

HUSBANDRY AND REPRODUCTION OF THE NORTHERN TERRITORY/ KIMBERLEY FORM CARPET PYTHON, *MORELIA SPILOTA VARIEGATA* (GRAY, 1842)

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INTRODUCTION

The Carpet python is a well known Australian boid found in all mainland states and showing considerable variation in adult size, colouration and abundance over its range.

Under the broad 'Carpet python' heading, a number of separate species and subspecies exist.



Foto 1: *Morelia spilota variegata*, vrouwtje 4, drachtig, tekening en kleur specifiek voor de Northern Territory/Kimberley vorm, windingen gedeeltelijk gedraaid, typisch voor drachtige pythons. Gravid female 4, showing distinctive pattern and colouration of Northern Territory/Kimberley form, coils partially inverted, typical for many gestating pythons.

Foto: Brian Barnett.

Morelia spilota spilota (Lacepede, 1804) - Coastal New South Wales.

Morelia bredli (Gow, 1981) - Arid Central Australia.

Morelia spilota imbricata (Smith, 1981) - South Western Australia.

Morelia spilota variegata (Gray, 1842) - Remainder of range.

However, *Morelia spilota variegata* has been further broken down by some authors into various geographical forms. i.e. Colour and size which is confined to Carpet pythons of particular regions only and is continuous within that given area. Examples are:

- Jungle (Atherton Tableland) form, (Banks, 1979; Wilson & Knowles, 1988; Hoser, 1988).
- Murray/Darling form (Banks, 1979; Wilson & Knowles, 1988; Hoser 1989).
- Northern Territory/Kimberley form, (Wilson & Knowles, 1988; Hoser, 1989).
- Typical form, Banks, 1979; Wilson & Knowles, 1988; Hoser, 1988).
- Dorrigo/Kempsey intergrade, (Worrell, 1963; Cogger, 1975; Wilson & Knowles, 1988; Hoser, 1989).

For detailed information on distribution, colouration, size etc., which is beyond the scope of this work, refer to the various authors cited.

The subject of this paper is the Northern Territory/Kimberley form of the nominate race, *Morelia spilota variegata*. Interestingly enough, whilst this has never been a common snake in captivity, the holotype (first described) of the subspecies was this form, being collected at Port Essington, N.T., (Worrell, 1963).

The Northern Territory/ Kimberley form typically presents with pale tan to orange background colouration with cream bands posteriorly and broken bands and blotches anteriorly bordered by black scales, two or so wide. Ventral scales are cream to lemon/yellow with black markings. Adult size appears to be about two metres.

Disposition is similar to other Carpet python forms where careless handling or disturbance of the resting animal may result in a bite - but not overtly pugnacious

The snakes involved in this breeding attempt were;

No. 1 - Male, approximately 4 year old, raised in captivity.

No. 2 - Male, approximately 4 year old, raised in captivity.

No. 3 - Female, long term captive, wild caught.

No. 4 - Female, approximately 4 year old, raised in captivity.

All snakes are approximately 1.8-2 m (total body length) and weigh in the vicinity of 1.8 kg.

HOUSING

All reptiles in my collection are housed in individual cages in a sub-floor cellar style room situated below the dwelling. As the walls are double brick and below ground level, the room is well insulated and prevailing weather conditions have no short term effect on ambient air temperature. I have never recorded room temperatures above 28°C regardless of how hot it may become outside. Average ambient air temperatures are 24-26°C/summer and 16-18°C/winter.

Room lighting is provided by two double 120 cm fluorescent ceiling fixtures fitted with 40 Watt 'cool white' globes. These are connected to a mains timer to provide a day/night cycle which varies from month to month.

All individual cages have 'daylights' of various wattages and monthly manipulated photoperiods. These particular Carpet python units employ 15 Watt incandescent 'pearl' bulbs which are fitted to a plug in type timer and in any given month provide a photoperiod 30 minutes shorter than the ceiling lights. By adjusting the cage lights to come on 15 minutes after the ceiling lights and extinguish 15 minutes before the ceiling lights, a dawn/dusk effect is created within the units. Photoperiod is manipulated to provide maximum daylight hours in summer and minimum in winter, following a Melbourne cycle.

Carpet pythons no.'s 1, 2 & 4 are housed identically in 19 mm particle board, top opening boxes measuring 45x40x45 cm (lxwxh), with a 4 mm thick glass window in each lid. No. 3 is housed in a front opening 19 mm particle board unit which is one of a bank of four, each measuring 60x57x45 cm (lxwxh). The entire front, except for a 38x22 mm wooden 'substrate retainer', is a hinged, aluminium framed 3 mm glass door.

The cages, in each instance, are ventilated by a 12x6 cm plastic cupboard vent and utilize a washed aquarium gravel substrate. All cages are also provided with a hollow log of appropriate size for security. Water is available at all times in removable plastic bowls of 15 cm diameter, set in cement moulded supports to avoid spillage.

HEATING

All cages are heated by means of light bulbs. Each of these Carpet pythons cages has three standard batten holders mounted horizontally towards the top of the back wall. two are fitted with 25 Watt blue incandescent bulbs wired to a Landis & Gyr RAD5 thermostat and one 15 Watt pearl incandescet bulb used for lighting.

Because of the extremely stable temperature conditions in my herp room, I am able to leave my 'daylights' on year round without the risk of overheating the cages. In the units described the daylights provide a daytime temperature of around 30°C in the summer and 26°C in winter. The blue thermostatically controlled globes are set at 26°C and in the warmer months only come on when the daylights are extinguished.

In effect, I am able to provide a desirable daily temperature fluctuation with this simple method, rather than using two thermostats.

FEEDING

The four Carpet pythons are fed exclusively on rodents, primarily bred on the premises and freshly killed, but occasionally thawed. No. 3 eats mice only and seems to prefer thawed. However, it is thought that fresh food items are more desirable. The other three have graduated to rats after being raised on mice.

These snakes may be fed at any time of the day or night and no regular routine is in place regarding frequency of meals. All specimens except no. 3 were fed weekly until reaching maturity, at which time an attempt was made to contain their growth due to space limitations. Females are fed more than males to ensure good fat-bodies to assist the development of eggs. No vitamins or supplements are added.



Foto 2: *Morelia spilota variegata*, vrouwtje 3, eieren leggend, links boven en rechts midden zijn 2 onbevuchte eieren zichtbaar. Female 3, laying eggs: infertile eggs - upper left and centre right
Foto: Brian Barnett.



Foto 3: *Morelia spilota variegata*, vrouwtje 4, broedend op 11 eieren. Female #4, breeding 11 eggs. Exhibiting brooding behaviour found in all python species.
Foto: Brian Barnett.

BREEDING

Specimens no's 1, 2 and 4 were sexed by probe as juveniles and the sexes determined at that time have proved correct. No. 3 was probed as a female upon coming into my care as an adult.

Breeding attempts prior to 1989 were impossible. Due to the size and age of no's 1, 2 and 4. All breeding efforts in 1989 proved unsuccessful and no reproductive activity was recorded despite the use of a number of animal combinations and temperature manipulations.

Some authors have stated (Slip & Shine, 1988; Weigel, 1988) and personal experience in my collection and others (S. Cook and P. Newman, pers. comm) has shown that probing of Carpet pythons may not always be a reliable indication of sex, with some females probing to the same depth as males. As a result, pelvic spurs have been cited as a fairly reliable uninvasive indicator (Slip & Shine, 1988; Weigel, 1988), with males having larger, broader 'hooks/claws' on their spurs. Another method I have found useful with other Carpet python morphs in my collection is to place the suspect snake with a proven, mature male. If the intruder is female, quiet acceptance or reproductive activity will usually occur; should it be a male however, boisterous activity and/or escape attempts with both snakes, will begin almost immediately.

In June 1990 I decided to mix specimens of this group to determine by their behaviour if their suspected sexes were correct.

The first introduction of no's 1 and 3, at midday June 25th, resulted in copulation within 30 minutes. As no. 1 was observed raking its pelvic spurs over the dorsum of no. 3, it was determined to indeed be the male of the pair. Two days later on, the 27th June, no's 2 and 4 were introduced to each other. Within hours no. 2 was seen to be 'spurring' no. 4, thus proving their original sexing correct. A fifth specimen of this form, not included in this work, was determined to be female using this method, and these males, during this reproductive period.

When this reproductive activity, which was in complete contrast to the preceding season, was observed, temperatures were lowered slightly and introduction of the females were made systematically to each male.

Male, no. 2, was seen to be courting the females on a number of occasions, however copulations were only seen in the cage of no. 1. The small size of these cages frequently made clear observation impossible.

All the snakes involved were fed throughout this breeding period and copulation and courtship were noted within 3 days of males consuming large rats and still exhibiting considerable abdominal swelling.

Female, no. 3, was fed between reproductive activity and fed eagerly until July 23rd, when feeding ceased. Around the same time a solid thickening was felt in the lower half of her body. Her behaviour also changed at this time and she remained in her hollow log constantly. She was kept isolated from this time on.

After some six weeks, when mating activity ebbed, temperatures were restored to normal and all snakes permanently separated again. Soon after female, no. 4, was found to be refusing food and lying belly-up in typical gravid python fashion. No. 3 was also observed to have coils inverted while resting in her log, on a number of occasions. On closer inspection, no. 4 exhibited the same abdominal swelling and was determined to be gravid also.

During this latter period, I was to be hospitalised frequently due to severe ill health and as a result the decision was made to transfer both gravid snakes to Brian Barnett for management of the females and incubation of the eggs. Gestation was



Foto 4: *Morelia spilota variegata*. Net geboren jong, dorsale en ventrale rode kleuring by alle pasgeborenen aanwezig. Newly hatched young, demonstrating dorsal and ventral reddish colouration exhibited by all hatchlings.
Foto: Brian Barnett.



Foto 5: *Morelia spilota variegata*, jong na eerste vervelling, Northern Territory/Kimberly. Hatchling Northern Territory/Kimberley carpet python after first slough.
Foto: Brian Barnett.

reportedly uneventful. Both females fasted throughout and spent long periods basking with coils partially or completely inverted.

LAYING AND INCUBATION

Female, no. 3, produced 12 eggs on 25th October. Of these eight were fertile and four infertile.

Egg lengths,	47.7-52.3 mm,	mean 50.4 mm (n=8)
Egg width,	35.3-37.6 mm,	mean 36.5 mm (n=8)
Egg weight,	37.4-41.1 g,	mean 38.4 g (n=8)

Female, no. 4, laid 11 fertile eggs on 11th November.

Egg length,	50.8-64.3 mm,	mean 54.0 mm (n=11)
Egg width,	31.7-38.8 mm,	mean 36.4 mm (n=11)
Egg weight,	38.6-42.8 g,	mean 41.1 g (n=11)

The 19 fertile eggs were separated from their adherent clumps and incubated artificially in sealed plastic bread containers (Barnett, 1981) and a vermiculite/water ratio of 1:1, 150 ml of water to 150 g of vermiculite. Incubation temperatures ranged from 29.5°C to 32°C.

All eggs hatched from the first clutch between 29th December and 1st January (65-68 days) producing eight healthy young. The sex ratio of 3 females and 5 males was determined by probing.

Snout-vent length,	45.0-46.3 cm,	mean 45.8 cm (n=8)
Tail length,	8.3- 8.8 cm,	mean 8.5 cm (n=8)
Total body length,	53.3-54.7 cm,	mean 54.3 cm (n=8)
Weight,	19.9-22.7 g,	mean 21.2 g (n=8)

Eleven normal young emerged from the second clutch between 19th and 20th January, (69-70 days). The sex ration of 7 females and 4 males was determined by probing.

Snout-vent length,	44.3-49.3 cm,	mean 47.9 cm (n=11)
Tail length	8.5- 9.4 cm,	mean 9.0 cm (n=11)
Total body length,	52.8-58.7 cm,	mean 56.9 cm (n=11)
Weight,	22.5-25.6 g,	mean 24.1 g (n=11)

The neonates were less distinctly marked than the adults and exhibited a fairly uniform brick-red colouration, dorsally and ventrally, in contrast to the varied colours of the parents. This colouring and marking persists after the first slough and only alters with growth and successive sloughs.

CARE OF YOUNG

Hatchlings were housed individually in clear top plastic lunch boxes (Click-Clack Brand). Washed aquarium gravel was used as a substrate and water was available at all times in a small, weighted plastic bowl.

As with some other juvenile Carpet pythons housed in this manner, specimens showed a persistent habit of crawling in and out of the water bowl until the substrate is

thoroughly saturated. The provision of upturned plastic bowls of appropriate size as shelters largely alleviate this problem.

Feeding the young proved somewhat difficult with only four individuals taking mice when first offered. A combination of trick-feeding techniques and plain persistence has resulted in all except one of the young feeding voluntarily at the time of writing (September 1991).

FOOTNOTE

It is my opinion that when an attempt is made to breed Carpet pythons every precaution possible should be taken to ensure that the specimens be of the same subspecies and geographic morph. By doing so we will retain many natural forms which are currently held in captivity and not develop captive bred 'mongrels' which could eventually dominate Australian herpetoculture.

ACKNOWLEDGEMENTS

To Brian Barnett who has sacrificed precious time and energy for almost three years to maintain my collection at a moments notice when illness and endless operations prevented my doing so.

Also to Matthew Kettle who never seemed to tire of cleaning mice and rats during the same period. And to the many others who offered help - without these friends I would now be left with a room full of empty boxes.

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