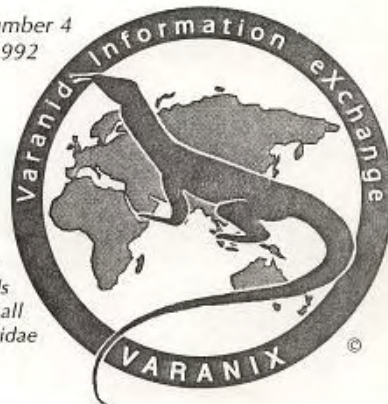


VaraNews

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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 Varanidae

General Info

Several readers expressed concern over some of the captive husbandry practices described in publications discussed in last month's Book Review insert. Perhaps a few words on the purpose of the book reviews is in order.

These reviews are published to provide the reader a synopsis of each publication's content, focusing on the potential value to the varanophile. These reviews are neither judgment calls nor blanket approval of ideas and opinions presented by each author.

Most of the captive husbandry techniques appearing in this newsletter are based on individual experiences and are presented as such. Best efforts are always made to qualify and verify what is described in these pages. However, what works in one case may not work in another.

Publishing information on medical techniques can be a no-win situation. On one hand, not everyone has access to a knowledgeable veterinarian or experienced herpetologist. This means that each varanophile must strive to be as knowledgeable and self-sufficient as possible, learning from the experiences of others through publications such as VaraNews. On the other hand, it is a near-impossible task to publish a written tutorial on most medical procedures, especially of a surgical nature, that would be of use to most people (not to mention potentially dangerous).

Remember that you, the reader, are the most important part of the editorial review process. *You are always advised to question and analyse what you hear/read and to consult with experienced individuals, especially with medical procedures.*

If you read something you feel is questionable or wrong, let others hear what you have to say.

Speaking of books: Check out the bibliographies of articles for sources of information about monitors, such as the one for the notes on the reproductive behavior of the Nile monitor, compiled by Mark Bayless, later in this issue.

Until recently, monitors for sale were gleaned from dealer price lists and published in the Ads/Notices section. Unfortunately, there is seldom much information provided about their physical condition. In order to best serve the readers interest, future ad submissions for the sale/trade of monitors must include a description of each specimen, including physical condition and size.

Legislators at Work

Florida's Compromise Bill (HB1476) seeking to raise fees for wildlife permitholders and to fund increased inspections died in the house of representatives, after having been passed in the senate. Members of Florida's League of Herpetologists were acknowledged for letting their voices be heard in opposition.

According to the report in Pet Product News 5(7):12-13, this buys Florida herpetologists one year until the American Humane Society reorganizes and lobbies this platform again next year. "La lutte continue" (The struggle goes on.)

A reoccurring thought is that a varanid voice, especially on the part of the amateur, will need to be heard at some point (soon?). As the visibility of monitors increases, the non-varanophile world (e.g., legislators) will be most influenced by the loudest voices. And if that happens to come from the *opposition?*

It might be wise to begin putting together some facts and figures, a press release kind of package, that portrays the need for captive varanid husbandry/breeding. The message must be concrete enough to respond to opposition from every adversarial point of view: decimation of wild populations (the skin trade is the primary culprit), inability of amateurs to properly care for monitors (successful captive breeding would be an effective countervoice), danger to the general public (education of the masses that monitors can be as properly and securely maintained as any creature).

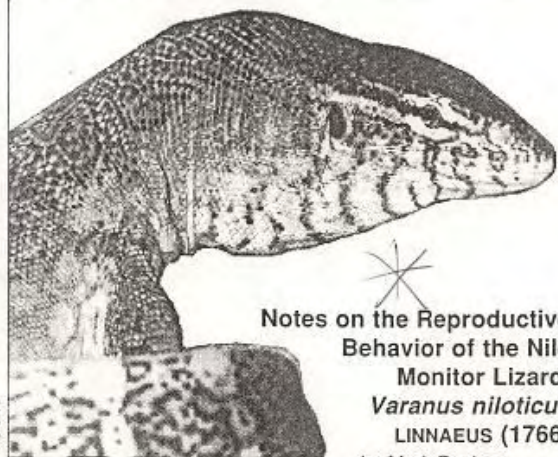
whatever. They are able to observe me for long periods of time in a non-threatening situation. My reasoning is to accustom them to my presence such that they remain less nervous when we are in close quarters, such as at cleaning time. (I do not attempt to "tame" my monitors through frequent capture and handling. Some are handled at most once per week when moving them between indoor and outdoor enclosures; others may be handled only once every few months for weighing and measuring. Each individual is allowed to reach its own "comfort level" with my presence, which ranges from thrashing & snapping to quite approving.)

Observations of a single animal are of value in understanding that specific animal. It is collective observations that will lead to a greater understanding of each species. VaraNews is one vehicle which offers each reader the opportunity to share her or his experiences with other varanophiles (especially to assist the initiate get off to a good start). To this end, you are invited to publish your experiences in these pages.

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Original Articles



Notes on the Reproductive Behavior of the Nile Monitor Lizard, *Varanus niloticus* LINNAEUS (1766) by Mark Bayless

Lacerta nilotica was first described by Swedish naturalist, Carl von Linne (1707-1778), also known by his latinized name "Carolus Linnaeus". The species is composed of two forms: *Varanus niloticus niloticus* LINNAEUS, 1766 and *V. n. ornatus* DAUDIN, 1803. Linnaeus described *V. n. niloticus* as "General form slender; digits moderately elongate; nostrils round, a little nearer eye than to end of snout; head usually at

least twice as long as broad; snout depressed at tip; canthus rostrils sharply marked" (Fitzsimmons). Francois-Marie Daudin (1774-1804) described *V. n. ornatus* in 1803 as "Nostrils medial, above black, beneath white; throat, with nine black bands; nape, with four or five curved lines, and with seven bands of round white spots" (Cuvier).

The geographical distribution of *V. n. ornatus* is in West Africa from Senegal east across Africa to Cameroon and south to Cabinda. (Ironically, the range of *V. n. ornatus* does not include the central-east African country of Burundi, though it is this subspecies which is commonly referred to as the Burundi Nile.)

V. n. niloticus inhabits regions along the Nile River of Egypt south into east South Africa and most regions south of the equator at all elevations providing water is close by. *V. n. ornatus* inhabits regions described above, at elevations from sea-level to 500 meters. The reproductive behavior described in this paper is for *V. n. niloticus*, the majority of recorded observations being from S. Africa.

The phases of reproductive behavior that have been observed include male-male combat, copulation, egg deposition, and hatching of *V. n. niloticus* babies. Unfortunately, this behavior has been very rarely observed in the wild and much less so in captivity.

The Nile monitor is reputed to be highly territorial, especially against other male Nile monitors (Branch, 1991). Unsexed Nile monitors have been observed in combat behavior in North Zululand, clawing and rolling about on the ground and in rock crevices (Hoffman, 1989). Combat behavior can be described as the violent, quick circling of the combatants around one another, attempting to bite and claw the opponent about the head and neck, while simultaneously hissing and tail-lashing. This behavior lasts as long as both combatants persist. If one of the males should retreat from the combat, it may be sought after by the victorious male.

(Author's note: I have observed similar behavior with male Savannah monitors, *V. exanthematicus*, often in June and July.)

Copulation behavior has been described as: "The male Leguaans will claw the female on her back and tail before copulation take place. The male entwines his tail with hers and fertilization is internal" (Hoffman). This behavior is known as "fawning behavior", as it was first described by Alfred "Gogga" Brown (1834-1920) in his observations of the courtship behavior of the White-throat monitor, *V. albigularis*, from 1876 to 1916 (Branch, 1991).

The time of the year that copulation takes place appears to be on a hormonal-cyclic basis. The size and weight of the testes and ovaries varies depending on the time of year. Animals collected in Senegal (*V. n. ornatus*) showed that the weight of the

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gonads show little variation from January to May, except for a weight increase in February. A progressive rise in the weight of the gonads takes place between June and September followed by a drop from October to January. This data would indicate that during the months of June to September, and especially in September, the hormonal urges of the sexes is highest in promoting reproductive behavior (Cissé). This data compared with the records on egg deposition listed in Table 1 would indicate that it also has a similar hormonal cycle as does its northern counterpart.

It is estimated that egg deposition takes place four to six weeks after copulation and fertilization (Horn). There are observations of the discovery of *V. n. niloticus* eggs deposited within antheap mounds, along river banks of the Middle Zambezi Valley and Umfolozi River and within soft soil (Branch, 1991; Branch & Erasmus; Bourquin, 1990; Cowles; Haagner, pers. comm.; Hoffman).

From 1876 to 1916, Alfred "Gogga" Brown kept detailed notes on the geology, meteorology and reptiles around him in his South African home. He described the Water Leguaan's (local name for Nile monitor) use of termite (*Nasutitermes*) mounds as the nesting site. Gogga once heard of the discovery of 30 hatchling Nile monitors, no more than 6 inches in length, wiggling and crawling about in a disrupted antheap (termite mound). It was during autumn. In conversations with another neighbor, Gogga recounts: "On the monitors, I was having a chat with a farmer friend recently regarding Leguaans when he said they often lay their eggs in antheaps..." "He made the extraordinary statement that the eggs take 3 years to hatch, backing this up by saying that every few years Leguaans become scarce which remains to be the case for 3 years or so and then they appear in numbers again" (Branch, 1991).

In Raymond B. Cowles (1896-1975) detailed treatise on the Nile monitor (1930), he discusses incubation time as being approximately 10 months. Cowles noted that the Nile monitor hatchlings will stay within the termite mound until all the eggs have hatched. The new hatchlings then all dig their way out in a near vertical direction, impervious to the attacks of termite soldiers attempting to defend their nest.

Branch (1988) reports that Nile monitor eggs are laid after the rainy season and may take as long as a year to hatch. Sprackland (1989) reports that eggs incubated in captivity at 26 - 31 C, with a humidity of 65 - 75%, may hatch in 129 - 175 days.

What follows is a list of the African varanids and studies done on their reproductive behavior in captivity: White-throat monitor, *V. albigularis* (Bom; Staedeli; Visser); desert monitor, *V. griseus caspius* (Grechanichenko, pers. comm.; Igoikin); savannah

monitor, *V. exanthematicus* (Bayless, in press). The range and reproductive behavior for the Yemen monitor, *V. yemenensis*, remains a mystery.

Table 1. Clutch Size of *Varanus niloticus* LINNAEUS in the Wild and in Captivity

Collected/ hatched*	SVL (mm) of female	No. eggs	Egg Dimensions (mm)			Reference
			L	W	H	
November	1435	43	50	35		Barbour & Loveridge Bourquin Branch, 1991/ Gogga Brown
		63				Cowles, 1930
	1942	56				Haagner (pers. comm.)
Sept-Oct. 1926		16-34				
Jan. 1 1988	1379 (TL)	23*	36.16	32.89	36.23	Haagner (pers. comm.)

* See Table 2 below for data on 16 of these eggs

Table 2. Biometrics of Young Hatched from Jan. 1, 1988

Locality: Manyeleti Game Reserve, S. Africa. (Haagner, pers. comm.)

TL (mm)	SVL (mm)	Wt. (g)	TL (mm)	SVL (mm)	Wt. (g)
270	110	19.1	295	112	20.2
260	110	21.3	270	110	20.4
260	105	19.0	275	110	18.7
265	110	19.5	278	112	21.8
274	112	19.1	280	114	20.8
265	110	18.7	270	114	18.7
278	115	18.0	282	114	21.3
271	114	19.5	275	110	19.5

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