The *Tomistoma* (*Tomistoma schlegelii*), also known as the False Gharial, is a large slender-snouted crocodylian that inhabits rivers, lakes and peat swamp forests in parts of Peninsular Malaysia, Borneo and Sumatra. It is listed as an endangered species by the USFWS, Appendix 1 of CITIES and currently classified as EN C1 on the IUCN RED LIST. Current populations in the wild are estimated to consist of less than 2500 adults. This species may in fact be critically endangered due to loss of habitat as a result of illegal logging and the systematic drainage of peat swamps for agricultural purposes.

The first captive reproduction of this species took place in 1985 at the Wildlife Conservation Society/Bronx Zoo in New York and later that same year at the Miami Metrozoo in Florida. In Asia, this species is being reproduced in captivity on an annual basis at the Utairatch Crocodile Farm in Thailand. Jong's Crocodile Farm in Sarawak, Malaysia has reported successful reproduction occurring on a periodic basis. The National Zoological Park of Sri Lanka in Dehiwala has also hatched this species, but has reported extremely high neonate mortality. The most recent reproduction in North America occurred at Florida Cypress Gardens in 1999. The history and results of that reproduction are presented in this report along with additional information on the husbandry and reproduction of *Tomistoma* held in captivity at other facilities in North America, Europe and Asia.

JOHN H. TASHJIAN

Field Associate, California Academy of Science
P.O. Box 522, San Marcos, California 92079-0522
Phone: (760) 744-2454 E-mail: JHT522@aol.com

Scientific Nomenclature

Usos Latinae et Grecae non timete or, translated freely by one who is intimidated even by English, fear not the use of Latin and Greek and, one might add, all the other bases for scientific names. Because common names of animals (and plants) are different and may be unrecognizable in different countries as well as regions in a single country it is a good idea for a serious herper to learn and use scientific names. Scientific names may reflect descriptive characteristics, geography, habitat, habits and omomatopoeia (see text for that one), and others, providing us with information for better herpetoculture.

DR. KENT VLIET

University of Florida, Biological Sciences,
Gainesville, Florida 32611
E-mail: kent.vliet@zoo.ufl.edu

Neurobiology and Learning in Crocodilians

(Abstract not available)