HOPLOCEPHALUS BUNGAROIDES, THE BROAD-HEADED SNAKE IN CAPTIVITY

By: Raymond T. Hoser, 41 Village Avenue, Doncaster, Victoria 3108, Australia.

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INTRODUCTION

Broad-headed Snakes are easy to maintain in captivity. As captives they are very easy to maintain, so handling them is rarely necessary. They are also long lived. Captives held in excess of ten years are common. Wollongong herpetologist Marion Anstis successfully kept a specimen on a diet of mice for over 19 years. That was the same specimen that didn't eat at one stage for over 12 months. I have never kept this species myself, so the following account in relation to keeping these snakes is in effect second-hand.

No keeper has ever indicated problems with these snakes. The general consensus is that they are among the easiest and most durable Australian elapids to keep. They don't seem to be prone to any particular ailments and breed readily.

IN CAPTIVITY

Probably the most expedient method to keep these snakes is in shoe-box style accommodation used successfully with small colubrids and other reptiles. Most keepers however seem to house these snakes in modified fish tanks and/or wooden snake cages set up with rocks and other natural artifacts, the mandatory water bowl and so on. The most common substrate used is gravel.

Temperatures should not go below 10°C or above about 30°C. The cage should always have a temperature gradient so that the snake(s) can select their preferred temperature. Captive snakes will actively thermoregulate. Seasonal/overwinter cooling is recommended and probably essential for breeding success. Three separate breeders regularly achieved success without separation of the sexes prior to breeding. There has never been a need to attempt to induce mating in Broad-headed Snakes. Hayes (1973a) documented a case of a male Broad-headed Snake mating with a female Stephen's Banded Snake in the same cage. The male snake apparently chases and 'corners' the female before mounting her. Mating has been observed at as low as 12°C.

Male combat hasn't been documented for *Hoplocephalus* and according to Shine (1983) it is unlikely as the females tend to be larger. It is when the males are usually the larger sex that male combat is a common behaviour. Certainly keepers of Broad-headed Snakes have not yet documented fights between co-habitants of cages or similar behaviour.

Adams (1973) stated that, based on his experiments keeping the genus, he thought Broad-headed Snakes weren't cannibalistic, but that the other species in the genus were. In spite of the above statement, there have since been documented cases of cannibalism in this species. Herpetologist Greg Sinclair had a large adult Broad-headed snake eat a cage-habitant of the same species that was less than half it's length. It was later regurgitated

partially digested. In a similar incident a large specimen (s-v 53 cm.) ate another individual (s-v 41 cm.) which was not regurgitated. White (1973), also reported an adult consuming two large Small eyed Snakes *(Cryptophis nigrescens)* whilst in captivity. Wells, Wellington and Williams (1988) also reported on a captive Broad-headed Snake feeding on an immature Yellow-faced Whip Snake *(Demansia psammophis)*. Captive Broad-headed Snakes have also been induced to eat young Bluetongue Lizards *(Tiliqua scincoides)* and even live fish dropped onto the cage substrate. How much of this behaviour was unusual to captive specimens, as opposed to what takes place in the wild is yet to be established. Where these snakes occur in the wild, tadpoles/frogs of several species are sometimes available and may constitute food in some circumstances.

When feeding, these snakes will usually sit and wait for food to approach as opposed to actively forage for it, although this is in part depends on the set-up of the cage. When snakes bite their food, they tend to hang on to it and immobilize it by using their body to push it against a restraining surface such as a rock. Using coils to restrain prey (like constriction) has also been observed. Food is eaten only when the prey is completely subdued by venom.

Shine and Fitzgerald (1989) documented mating in captive snakes in spring (September/October) with live young being born in January to March (4 breedings). This correlates with what is seen in terms of reproduction in wild specimens. However I have been advised by other keepers that male Broad-headed Snakes will mate, and mate repeatedly

Foto 1: *Hoplocephalus bungaroides*. Volwassen exemplaar uit Lawson, New South Wales. Adult from Lawson, New South Wales.
Foto: Raymond Hoser.

at any time of years. The Autumn and Spring periods were the periods of most intense mating activity. However, offspring were only produced in the period Summer/Autumn. Mark Fitzgerald got litters of between 4 and 12 youngs in four breedings. Including other documented cases, all liters for the species range between 2 and 12 and in the period January to April. All breedings to date have been in Eastern Australia which is where the species occurs naturally. However there is nothing to suggest these snakes won't reproduce just as successfully if kept elsewhere.

The actual mating act in Broad-headed Snakes has only been observed once by myself (when visiting a keeper of this species). Mating appeared no different to that observed by myself in other Australian Elapids. The male had aligned his body over that of the female and was rubbing himself (in particular the head and chin) over the female. He was trying to raise the female's tail with his own. Both snakes moved their tails vigorously when this was done. I've been told that observed copulation usually lasts from one to several hours (often seeming to go on all night.) See Hoser (1983) for a description of mating behaviour in Death Adders *(Acanthophis antarcticus)*. The main observed difference between the two species is that the female Broad-headed Snake does not rapidly twitch her tail in the same 'end-shaking' manner as the female Death Adder, when first mounted by the male. Hayes (1973a) documented five repeated copulations between a male Broad-headed Snake and a female Stephen's Banded Snake. No offsprings were reported. Carpenter and Ferguson (1977) discuss stereotyped mating behaviour in reptiles in detail.

Known distribution of Hoplocephalus bungaroides.

According to Sydney breeder Charles Acheson, the actual act of giving birth is very quick, with the young snakes being expelled from the female at great speed, making photographing the act fairly difficult. He also noted the young snakes rapidly moved away from the female shortly after birth. He has bred these snakes many times.

Like the adults, young snakes are also pugnacious. Shine and Fitzgerald (1989) quoted snout-vent lengths of newborns ranging from 21.8 to 22.7 cm. A problem indicated by Shine and Fitzgerald, Acheson and another breeder, Richard Shearim, has been stillborn young and unfertilized ova (eggs). An identical scenario seems to commonly occur in Death Adders *(Acanthopis antarcticus)* another live-bearing Australian elapids. It also probably occurs in other reptiles. Shine is now investigating the cause/s of this phenomenon.

Mirtschin (1985) has speculated that a cause of stillborn young in captive snakes may due to overheating of the gravid female. When he altered the substrate of his cages to

make them cooler, he reduced the rate of stillborn young. However the reduction in stillborn young may also have been a result of some other factor such as the female snake/s increasing in age/maturity.

Also in line with Death Adders *(Acanthophis antarcticus)*, Broad-headed Snakes will feed prior to sloughing while the eye scales are clouded. There are no accurate records of growth rates or sloughing frequencies in either captive or wild snakes although Shine, Webb and others are presently attempting to address these issues.

VENOM

Broad-headed snakes are highly strung and won't hesitate to attempt to bite. When agitated a snake will raise the forepart of it's body in an s-shape, flatten and broaden it's head and strike repeatedly at any object brought within range.

Although one fatally is known from the bite of this snake, it isn't usually regarded as dangerous. The bite is however painful. Severe bites can be neutralized with Tiger Snake *(Notechis)* anti-venom, although this is rarely indicated because the effects of the horse-serum may well be worse than those from the venom itself.

The venom is powerfully coagulant and neurotoxic. It also has weak blood destroying properties (Mirtschin and Davis, 1992). Severe bite symptoms include drowsiness, slurred speech, lack of muscle control and local swelling.

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