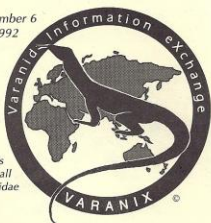


Varanews

Volume 2 Number 6
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Varanews is published by Varanix®, the Varanid Information eXchange,
dedicated to the responsible captive care of monitor lizards
through education and the open exchange of all
information pertaining to Varanidæ

General Info

This issue has taken on the primary theme of notes on reproduction of the Nile (*niloticus*), Timor (*timorensis*), and water (*salvator*) monitor. We begin with the zoo breeding news below, followed by a call to readers who may be able to shed some light on a parasite problem in a green tree monitor.

Captive Breeding News: Malayan water monitors

Mike Fost sent in the following report which appeared in the September 1992 AAZPA Communiqué.

"Four Malayan water monitors (*V. s. salvator*) hatched at the Sedgwick County Zoo & Botanical Garden between 2 and 11 May after nearly eight months of incubation. Thirteen eggs were laid on 10 September 1991, with five proving to be fertile. The eggs were incubated on a vermiculite medium (1:1 - water: vermiculite ratio) at 82 - 84F. The success of this breeding is thought to be attributed to seasonal photoperiods, availability of daily and seasonal temperature fluctuations, provision of thermal gradients through use of basking lights, and separation-reintroduction. Two notable observations were made: 1) nest excavation and 2) post-oviposition defensive behavior towards anyone approaching the nest site. It is believed this represents the fifth captive breeding of this taxon in the Western Hemisphere. (J. Etting)"

Unidentified Parasite in the Green Tree Monitor, *V. prasinus*

About a year after acquiring a male *V. prasinus*, Zuzana Kukol reports finding what she termed "noodle" parasites near the front legs of her monitor. The description below is based on her notes.

November 1991: I received a *V. prasinus* from a dealer in Florida. The monitor was skinny (about 80 g / 2.8 oz), had a wound on his tail, had worn down the upper tip of his snout from rubbing the cage walls (while at the dealer for several months), displaying evidence of incomplete sheds and had

mites. He was only interested in eating small lizards, showing no interest in pinkies (even though the dealer said he was "eating pinkies like popcorn"). I put him in a bare cage to make it easier to eliminate the mites. He was given warm baths daily to help his shedding condition.

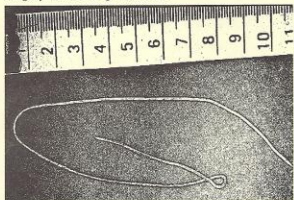
My veterinarian gave him Ivermectin (orally) two weeks apart, antibiotic shots (Tribriksen®) for his tail wound and Betadine® and antibiotic cream for external treatment of the wound.

Dec 91: He was doing much better a few weeks later, his weight was up to almost 130 g (4.6 oz) and he started accepting dog/cat food & raw meat. Once I stopped feeding him small lizards, he was treated with Flagyl® and Panacur® to get rid of possible intestinal parasites.

Jan 92: Since his health had improved, the cage was furnished with live plants & sphagnum moss to help keep humidity high; weight was up to 190 g (6.7 oz).

For several weeks in the spring I often saw him basking under the heat lamp with his hemipenis everted, a "ritual" he has since stopped. He has not exhibited any snout-rubbing.

Summer 92: I discovered a bump near his right front leg. Assuming it to be a tumor, I took him to my vet, who thought it might be an infection due to a possible internal injury. The monitor was given Baytril® for a week with no results and we decided surgery should be performed.





Instead of finding infected tissue, the vet found an 11-inch (28 cm) long parasite, resembling a thin, white noodle.

The *V. prasinus* had not come into contact with any other animals in my house.

Preparing to take him to the vet six weeks later for removal of the stitches, I noticed a similar bump on his left side (photo above). Surgery was performed, and a similar, though smaller, parasite was removed. He was given Ivermectin after the second surgery.

Six weeks later no new bumps are evident, hopefully because he is free of them and not because they are deeper in his body where they can't be seen.

Zuzana ends her report with: "I am hoping somebody who reads VaraNews might know more."

■ Notable Publications ■

Observations on the Reproductive Biology & Growth of the Water Monitor (*V. salvator*) at the Madras Crocodile Bank [Hamadryad 15(1):1-5]

The Abstract on page 1 of this paper by Harry Andrews and Maren Gaulke:

"Reproduction in the water monitor lizard, V. salvator (Laurenti, 1768) started in 1987, and within a year (1987-88) seven clutches were produced with an interesting interval of 3 months. The average clutch size was 13.8, size and weight of eggs varied considerably even within one clutch. Viability of each egg was determined by candling. The incubation period was temperature-dependent, sexing at hatching and yearling stages proved to be difficult."

This study begins with the Madras Crocodile Bank's acquisition of 3:3 (3 male, 3 female) adult water monitors wild-caught in north-eastern India. They were housed in an outdoor pen with four small ponds, climbing branches, vegetated hiding places and an exposed sandy section. A varied diet included small fish, rats, and crabs.

Mating activities began shortly after the monitors became accustomed to their new home. Within a two year period, two females laid three clutches each, a total of 76 eggs in all. Clutch size ranged from 7 to 17

eggs. All eggs were artificially incubated at one of three temperature ranges, two clutches each at: 25-30 C (77 - 86 F), 31-32 C (87.8 - 89.6 F), or 32 - 33 C (89.6 - 91.4 F). Hatchlings emerged after 9, 8 and 7 months, respectively.

A total of "20 vigorous juveniles" hatched; 16 were still alive at the time of publication. Average total length after two years exceeds one meter. A variety of attempts at sexing were made unsuccessfully. However, the authors report that at two years of age the males are large enough to be identified by their bulging hemipenial pockets. A larger enclosure is planned for the future.

(The back cover of this issue of Hamadryad shows a close-up profile of a large water monitor with a smaller monitor grasped in its jaws.)

The Madras Crocodile Bank was founded as a breeding center for Indian crocodiles nearing extinction, one of the goals being to release surplus animals back into the wild. Starting with twenty five crocodiles in 1976, there are now over six thousand! Another goal is to spread environmental awareness about crocodiles and the importance of preserving them. As you've just read, they are also breeding water monitors. Turtles, the "crocodile's environmental partner", round out the list.

Annual subscription to Hamadryad is \$25. For more information about this, and other publications (esp. crocodile-related), contact:

Madras Crocodile Bank Trust
Post Bag: 4
Mahabalipuram Tamil Nadu 603104
INDIA

The Social Hierarchy of the Water Monitor, *V. salvator*

[Hamadryad 16(1,2):10-20]

The Abstract on page 10 of this paper by Jennifer Daltry (Dept. of Zoology, Univ. of Aberdeen, Scotland) sums up this study on 17 water monitors, also undertaken at the Madras Crocodile Bank.

"Water monitors of both genders and all age classes will organize themselves into a dominance hierarchy. This is based upon aggressive behaviours involving the characteristically sharp teeth and claws. Animals of inferior status respond to aggression with flight, whereas lizards of similar rank typically respond with warning displays and will fight if the aggressor persists in offence. The largest individuals tend to be the highest ranking, irrespective of their gender. Water monitors probably have some ability to recognise other members of the local hierarchy in order to quickly respond in a manner appropriate to their social status. Aggressive interactions are undoubtedly detrimental to the monitors' health. In order to maximise 'output' in captive breeding programmes for this species, such

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General Info

Speakers at Ecology of Varanids Symposium, 2nd World Congress of Herpetology

Dennis King sent in a partial list of topics scheduled for this event in Australia at year's end (not all titles were available at publication time):

- Energetics of several species of varanids (ranging in size from *V. gouldii* to *V. caudolineatus*) in the laboratory
- Radiotracking and field energetics of *V. gouldii* and *V. panoptes* on the floodplain east of Darwin
- Australia breeding behaviour and energetics of *V. rosenbergi*
- Sperm morphology as a taxonomic tool for varanids
- Home range, activity pattern and thermoregulation in the perentie (*V. giganteus*)
- *V. albigularis* ecology in Nambia
- Thermal ecology of adult and juvenile Komodo dragons, *V. komodensis*
- Daily activity patterns, temperature regulation and behavioural aspects of *V. salvator* in captivity
- Economic use and some biologic parameters of heavily exploited populations of the Nile monitor (*V. niloticus*)
- The captive breeding of *V. acanthurus*
- Observations on the habitat selection of water monitors (*V. salvator*)
- Kinematics of throat extension of *V. griseus* in throat display

Questions for your response...

By coincidence, several requests were received about using earthworms as part of a monitor's diet. What are the concerns and what precautions can be taken? Can parasite-free colonies be raised?

(Editor's note: I imagine people using worm bins to "recycle" kitchen scraps are looking forward to your answers... I am.)

Tegus

A handful of members have requested information about tegus. Some time ago an offer was extended to

Future Articles

- Michael Balsai discusses subcutaneous abscesses which can affect the savannah monitor. (Previously announced for this issue, more information became available shortly before publication.)
- Michael McCoid offers some data on the reproductive output in captive and wild mangrove monitors, *V. indicus*.

include articles in these pages. An updated offer is being extended to the Tupinambian brethren: Tegus articles will be accommodated as an insert in Varanews. On the premise that articles will be submitted, an editor is also needed.

AAZPA Communiqué, March 1993

Cape Monitors Hatch at Hogle Zoo, K. Davidson

"Utah's Hogle Zoo recently reported the successful reproduction of the Cape, or Bosc's monitor (*V. exanthematus albigularis*). In December 1992, following 140-151 days of incubation, 9 monitors hatched from the original 30 eggs laid. The eggs were artificially incubated on vermiculite with temperatures ranging from 28-29C. This is believed to be the first time this species has been bred outside of its native country of South Africa. The offspring are doing well."

Monitoring Medicine

This information is not a substitute for training and years of experience. Always work with someone qualified in the medical treatment of monitors.

Nematode in Green Tree Monitor Identified

Varanews 2(6) and 3(1) reported on a "noodle" parasite found in *V. prasinus*. Zuzana Kukol sent in the results of an examination of the specimen by Patricia Pillitt, a Zoologist with the USDA Biosystematic Parasitology Laboratory:

"We have examined the specimen from the Green Tree monitor, *V. prasinus*, that you sent. It is a spirurid nematode in the subfamily Dicheilonematinae. We believe it belongs to the genus *Hastospiculum*. This genus is a parasite of reptiles while other genera within the subfamily are parasites of birds.

Not much is known about the life cycle of this parasite in lizards. In birds, a species of the similar genus (*Diplotrriaena*) develop in grasshoppers. I suspect that an arthropod, probably an insect, is the intermediate host for *Hastospiculum* and may have been used to feed the lizards."

The nematode specimen examined was filled with larvated eggs which resulted in the "noodle" appearance [Varanews 2(6):1]. Exact species identification of this parasite can only be determined by male characteristics.

Species of *Hastospiculum* listed as parasites in monitors include: *H. macropthallos* and *H. varanus* in the water monitor, *V. salvator* and *H. spinigerum* in the yellow monitor, *V. flavescens*.

Assoc. of Reptilian & Amphibian Veterinarians 2(2)

From the section "In My Experience":

Michael Corwin, DVM, reports on the treatment of parasites in savannah monitors, *V. exanthematicus*. Dr. Corwin has used oxfendazole at 75 mg/kg orally injected into a mouse and fed to the infected monitor every 72 hours for 3 treatments. He adds that sulfadimethoxine has been effective in the treatment of coccidial infections.

Dr. Corwin has not found Ivermectin effective against nematodes in savannah monitors, citing several recent cases of hookworm infestations going unaffected following treatment.

Thomas Ryan, DVM, treated a savannah monitor diagnosed as having a *Dermatophilus* infection, or cutaneous streptotrichosis, on the hind legs. Once the lesions were removed and the lab report confirmed the diagnosis, subcutaneous injections (SQ) of ampicillin (10mg/kg) were given twice a day for 1 week and five injections of amikacin (2.5 mg/kg) administered every third day. The monitor was also bathed in a dilute betadine solution the color of weak tea. Dr. Ryan recommended the owner buy a thermometer and humidity gauge to monitor conditions in the tank and provide a water bowl

which could not be spilled or tipped over. This had occurred on a regular basis resulting in excessive moisture for a savannah monitor.

The lesions have not reoccurred since June 1990.

Publications

If you know of any good books, magazines, newsletter articles, etc., send in the title, author, publisher and publication date/issue. Comments on the material's focus and usefulness are most welcome.

TRAFFIC Bulletin 13(2):61-67, 1992

Observations on Wildlife Trade in Vietnam, Edmond Bradley Martin

"Wild animals and their products are widely available in markets throughout Vietnam, especially in Ho Chi Minh City (formerly Saigon). In 1989, the Ministry of Forestry brought in a regulation prohibiting killing and trade in certain animal species, but this is not enforced."

This report details the findings of a survey conducted by the author to "carry out a study of the wildlife products offered for retail sale". Two visits were made to Ho Chi Minh City, one in March 1990 and the second in January 1991. The article focuses on the various factors contributing to the potential extermination (in the wild) of the animals in this region of southeast Asia.

The survey listed items found in souvenir and medicine shops along with the live animal trade. Among the sad list of "souvenirs" offered the tourist, stuffed monitors could be had for \$37. Water and Bengal monitors are sold live, for use as both food and medicine, or already butchered. Cost per kilogram: \$4.

Also reported in this issue was the seizure of 18 Desert monitors, *Varanus griseus* (Appendix I), by customs officials at Düsseldorf Airport in August 1992.

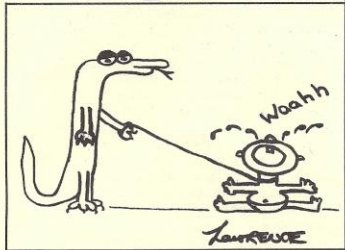
The Vivarium 4(3):19-22, Nov/Dec 1992

Monitors and the Rotterdam Zoo, Gerard Visser

The author begins with an overview of the monitor family before moving on to notes on the White-throated, or Cape, monitor (*V. albigularis*) and the yellow monitor (*V. flavescens*). Discussion of each includes distribution, habitat, caging, diet and activity, and reproduction. Five color photos accompany the article (*acanthurus*, *prasinus*, *varius*, *albigularis*, *flavescens*).

A pair of adult White-throated monitors were kept in a 16x6.3x7ft (5x2.5x2.8 m) enclosure set on a cement slab covered with a thin layer of sand. Furnishings included a tree, rocks, artificial palm trees and a small pool kept at 75 F (25 C). Daytime temperature ranged from 75-86F (25-30C); nighttime above 68F (20C). Diet included day-old chicks, rats, mice, and

Vinny The Varanid



To be perfectly honest, Vinny had intended on buying a baby chimp. He changed his mind, however, and purchased a juvenile *Homo sapien* upon hearing how most have a tendency of becoming "dog" tame.

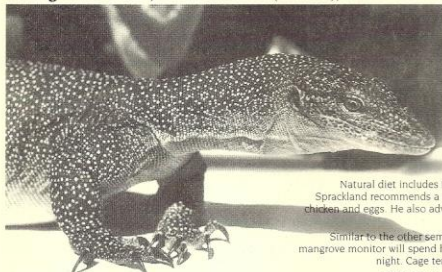
McCoid, M. J., Hensley, R. A., and G. J. Witterman. MS. The decline of monitor lizard populations on Guam, Mariana Islands. submitted to Elepaio.

McCoid, M. J. and G. J. Witterman. 1993. *Varanus indicus* (mangrove monitor). *Diet. Herpetol. Rev.* 24: in press

Wikramanayake, E. D. and G. L. Dryden. 1988. The reproductive ecology of *Varanus indicus*. *Herpetologica* 44: 338-344.

*Present Address: 10 Stratford Road, Edenton, North Carolina 27932

Mangrove Monitor, *Varanus indicus* (DAUDIN), 1802



The mangrove monitor's natural range includes the Indonesian islands of Celebes and Timor, New Guinea, Papua New Guinea, the Solomon Islands, the Carolines, the Marshall Islands and parts of Northern Australia. *V. indicus* is the only monitor species inhabiting the Marianas, occurring on all but the 3 northernmost islands. Length is up to 1.5 m (4.9 ft) TL.

On page 95 of *Giant Lizards*: "Found in moist environments near permanent bodies of water, [the mangrove monitor] is an excellent climber and swimmer. These monitors may sunbathe on large branches then drop suddenly into the water below in order to escape detection or chase after prey. In the water they are in their second element."

Natural diet includes fish, crabs, shrimp, crayfish, mollusks, frogs and turtles. Sprackland recommends a high-protein captive diet, including mice, strips of steak, chicken and eggs. He also advises the use of vitamin and mineral supplements along with broad-spectrum lighting.

Similar to the other semi-aquatic monitors, such as *V. niloticus* and *V. salvator*, the mangrove monitor will spend hours in the water, often remaining there throughout the night. Cage temperature should fall into the 86 - 92 F (32 - 33 C) range.

Captive *V. indicus* Egg Deposition

Zuzana Kukol reports one of her *V. indicus* having deposited eggs on several occasions. Ten eggs were deposited in Sep/Oct 1992. Four more were found on November 1st. Nine days later, Zuzana witnessed one of the females deposit an egg in the saiking pan which had just been refilled with clean water. Upon entering the water, the *V. indicus* raised its tail and laid an egg.

Two more clutches were found, numbering nine and five eggs, through mid-January 1993. None of the eggs to this point appear to have been fertile.



Zuzana Kukol took the three photos on this page. The two photos of the monitor are of the same gravid *V. indicus*. At the time the photos were taken, the female had just recently deposited 2 eggs. Four more eggs were subsequently laid.

The other photo is of the eggs laid by the female in September 1992. [tape measure in centimeters: 2.54 cm = 1 in.]