

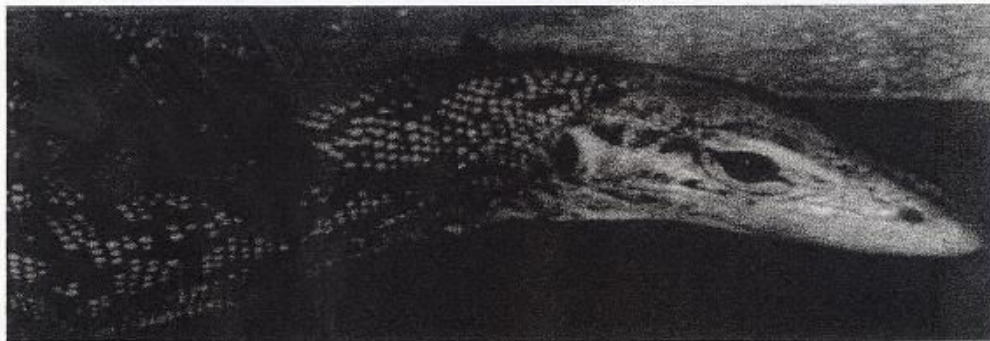
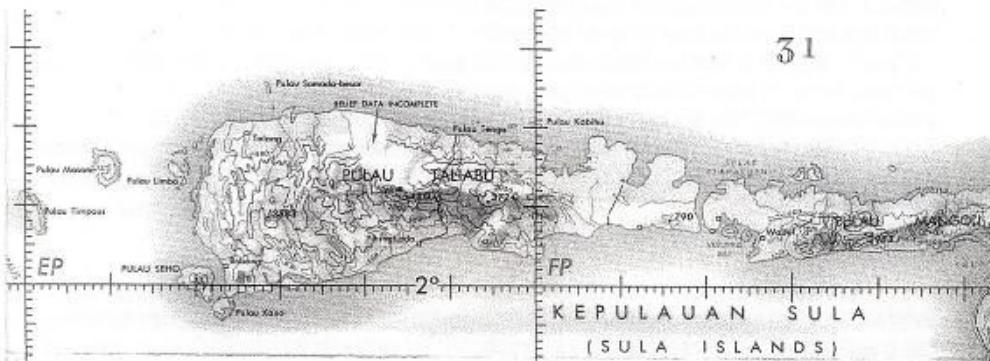
DRAGON NEWS

VOLUME 2 ISSUE 2

JULY/SEPTEMBER 1998

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LV.A



NEW ERA OF DISCOVERY AND THE RAGING FIRE OF CAPITALISM

THE INTERNATIONAL VARANID ASSOCIATION IS DEDICATED TO THE CARE AND UNDERSTANDING OF CAPTIVE MONITOR LIZARDS.

FROM THE EDITOR

"The raging fire of capitalism" I think sums up the state of the reptile trade today. Money is the primary driving force behind every aspect of the reptile trade from the time the animals are harvested to the time they are sold and resold and resold over and over again. Anything for a buck. I guess exporters, importers and retailers understand the darker side of human nature. The side that wants to *possess* things. The side that wants something just to say that they have it, not that they are going to do anything with it. The exporters, etc. feed that need to *possess* at the expense of wild populations of animals, some of which have only recently been discovered.

A good example involves the newly discovered *V. melinus* from the Sula Islands (Tallabu to be more specific). One day, someone collects these animals and sells them off as "yellow" water monitors to an exporter who in turn sells them to an importer here (or elsewhere). The animals sell like hotcakes because they are "different". Someone notices that these animals are not water monitors but are in fact something new. Now, everybody wants one and with the quota on water monitors at 40,000 animals a year, how many "yellow" water monitors do you really think are left on that tiny little Sula island in Indonesia after a whole year of harvesting? Fortunately, Indonesia has not allowed exportation of *V. melinus* once it was formally described as a new species. I hope that captive animals are not all that is left of this species. It would be nice to think that a few exist in the wild yet.

On another similar note closer to home

I, as well as many others, have noticed that many of the "hardcore" snake breeders and enthusiasts are giving monitor lizard keeping a go. That's a scary thought! One must keep in mind that these are the same people that brought pure strain snake breeding to a screeching halt and ushered in the capitalistic era of "designer" snakes. Common forms of snakes stopped selling and the ones that did were priced at next to nothing. Every year animals have to be more and more unusual to be commercial. It is sad that many people want a "morph" instead of taking a genuine interest in a "common" form. It is also sad that these animals are purchased because they are the latest "thing" only to be unloaded as soon as the next wave of morphs come around. **DON'T LET THIS HAPPEN TO OUR HOBBY!**

If you keep monitors or are thinking about starting, do so because you want to, not because it might make you some money!

I would also like to thank the members of the Indonesian government and C.I.T.E.S. for taking steps to close, or at least highly regulate, the exportation of Indonesian fauna.

I hope that I am not the only one that feels this strongly

Let us know what you think!

HAPPY MONITORING!

I.V.A. OFFICERS AND DRAGON NEWS STAFF

JOHN HOGSTON : President and Managing Editor
MARK K. BAYLESS: Vice President and Contributing Editor
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MARK D. BUTLER, D.V.M. : Veterinary Advisor
KELSEY ENGLE : Advisor (Australia), Curator of The Queensland Reptile and Fauna Park

CONSIDERATIONS

Let us know about your breeding successes / failures.

Send in your animal pictures !

Send in your nominations for the largest privately held monitor (Each Species).

Volunteers are needed to help with newsletter publication (call for specifics).

Article update : The article on the new and recently discovered monitor species/subspecies will be completed for the next issue of *DRAGON NEWS*. Several changes needed to be made in order for it to be accurate and complete.

We still need more of the membership to contribute articles, etc on a more regular basis.

THE I.V.A. WOULD LIKE TO THANK :

Phil Crawley, again for the great artwork !

Roger Price for going out of his way to promote the society .

Marc Weiss for his enthusiasm for the organization and his willingness to contribute .

Daniel Bennett for his eagerness to expand I.V.A. contacts in Europe and beyond .

**Varanus griseus caspius: Perspective of reservations
in Uzbekistan Part II
By Dmitry Grechanichenko
Alma-Ata Zoo
Director**

Editor's note: This series of original papers will be in Dragon News over the next few issues, with five papers being presented. These papers will discuss the field observations and studies made by the author on the desert monitor (*Varanus griseus caspius*) of Uzbekistan.

For the last seven years 87 specimens of the Desert Monitor (*Varanus griseus caspius*) were registered. The intensive developing of the territory resulted in constant decreases of specimens. During the last 20 years, the natural vegetation was reduced 40%; in some districts such as Tashkent and Syrdaria it has been reduced by 90%!

In Phergana's valley the population of *V.g.c.* is on the verge of local extinction.

The density of distribution varies essentially depending on the presence of refuges and rodents (i. e. burrows and prey). The number of monitor lizards / kilometer were found in the following areas:

Near Nuratau mountain ridge	8
sand of Aldaroul lake	8
Babatag foothills	5
Kizil-kum preserve	2-14
Jaz-Javan's sands	3

Of the animals found, 8% of them were younger animals. In the foothills, most of the population is isolated. Perhaps the subsequent reduction of area location in the south-east of Uzbekistan is suggested concerning the anthropomorphic factors influencing the foothills. The main reason for *Varanus griseus* death in deserts is motor transport vehicles.

Courtship, Mating and Egg Deposition by the Captive Perentie *Varanus giganteus* at Queensland Reptile and Fauna Park.

By Steve Irwin, Queensland Reptile and Fauna Park,
Beerwah, Queensland.

(This article was originally published in *Thylacinus* vol. 21 no. 1, 1986. It is reprinted here with the permission of the author.)

The perentie *Varanus giganteus* is the largest lizard in Australia and one of the largest in the world, attaining lengths of 2.5m and weights of over 15kgs. They are found from western Queensland across the arid and semi-arid interior to coastal Western Australia. The perentie is a ground-dwelling goanna which can run extremely fast. They are powerful diggers and frequent rocky escarpments and outcrops.

At the Queensland Reptile and Fauna Park the main breeding enclosure is a concrete block structure 11.2m long, 7.0m wide and 2.0m deep with a 600mm slip panel around the top inside wall. The substrate is coarse sand, the furnishings are large sandstone boulders with hollow logs wedged between them and some partially buried in the sand. A sandhill covers the north-facing wall at an angle of approximately 30 degrees to maximize the amount of sunlight entering the enclosure. We have been breeding perenties at the park since 1986. (See Table 1).

Four specimens are housed in the enclosure:

- One adult male, wild caught (captured 17 March, 1986, in western Queensland), 1.8m total length.
- One adult female, captive bred, hatched 18 June, 1989, 1.33m total length.
- One adult male, captive bred, hatched 18 June, 1989, 1.4m total length.
- One juvenile female, (assumed female), captive bred, hatched 13 August 1992, 1.16m total length.

During winter, (June and July), the perenties are inactive and refuse food, only moving into the sun during the hottest part of the day, basking, then retreating early in the afternoon.

On 9 August 1994, all four perenties were showing interest in food, spending more hours basking and were becoming more active. They were offered a pink mouse each, all four ate. No further interest was shown in food until 22 August 1994, when they all ate two small adult mice each, then, on 1 September, 1994, the three adults ate a medium-sized rat each and the juvenile ate an adult mouse. Small rats or rabbit's legs were then offered approximately every three days and were eaten every time.

At 2:00 pm on 17 September, 1994, after a feed of rabbit pieces, the adult female known as 'Crinkle', started digging holes in the sandhill. Although she had just eaten, it was thought that her belly was slightly distended.

On 4 October, 1994, after a feed of chicken, she commenced digging more test holes. It was now very obvious she was ovulating, as her belly was quite distended. She continued to dig test holes daily and on 17 and 18 October, 1994, she was very active, pacing the entire enclosure and doing a lot of digging.

At 8:00 am on 19 October, 1994, the female 'Crinkle' and the young male 'Pete', were very agitated, pacing back and forth. The female then chased the older, largest, dominant male, 'Ledge'. He showed no interest. Within an hour, both males became very agitated and their tongue flicks were rapid, particularly where 'Crinkle' had walked.

'Ledge' located 'Crinkle' and immediately mounted her. She was basically pinned underneath him. His tongue flicks were very rapid and he licked her eyes and snout, simultaneously raking her back legs with his, trying to get her to raise her tail. After several minutes she'd had enough and simply walked out from under him.

'Pete' would then do exactly the same and often both males would be trying to mate with her simultaneously. The most incredible observation was the lack of aggression between males. Normally dominant males bite and lacerate any subordinate males on the tail, chase them aggressively and, if it develops into a confrontation, bite around the head and neck. This was not the case.

Occasionally whilst walking, the female would drop her cloaca to the ground and drag her rear end for several metres. When the males were searching for her and they'd find her, or come across a cloaca drag area, their tongue flicks would increase to a very rapid rate and their excitement would accelerate.

'Crinkle', whose belly was now so distended it dragged on the ground as she walked, was obviously annoyed with both males wanting to mate with her from sun-up to sundown. She could only rest if she was able to get out of their sight. 'Pete' and 'Ledge' could not locate her by smell as her scent was all over the enclosure, but parenties have very acute eyesight and as soon as she became visible, they would mount her.

This mating behaviour was very rigorous every day until 28 October, 1984; nine days. Tongue flicking around the eyes and snout, the jerky head movements, mounting and raking with the back legs were continuous during daylight hours. However, 'Crinkle' was only observed to be responsive towards 'Pete' on two occasions during this period.

She allowed him to rake up one of her back legs and roll her tail over, he then moved his cloaca alongside hers and inserted a hemipenis.

They would lay still and relaxed whilst joined, occasionally shutting their eyes. After approximately 10 minutes, she would then stand up and walk from under him.

We were never able to observe hemipenes, even while observing from one metre away. 'Ledge', at ease with 'Pete' mating, would sit just 600mm away, watching. It was interesting to note the female was observed drinking once during this period. This was the first time in the 10 years the Park has held this species that drinking has been observed.

She would tolerate 'Ledge' mounting her but was never observed responding to him. She never allowed him to raise her tail so that their cloacas could meet.

By 28 October, 1984, mating behaviour had become spasmodic. On the following day it was less and by 1 November, 1984, the males were showing very little interest in her. However, 'Ledge' was noticed asserting dominance again and was becoming less tolerant of 'Pete'.

Throughout the entire mating ritual, the juvenile parentie named 'Missey' always stayed several metres from the other parenties and showed no interest in their behaviour.

For the next two weeks, 'Crinkle' did a little digging and a lot of relaxing-often sleeping in the water bowl. 'Ledge' would endeavour to bite 'Pete' at the base of the tail if he came too close. They were being fed twice weekly. All were eating well.

On 14 November 1984, 'Crinkle' was starting to become more active and doing a lot more digging. By 17 November 1984, she was very enthusiastic about digging particular test holes. She would spend all day digging a hole to a depth of approximately 600mm. The next day, 18 November, 1984, she refused food and dug another large hole in the same vicinity as her nest hole from last year.

When the female parentie digs a hole she embeds her snout in the substrate, then rakes out her forelegs. I would assume a gravid female parentie's snout is receptive to temperature and moisture, which is essential to locate the right spot to deposit her eggs.

From 8:00 am to 3:00 pm on 19 November 1984, 'Crinkle' was digging in last year's nest site. Then, at 4:00 pm, she moved up onto the sandhill to a hole she had dug several days earlier. She walked into the hole head first, spent 30 minutes excavating, then went all the way in and turned around, came out up to her front shoulders, then rested her head and neck at the entrance.

Within 10 minutes (4:50 pm, 19 November, 1984) she raised her head from the resting position, her eyes opened wide and she strained for nearly 30 seconds. It was assumed she had laid her first egg. Then she rested her head back down occasionally closing her eyes and looked relaxed. Within five minutes, she raised her head, her eyes opened wide and she strained again. This behaviour continued at intervals of between 5-10 minutes. Each time she strained she'd take two large breaths and her mouth would be slightly ajar; no tongue flicking at any stage.

At 6:40 pm it was 22 minutes since laying her last egg, she was in the rested position and by 7:43 pm she was asleep. She woke up and was alert at 8:00 pm. After several minutes, she moved forward out of her hole several centimetres with her tongue flicking. She turned her head around and looked back down the hole for approximately one minute, then straightened her head and tongue flicked the entrance for approximately 45 seconds, then turned her head back down the hole.

At 8:50 pm she turned her head out of the hole, tongue flicking, walked out of her hole, turned around and explored the entrance with her tongue. She then walked, head first, down the hole as far as she could, gave the eggs a few tongue flicks, then started packing sand on top of her eggs with her head.

To pack back over the eggs she would cave sand down from the roof and sides of her hole, then pack it down by exerting downward pressure with her head, often so strenuously that all four of her legs would come off the ground. As she filled and packed closer to the entrance, she would pull back and use her head like a shovel to scoop and push forward more sand from in front of the entrance, then she would meticulously pack it with her snout.

During the entire backfilling/packing process she was alert and would stop and tongue flick at any strange noises or disturbances.

At 8:05 pm, she exerted so much force packing down with her snout that her legs and feet came off the ground and another egg was squeezed out. She didn't realise that she had deposited a random egg, so she continued to pack for 7 1/2 minutes. Then she drew back out of the hole to shovel more sand in and noticed the egg approximately 300mm from the hole entrance.

She flicked it with her tongue, touched it with her snout, then rolled the egg by nuzzling it towards the hole. It rolled towards the entrance. She then grabbed it with her mouth and gently repositioned it. Then she nuzzled it with her snout towards the entrance and it rolled straight down the hole. She followed it down, then pushed it to the back of the hole and returned to the job of backfilling and packing. From the time she noticed the egg, manipulated it into the hole then resumed packing, it took 80 seconds.

By 10:00 pm she had filled and packed to within approximately 200mm from the entrance and was now raking sand with her forefeet towards the entrance, packing it down with her snout.

'Crinkle' worked non-stop since depositing the first egg and continued to work until 12:32 am. At this time she stopped, tongue flicked the area, then walked 2.0m away, crawled under a rock and went to sleep.

7:00 am that morning (20 November, 1984) she came out from under the rock and went straight to work, raking with her forelegs and compacting with her snout. She finished the job at 12:20 pm and it was impossible to tell where the hole was; all that was visible were goanna tracks. she walked 1.5m away and rested.

All the other parentias stayed well away from her while she was working. When she had finished, they went back to normal and started walking around. After a 10 minute rest she started walking around the general nest hole area and seemed very agitated.

As soon as she spotted 'Pete' she charged straight at him very aggressively, then chased him. When she caught, she rapid tongue flicked him around the eyes and snout, then wrestled. He finally overpowered her and held her down with his body. As he tried to walk off, not wanting to fight, she wrestled him again. Once again, he overpowered her. Now exhausted, she walked straight under a rock to 'Ledge' and sidled up to him.

'Ledge' acknowledged her with three tongue flicks then walked straight out and appeared to stand guard over her. He became very territorial around his female and would aggressively defend 'Crinkle' and her immediate territory.

His aggression towards 'Pete' developed into 'Ledge' striking with intent to damage the base of 'Pete's' tail.

After resting for 10 minutes, 'Crinkle' returned to the nest site and walked into a hollow log right behind the site. I quickly jumped in and blocked both ends so she couldn't see us raiding the nest. She became very aggressive and bit the rag blocks.

I dug down her hole to the nest chamber. It went down at 30 degrees, 800mm from the top of the eggs to the hole entrance. The hole was 220mm high by 240mm wide. The sand in the chamber was moist and 27 degrees c. I collected all of the eggs then backfilled and packed as close to its original state as possible, removed the blocks then got out of the enclosure.

She came out of the log in a hurry but appeared unperturbed by the event and showed no sign of acknowledgement that the nest had been disturbed.

For the next three days both 'Crinkle' and 'Ledge' were very aggressive towards 'Pete' and 'Ledge' caught him twice and lacerated the base of 'Pete's' tail.

13 fertile eggs were collected and the total clutch weight was 1234g. (Table 2).

COMMENTS:

This account of nesting behaviour has provided much valuable data. The entire procedure has been recorded on video tape and with photographs. Further research on the nocturnal nesting activities of varanids is currently being conducted. The most fascinating observation was her response to the stray egg, which she acknowledged and gently manipulated on to the clutch.

TABLE 1

PERENTIE BREEDING RECORDS

Queensland Reptile and Fauna Park, Glasshouse Mountains Tourist Road, Beerwah, Queensland

March 17, 1985	Wild caught 1.10
October 3, 1985	Wild caught 0.10
November 22, 1986	Mating
December 31, 1986	Eggs
August 22, 1987	Hatching (234 days incubation)
-----	No mating record
December 21, 1987	Eggs
-----	Died during incubation
November 2, 1988	Mating
November 30, 1988	Eggs
June 18, 1989	Hatching (200 days incubation)
December 11, 1989	Mating
-----	No eggs located
-----	No Hatching
November 5, 1991	Mating
December 7, 1991	Eggs
August 13, 1992	Hatching (248 days incubation)
November 3, 1992	Mating
November 28, 1992	Eggs
July 30, 1993	Hatching (228-233 days incubation)
August 4, 1993	Hatching
October 20, 1993	Mating
November 20, 1993	Eggs

TABLE 2

PERENTIE EGGS: 20 NOVEMBER 1994

Egg No.	Length mm	Width mm	Weight grams
1	86.5	45.5	96.0
2	88.0	43.5	96.0
3	85.0	45.0	92.0
4	90.5	44.5	101.0
5	85.5	46.0	96.0
6	88.0	44.5	96.0
7	88.0	44.0	94.0
8	86.5	44.0	92.0
9	88.5	44.5	98.0
10	83.0	44.5	88.0
11	90.5	44.0	100.0
12	83.5	45.0	94.0
13	91.0	43.5	100.0

Its characteristic that *V. g. caspius* distribution is uneven in places of the same habitat. For example, in 1988 at the same time when *V. g. c.* began to emerge from their wintering burrows, one could encounter 2-3 *V. g. c.* per hectare. On 15 May 1987 there were *V.g.c.* met at 200 meters at 15 specimens per hectare; but on 16 May *V.g.c.* at the same Orinbay farm location at 1500 meters, only 3 *V.g.c.* specimens were found (= 1.7 lizards per hectare). On Greyland plain, *V.g.c.* is extremely rare.

Activity and Reproduction

In Uzbekistan, the reproduction of *V.g.c.* is unknown. The reproduction period of activity is from May to September. In 1987, the first adult lizards were noticed in May, five were seen; later in May, many more were seen. In east Uzbekistan, near Kyzyl-Kum, the first adults were seen on 10, 12, & 21 September of 1983-84. Puberty comes to these lizards at 3-4 years old, with courtship and copulation taking place in May, soon after they emerge from their burrows. The adult females lay their eggs in June-July, with fertility from 8-34 eggs being the clutch size range. The eggs are layed at the end of June, with sizes measured at:

Table 1. Biometrics of *Varanus griseus caspius* eggs found.

	Length (mm)	Width (mm)	Weight (gr)
#1	49.0	26.0	19.3
#2	50.5	27.5	20.7
#3	47.5	28.0	20.3
#4	52.0	27.5	20.9

Pairs of *V.g.c.* were never seen, and the 6 animals captured were all males.

Feeding

Varanus griseus is omnivorous. There are different kinds of rodents, lizards, middle asian tortoises, toads, birds and their eggs which were found in the stomach contents of the animals captured. Some *V.g.c.* were found with the poisonous Kufi (*Vipera lebetina*) and the Asian cobra (*Naja oxiana*) within their stomachs. There are also known cases of cannibalism. The Caspian monitor swallow adult rodent (*Rhombomys opimus*) from 10 seconds to one minutes time. When hungry, a single caspian monitor may eat 2-3 *Rhombomys* at a single feeding. The speed of digestion is from 2-4 days time. A well fed caspian monitor will remain in its burrow for 3-4 days in a very drowsy condition. In June, a great many *Rhombomys* are present,

A CAPTIVE REPRODUCTION OF THE NILE MONITOR LIZARD

(*Varanus niloticus niloticus*)

By Phillip Harris¹, Bill Harris¹, and Michael Fost²

In mid-January 1986, a pair of Nile monitor lizards (*Varanus niloticus niloticus*) copulated, and produced 18 offspring in captivity (Accord, New York, USA). The larger Nile monitor was approximately three years old, having been raised in captivity from a tiny juvenile to a 1.5 meter (m) total length (TLL) adult. This lizard had been in the authors' (PH, BH) care for nearly one year. A slightly smaller Nile monitor, approximately 2.5 years old, 1.35 meter TLL specimen, that had also lived in captivity for most of her life was recently acquired. The larger Nile monitor lived within a glass aquarium with dimensions of 1.8 m (L) x .46 m (H) x .61 m (W).

Due to a lack of cage space, it was decided to place the more recently acquired Nile monitor into the enclosure with the resident Nile monitor. Sexes of the monitors was unknown at this time. From the moment the two animals were introduced to one another, the larger lizard showed obvious 'interest' towards the smaller animal. Within fifteen minutes of being introduced to one another, copulation behaviour was observed. Copulation behaviour lasted 45 minutes. It seemed apparent from the copulation behaviour which was male and which was female.

From the copulation behaviour observed, eggs were expected, hence the male was removed, and the aquarium was modified to accommodate oviposition. A 30 centimeter (cm) layer of pine shavings, soaked with water at one end, covered the floor. A 75 watt flood lamp was placed above this wetter area. Thirty days after copulation, in mid-February, the smaller female dug a hole through the wet substrate beneath the lamp. She dug all the way to the floor, where she deposited her 18 eggs. She covered the hole with the eggs within it, piling the shavings 45 cm, nearly to the top of the cage. The female was offered a rat, to distract her while the eggs were removed from the nest site.

The eggs were placed in damp vermiculite (but dry enough to "pour without clumping") into a plastic sweater box with no airholes upon the box*. An incubator was fashioned from an insulated wine cooler. The temperature was maintained at 28°C, with a humidity of approximately 90%. The humidity within the egg bound sweater box was 100%, evidenced by the presence of condensation on the sides of the box.

Just short of five months (approximately 143-167 days) later, in July, 14 of the eggs hatched, with the following eggs hatching within a 24 hour period.

The smallest hatchlings were only 10-13 cm in TLL, while the largest hatchling was 12 cm in TLL. The average TLL was 20 cm. All of the hatchlings began to feed on crickets, canned cat food, and newborn mice within three days of hatching.

It seems that Nile monitor lizards, so frequently imported, has rarely been bred in captivity (Bayless, 1982). Unfortunately, there is no easy method to determine the sex in *V. niloticus*.

* The authors recommend no more than a 1:1 ratio vermiculite: water by weight, although it was not determined for this event.

Seperation and reintroduction is a husbandry technique that was successful here, and has also been successful with other varanid species (Bennett, 1995).

The adult animals were sold to a proprietor in California, and the authors have been informed that this adult pair have reproduced, with the female depositing additional eggs as well.

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Bayless, M. 1982. Notes on the reproduction behaviour of the Nile monitor lizard, *Varanus niloticus* Linnaeus (1766). *VaraNews* 2(4): 5-6.

Bennett, D. 1995. A Little Book of Monitor Lizards. Viper Press, Aberdeen. 208p + PL.

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BIRTH ANNOUNCEMENT !
GREEN TREE MONITORS HATCH AT THE RIVERBANKS ZOO
COLUMBIA, SOUTH CAROLINA

Two green tree monitors (*Varanus prasinus*) hatched on June 7-8, 1988 at the Riverbanks Zoo and Garden, Columbia South Carolina. The eggs had an incubation period of 177-178 days.

This represents the only second generation managed reproduction of this arboreal monitor in the United States. The F-1 sire and dam of the babies were hatched at Riverbanks and Fort Worth Zoos in 1986 and 1983, respectively.

SOURCE: A.Z.A. COMMUNIQUE SEPTEMBER 1988

OTHER SIGNIFICANT HATCHING:

Rob Faust of Texas reports the captive breeding and hatching of a clutch of Ornate monitors (*Varanus ornatus*). No specifics are supplied as of this writing but will be included in the next issue. This is the second instance of this monitor being bred and hatched in captivity. The first instance was in New York shortly before Rob's hatching / no details yet

Editor's Note:

Gary Maynor Jr. of Ohio bred a pair of Ornate monitors and a clutch of eggs were produced, but shortly thereafter became infertile. This event represents the first captive egg deposition of this species.

These breeding events all happened this year. Hopefully, with the popularity of monitor lizards growing, more successful hatchings of the more 'common' species will continue this year and beyond.

**IF YOU OR ANYONE YOU KNOW HAS HAD A BREEDING SUCCESS / FAILURE
PLEASE SEND DRAGON NEWS ALL THE DETAILS !**

NOTES ON BREEDING THE TIMOR MONITOR

By Roger C. Price

Over the past several years, I have kept many different species of monitors, but the timor monitor, *Varanus timorensis*, is easily one of my favorites. They possess many positive attributes: color, managability, size (approx 20 inches tl), very active, intelligent and breeding potential. One must experience timor monitors to really appreciate them.

GETTING STARTED

All of my experiences are with captive born animals. I believe this is an important factor in my success. My breeding successes began with the acquisition of two different groups of siblings (nine total). From these, I chose two pairs to concentrate on.

Sexing the animals proved to be a challenge, but not an impossible one. A combination of two methods has given me accurate results: Observation of both post-anal bulges and behavior. First, I compare post-anal bulges to give me a general idea of sex. Males have hemipenial bulges, which are usually long and very obvious. Females have very short, slightly rounded, less pronounced bulges.

Next, I introduce the prospective pair and observe their behavior. It has been my experience that a male will immediately begin a lateral head jerk and will approach the female. Once in contact, he will chin-rub the nape of the female's neck, while trying to ride on top of her body.

A female seems to react in one of two ways: She will either do quick, jerking "push-ups" and try to escape, or she will submit and copulate.

Two females placed together will circle each other with their backs arched and their gular pouches enlarged, but will not fight. After an initial "testing" period, they will become used to each other. They will be tolerant cagemates for a short time.

Males will generally act the same as females. However, the dominant male, apparently just by his presence, will usually cause a subordinate male to retreat and hide. I have never witnessed timors

of any sex fight in any way.

HUSBANDRY

Most animals are given 2 foot by 3 foot floor space with a 60 watt spotlight for heat. ambient temperature ranges from 75 degrees to 80 degrees F. The basic daily routine of captive timors seems to be basking, exploring and waiting to be fed. They are extremely curious animals. I will add cage furniture (such as bark) to stimulate their investigative instinct.

Feeding time is once daily on weekdays and twice daily on weekends. I have yet to see a timor eat until it was full. They always seem to want more. Their basic staple food is adult crickets, with week old mice once per week. I occasionally feed them super worms, although observation of the stools seems to indicate poor digestion of this food.

Each timor is housed individually. The cage setup is simple, with a water bowl, basking site and hide area. Females are also given a nest box. The nest box is opaque and filled with a damp half sand - half peat moss mixture.

BREEDING

From March 1987 to November 1988, I have had nine clutches of eggs from three females. Of the initial two pairs, all animals have laid or sired offspring.

Factors contributing to this success are speculative. Even so, I will mention what I believe explains this good fortune:

1. All animals are captive born
2. Animals are kept apart when not being bred
3. Animals are subject to slight seasonal variations in temperature and humidity

All of my timors are " Terminators ", being aggressive feeders. However, when females begin to develop eggs, they step this up a couple of notches to " Nitro - Terminators ". They leap into the air before the crickets have a chance to hit the floor. They charge around the cage, snapping at any movement. They never seem satiated. Females also develop a plump girth to the torso, especially anterior to the hind

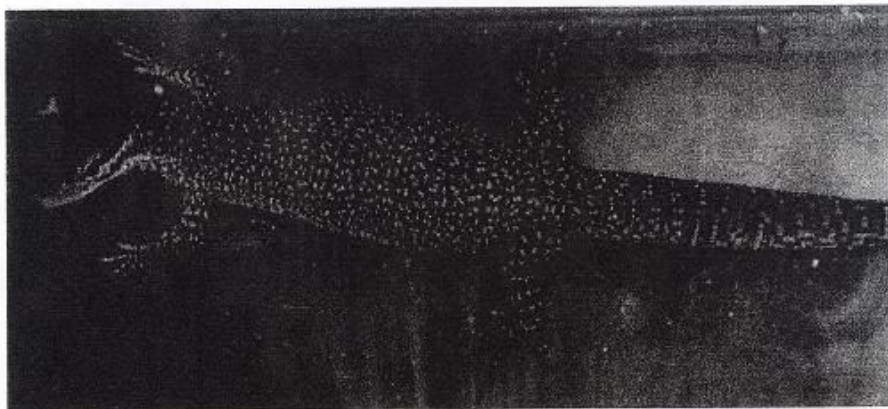
limbs. (see photo 1)

Females Also begin to spend time digging in their nest box. This behavior will increase in duration and frequency until the last two or three days before egg laying. At this time, they lose interest in food. Now, they will not leave the nest until eggs are deposited.

Female #2 (see table) prefers to excavate a corner of the nest box, lay her eggs, then bury them, thus creating a mound. Female #1 digs a tunnel system. It is usually a perimeter tunnel with either one or two accesses. She then leaves the eggs partially buried in the corner of the tunnel farthest from the entrance. The second generation female (3c) prefers to use the method of female #2 (see photo #2).

All females have tenaciously resisted leaving their eggs. Normally, they will scurry away from gloved hands. However, after laying, they must be forcibly removed. They often return to feeding the same day they lay. Figure #1 shows clutch data. Generally, females initially lay seven eggs. They later seem to peak at nine eggs. Eggs incubated at 83° - 84° F hatch in 100 to 120 days. Photo #3 (clutch 8) (see parting shots at end of newsletter for the next photos).

Hatchlings are housed as a group. They begin to feed after 4 to 5 days. Out of the egg they are about six inches total length. I have retained one hatchling. This female (3c) reached 15 inches in one



year. She also laid a clutch of seven eggs at that age (photo 2). On the same note, a one year old male sired a fertile clutch of eggs.

REFLECTIONS AND CONCLUSIONS

I have been involved with keeping and breeding reptiles since 1969. My roots, as with most varanid enthusiasts, began with snakes. I turned to monitors after many discouraging encounters with the "Moneyculturist ". I found that monitors were the most amazing, exciting and personable reptiles I have ever seen. They rekindled my love for scaly things.

One of several positive aspects of monitors is that it is a relatively new field. Unlike other things in our capitalistic, profit driven society, monitors have so far escaped unilateral corruption. I find almost everyone that I talk to who keeps varanids does so for the love of the species, not the love of the dollar. They all have been warm, eager to share and go out of their way to offer help. Thanks to all of you who can be classified as *varanus enthusiasts*. Monitor lizards are a unique group : The best kept secret in the herp world.

THE THRILL IS BACK !

Breeding success has been wonderful, for two reasons. First, it may keep timers around for a longer time. More importantly, I hope breeding success will take some collection pressure off of wild populations.

If you love monitors, acquire captive born animals (if possible) and breed. Be a pioneer. Join the next wave *Monitors!*

THANKS TO :

My wife, Janet, who always encourages me and helps me with photos and much more.

Aaron Hampton, of the Brookfield Zoo, who showed me there's more to monitors than Savannahs, and has provided tons of husbandry information.

Mike Fost of Zoo Atlanta, who also provided alot of information and who reminded me that money

is not our goal.

Patrick "Jim" Nabors

who taught me to never trust a "friend".

Last, but not least, John Hogston, who encouraged the writing of this article and who has also put together a pioneer publication that will soon ride the crest of "The Next Wave". His non-profit efforts are tremendous and proves his love for monitors.

FIGURE 1: Animal identification and clutch / hatch data.

KEY:

A = Light phase sibling group (P. Nabors)
B = Dark phase sibling group (Ft. Wayne Children's Zoo)
C = F2 (Second generation) cross of A x B

1. 0 = Male

0. 1 = Female

' S = Assigned by age and time they reproduced

FEMALE. 1A CROSS WITH MALE. 1B. RESULTS:

Clutch 1: 7 eggs laid on 3/3/87, 5 hatched on 6/27/87

Clutch 2: 9 eggs laid on 4/23/87, 7 hatched on 8/3/87

Clutch 3: 9 eggs laid on 5/30/87, 5 hatched on 8/15/87

Clutch 4: 8 eggs laid on 12/14/87, Infertile (this clutch was produced with male 2A)

Clutch 5: 10 eggs laid on 7/8/88, eggs went bad at 80 days (this clutch was also with male 2A)

FEMALE. 2B CROSS WITH MALE. 2A. RESULTS:

Clutch 1: 7 eggs laid on 12/15/87, Infertile

Clutch 2: 9 eggs laid on 3/7/88, 9 hatched 6/9/88

Clutch 3: 10 eggs laid on 11/20/88, ? hatched 2/89 ? (Still in incubator at the time of this writing)

FEMALE. 3C CROSS WITH MALE. 2A. RESULTS:

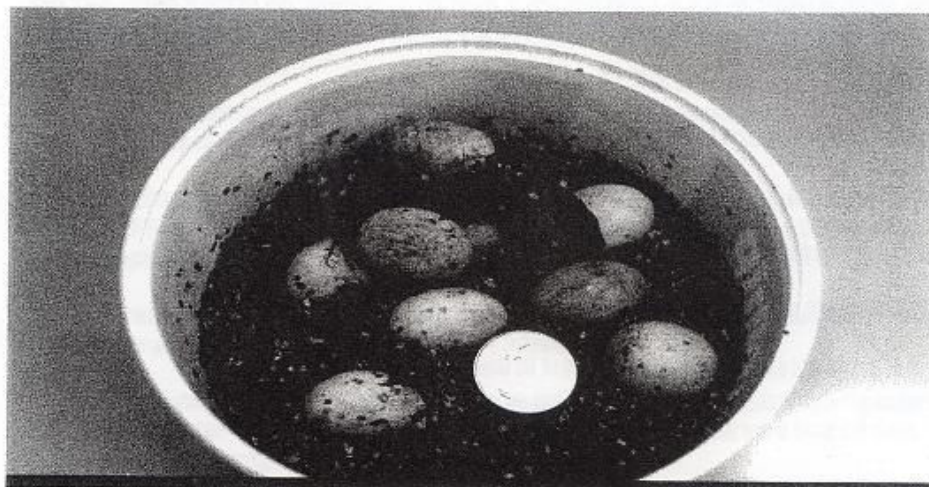
Clutch 1: 7 eggs laid on 7/13/88, eggs went bad at 60 days

PARTING SHOTS

Photo #2, Female timor #3c, laying clutch #1
Courtesy of Roger Price

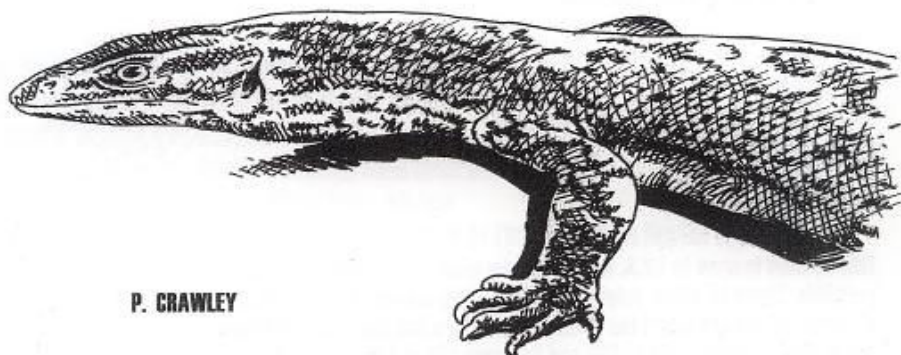


Photo of clutch #2 from Female #2B
Photo courtesy of Roger Price



LV.A. BONUS PIC PAGE !

V. ALANTHURUS



P. CRAWLEY

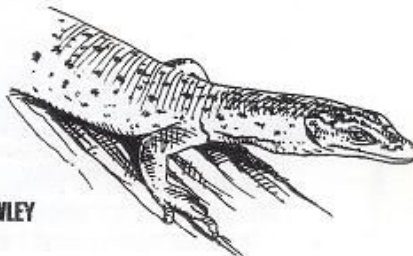


V. timorensis Photo by JOHN HOGSTON



CLASSIFIEDS

V. SAUDOLINGBATUN



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FOR SALE: Storr's monitors, hatchlings, \$525 each. Argus hatchlings, \$175 each. Timors available regularly. Patrick 308-662-2609.

FOR SALE: Back issues of Dragon News I \$40 U.S. for current set. Make check out to I.V.A. and mail to John Hogston, 1740 Norfolk Ave. #14 Saint Paul, MN 55116 USA.

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V. timorensis

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