

# Adrian's Reptile World

Notes on keeping and breeding the Australian Green Tree Python  
(*Morelia viridis*) (Schlegel, 1872)

By Adrian Hemens

## Introduction

The green tree python or “Chondro”, in reference to its previous generic name *Chondropython* is restricted to a very small area of monsoon rainforest on Cape York Peninsula. Most active during the summer months at night and particularly after rain, it is usually observed coiled, waiting in ambush on a branch or vine and occasionally on the ground. A nocturnal and arboreal species, that shelters in tree hollows and epiphytic plants during the day. Green Pythons are slender and elongate with a triangular head that is distinct from the neck. The body is laterally compressed and the tail is long, slender and prehensile. Adult specimens are a lime green with a vertebral row of white scales. The ventral scales range from white to yellow in colour.

Hatchlings are a dull orange until their first shed after which they revert to bright yellow. Juveniles are patterned with pale-centered purplish brown lines and blotches and a similar coloured streak from the nostril through the eye to the back of the head. This colouration is maintained for about 12 months before the ontogenetic transition to green occurs over a period of weeks - but can literally occur overnight. Australian green pythons reach about 1.4 metres in length.

Adults are recorded as feeding on mammals which would include the Cape York rat (*Rattus leucopus*), Melomys (*Melomys capensis*) and probably the Antechinus (*Antechinus leo*) as well as various birds. Juveniles eat mostly frogs and lizards with the proportion of mammals in the diet, increasing with age. In captivity juvenile green pythons engage in frequent caudal luring. It is safe to assume that this is a natural behaviour and would occur in the wild.

The green python is one of the more 'recent' arrivals from Papua New Guinea when it was connected via a land bridge to Cape York Peninsula during the last ice age. Other successful migrants include the eclectus parrot (*Eclectus roratus*), palm cockatoo (*Probosciger aterrimus*), spotted cuscus (*Phalanger maculatus*) and rufous spiny bandicoot (*Echymipera rufescens*).

On the Papua New Guinea mainland, green pythons have been well studied and permissive export laws have allowed many different variants to make their way into the reptile hobby all over the world. However, very little is known about the Australian green python population. This is partly because they are very difficult to find. Despite extensive surveys by researchers, they have not been located north of Iron Range or south of Rocky River in the McIlwraith Range and appear to be restricted to monsoonal rainforest pockets. The population at Iron Range is estimated to be 10,000 with at least a similar number in the McIlwraith Range. (David Wilson pers.comm.)

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Other adjacent habitats on Cape York such as wet sclerophyll forest do not appear to support green pythons. However, there are two unpublished records from Lockerbie Scrub north of Iron Range. Other large areas of potentially suitable rainforest habitat in the wet tropics area between Cooktown and Cardwell have not been colonized by the green python as the large stretch of dry country between Coen and Cooktown (known as the Laura Basin-see Lavarack and Godwin 1987) almost certainly prevented them penetrating any further south.

Australia's green pythons are therefore restricted to two small, but secure populations in some of the country's most remote and rugged regions.

Conservation status: Rare (Queensland)

In recent years, the Iron Range population has been the subject of a PhD thesis conducted through the Australian National University in Canberra. The results of this study are in the process of being published. It is unlikely that there is any genetic or physical difference between these populations as there is continuous habitat between them. (David Wilson pers.comm.) However, there is almost no information available on the Mcllwraith Range population.

Typically, Australian green pythons are a lime green rather than an olive green colour and tend to be on the smaller side, with the largest animal recorded at Iron Range being 142cm. (David Wilson pers.comm.) However, the most prominent feature is the characteristic white vertebral pattern exhibited by these animals. Compared with Papua New Guinea mainland populations, they are superficially most similar to specimens referred to as the 'Merauke' type - which is likely where the original bloodstock came from. This vertebral pattern is comprised of a continuous or discontinuous row of white (with occasional yellow) scales extending the entire length of the snake. They may also have a number of clusters of white scales occurring every 4-5 cm arranged at right angles to the linear pattern. The ventral scales of an individual may vary from white to yellow and there may be some small patches of blue anywhere on the body.

In captivity there are matings recorded in the winter months with eggs laid between July and September. Clutch sizes ranging from 15-22 eggs have been recorded.

## **Housing and Management**

Until recently green pythons were considered difficult to maintain in captivity and had a reputation for being aggressive. This is simply not true. With rare exceptions, almost all captive bred green pythons are calm and a pleasure to maintain. If a bite occurs, it is usually because the keeper's hand is mistaken for food, or the aggression is a symptom of another health or environmental issue. Remember, a snappy animal may just be feeling insecure because its enclosure does not provide suitable cover.

In the wild green pythons occasionally take birds – but rodents almost certainly comprise the majority of their diet. Captive animals can be fed once every seven to ten days on a medium-sized dead rat presented with forceps. If an animal refuses food (and you are not cycling it for breeding), it is usually because a skin sloughing is imminent and is no cause for alarm.

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However, it should be noted that in comparison to other pythons, it is easy to overlook the “opaque” stage of the sloughing cycle in this species.

Green python populations likely have varying temperature requirements depending on where they occur. An animal found on the lowlands of Biak Island - the northern limit of the species - is probably adapted to constant high temperatures all year round. While animals found on Cape York Peninsula – the southern limit of the species - would be able to tolerate lower temperatures. Mean July temperatures (mid-winter) for Iron Range are 22.5°Celsius dropping to 17°C on cold nights.

However, I recommend not dropping the temperature in enclosures below 20°C at night in mid-winter and also ensuring the daytime winter temperature remains consistent around 28°C. During summer, set the hottest spot in the enclosure at 32°C with a drop to 26°C at night. Day and night cycling is best done using natural light delivered through a skylight or window.

## Breeding

Attempting to determine sex using a cloacal probe is not recommended until animals are at least 12 months old when females should probe to a depth of 3-4 sub-caudals and males to approximately 10-12 but there is usually some variation with a proportion of animals probing in-between. The reliability of sexing hatchlings by measuring tail length was investigated. The tail lengths of a clutch of 18 one day-old hatchlings was recorded. Measurements were taken from tail tip to cloaca with a reasonable degree of accuracy by flattening the tail against a wooden ruler attached to a piece of timber. Tail lengths ranged between 46mm and 52mm. Animals were then probed at 14 months. The results are listed below.

Identification number	Tail Length (mm) at 1-day-old	Sex as determined by probing at 14 months of age
F1M10605	46	Female
F1M10405	47	Female
F1M11205	47	Female
F1M10105	48	Male
F1M11605	48	Male
F1M11005	48	Female
F1M10905	49	Female
F1M10805	49	Male
F1M11705	49	Male
F1M10205	49	Male
F1M11305	50	Male
F1M10505	50	Female
F1M11805	50	Male
F1M11505	51	Male

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F1M11405	51	Male
F1M10305	52	Female
F1M10705	52	Female
F1M11105	52	Female

As expected, those individuals with the shortest tails turned out to be females, however the three individuals with the longest tails also proved to be females. Based on the results of this clutch I would conclude that tail length of hatchlings is probably not a reliable indicator of sex. Measurements were also collected at 6 months and 12 months for mass, total length, head length and head width and no obvious difference between the sexes was observed. However, at 14 months of age some males already have thicker and more discernable cloacal spurs than females. Males probably reach sexual maturity between two and three years of age and females between three and four.

## Mating

Under normal circumstances, if a good male is introduced to a female, mating will occur at any time of the year. However, cycling the female is the key and this is best timed for early winter when the female will signal her readiness by refusing food. A typical breeding calendar with green pythons is as follows: (see table 1.)

Table 1. Green python breeding calendar.	
January	Female feeding normally
February	Female feeding normally
March	Female feeding normally
April	29th - Female sloughed
May	17th - Female suddenly refuses food after eating ravenously over the preceding 6 months. 28th - Introduced male. Matings observed at the rate of 2-3 per week
June	18th - After this date no more matings were observed
July	15th - ovulation swelling observed
August	5th - Female underwent pre-lay slough. 21st - Female laid eggs between 5 and 11 am.
September	11th - Female resumed eating
October	13th - Eggs start to hatch
November	25th - Female refused food
December	4th - Female underwent post lay slough and then resumed feeding

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## **Egglaying**

Oviposition usually occurs in the early hours of the morning. Clutch size in captivity has ranged between 15 and 22 eggs. The former being a first and the latter being a second clutch. Egg mass is between 22 and 25 gms with a mean of 23 gms. Fertility rate was 100 % with all clutches.

## **Incubation**

I recommend artificial incubation. After egg laying is complete, remove all eggs and separate them where possible. Candle to check for fertility and set them up in a plastic ice cream container 75% filled with about 5 litres of damp vermiculite (70% vermiculite, 30% water mixture by weight). Cover the container with cling-wrap, make a half dozen air holes with a tooth pick and place in the incubator. Set the temperature at 31.4 °C for the first six weeks then reduce to 30°C for the last week. The air should be refreshed in the incubation container every few days but less frequently during the first two weeks when they will benefit from very high humidity. It should be noted that during the first few weeks and particularly the last week of incubation, there is a tendency for condensation to build up on the inside of the cling wrap. It is important that none of this is allowed to drip onto the eggs or they will begin to rot. Eggs usually begin to dimple markedly around day 40 when the rate of evapotranspiration will increase. I recommend manually slitting all eggs on day 49 and hatchlings will begin to emerge within a few days. Hatchlings are a dull orange until their first shed after which they revert to a bright yellow. It is advisable to replace the vermiculite with damp paper towels after the first heads start to appear. This prevents the babies from becoming smothered in vermiculite. Hatchling mass ranges between 11 and 16 gms with a mean of 13 gms, which is above average for the species.

## **Hatchling management and feeding**

Hatchlings should be set up separately in small plastic tubs each containing a perch and a water bowl. Until their first shed at approximately ten days they should not be allowed to become too dry. This is essential and I would recommend spraying them everyday until this occurs. After sloughing, leave them undisturbed for at least a week or two before starting any feeding attempts. Don't assume your babies are drinking from the bowl until you actually see them doing so. Under natural conditions they drink dew and rain droplets off foliage and themselves. Under artificial conditions they can dehydrate quickly so continue spraying at least once every two days for the first month, and longer if necessary. It is probably advisable to inject thawed pinkies with a small quantity of water for the first few months anyway. This is easily done with a fine gauge hypodermic. Make sure the temperature of the hatchlings is at least 28°C during the day or you will not get a strong feeding response at dusk. I begin by offering thawed, unscented 'pinkies' on forceps. Pre-heat them in a glass of warm water. If you are lucky, a few will feed immediately. The remainder should be offered live unscented pinkies and usually a few more catch on. However, the majority of the clutch will need to be tricked into feeding on pinkies, which after all, is not a natural prey item. This can be done by scenting live pinkies with day-old chick down. If that doesn't work try rolling the live pinkie in some chick 'juice' found in the

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body cavity or just under the skin. Do not re-freeze chicks after use as the risk of salmonella poisoning increases. To avoid wastage cut freshly killed chicks up into pieces before freezing and then discard every piece after use. Persistent attempts with this technique should establish most of the clutch feeding on pinkies. Success is also possible using quail, duck and finch to scent in much the same way. The most stubborn individuals may need to be force-fed. Use the smallest day old pinkies lubricated with raw egg white and literally push them down the baby's throat. This requires some finesse and patience and is not recommended for the inexperienced keeper. A last resort is to scent live newborn pinkies with either frog or skink. This usually works a treat and does not require actually killing the frog or skink.

Once babies have had their second or third slough, and are feeding unassisted there should be no more problems. Don't feed babies more than one pinky once every seven days until they are six months old. Feeding more may increase the chance of prolapse. This is most likely due to pinkies being an unnatural food for baby green pythons. I doubt whether it ever occurs in the wild where babies are feeding on small frogs and skinks, which contain more calcium and fibrous matter.

If a prolapse occurs don't panic. It may just be a normal defecation. If the problem does not correct itself within an hour the keeper should then intervene. Begin by coating the prolapse with castor sugar and leave for 30 minutes. By this time it should have shrunk considerably. Wash the sugar off and then with a blunt object such as a sexing probe carefully push the prolapse back into the cloaca and tape it up with a thin strip (5mm wide) of waterproof band aid. Be careful not to completely block the cloaca. The smallest gap is sufficient to allow urates to pass. Feed the affected animal lightly for the next few months. Try to avoid pinkies if you have an alternative. In most cases after the affected animal sloughs, the problem will disappear. It has been speculated by researchers that juvenile green pythons may occasionally feed on invertebrates. Experiments to test this theory using live crickets and cockroaches have not supported this idea. Where babies showed an interest in insect movements they began caudal luring. Insects will not respond to caudal luring and as a consequence all babies eventually lost interest without a single strike being elicited.

Babies will remain a bright yellow colour until approximately 12 months of age when they will turn lime green. This can literally occur overnight, (though most often takes a week to ten days), and seems to be size related i.e., when the individual reaches approximately 60cm in length. However, the vertebral white stripe will start to become apparent from about seven or eight months of age when the scales along the spine enlarge and turn pale. Captive animals will probably live for 20 years or more.

## **Summary**

Green pythons embody the mysterious and exotic nature of tropical rainforests. They are already great ambassadors for a group of animals not often associated with beauty. Most Australians have only ever seen them in books and this is where they would have stayed if not for the efforts of a few dedicated breeders who have put many years into unraveling the mysteries and secrets of this species. While they are still uncommon in the reptile hobby, I am confident that in years to come, they will be much more readily available for all Australians to see and appreciate 'in the flesh'.

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## **References**

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